



Draft Basic Assessment Report

Proposed Bethal-EMzinoni 88KV power line and 40 MVA substation



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Proposed Bethal_Emzinoni 88KV Powerline and 40 MVA Substation

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1. Introduction

Electricity in South Africa is mostly supplied by the parastatal utility, Eskom and municipalities. Municipalities would buy from the power utility and re-sell. About 90% of the electricity is produced by Eskom's coal fired power station fleet. However, many of these power plants are aging and inefficient and have been partly responsible for the rolling blackouts experienced by the country.

South Africa's power system remains highly constrained with Eskom currently implementing rotational load shedding and will be for some years. Keeping the lights on is currently the most pressing challenge for South Africa's electricity supply industry for the next few years. It is also key to the longer-term prospects for the economy. Govan Mbeki Municipality (GMM) as the distributing entity also faces the same challenge for its residents. Load-shedding is the order of the day. The intention for this report is to conduct an environmental assessment process for the proposed development of Bethal_Emzinoni 88KV powerline and a supporting infrastructure, 40 MVA substation, with the intention to enhance electrification system that is under a lot of pressure in both Bethal town and Emzinoni township.

1.1 Project Description and Background

Gert Sibande District Municipality, an Implementing agent of Govan Mbeki Municipality appointed EnpowerMachite as a service provider for the Bethal and Emzinoni Electricity project. EnpowerMachite has proposed the development of a new power line, namely the Bethal_Emzinoni 88kV powerline and a 40 MVA Substation. The project constitutes of a high voltage power line starting from Eskom substation, which is in the Northern Part of Bethal Town, ending at Emzinoni township, where the new 40MVA substation will be located. The proposed 40 MVA substations will be approximately 100m x 100m. The HV Substation will consist of large ground mounted transformers and outdoor high voltage switchgear with overhead conductors and steel monopole structures.

The grid connection will be from the Eskom Bethal Substation via the new 88kV distribution powerlines partially running parallel the existing servitudes for 88KV and 22KV lines, then traverse a few farms.

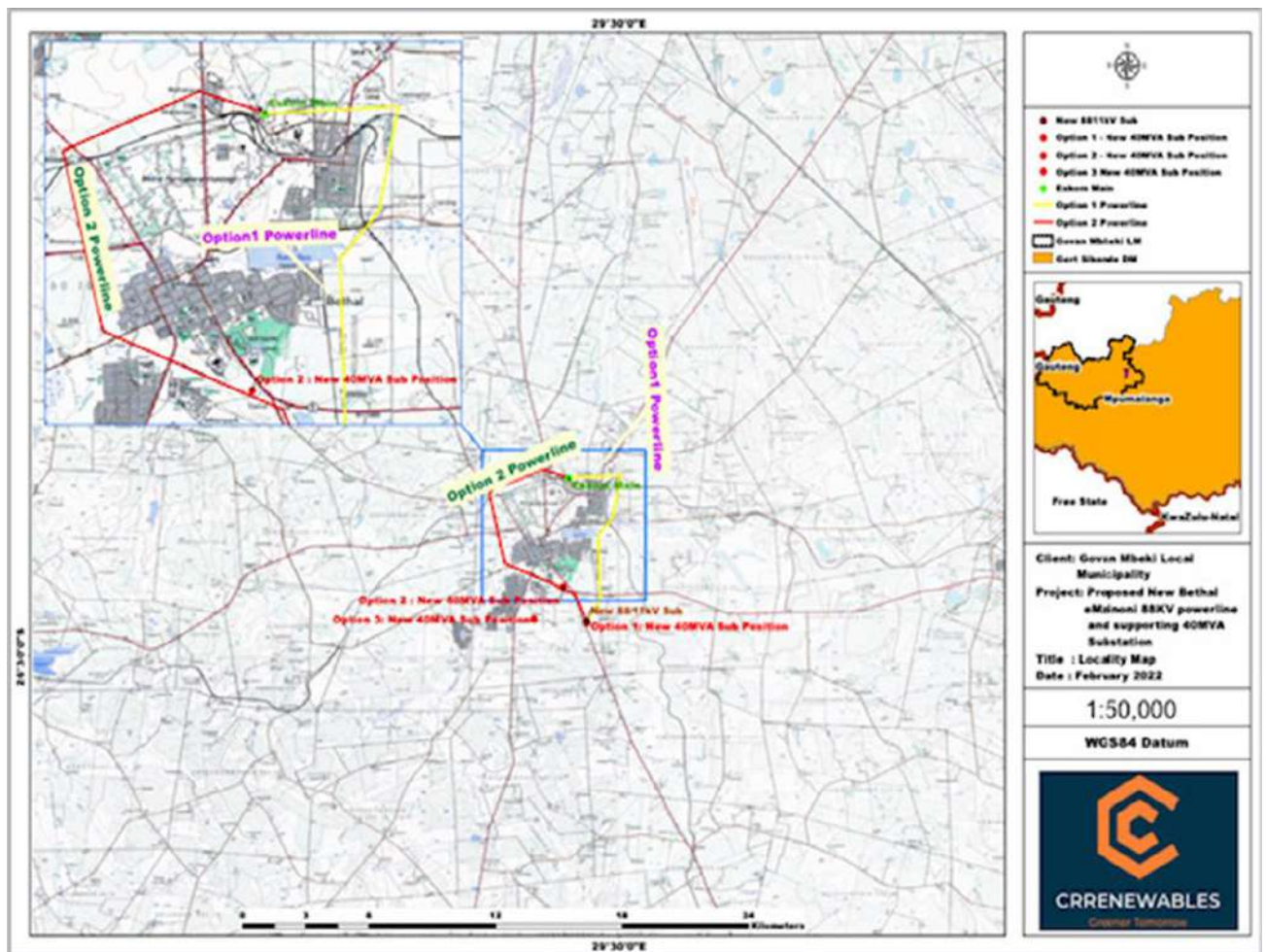
Furthermore, this development will also strengthen the electricity supply in Bethal town. This proposed development will contribute significantly in reducing the current continuous load reduction challenges experienced in the area, which will positively influence the business community and improve the quality of electricity supply and lives of Bethal and Emzinoni residents.

1.2 Project Location

The proposed development falls within the jurisdiction of Govan Mbeki Municipality and it entails the establishment of a new 88kv powerline and a supporting infrastructure 40MVA Substation. The project will be located on the Northern Part of Bethal Town, ending at Emzimoni township, where the new 40MVA substation will be located.

Please refer to the locality map below.

Figure 1: Locality Map

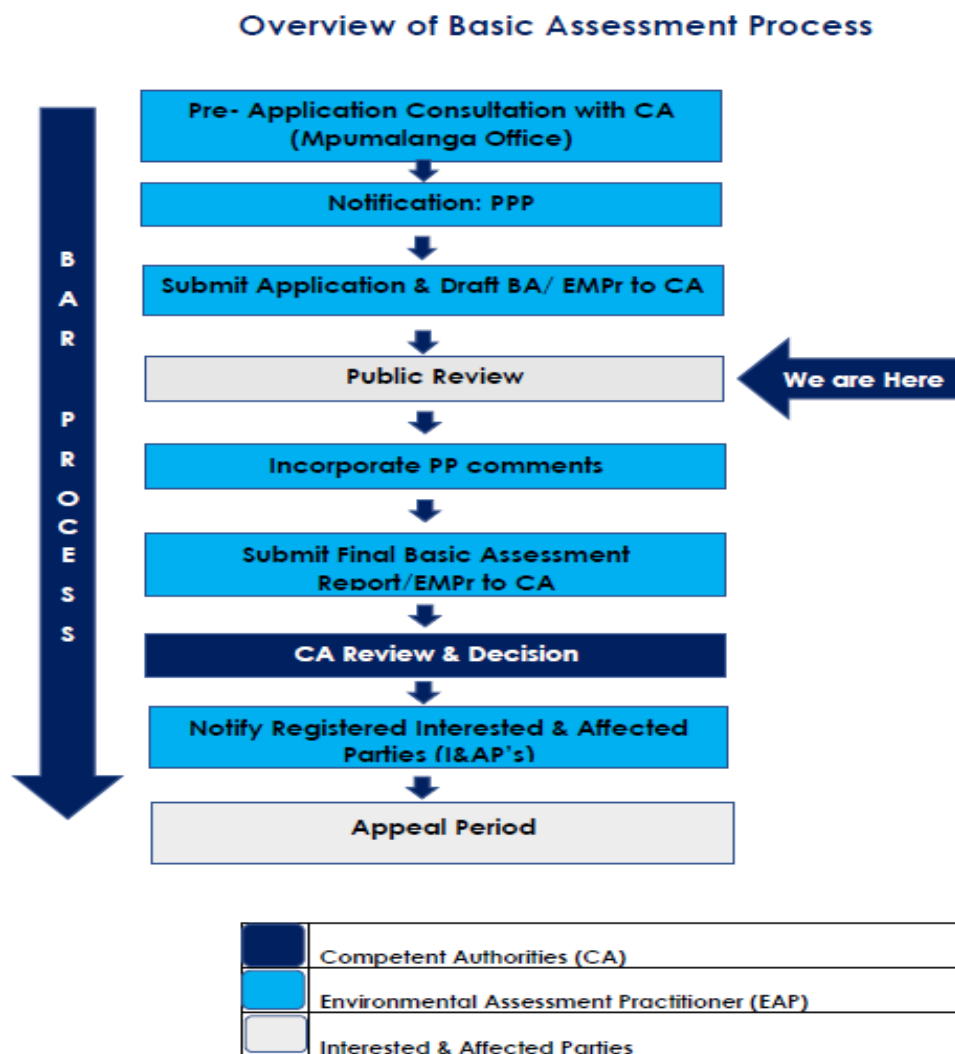


1.3 ENVIRONMENTAL LEGAL REQUIREMENTS

1.3.1 APPLICATION FOR ENVIRONMENTAL AUTHORISATION

The development of an 88kv Powerline and supporting infrastructure 40MVA Substation outside an urban edge, require the Basic Assessment Process as contemplated in NEMA EIA Regulation 11(1) of GN No R983 of December 2014 as amended (07 April 2017)

Figure 2: Basic Assessment Process & Status



1.3.2 LEGISLATION CONSIDERED

The following legislation was considered in the assessment process. The manner in which sections of the legislation affect the proposed development will be outlined in detail, in the body of the report:

- National Environmental Management Act (No. 107 of 1998)
- National Environmental Management: Waste Act (Act No. 59 of 2008)
- National Water Act (Act No. 36 of 1998)
- National Environmental Management Air Quality Act (Act No. 39 of 2004)
- National Environmental Management: Biodiversity Act (Act No. 10 of 2004); and
- National Heritage Resources Act (Act No. 25 of 1999).

1.4 PROJECT ALTERNATIVES

The following alternatives were assessed in relation to the proposed development:

- **Location Alternative:** Two routes were assessed for the proposed powerline (Refer to route option A & route option B on the locality map) and three sites were assessed for the proposed substation (Option 1, Option 2 & Option 3 on the Locality map)
- **Technology Alternative:** The Monopole Structure was the preferred technology option over the lattice structure. The benefits, amongst other technology due to its positive benefits, economically and ecologically, with appropriate mitigations.

1.5 THE RECEIVING ENVIRONMENT

The receiving environment has been described in the Basic Assessment Report based on the following:

- Topography
- Surface Water
- Flora & Fauna

- Socio-Economic Environment
- Land Use and Land Cover
- Climate
- Geology and Geohydrology
- Soils
- Planning
- Existing Structures and Infrastructure
- Transportation
- Air quality
- Noise
- Cultural Heritage & Palaeontological Features

1.6 SPECIALIST STUDIES CONDUCTED

The following studies were conducted based on the receiving environment and the type of development proposed.

- Water Resources Impact Assessment
- Terrestrial Ecology Assessment (Biodiversity Study)
- Phase 1: Cultural Heritage Impact Assessment
- Desktop Paleontological Assessment
- Avifauna Assessment

The information acquired from the respective specialist studies was integrated into the Basic Assessment Report. The information was further used to inform the proposed route selection and the position of the proposed substation.

1.7 ENVIRONMENTAL IMPACT ASSESSMENT

The Basic Assessment Report investigated the appropriate potential environmental impacts that could result during the following phases of the development, during the pre-construction phase, construction phase and operational phase of the Project. The identified Impacts are listed below:

- Impacts associated with listed activities contained in Government Notice No. R. 983, of 4 December 2014 (As amended), for which Environmental Authorisation have been applied for;
- An assessment of the Project's activities;
- An assessment of the receiving social, economic, biophysical and built environments;

- Findings from specialist studies;
- Comments gathered during the public participation process; and
- Requirements by the environmental authorities

Based on the impacts associated with the proposed project, mitigation measures were established which took cognisance of measures identified by various environmental specialists, environmental legislation requirements and environmental best practices. The Environmental Management Programme (EMP) provides a broad list of mitigation measures for specific elements of the Project. The “no-go option” and its implications was also assessed, details are provided in the Basic Assessment Report. The cumulative impacts associated with the proposed development were addressed in the report.

1.8 PUBLIC PARTICIPATION PROCESS

The PPP was conducted based on the requirements of Chapter 6 of GN No. 982 of the 2014 EIA Regulations, as amended (07 April 2017) of the NEMA.

The process involved the following:

- Placing site notices at noticeable and strategic points.
- Placing notices at the earmarked site and around the study area.
- Notices were e-mailed to all identified Interested and affected parties, including ward councillors of the area, authorities and relevant state departments
- Notice was placed in the local newspapers (Ridge Times)
- The African speaking community and those disadvantaged were informed of the EIA notice through the ward councillors, and where possible community meetings will be held.
- Other younger generation / class of the community was also informed through social media Platforms such as Facebook.

1.9 CONCLUSION

Based on the specialist study's findings, assessment of the project life-cycle's possible or potential impacts and the implementation of mitigation measures aimed at either preventing, reducing and minimising possible significant impacts, It is recommended that the project be considered for authorisation

Further, looking at the cumulative impacts, it is unlikely that any of the assessed impacts would result in spatial and temporal cumulative change. With mitigation measures, all the envisaged and assessed cumulative impacts can be regarded as marginal or minimal. The significance of cumulative impacts

can be further reduced should existing infrastructure servitudes and access roads /tracks used.

Based on alternatives assessed, Option 1 Substation and Option 1 Powerline are recommended to be granted Environmental Authorisation to satisfy the purpose and need of the proposed project on condition that EMPr and all mitigation measures recommended by the Environmental Specialists in the BAR are implemented. The services of an Independent ECO to audit compliance at all project phases should be mandatory. All necessary Environmental Authorisations in terms of NEMA legislation and other relevant legislations such as SAHRA, NWA regulations on GA/ WULA and NFA regulations on vegetation clearance be acquired prior to construction activities.

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LIST OF ABBREVIATIONS & ACRONYMS

AC	Alternating Current
AEL	Atmospheric Emission Licence
Aoi	Area of Interest
ASAPA	Association for Southern African Professional Archaeologists
BAR	Basic Assessment Report
BPEO	Best Practicable Environmental Option
CBAs	Critical Biodiversity Areas
CR	Critically Endangered (CR), (EN), (VU) or (LC),
DFFE	Department of Forestry, Fisheries and the Environment
DEL	Department of Employment and Labour
DARDLEA	Department of Agriculture, Rural Development, Land and Environmental Affairs
DMRE	Department of Mineral Resources and Energy
DPRT	Department of Police, Roads and Transport
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
EHS	Environmental, Health, and Safety
EMPr	Environmental Management Programme
EN	Endangered
ESAs	Ecological Support Areas
MPHRA	Mpumalanga Heritage Resources Authority
GHG	Greenhouse Gas
GIS	Geographical Information System
GN	Government Notice

HIV	Human Immunodeficiency Virus
HV	High Voltage
IAPs	Interested and Affected Parties
IBAs	Important Bird & Biodiversity Areas
SDF	Spatial Development Framework
IDP	Integrated Development Plan
WMA	Water Management Area
ESA	Ecological Support Areas
FEPA	Freshwater Ecosystem Priority Areas
HPA	High Priority Area
APPA	Atmospheric Pollution Prevention Act; Act No. 45 of 1965

LIST OF UNIT MEASURES

°C	Degrees Celsius
ha	Hectare
km	Kilometre
km²	Square kilometre
km/h	Kilometres per hour
kV	Kilovolt
m	Metre
m²	Square metre
m³	Cubic metre
m/s	Metre per Second
mm	Millimetre
MVA	Megavolt ampere
MW	Megawatt
MWh	Megawatt hour
TWh	Terawatt Hours
%	Percentage

1. Project Background and Motivation

South Africa's power system remains highly constrained with Eskom currently implementing rotational load shedding and will be for some years. Keeping the lights on is currently the most pressing challenge for South Africa's electricity supply industry for the next few years. It is also key to the longer-term prospects for the economy.

Govan Mbeki Municipality (GMM) as the distributing entity, also faces the same challenge for its residents. Load-shedding is the order of the day. The purpose for this report is to conduct an environmental assessment process for the proposed development of Bethal_Emzinoni 88KV powerline and a supporting infrastructure, 40 MVA substation. The development will enhance electrification system that is under a lot of pressure in both Bethal town and Emzinoni township

The grid connection will be from the existing Eskom Bethal Substation via the new 88kV distribution powerline, partially running parallel the existing servitudes for 88KV and 22KV lines. Furthermore, the development will strengthen the electricity supply in Bethal town. The proposed development will contribute significantly in reducing the current continuous load reduction challenges experienced in the area, which will positively influence the business community and improve the quality of lives of Bethal and Emzinoni residents.

2. Objectives of the study

The study seeks to outline steps followed in conducting the environmental assessment, in this case, the Basic Assessment Report (BAR) of the proposed Bethal_Emzinoni 88kv powerline and a 40 MVA substation.

The objective of the basic assessment process is to, through a consultative process—

- determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- identify the alternatives considered, including the activity, location, and technology alternatives;
- describe the need and desirability of the proposed alternatives through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites

- determine the nature, significance, consequence, extent, duration, and probability of the impacts occurring to the degree to which these impacts—
 - (a) can be reversed;
 - (b) may cause irreplaceable loss of resources; and
 - (c) can be avoided, managed or mitigated;

Through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—

- (a) identify and motivate a preferred site, activity and technology alternative;
- (b) identify suitable measures to avoid, manage or mitigate identified impacts; and
- (c) identify residual risks that need to be managed and monitored

3. Location of the Activity

3.1 Geographic Location

Govan Mbeki Municipal Area, situated in the Gert Sibande District Municipality, the south – eastern part of the Mpumalanga province. The major towns in Govan Mbeki Municipality are Bethal, Charl Cilliers, Embalenhle, Evander, Kinross, Leandra, Secunda and Trichardt. Gauteng Province is situated to the west. The total size of the Municipal Area is 295,708 Ha. The proposed development constitutes a high voltage power line (88 KV) starting from Eskom Bethal Substation, which is located in the Northern Part of Bethal Town, ending at Emzinoni township located in the Southern part of Bethal Town, where the new 40MVA substation will be located (Refer to Figure 2 Below).

3.2 Description and Coordinates of the corridor

Refer to Section 4.3 for coordinates of the powerline corridor and substation site.

3.3 Locality Map

Figure 3: Locality Map (1: 12,000 Scale)

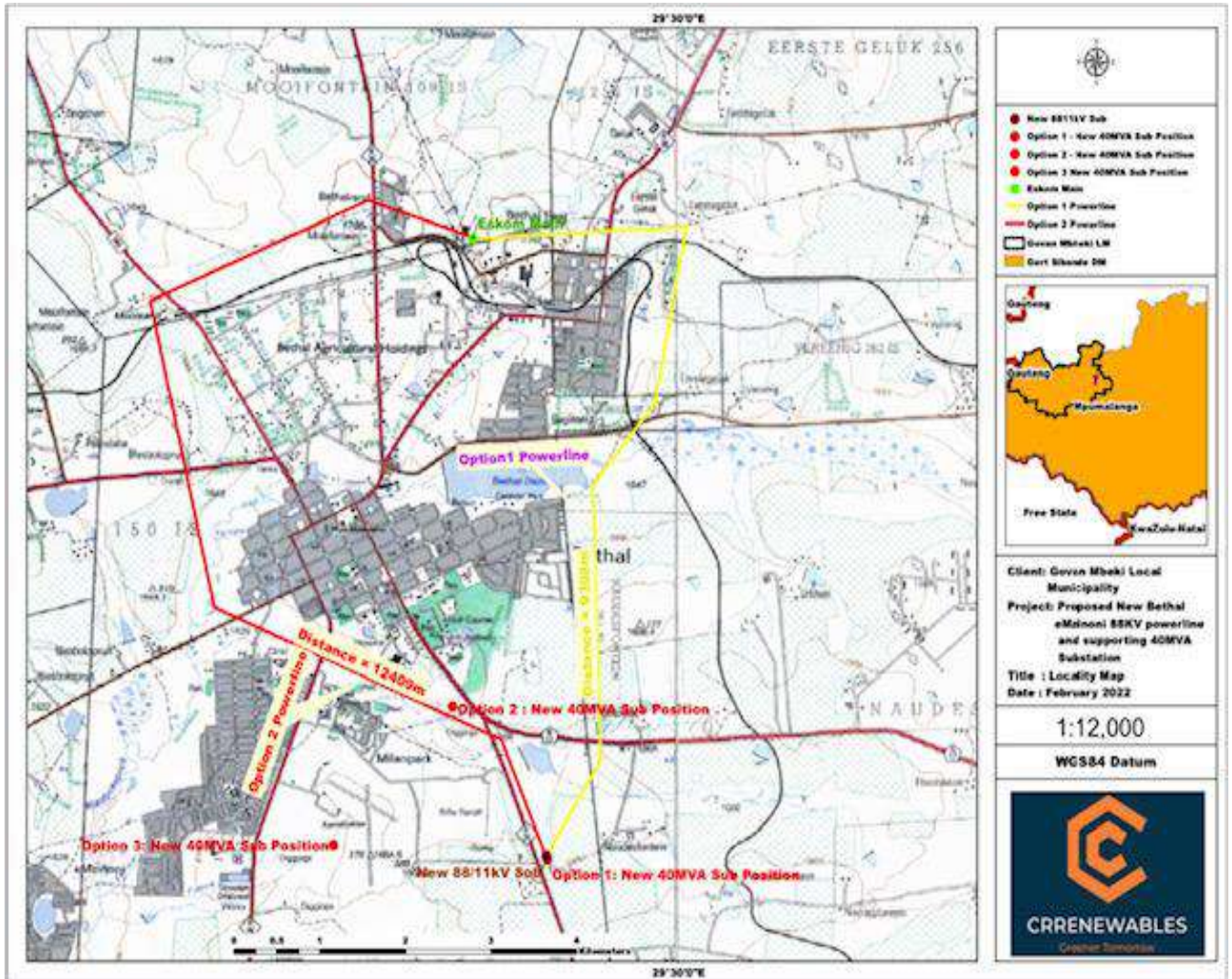
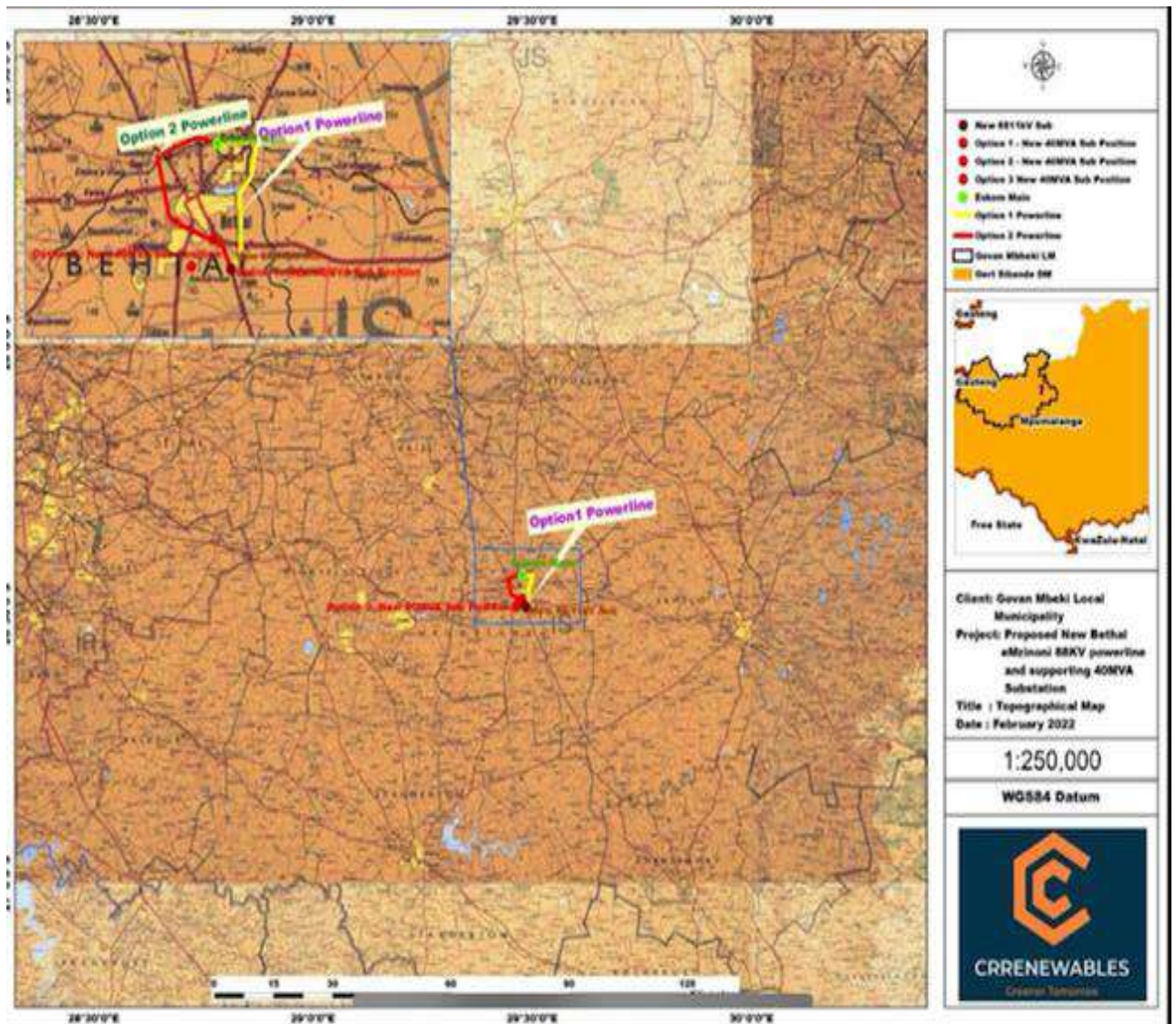


Figure 4: Topographical Map (1: 250,000 Scale)



4. Project Description

4.1 Project Scope

The proposed project includes the development of a new Bethal _Emzinoni 88 KV overhead powerline, a Monopole Structure and a 40MVA substation called 88/11kv Emzinoni Extension 11. The substation has a footprint of 100m x 100m.

Figure 5: An Example of a Substation _Picture



Figure 6: An Example of Powerline Picture (Monopole Structure)



4.2 Listed activities triggered

The table below provides Specific Listed activities triggered by the proposed development and the relevance.

Table 1: Listed Activities Triggered

Listed Activities Anticipated	Relevance
<p>R.983 – Activity no. 11(i):</p> <p>The development of facilities or infrastructure for the transmission and distribution of electricity—</p> <ul style="list-style-type: none"> (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or (ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more; <p>excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is —</p> <ul style="list-style-type: none"> (a) temporarily required to allow for maintenance of existing infrastructure; (b) 2 kilometres or shorter in length; (c) within an existing transmission line servitude; and (d) will be removed within 18 months of the commencement of development. 	<p>The capacity of the proposed power lines will be 88 kilovolts, outside an urban area.</p>
<p>GN No. R.983 – Activity no. 27:</p> <p>The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-</p> <ul style="list-style-type: none"> (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan. 	<p>The proposed clearance area consisting of indigenous vegetation associated with the construction footprint for the substations triggers this section.</p> <p>The proposed substations will be approximately 100m x 100m.</p>

4.3 Feasible and Reasonable Alternatives

4.3.1 Site Alternatives

Substation Alternative

Alternative 1 (Preferred)	Lat (DDMMSS)	Long (DDMMSS)
Description: Located in Farm Blesbokspruit 150/27 IS Farm	26° 29' 8.3115" S	29° 29' 8.5202" E
Alternative 2		
Description: Blesbok spruit 150/IS Farm near Milan Park	26°28'20.1"S	29°28'42.6"E
Alternative 3		
Description: Located within Emzinoni x 22 Township	26°28'57.6"S	29°28'12.6"E

4.3.2 Powerline Alternatives (Linear)

Alternative 1 (Preferred)

Starting point of the activity (T14)	26° 25' 45.2873" S	29° 28' 42.4916" E
Middle point of the activity (T7)	26° 25' 46.2463" S	29° 30' 6.0679" E
Middle point of the activity (T8)	26° 25' 39.6616" S	29° 30' 3.249" E
End point of the activity (T1)	26° 29' 8.3115" S	29° 29' 8.5202" E

Alternative 2

Starting point of the activity	26° 25' 45.2873" S	29° 28' 42.4916" E
Middle point of the activity	26 ° 27'01.8" S	29 ° 26'39.4" E
Middle point of the activity	26° 46' 28.47" S	29 ° 27'19.0" E
Middle point of the activity	26 ° 27'47.7" S	29 ° 27'17.7" E
End point of the activity	26° 29' 8.3115" S	29° 29' 8.5202" E

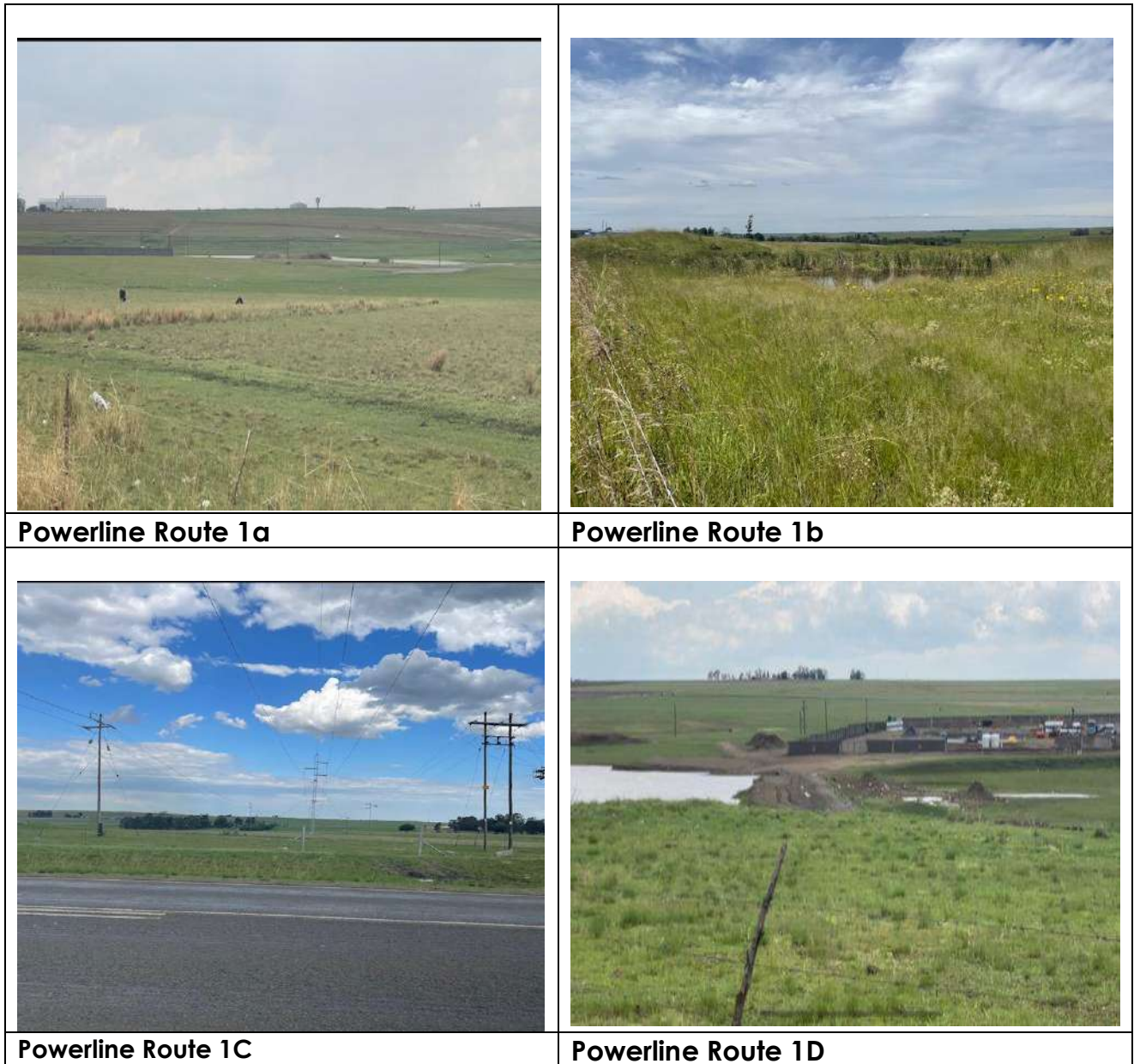
Lay-out alternatives

Powerline	Description
Alternative / Option 1 (Preferred)	The assessment is still in its feasibility stage and no final layout designs exist. After the Environmental Authorisation is received the final layout will be submitted to authorities accordingly.
Alternative / Option 2	
Substation	
Alternative/ Option 1	The assessment is still in its feasibility stage and no final layout designs exist. After the Environmental Authorisation is received the final layout will be submitted to authorities accordingly.
Alternative / Option 2	
Alternative / Option 3	

Technology alternatives

Powerline	Description
Alternative / Option 1 (Preferred)	The technology preferred for the proposed development is a steel monopole structure vs lattice structure. The Monopole has more benefits financially and environmentally.
Alternative / Option 2	
Substation	Technology alternatives such as solar generation has been considered by the municipality in their IDPs /SDF, but consideration at this stage is connecting to the existing Eskom grid to address the current energy crisis.
Alternative/ Option 1 (Preferred)	Energy efficiency and water saving devices will be encouraged in the final design of the substation building. Promotion of natural landscape in storm water drainage design is encouraged.
Alternative/ Option 2	
Alternative/ Option 3	

Figure 6a: Pictorial view of the study area





Powerline Route 2a



Powerline Route 2b



Powerline Route 2C



Powerline Route 2D

Based on the pictures above, both routes (Route 1&2) have agricultural activities and water bodies. Route 2 is however, characterised by major areas with wetlands (see the land cover map in figure 9). Substation Location options are provided on the map too. Option 1 & 3 are not located in the wetland area, but option 3 located in the wetland area.

4.3.3 No-go Alternative

The consideration for the No-go alternative was analysed based on the following; Current status que, the risk it poses both negative and positive impacts. The current load-shedding challenge is a reality at Govan Mbeki Municipality, especially at Bethal and Emzinoni township. Most businesses and residents are affected by the status que daily, and this has caused unhappiness and some businesses to shut. The challenge has been happening for some time now. Considering the No-go option would mean everything will remain as is. Electricity shortage at the new residential area of Emzinoni township, and load-shedding will continue affecting businesses and residents. The physical and social environment where the new substation and power line is proposed will remain undisturbed, however the economic implications and social impact for this option will continue affecting the residents negatively.

4.3.4 Motivation for the preferred site, activity and technology alternative

The determining factors for selecting the proposed location are;

1. Option one provides a viable option financially, due to its length and footprint.
2. Most sections of option 1 are not crossing residential area, therefore does not pose safety hazard to the residents
3. The options 1 for both powerline and substation would make access easy during construction and operational phases of the development.
4. Maintenance activities would be conducted with ease since the substation will be located near one of the major roads in Bethal, namely R35
5. The Environmental Screening conducted showed opportunities and constraints that can be mitigated with ease in all phases of the development, in particular option one.

6. Most parts of option 2 powerline route are located in an aquatic environment which could pause maintenance and access challenges during operational phase. When assessed financially, socially and environmentally the option possess sensitive environmental aspects compared to option one (land cover map -fig 9 below)

Assessment based on the following environmental Features:

Project Alternatives	Agric	Fauna/ Avifauna	Heritage/ Paleo	Terrestrial Biodiversity	Water /Wetlands	Social	Technical
Powerline Option 1	Green	Orange	Green	Green	Orange	Green	Green
Powerline Option 2	-	Orange	-	-	Red	Orange	Red
Sub 1	Green	-	Orange	Green	Green	Green	Green
Sub 2	-	-	Green	-	Red	-	Red
Sub 3	-	-	Green	-	-	-	Red

Red: HR (High risk)
 Orange: MR (Medium Risk)
 Green: LR (Low Risk)

NB: With application of mitigation measures suggested by specialists and technical inputs received during assessment.

4.4 Grid Connection

The grid connection will be from the existing Eskom Bethal Substation via the new 88kV distribution powerline, partially running parallel the existing servitudes for 88KV and 22KV lines.

4.5 Project Life-Cycle

The project lifecycle for a new substation and the distribution powerline will include the following activities:

Table 2: Project Phases Activities

The Phase	Primary Activities	Activities for a new Powerline	Activities for a new Substation
Feasibility phase	<ul style="list-style-type: none"> This includes Investigating and selecting a suitable location for the substation as well as corridors for the distribution powerline route. 		

<p>Planning and design Phase</p>	<ul style="list-style-type: none"> • The phase will only be undertaken should Environmental Authorisation be obtained, and it includes survey of the route, selection of the most appropriate structures; conduct a walk-down survey to determine the exact locations of the towers, based on sensitive environmental features and technical criteria. • Prepare relevant planning documentation, including technical and design documentation. 		
<p>Construction Phase</p>	<p>Construction activities include installation of the necessary infrastructure and equipment's.</p>	<ul style="list-style-type: none"> • Vegetation Clearance • Pegging of towers • Establishment of camps • Access Route • Excavation of tower foundations • Installation of bird flappers to ensure line visibility to bird species • Erection of steelworks • Stringing of cables/ Conductors • Concrete Works • Rehabilitation of the affected site 	<ul style="list-style-type: none"> • Site Preparation (fencing, clearing, levelling and grading, etc.); • Establishing access roads; • Establishing the site office; • Laydown areas and storage facilities; • Transporting equipment to site; • Undertaking civil (e.g. digging foundations, storm water drainage construction and concrete works), mechanical and electrical work (including the installation of circuit breakers, current transformers, isolators,

			<p>insulators, surge arrestors, voltage transformers and earth switches);</p> <ul style="list-style-type: none"> • Connection of power line to the substation; • Reinstating and rehabilitating working areas outside of permanent development footprint; and • Testing, commissioning and hand over •
Operational phase	The phase include implementation of operational activities associated with the maintenance and control of the substation and distribution powerline.	<ul style="list-style-type: none"> • Servitude Maintenance to ensure continual supply of power • Vegetation Clearance • Soil Erosion control • Ensuring possible bird nests are controlled • Avoid electrocution of birds by placing necessary 	<p>Substation Maintenance activities will include amongst other things:</p> <ul style="list-style-type: none"> • Testing, • Inspecting, • Servicing, • Examining, • Overhauling of equipment associated with the substation (e.g. circuit breakers and transformers) • Inspecting Fire detection system

		bird-flappers/ guards	<ul style="list-style-type: none"> • Fence repair, • Stormwater maintenance • Landscaping • Changing Oil from transformer/s (Drain old oil, flash and refill) • Maintaining Oil catchment dams • Vegetation Clearance around the substation to ensure safety
Decommissioning	The phase includes dismantling all equipment's (Substation & Powerline) in trying to mitigate the sites to resemble the original status. It includes measures for complying with the prevailing regulatory requirements, rehabilitation and managing environmental impacts caused. Funds should be allocated in order to ensure decommission process is successful and complies with relevant legal requirements.		

4.6 Resources and Services associated to the Construction & Operation of the proposed development.

The section outlines the resources that will be needed to execute the Project. It is important to note that the Environmental Management Plan Report (EMPr) established, has provided necessary mitigations to manage possible impacts associated with aspects listed below (Refer to Appendix G).

4.6.1 Raw Materials

Construction activities will require that following material (e.g. steel, cement, sand, aggregate, etc.). These materials will be sourced from accredited suppliers appointed by the developer.

4.6.2 Water

During construction phase, portable water will be required for construction activities. According to the National Water Act, the user of water must not waste water. Necessary steps will be taken to ensure that water is not wasted

and acquired legally. Necessary permit will be obtained where necessary, and arrangements with nearby land users will be made to ensure water is used appropriately.

4.6.3 Sanitation

Sanitation services, such as chemical toilets will be needed for construction workers. Approved suppliers in this regard will be used to ensure construction workers are not inconvenienced.

4.6.4 Waste

Different types of waste will be generated. Waste will be temporarily stored at suitable locations (e.g. demarcated areas at construction camp in labelled bins and containment) and will be removed and disposed of at approved landfill sites.

Liquid Waste will include the following:

Sewage;

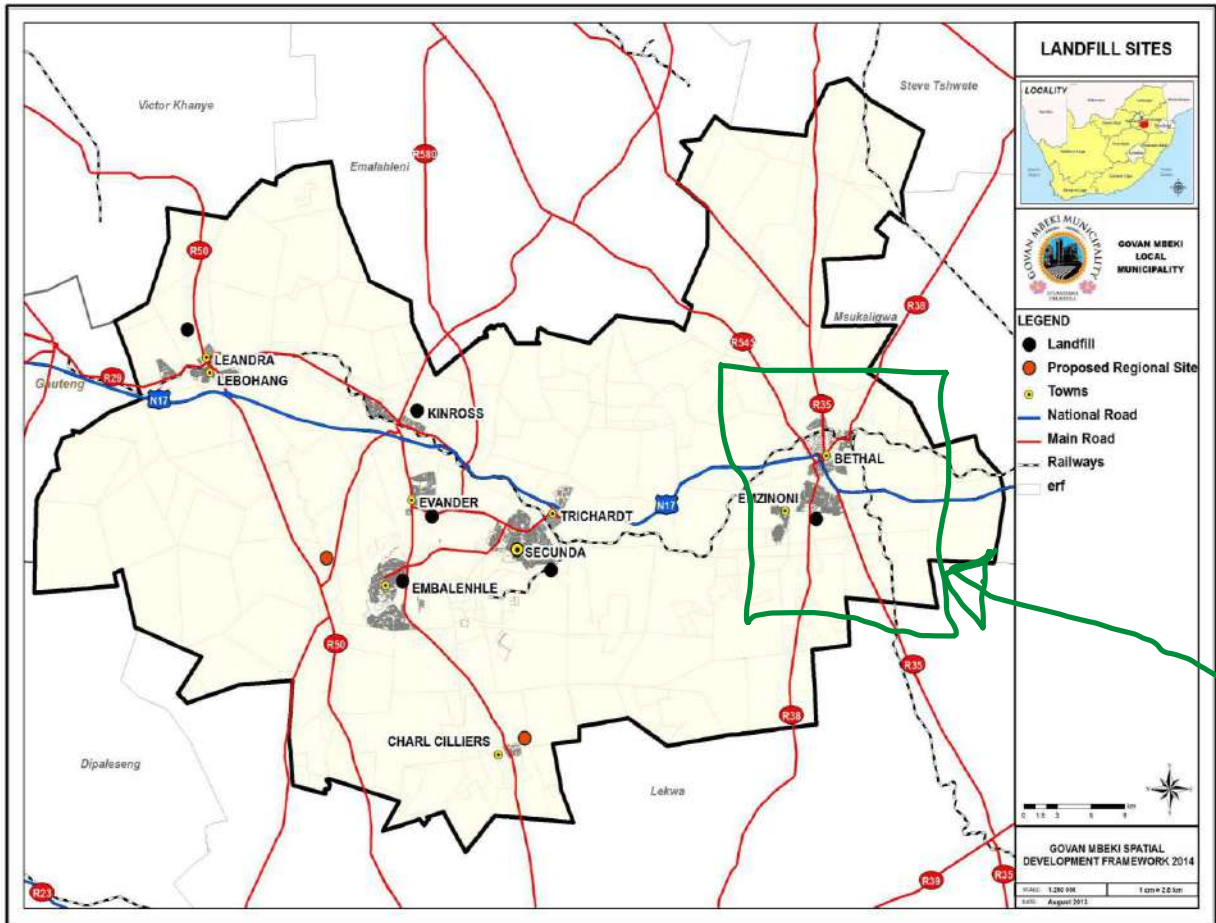
- Grey water: water used for washing purposes (e.g. equipment, staff);
- Drainage contaminated water from (e.g. workshop, equipment storage areas), stormwater run-off.

Solid waste from construction activities and material such as cement contaminated papers, broken bricks, concrete etc

Domestic and biological waste, generated during the operational phase

It must be noted that appropriate measures will be implemented to manage all waste and wastewater generated during the construction and operational phases.

Figure 7: GMM Landfill Sites



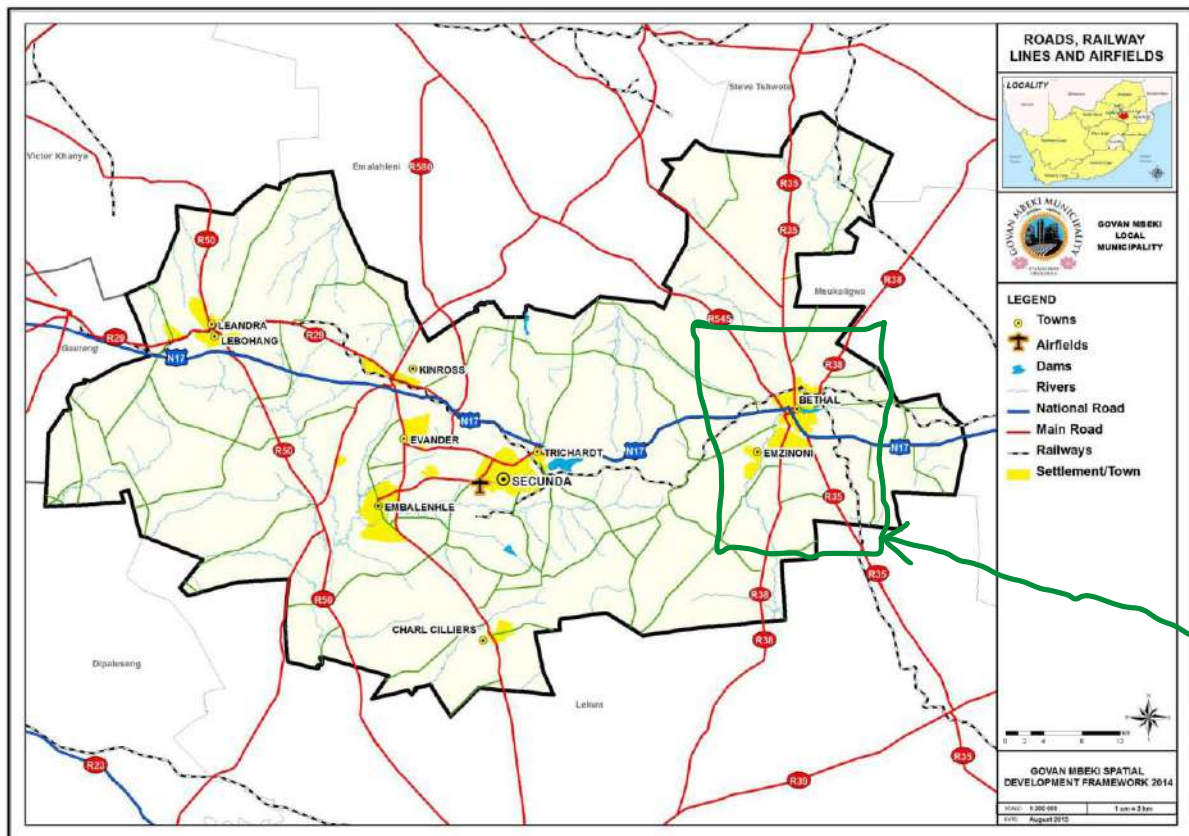
(Sourced from GMM SDF 2014-2034)

4.6.5 Roads

Where necessary temporary access roads will be created during the construction phase. The areas affected by temporary roads will be reinstated, if they would not be used as permanent, in the operational phase.

Routes will be accessible via the surrounding road network, such as R35 and N17. Please refer to the map below.

Figure 8: GMM Roads



(Sourced from GMM SDF 2014-2034)

4.6.6 Stormwater

An on-site stormwater drainage system will be established in line with best practices. Appropriate controls will be implemented to ensure that sediments, oils and chemicals are controlled and contained in the catchment dam. No liquid / solid waste will be released from the substation site.

4.6.7 Electricity

Electricity will be obtained or generated using diesel generators or temporary electricity connections during the construction phase will be arranged to ensure development runs uninterrupted.

4.6.8 Laydown Areas

A laydown area will be required during the construction phase. Care must be taken to ensure negative impacts are minimised.

4.6.9 Construction Workers

The appointed contractor will mostly use services of skilled labour for the construction of the substation and distribution powerline. In instances where casual labour is required, the developer will request that such persons are sourced from local communities, as far as possible.

3. PROJECT NEED AND DESIREBILITY

The format contained in the Guideline on Need and Desirability (DEA&DP, 2010b) was used in determining the need and desirability for the proposed development. See Table 3 below.

Table 3: Need and Desirability of the Project

	Question	Response
NEED ('timing')		
1.	Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved Spatial Development Framework (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 IDP).	<ul style="list-style-type: none"> The proposed development is in line with GMM Spatial Development Framework 2014-2034
2.	Should development, or if applicable, expansion of the town/area concerned in terms of this land use (associated with the activity being applied for) occur here at this point in time?	Based on the specialist studies conducted the proposed development does not pose significant risks to the environment
3.	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,	The proposed project will be in line with developed objectives for GMM SDF 2014-2034.

	but within a specific local context it could be inappropriate)	
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4.	Are the necessary services with appropriate capacity currently available (at the time of application), or must additional capacity be created to cater for the development?	<p>The proposed powerline and substation will be connected to the existing Eskom substation</p> <p>The services required for the development are explained in section 4.3 and seem sufficient.</p>
5.	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)?	<p>According to KPA 2 of the GMM Spatial Development Framework 2014-2034 :Their objective is to improve energy efficiency.</p>
6.	Is this project part of a national programme to address an issue of national concern or importance?	<p>According to the Department of Energy (2017), energy is by nature an intergovernmental issue, cutting across energy security, economic prosperity, employment and environment, among others.</p> <p>This Project supports SIP 10: Electricity transmission and distribution for all,</p> <p>Expand the transmission and distribution network to address historical imbalances, provide access to electricity for</p>

		all and support economic development.
DESIRABILITY ('placing')		
7.	Is the development the best practicable environmental option (BPEO) for this land/site?	Kindly refer to Section 4.3 for the selected BPEO for the Project alternatives.
8.	Would the approval of this application compromise the integrity of the existing approved municipal IDP and SDF as agreed to by the relevant authorities?	The development is aligned with GMM Spatial Development Framework 2014-2034, KPA 2.

9.	Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?	The development will be addressing the most needed solution for electricity supply, which is the social leg of sustainable development.
10.	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).	The rationale for the proposed project is based on its geographic location and the value it adds to GMM and users of electricity/energy. The specialist studies assessed the location based on sensitive environmental features and receptors. Kindly refer

		to the specialist study recommendations (Appendix K)
11.	How will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	Refer to compilation of significant environmental issues associated with the proposed project (Table 8)
12.	How will the development impact on people's health and wellbeing (e.g. in terms of noise, odours, visual character and sense of place, etc.)?	The development will enhance the wellbeing of residents of Bethal town & Emzinoni township. Please refer to the project EMPr in relation with development aspects and impacts, and mitigation thereof.
13	Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?	The land & rights specialist study conducted assisted in determining whether the opportunity costs will be acceptable or unacceptable. The assessment has not encountered any negative feedback so far
14	Will the proposed land use result in unacceptable cumulative impacts?	Cumulative impacts are considered in Section 13.15, and mitigations provided

6. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

The legislation that has possible bearing on the proposed powerline & Substations from an environmental perspective is captured in **Table 3** below.

Name of Legislation	Purpose for the Legislation relevant to the proposed development
Constitution of the Republic of	Important sections: <ul style="list-style-type: none"> Chapter 2 – Bill of Rights.

<p>South Africa, (No. 108 of 1996)</p>	<ul style="list-style-type: none"> • Section 24 – Environmental Rights.
<p>National Environmental Management Act (NEMA) (No. 107 of 1998)</p>	<p>Important sections:</p> <ul style="list-style-type: none"> • Section 24 – Environmental Authorisation (control of activities which may have a detrimental effect on the environment). • Section 28 – Duty of care and remediation of environmental damage. • Environmental management principles. • Authorities – Department of Forestry, Fisheries and the Environment (DFFE) (national) and (Province)....
<p>NEMA: GN No. R 982 of 4 December 2014 (as amended)</p>	<p>Purpose - regulate the procedure and criteria as contemplated in Chapter 5 of NEMA relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities, subjected to EIA, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto.</p>
<p>NEMA: GN No. R. 983 of 4 December 2014 (as amended) (Listing Notice 1)</p>	<p>Purpose - identify activities that would require environmental authorisations prior to commencement of that activity and to identify competent authorities in terms of sections 24(2) and 24D of NEMA.</p> <ul style="list-style-type: none"> • The investigation, assessment and communication of potential impact of activities must follow a Basic Assessment Process, as prescribed in regulations 19 and 20 of GN No. R 982 of 4 December 2014 (as amended). However, according to Regulation 15(3) of GN No. R 982 (as amended), S&EIR must be applied to an application if the application is for two or more activities as part of the same development for which S&EIR must already be applied in respect of any of the activities. • Activities under Listing Notice 1 that are relevant to this project follow.
<p>National Heritage Resources Act (Act No. 25 of 1999)</p>	<p>Important Sections:</p> <ul style="list-style-type: none"> • Section 34 – protection of structure older than 60 years. • Section 35 – protection of heritage resources. • Section 36 – protection of graves and burial grounds. • Section 38 – Heritage Impact Assessment for linear development exceeding 300m in length; development exceeding 5 000m² in extent, etc. • Authorisation type – Permit. • Authority – South African Heritage Resource Agency

<p>Conservation of Agricultural Resources Act (Act No. 43 of 1983)</p>	<ul style="list-style-type: none"> • Control measures for erosion. • Control measures for alien and invasive plant species. • Authority – Department of Agriculture.
<p>Hazardous Substance Act (No 15 of 1973) and Regulations</p>	<ul style="list-style-type: none"> • Provides for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances, and for the control of certain electronic products • Provides for the division of such substances or products into groups in relation to the degree of danger. • Provides for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products.
<p>Occupational Health & Safety Act (Act No. 85 of 1993)</p>	<ul style="list-style-type: none"> • Provisions for Occupational Health & Safety. • Authority – Department of Employment and Labour (DEL). • Relevant regulations, such as Electrical Installation Regulations, Construction Regulations, etc.
<p>Minerals and Petroleum Resources Development Act (Act No. 28 of 2002)</p>	<p>Equitable access to and sustainable development of the nation's mineral and petroleum resources and to provide for matters related thereto</p> <p>Important Sections (amongst others):</p> <ul style="list-style-type: none"> • Section 22 – Application for mining right. • Section 27 – Application for, issuing and duration of mining permit. • Section 53 – Use of land surface rights contrary to objects of Act. • Authorisation type – Mining Permit / Mining Right. Note that this is not required for the Project. <p>It is possible that quarry material may be required for maintenance work on the new access roads and the s along the powerline servitude, which may require new borrow pits to be opened.</p> <p>Should this be necessary then the necessary applications will be made to the Department of Mineral Resources (DMR). In terms of the Act, the sourcing of material for road construction purposes (i.e. the use of borrow pits) is regarded as mining and accordingly is subject to the requirements of the Act.</p>

	Only where the organ of state has obtained formal exemption from the Minister, the organ of state has to compile an EMPr per borrow pit and submit these to DMR for approval (DME, 2002). In this case, an EMPr would be appropriate for approval.
National Water Act (Act No. 36 of 1998)	Sustainable and equitable management of water resources Important sections (amongst others): <ul style="list-style-type: none"> • Chapter 3 – Protection of water resources. • Section 19 – Prevention and remedying effects of pollution. • Section 20 – Control of emergency incidents. • Chapter 4 – Water use. • Authority – Department of Water and Sanitation (DWS).
National Environmental Management Air Quality Act (Act No. 39 of 2004)	Air quality management Important sections (amongst others): <ul style="list-style-type: none"> • Section 32 – Dust control. • Section 34 – Noise control. • Authorisation type – Atmospheric Emission License. Note that this is not required for the Project. <p>Authority – DFFE (national) and provincial counterparts as well as municipalities.</p>
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	Management and conservation of the country's biodiversity: <ul style="list-style-type: none"> • Protection of species and ecosystems. • Authorisation type – Permit. • Authority – DFFE and provincial counterparts.
National Environmental Management: Protected Areas Act (Act No. 57 of 2003)	Protection and conservation of ecologically viable areas representative of South Africa's biological diversity and natural landscapes.
National Environmental Management: Waste Act (Act No. 59 of 2008)	Management of waste: <ul style="list-style-type: none"> • Chapter 5 – licensing requirements for listed waste activities - GN No. R. 921 of 29 November 2013 (as amended). • Authorisation type – Waste Management Licence. Note that this is not required for the Project. • Authority – DFFE (national) and provincial counterparts
National Forests Act (No. 84 of 1998)	Supports sustainable forest management and the restructuring of the forestry sector, as well as protection of indigenous trees in general.

	<p>Section 15: Authorisation required for removal and disturbing of protected trees.</p> <p>Section 7: Authorisation required for impacting indigenous trees.</p>
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6.1.1 NATIONAL ENVIRONMENTAL MANAGEMENT ACT

The National Environmental Management Act, 1998 (NEMA), through the EIA regulations require the undertaking of Environmental Impact Assessment or Basic Assessments for a range of different activities identified in the listing notices. The applicable listed activities depend on the nature of the affected environment and the nature of the activity. An Environmental Authorisation (EA) has to be obtained before the commencement of construction of such an activity.

6.1.2 NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT

The main purpose of the National Environmental Management: Waste Act (NEM:WA) (Act No. 59 of 2008) includes the following:

- To reform the law regulating waste management in the country by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development;
- To provide for institutional arrangements and planning matters;
- To provide for specific waste management measures;
- To provide for the licensing and control of waste management activities;
- To provide for the remediation of contaminated land; and
- To provide for compliance and enforcement.

Some Important definitions from this Act include:

"Disposal" – the burial, deposit, discharge, abandoning, dumping, placing or release of any waste into, or onto, any land.

"General waste" means waste that does not pose an immediate hazard or threat to health or to the environment, and includes -

- domestic waste;
- building and demolition waste;

- business waste: and
- inert waste;

"Hazardous waste" – any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.

"Storage" – the accumulation of waste in a manner that does not constitute treatment or disposal of that waste.

- "Waste" – any substance, whether or not that substance can be reduced, re-used, recycled and recovered -
- That is surplus, unwanted, rejected, discarded, abandoned or disposed of;
- Which the generator has no further use of for (he purposes of production;
- That must be treated or disposed of; or
- That is identified as a waste by the Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but -
- A by-product is not considered waste; and
- Any portion of waste, once re-used, recycled and recovered, ceases to be waste.

GN No. R. 921 of 29 November 2013 (as amended) contains a list of waste management activities that have, or are likely to have, a detrimental impact on the environment. If any of the waste management activities are triggered in Category A and Category B, a Waste Management Licence is required. Activities listed in Category C need to comply with the relevant National Norms and Standards.

It is important to note that no authorisation will be required in terms of NEM:WA for the Project as no listed waste management activities are triggered. The following is noted with regards to waste management for the Project:

Construction phase:

Temporary waste storage facilities will remain below the thresholds contained in the listed activities under Schedule 1 of NEM:WA; and

The EMPr makes suitable provisions for waste management, including the storage, handling and disposal of waste.

Operational phase:

Minimum waste will be generated during the operational phase;

- Waste will be sent to the relevant municipal sites; and
- Waste generated during maintenance of substations will be suitable disposal sites.

6.1.3 NATIONAL WATER ACT (ACT NO. 36 OF 1998)

National Water Act (Act No. 36 of 1998)

The purpose of the National Water Act (NWA) (Act No. 36 of 1998) is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors:

- Meeting the basic human needs of present and future generations;
- Promoting equitable access to water;
- Redressing the results of past racial and gender discrimination;
- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Providing for growing demand for water use; protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources;
- Meeting international obligations;
- Promoting dam safety; and
- Managing floods and droughts.

The Department of Water and Sanitation (DWS) is the custodian of South Africa's water resources.

Some Important definitions from this Act include:

- "Pollution" – the direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it (a) less fit for any beneficial purpose for which it may reasonably be expected to be used; or (b) harmful or potentially harmful;

- “Waste” – includes any solid material or material that is suspended, dissolved or transported in water (including sediment) and which is spilled or deposited on land or into a water resource in such volume, composition or manner as to cause, or to be reasonably likely to cause, the water resource to be polluted; and

- “Water resource” – includes a watercourse, surface water, estuary, or aquifer.

The proposed project may encounter the following activities that constitute water uses in terms of Section 21 of the NWA:

- Section 21(c) - Impeding or diverting the flow of water in a watercourse; and
- Section 21(i) - Altering the bed, banks, course or characteristics of a watercourse.

Should the above case be experienced (especially during the final route selection and design), a Water Use Licence Application (WULA) /GA must be submitted to DWS to seek authorisation in terms of the NWA for the abovementioned water uses.

6.1.4 National Environmental Management: Air Quality Act (Act No. 39 of 2004)

National Environmental Management: Air Quality Act (Act No. 39 of 2004)

The purpose of the National Environmental Management: Air Quality Act (NEM:AQA) (Act No. 39 of 2004) is to reform the law regulating air quality by providing measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development. This Act aims to promote justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government, and for specific air quality measures.

Some key definitions from this Act include:

“Air pollution” – any change in the composition of the air caused by smoke, soot, dust (including fly ash), cinders, solid particles of any kind, gases, fumes, aerosols and odorous substances.

“Atmospheric emission” or “emission” – any emission or entrainment process emanating from a point, non-point or mobile source that results in air pollution.

“Non-point source” – a source of atmospheric emissions which cannot be identified as having emanated from a single identifiable source or fixed location, and includes veld, forest and open fires, mining activities, agricultural activities and stockpiles.

“Point source” – single identifiable source and fixed location of atmospheric emission, and includes smoke stacks and residential chimneys.

This Act provides for the listing of activities which result in atmospheric emissions that pose a threat to health or the environment. No person may without an Atmospheric Emission Licence (AEL) conduct any such listed activity, there is however, no AEL required for the proposed Project. Provision is made in the EMPr to manage impacts to air quality as a result of the Project during the construction phase.

6.1.5 National Environmental Management: Biodiversity Act (Act 10 of 2004)

National Environmental Management: Biodiversity Act (Act 10 of 2004)

The purpose of the National Environmental Management: Biodiversity Act (NEM:BA) (Act 10 of 2004) is to provide for the management and conservation of SA’s biodiversity within the framework of NEMA.

The Act allows for the publication of provincial and national lists of ecosystems that are threatened and in need of protection. The list should include:

- Critically Endangered Ecosystems, which are ecosystems that have undergone severe ecological degradation as a result of human activity and are at extremely high risk of irreversible transformation.
- Endangered Ecosystems, which are ecosystems that, although they are not critically endangered, have nevertheless undergone ecological degradation as a result of human activity.
- Vulnerable Ecosystems, which are ecosystems that have a high risk of undergoing significant ecological degradation.
- Protected Ecosystems, which are ecosystems that are of a high conservation value or contain indigenous species at high risk of extinction in the wild in the near future.

Similarly, the Act allows for the listing of endangered species, including critically endangered species, endangered species, vulnerable species and protected species. A person may not carry out a restricted activity (including trade) involving listed threatened or protected species without a permit.

The Regulations on the management of Listed Alien and Invasive Species were promulgated on 1 August 2014. The Listed Invasive Species were also published on this date and were subsequently amended in GN 864 of 29 July 2016.

Some key definitions from this Act include:

“Alien species” – A species that is not an indigenous species; or

An indigenous species translocated or intended to be translocated to a place outside its natural distribution range in nature, but not an indigenous species that has extended its natural distribution range by natural means of migration or dispersal without human intervention.

“Biological diversity” or “biodiversity” – the variability among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems.

“Indigenous species” – a species that occurs, or has historically occurred, naturally in a free state in nature within the borders of the Republic, but excludes a species that has been introduced in the Republic as a result of human activity.

“Invasive species” – any species whose establishment and spread outside of its natural distribution range -

Threaten ecosystems, habitats or other species or have demonstrable potential; and may result in economic or environmental harm or harm to human health.

“Species” – a kind of animal, plant or other organism that does not normally interbreed with individuals of another kind, and includes any sub-species, cultivar, variety, geographic race, strain, hybrid or geographically separate population.

The implications of this Act for the Project inter alia include the requirements for managing invasive and alien species, protecting threatened ecosystems and species, as well as for rehabilitation. The findings from the Terrestrial Ecological and Water Resources Impact Assessments that were undertaken for the Project are included in section of this report.

6.1.6 National Heritage Resources Act (Act No. 25 of 1999)

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

The purpose of the National Heritage Resources Act (NHRA) (Act No. 25 of 1999) is to protect and promote good management of SA's heritage resources,

and to encourage and enable communities to nurture and conserve their legacy so it is available to future generations.

In terms of Section 38 of this Act, certain listed activities require authorisation from provincial agencies:

- The construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- The construction of a bridge or similar structure exceeding 50 m in length;
- Any development or other activity which will change the character of a site –
 - Exceeding 5 000 m² in extent; or
 - Involving three or more existing erven or subdivisions thereof; and
- The re-zoning of a site exceeding 10 000 m² in extent.

The findings from the Cultural Heritage Impact Assessment and Desktop Palaeontological Impact Assessment that were undertaken for the Project and are included in section 13.

6.2 Energy Legislation in SA

6.2.1 South Africa has developed the following related legal frameworks:

- Electricity Regulation Act (Act No. 4 of 2006);
- National Energy Act (Act No. 34 of 2008); and
- Income Tax Act (1962) - tax incentive provided for Section 12

6.2.2 Policy Framework established in South Africa are listed below:

- White Paper on Energy Policy (1998);
- White Paper on Renewable Energy (2003);
- Integrated Energy Plan (2003);
- Integrated Resource Plan (IRP) 2010;
- Integrated Resource Plan (IRP) 2019
- National Climate Change Response White Paper (2011);
- Post-2015 National Energy Efficiency Strategy;
- The National Development Plan (2030);
- Climate Change Bill (2018); and
- Carbon Tax Bill (2019).

6.3 National and Regional Plans

The following plans were considered in the assessment of the proposed development:

- 2007 Mpumalanga Biodiversity Conservation Plan (MBCP)
- Municipal Spatial Development Frameworks (SDFs);
- Municipal Integrated Development Plans (IDPs);
- Relevant national, provincial, district and local policies, strategies, plans and programmes;

7. ENVIRONMENTAL ASSESSMENT

7.1 Environmental Assessment Authorities

In terms of the National Environmental Management Act, the lead decision-making authority for the environmental assessment is DARDLEA, they are the competent authority for the proposed application.

Various other authorities with jurisdiction over elements of the receiving environment or project activities will also continue to be consulted during the course of the BAR Process. A database of Interested and Affected Parties (IAPs) is contained in Appendix G of this report, and a list of the government departments.

7.2 Environmental Assessment Practitioner

CRRENEWABLES Pty Ltd is appointed, as an Independent Environmental Practitioner (EAP) to apply for Environmental Authorisation for the proposed Powerline and supporting substation in terms of the NEMA EIA regulations.

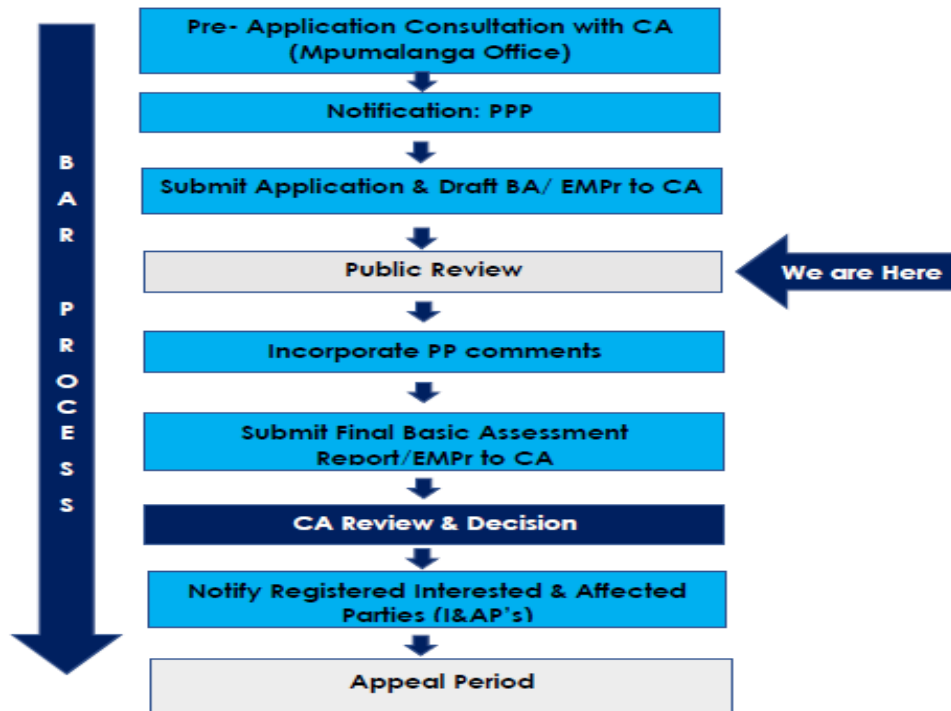
The company is a 100% black female owned company, with a level 1 BBEE rating. Kindly refer to Appendix E for Cv's of the team that is involved in this project and specialists.

7.3 Basic Assessment Triggers and Process

The construction of the 88kV distribution powerline, outside an urban edge, including associated structures require the Basic Assessment Process as contemplated in NEMA EIA Regulation 11(1) of GN No R983 of December 2014

as amended (07 April 2017) and may not commence without Environmental Authorisation.

Overview of Basic Assessment Process



	Competent Authorities (CA)
	Environmental Assessment Practitioner (EAP)
	Interested & Affected Parties

8. ASSUMPTIONS, GAPS AND LIMITATIONS

The following assumptions, gaps and limitations have been identified based on the Basic Assessment process conducted:

It is important to note that the project components are still at the feasibility stage. The dimensions, layout of the infrastructure and other aspects of the proposed development may change when the final designs are established, although no major changes are anticipated. The method used to determine the potential impacts associated with the proposed projects are only predicted on a probability basis.

The accuracy of the predictions is mainly dependent on the availability of environmental data and the degree of understanding of the environmental features and their related attributes.

The following assumptions, gaps and limitation were noted as part of the Specialist Studies.

8.1 Water Resources Impact Assessment

- The wetland delineation is based on sample data obtained from transects taken at selected points along HGM units. This data is then extrapolated in order to represent the entire HGM unit. Although every effort is made to ensure accuracy as far as possible, the wetland delineation represented in this report may differ marginally from the reality in some instances, and;
- It is also imperative to note that any changes to the wetlands systems within the study boundary after field work had commenced were not considered for this assessment. Any discrepancies as a result of this have not been regarded.

8.2 Terrestrial Ecology Assessment

In some studies, such as avifauna the specialist said, the numbers would have been higher if more time was spent as well as more days in search of species, if the surveys had started earlier and extended later in the day/night, and if every sector had been covered. The total number of species expected could have been much higher if other unlikely species that are only recorded as rare vagrants to the area were not excluded from this analysis due to inadequate availability of their preferred habitat(s).

8.3 Phase 1 Cultural Heritage Impact Assessment

Ground visibility was poor due to cover of thick summer grass

8.4 Desktop Paleontological Assessment

Based on the geology of the area and the palaeontological record as we know it, it can be assumed that the formation and layout of the dolerites, sandstones, shales and sands are typical for the country and do not contain fossil plant, insect, invertebrate and vertebrate material, except where there are unweathered shales of the Vryheid Formation. The soils and sands of the Quaternary period would not preserve fossils.

9. FINANCIAL PROVISIONS

According to Section 3(1)(s) of Appendix 1 of GN No. R. 982 of 4 December 2014 (as amended), details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts must be provided accordingly. Due to the sensitive nature of financial matters, the applicant is not able to disclose details but has confirmed the following:

- The applicant will be responsible for the costs incurred in complying with the NEMA EIA Regulations, 2014 and other environmental legislation including but not limited to –
 - costs incurred in connection with the appointment of the environmental assessment practitioner or any person contracted by the environmental assessment practitioner;
 - costs incurred in respect of independent reviews in terms of regulation 13(2) of GN No. R982;
 - costs incurred in respect of the undertaking of any process required in terms of the regulations;
 - costs in respect of any fee prescribed by the Minister or MEC in respect of the regulations;
 - costs in respect of specialist reviews, if the competent authority decides to recover costs; and
 - the provision of security to ensure compliance with applicable management and mitigation measures;
 - The Applicant is responsible for complying with conditions that may be attached to any decision(s) issued by the competent authority.

10. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

10.1 Solid waste management

QUESTIONS	ANSWER (YES/ NO)	
Will the activity produce solid construction waste during the construction/initiation phase?	YES	
<p>The facility will generate some solid waste during construction. Waste such as cut conductors, cement waste / surplus waste from building activities, domestic waste, hazardous waste (e.g. chemicals soil contaminated by waste and spillages, oil / petrol rags). Waste generated during the construction phase will be temporarily stored at demarcated sites, removed at regular intervals and disposed-of at licenced waste disposal sites.</p>		
<p>If yes, what estimated quantity will be produced per month? To be determined during final design stage?</p>		
<p>It is unknown at this stage</p>		
<p>How will the construction solid waste be disposed of?</p>		
<p>Construction solid waste will be temporarily stored at demarcated sites, removed at regular intervals and disposed-of at licenced waste disposal sites</p>		
Will the activity produce solid waste during its operational phase?	YES	
<p>If yes, what estimated quantity will be produced per month?</p>		
<p>To be determined during final design stage</p>		
<p>Where will the solid waste be disposed of if it does not feed into a municipal waste stream (describe)?</p>		
<p>A registered supplier will be used to collect the waste and dispose it of at registered dumping site.</p>		
	YES	

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?		
Possible hazardous waste that will be generated during the construction and operational phase will include chemicals, oils, soil contaminated by spillages, diesel /oil rags, etc. The management of this waste is catered for in the EMPr.		
Is the activity that is being applied for a solid waste handling or treatment facility?		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?		
The EMPr makes a clear provision for waste separation and recycling.		

10.2 Liquid effluent (other than domestic sewage)

QUESTIONS	ANSWER (YES/ NO)	
Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?		NO
<p>If yes, what estimated quantity will be produced per month? No</p> <p>If yes, has the municipality confirmed that sufficient capacity exists for treating / disposing of the liquid effluent to be generated by this activity(ies)? Registered waste removal suppliers will be used were necessary</p> <p>Will the activity produce any effluent that will be treated and/or disposed of on site? Unknown: To be confirmed after final designs</p> <p>If yes, what estimated quantity will be produced per month? Unknown: To be confirmed after final designs</p> <p>If yes describe the nature of the effluent and how it will be disposed? Unknown: To be confirmed after final design</p>		

Note: should effluent be treated or disposed on site the applicant should consult with the competent authority to determine whether they should follow a scoping or an EIA process.

Will the activity produce effluent that will be treated and/or disposed of at another facility?		NO
---	--	-----------

If yes, provide the particulars of the facility: N/A

Facility name:
 Contact person:
 Postal address:
 Postal code:
 Telephone: Cell:

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

Unknown at this stage, it will be clear at the final design stage.
 Should it happen, the applicant should use the services of a registered supplier to collect and disposed of waste water at a legal site.

10.3 Liquid effluent (domestic sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal sewage system?		NO
--	--	-----------

If yes, what estimated quantity will be produced per month? **N/A**

If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the domestic effluent to be generated by this activity(ies)?		NO
--	--	-----------

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

If yes describe how it will be treated and disposed of.

10.4 Emissions into the atmosphere

QUESTIONS	ANSWER (YES/ NO)
-----------	---------------------

<p>Will the activity release emissions into the atmosphere?</p> <p>If yes, is it controlled by any legislation of any sphere of government?</p> <p>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.</p>		NO
If no, describe the emissions in terms of type and concentration:		
Only construction related emissions are foreseen, such as vehicle emissions.		

10.5 Water Use

Indicate the source(s) of water that will be used for the activity:					
Municipal	Directly from water board	Groundwater	River, stream, dam or lake	Other	the activity will not use water
X					

QUESTIONS	ANSWER (YES/ NO)
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:	NO
If Yes, please attach proof of assurance of water supply, e.g. yield of borehole, in the appropriate Appendix.	NO
Does the activity require a water use permit from DWS?	NO
If yes, have you applied for the water use permit(s)?	NO
If yes, have you received approval(s)?	

10.6 Energy Efficiency


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

- At the substation e will be using outdoor energy efficient high mast LED lighting and indoor LED lighting with motion sensors.
- The powerline preferred is steel monopole structure/ design and will use chickadee conductor which has much less resistance, thus lower losses than other conductors for the power rated.

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

- None envisaged at this stage, however, should the budget allow, solar panels maybe considered as an alternative/ back-up energy source at the substation site.

10.7 Generation of noise

QUESTIONS	ANSWER (YES/ NO)	
Will the activity generate noise?	YES	
If NO, describe the noise in terms of type and level:		
The noise associated with construction activities would include construction vehicles, drilling and stringing machinery and general construction activities. This will be managed mainly through time management _ construction activities should be limited to daytime working and adherence with noise regulations of the area. Should the need to work during late hours, affected land users should be notified accordingly. Refer to the EMPr (Annexure G) for more details.		

11. Analysis of the Receiving Environment

11.1 General

This chapter provides a general description of the status quo of the receiving environment of the project area. The chapter allows for an appreciation of sensitive environmental features and possible receptors of the proposed Project. The potential impacts to the receiving environment will be discussed below and the Specialists Studies conducted, and their findings have been discussed below to provide a better understanding of the study area.

11.2 Land Use & Land Cover

The study area is mainly covered by cultivated commercial fields / land. The power line route will also traverse sensitive areas such as open spaces with water bodies / wetlands. Kindly see the map below for more details:

Figure 9: Land Use/ Cover

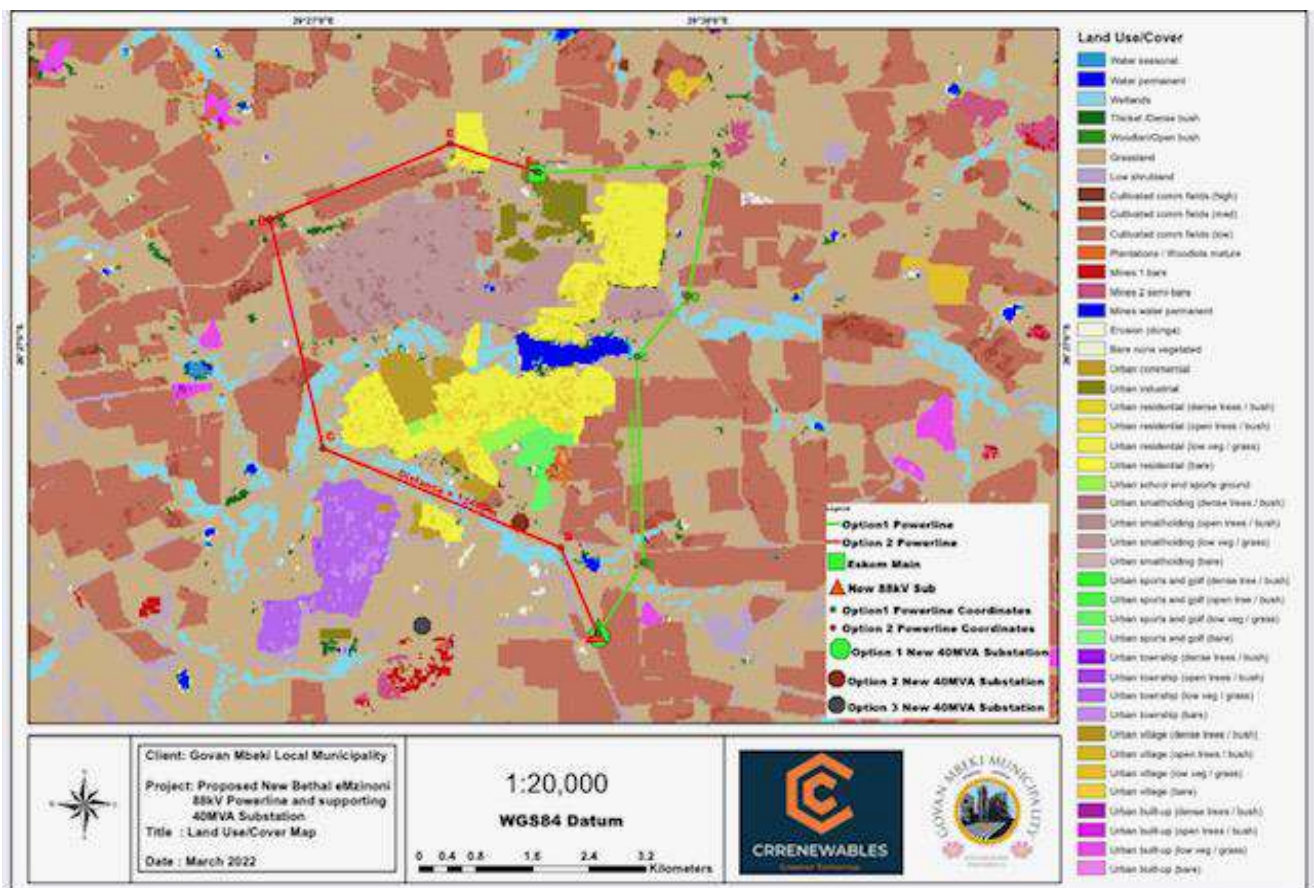
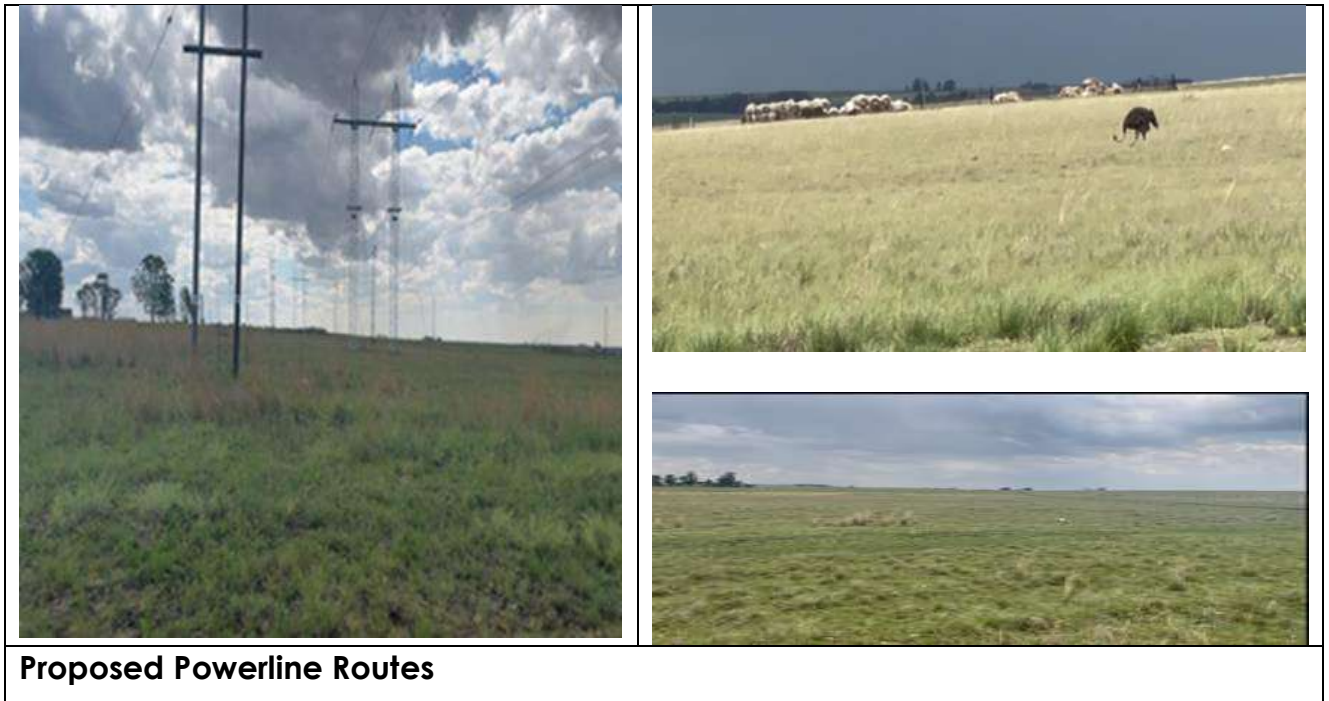


Figure 10: A view of current land uses on the proposed sites





Substation Option 1

11.3 Climate

Govan Mbeki is situated in the Highveld an extremely varied climate associated. The area experiences a summer rainfall during the months of October to February, and has contrasting temperatures of 8 degrees to 26 degrees during this time. Winter temperatures average in the range of 19 degrees during the months of April to August, characterised by dry conditions and frost would occur also (GMM SDF 2014-2034)

11.4 Geology

The table below provides a clear picture of the geological information for Govan Mbeki Municipality.

Table 4: GMM Geological Formation

Geological Formation	Area Covered (ha)	Percentage Covered
Arenite	134405.04	45.41%
Dolerite	156699.83	52.94%
Granite	38.93	0.01%
Rhyolite	4868.37	1.64%
Total	296012.18	100.00%

Source: National Department of Agriculture

Govan Mbeki Municipality's geology is dominated by sedimentary rocks of the Vryheid Formation of the Ecca Group, Karoo Supergroup (National Department of Agriculture). These rocks primarily consist of sandstones, shales and coal beds and are extensively intruded by dolerites of Jurassic age. Quaternary alluvial deposits are present in topographical lower lying areas adjacent to the major surface water drainage bodies.

The spatial distribution of the dominant underlying rock types forming part of the Karoo Super Group are as listed below:

- Dolerite dominates the majority of Govan Mbeki.
- Arenite is spread throughout Govan Mbeki in the form of intrusions.

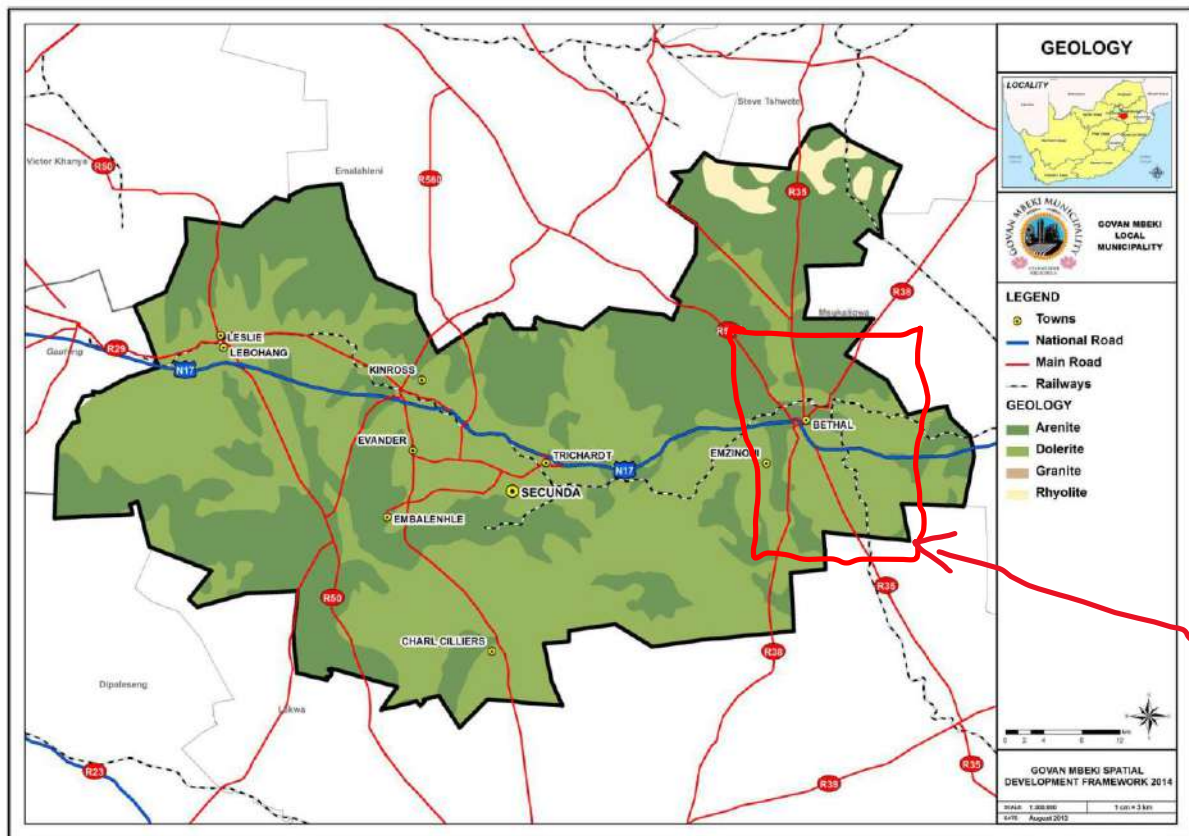
Types of Minerals Found in the area.

Minerals found in Govan Mbeki include:

- Gold (Au)
- Coal (C)
- Nickel
- Natural Gas

The map below provides a clear picture of the geological formation found in the study area. The Study area is mainly dominated by dolerite and arenite.

Figure 11: GMM Geology Map



Source: Council for Geoscience

11.5 Soils

The soil map provided in figure 8 below, provides a clear picture of the type of soils found in GMM. The soils associations provides Govan Mbeki with the agriculture potential needed for the production of food and the geotechnical basis supporting or restricting the physical development on land.

Agriculture Soil Potential:

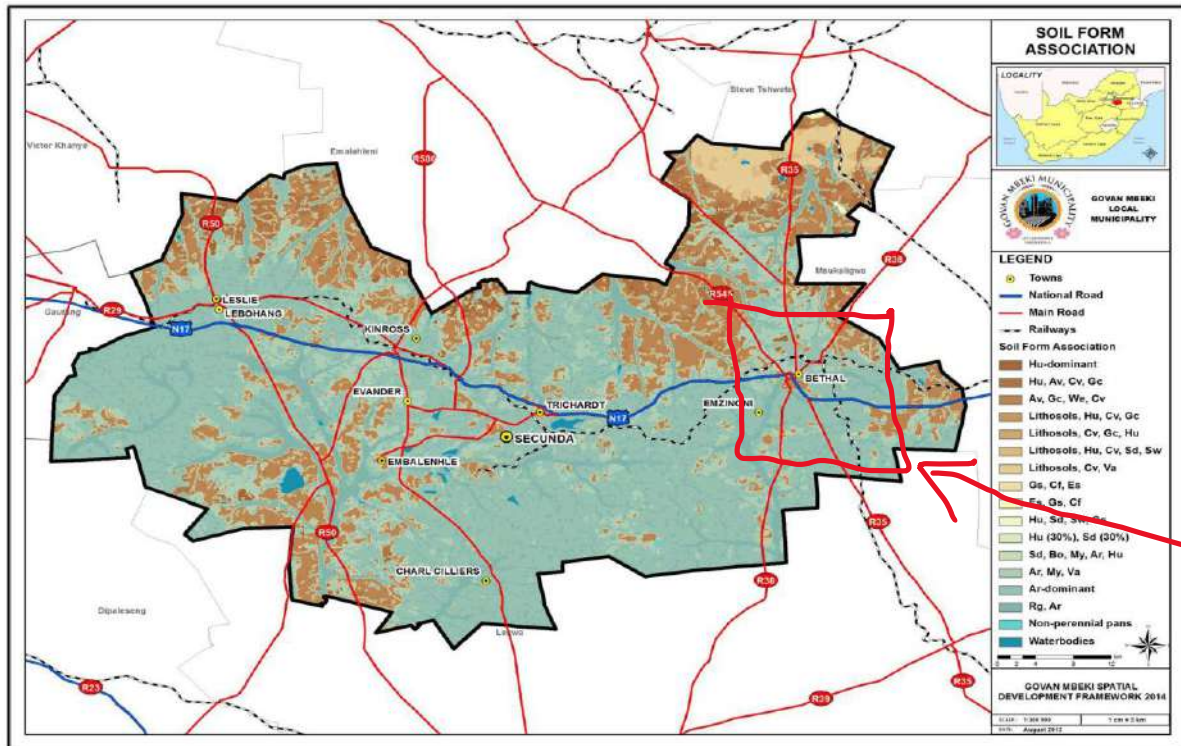
The agricultural potential of the soils are determined in terms of the soil type, the soils depth and the clay contents of the soils. In terms of agriculture potential Govan Mbeki soil type can be classified as

- High
- Medium High
- Medium

- Medium Low
- Low

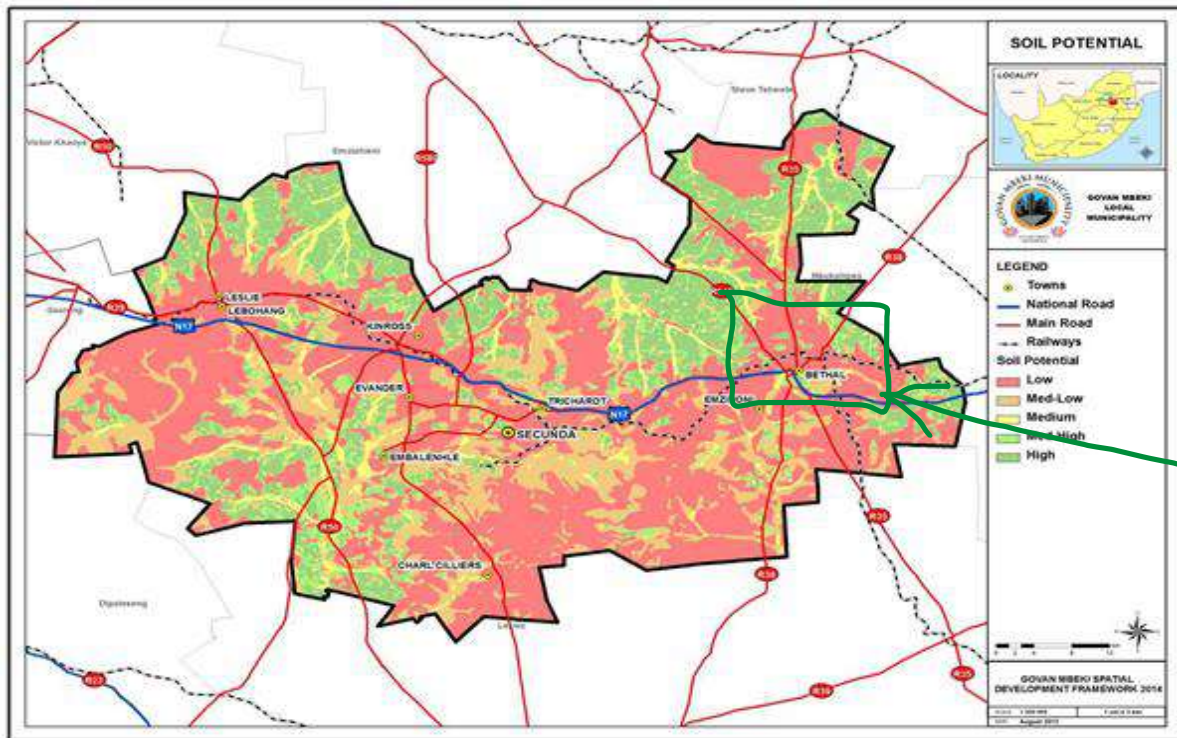
Based on the map below, the study area is mostly dominated by Avalon (Av) and Hutton (Hu) soil types.

Figure 12: GMM Soil Map



Source: Mpumalanga Department of Agriculture

Figure 13: Agricultural Soil Potential Map

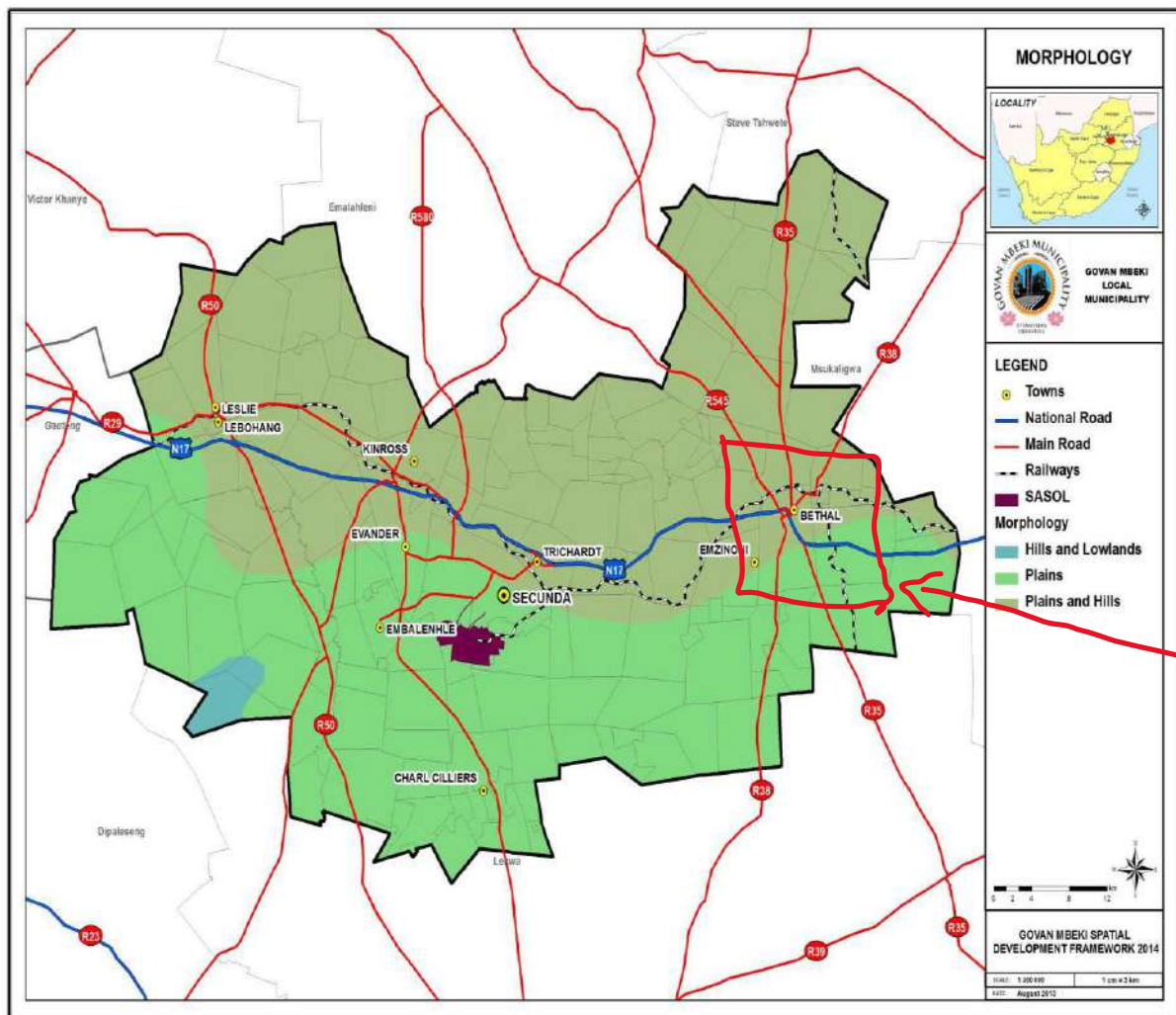


Source: Mpumalanga Department of Agriculture

11.6 Topography

Based on the data provided in the map below (Figure 9), one can conclude that Govan Mbeki is fairly flat with altitudes varying from 1500m to 1820m above the sea level. Most of the area is situated between 1560 to 1640 m above sea level. According to the Morphology Map, it shows that plains and hills make up 99% of the area (GMM SDF 2014-2034)

Figure 14: GMM Morphology Map



Source: National Department of Agriculture, Forestry and Fisheries

11.7 Hydrology

11.7.1 Surface Water

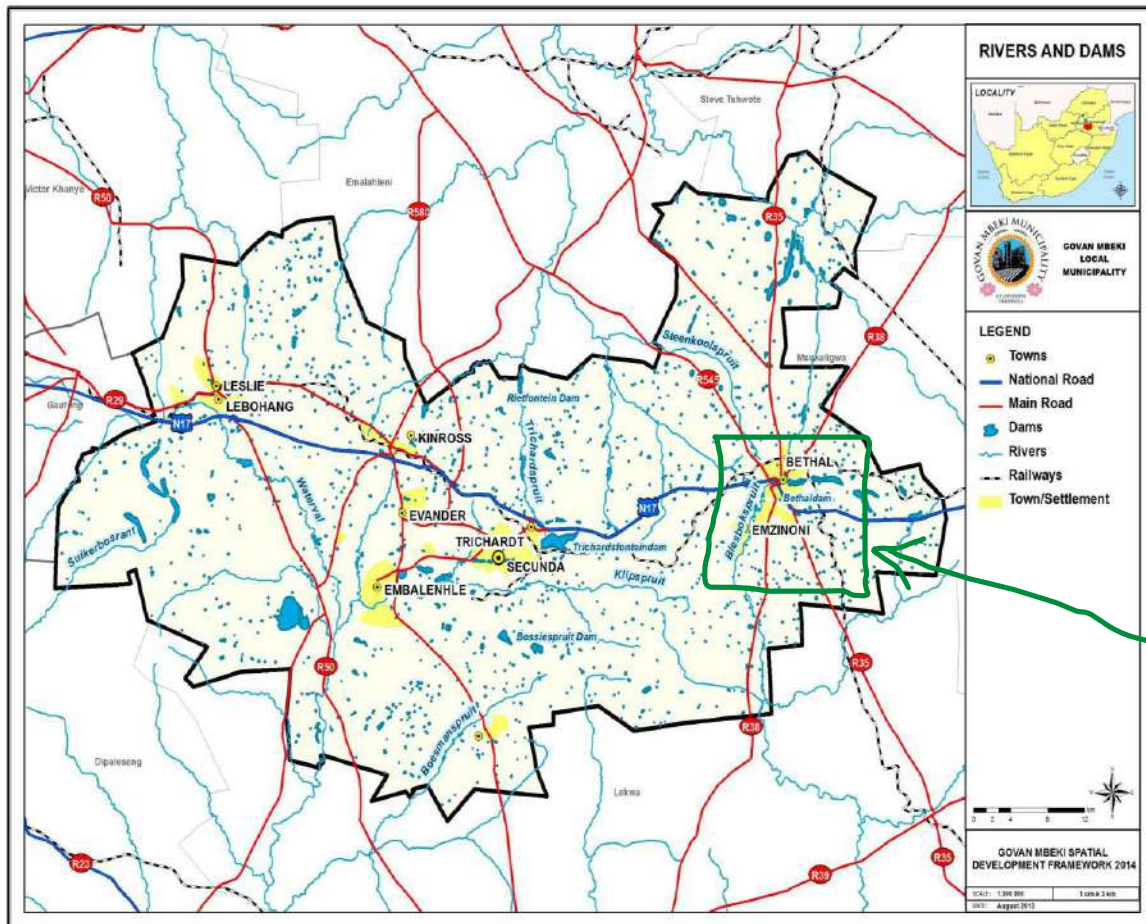
Rivers and Dams:

Most of parts of Govan Mbeki Municipality wards are located in the catchments of the Blesbokspuit and Waterval River. The rivers are in the Upper Vaal Water Management Area as well as the catchments of Olifants and Rietspruit of the Olifants River WMA. Govan Mbeki owns and operates the Bethal Dam, mainly used for recreational purposes only.

11.7.2 Ground Water:

Groundwater is mostly used by farming communities as their primary source of water as well as for garden purposes(GMM SDF 2014-2034)

Figure 15: GMM Dams & Rivers Map



Source: DWA 2013

11.7.3 Aquatic Ecosystems

The Aquatic assessment for Govan Mbeki is informed by the Freshwater Ecosystem Priority Areas (FEPA). FEPA provides guidance on the status of rivers, wetlands and estuaries, and further determines which ones should remain in a natural or near-natural condition.

Important rivers that meet national targets are called River FEPAs, and important wetlands that meet national targets are called Wetland FEPAs. River

FEPA and associated sub-quaternary catchments are required to achieve biodiversity targets for river ecosystems

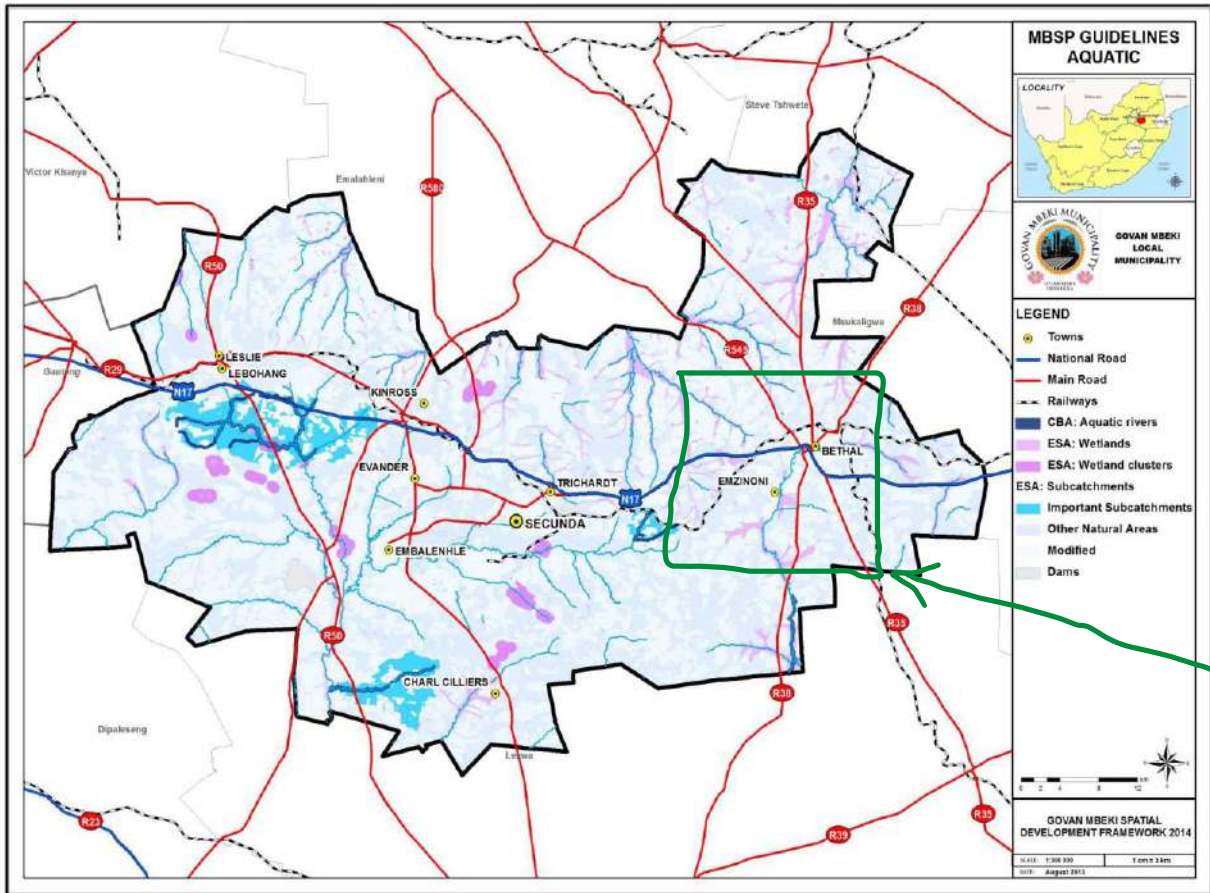
The status of the river and wetland FEPAs for the Govan Mbeki is summarized in table 5 below, and further illustrated on Figure 12 Map below.

TABLE 5: Govan Mbeki Aquatic Assessment

Type of Catchment	Land cover in ha	Percentages
Dams	2728.09	0.92
ESA: FEPA sub catchments	10271.19	3.47
Modified	134272.31	45.39
Other Natural Areas	148563.70	50.22
Grand Total	295835.29	100.00
Wetland Clusters	3523.74	19.14
FEPA wetland	4365.58	23.71
Natural	10520.98	57.15
Grand Total	18410.30	100.00
CBA: CR rivers	231.10	14.33
CBA: FEPA rivers	1381.92	85.67
Grand Total	1613.03	100

ESA: Ecological Support Areas
 FEPA: Freshwater Ecosystem Priority Areas
 CBA: Critical Biodiversity Areas
 CR: Critical Endangered Rivers

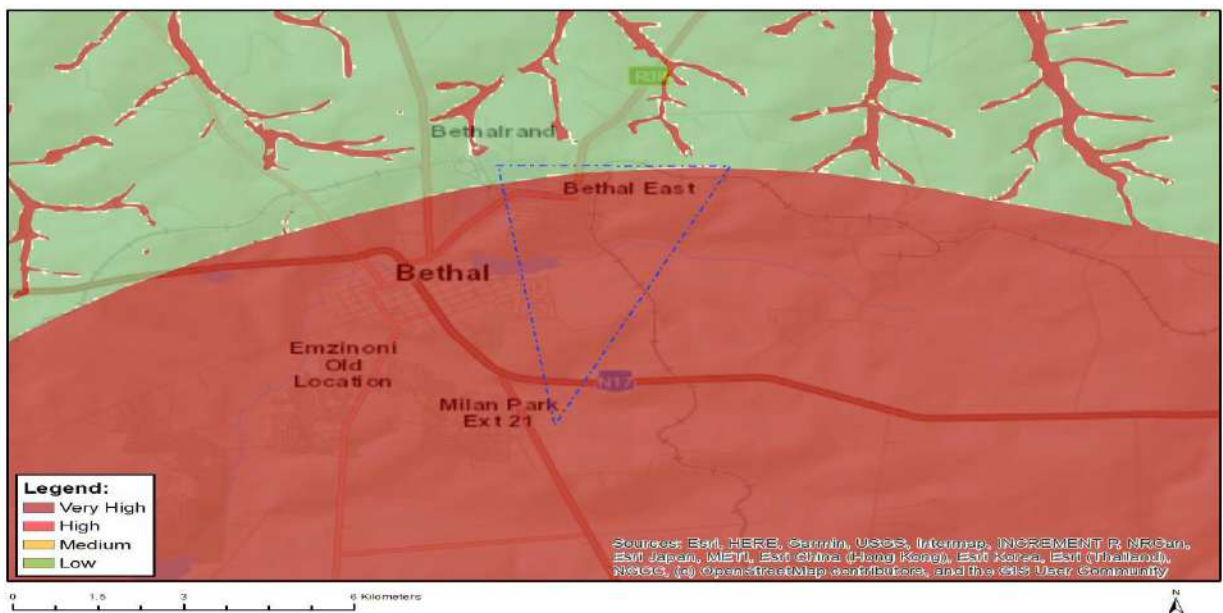
Figure 16a: GMM Aquatic Assessment Map



Study Area

Source: DWA 2013

Figure 16b: Aquatic Theme Sensitivity Map (Source: DFFE_Screening report)



March 2022

11.8 Flora & Fauna

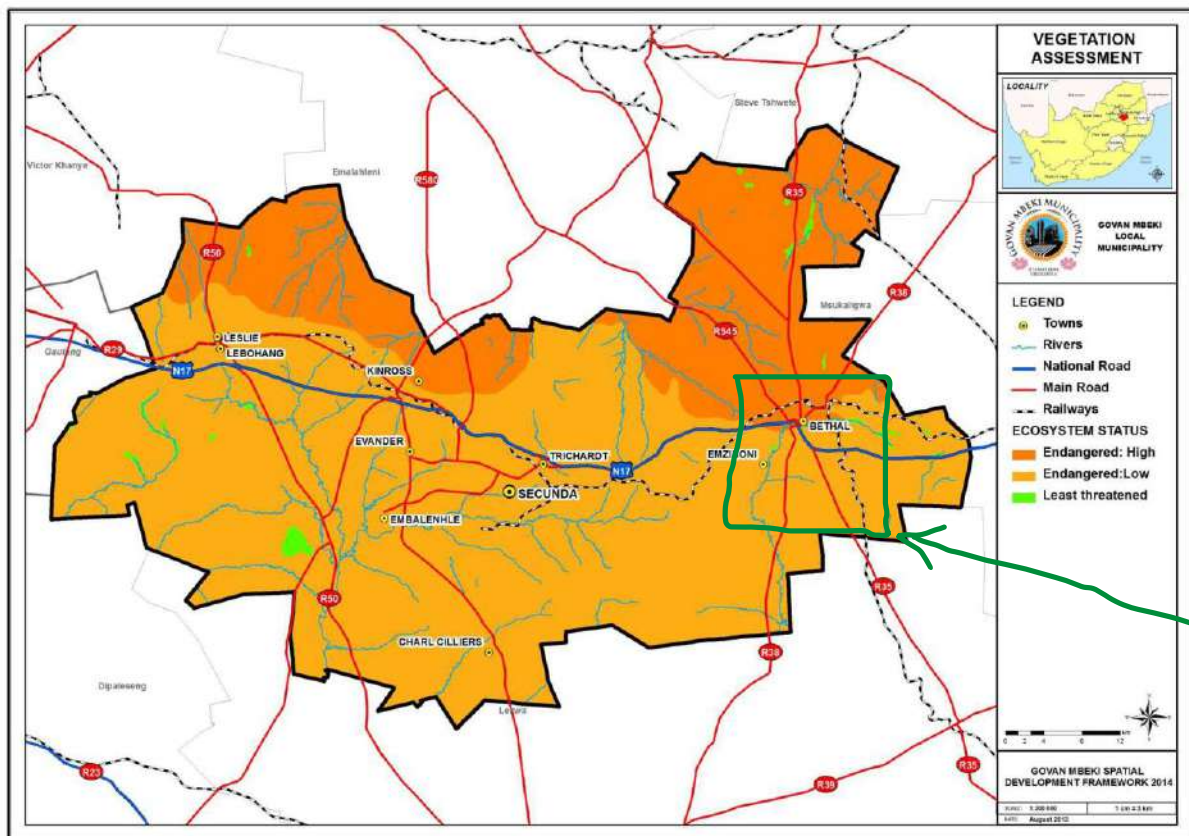
11.8.1 Mpumalanga Biodiversity Conservation Plan

Mpumalanga Biodiversity Sector Plan (MTPA, 2014) The Mpumalanga Biodiversity Sector Plan (MBSP) is a systematic conservation plan developed and adopted by the Province (DARDLEA) in order to aid in environmental and conservation planning of the province.

11.8.2 Flora

The Vegetation assessment for Govan Mbeki is summarised in table 6 below. Based on this map one can conclude by saying the vegetation cover in the study area is mainly vegetation that is endangered species.

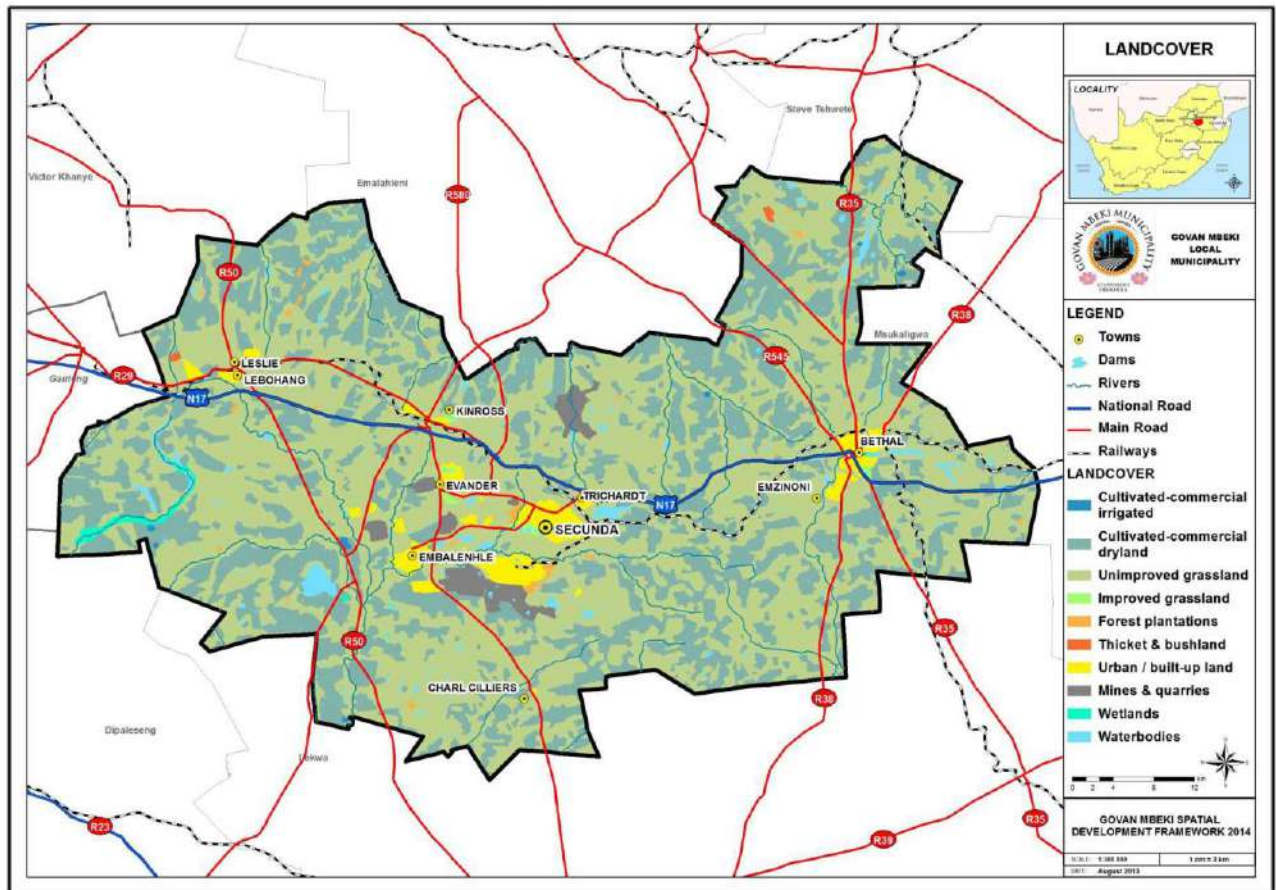
Figure 17a: GMM Vegetation Map



Based on the biodiversity study conducted, the vegetation occurring in the proposed development footprint consists mainly of grass species such as (*Aristida congesta* subsp. *congesta* (Tassel Three-awn), *A. congesta* subsp. *barbicollis* (Spreading Three-awn), *Cynodon dactylon* (Couch Grass) and *Urochloa mosambicensis* (Bushveld Signal Grass) as well as exotic forb species

such as *Bidens pilosa* (Blackjack) and *Tagetes*. Please refer to the summary of the specialist studies done for more details (Section 12.4).

Figure 17b: GMM Land Cover Map



Source: Mpumalanga Biodiversity Conservation Plan

According to the GMM Land Cover Map the study area is covered by Un-Improved grassland, cultivated-commercial dryland and irrigated land. Some portion of the powerline will cross wetland areas.

11.8.3 Fauna

This section provides a list of species that are observed or deduced to occupy the study area (Systematics and taxonomy as proposed by Bronner et.al [2003] and Skinner and Chimimba [2005])

Table 6: Mammal diversity: The species observed or deduced to occupy the site.

	RED DATA	SCIENTIFIC NAME	ENGLISH NAME
?	DD	<i>Elephantulus brachyrhynchus</i>	Short-snouted elephant shrew
?	DD	<i>Myosorex varius</i>	Forest Shrew
+	LC	<i>Lepus saxatilis</i>	Scrub hare
?	NT	<i>Atelerix frontalis</i>	South African hedgehog
+	DD	<i>Tatera leucogaster</i>	Bushveld gerbil
*	DD	<i>Lemniscomys rosalia</i>	One striped mouse
+	DD	<i>Crocidura cyanea</i>	Reddish-grey mush shrew
*	DD	<i>Crocidura hirta</i>	Lesser red musk shrew
*	DD	<i>Crocidura flavescens</i>	Greater Musk Shrew
?	DD	<i>Crocidura fuscomurina</i>	Tiny Musk Shrew
*	En	<i>Crocidura maguassiensis</i>	(Makwassie Musk Shrew
*	CR	<i>Cloeotis percivali</i>	Short-eared Trident Bat
*	NT	<i>Rhinolophus clivus</i>	Geoffroy's horseshoe bat

*	NT	<i>Rhinolophus darling</i>	Darling's horseshoe bat
*	NT	<i>Mellivora capensis</i>	Honey badger
*	LC	<i>Atilax paludinosus</i>	Water Mongoose
*	LC	<i>Cynictis penicillata</i>	Yellow mongoose
*	NT	<i>Hydrictis maculicollis</i>	Spotted-necked Otter
*	LC	<i>Caracal caracal</i>	Caracal
*	NT	<i>Leptailurus serval</i>	Serval
?	NT	<i>Hyaena brunnea</i>	Brown Hyena
?	LC	<i>Orycteropus afer</i>	Aardvark
+	LC	<i>Sylvicapra grimmia</i>	Duiker
+	LC	<i>Raphicerus campestris</i>	Steenbok
+	LC	<i>Ourebia ourebi</i>	Oribi

+ Definitely present or have high probability to occur

*** Medium probability to occur based on ecological and distributional parameters**

? Low probability to occur based on ecological and distributional parameters

11.8.4 Protected Areas

According to the Mpumalanga Biodiversity Sector Plan (MBSP), the proposed powerline between the existing Eskom Main Substation and the new 40 MVA Substation is not located within the threatened ecosystems (Critical Biodiversity Areas, important areas, as well as Ecological Support Areas (ESAs).

No red data or endangered plant species were observed within the area where the proposed powerline is to be erected. The vegetation occurring in the proposed development footprint consists mainly of grass species such as (*Aristida congesta* subsp. *congesta* (Tassel Three-awn),

11.9 Socio-Economic Environment

11.9.1 General

This chapter provides an overview of the current Socio-economic situation, in the Govan Mbeki Local Municipality. This overview incorporates sectoral performances and composition as well as overall.

11.9.2 Socio-Economic Baseline

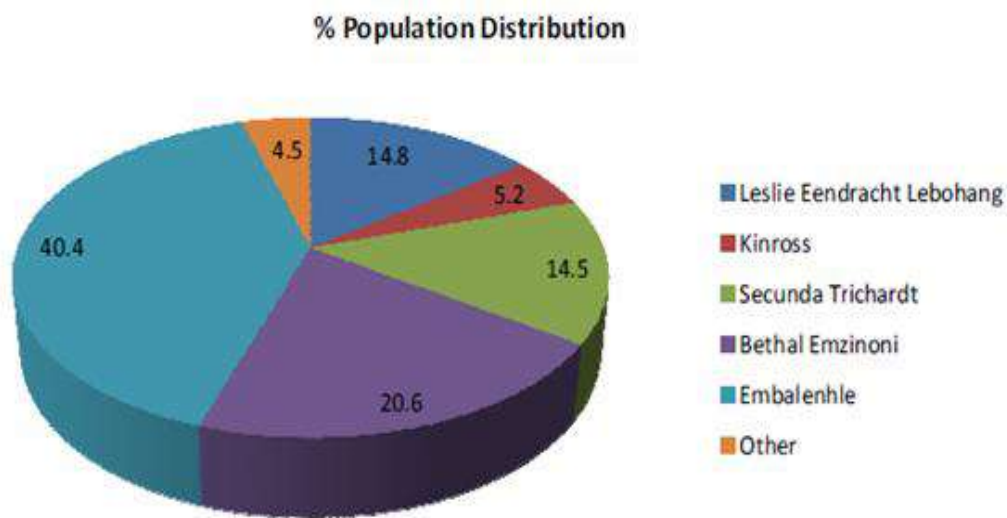
11.9.2.1 Population distribution

According to the SDF 2014-2034, the existing population within the developed areas of Govan Mbeki (urban and rural) totals 294 538 representing 83 874 households, at an average of 3.3 people per household.

Within Govan Mbeki:

- 40.4% of the population resides in Embalenhle
- 20.6% of the population resides in Bethal Emzinoni
- 14.8% of the population resides in Leslie Eendracht Lebohang
- 14.5% of the population reside in Secunda and Trichards
- 5.2% of the population resides in Kinross
- 4.5% of the population live on farms

Figure: 18 GMM Population Distribution



(Source: GMM SDF 2014-2034)

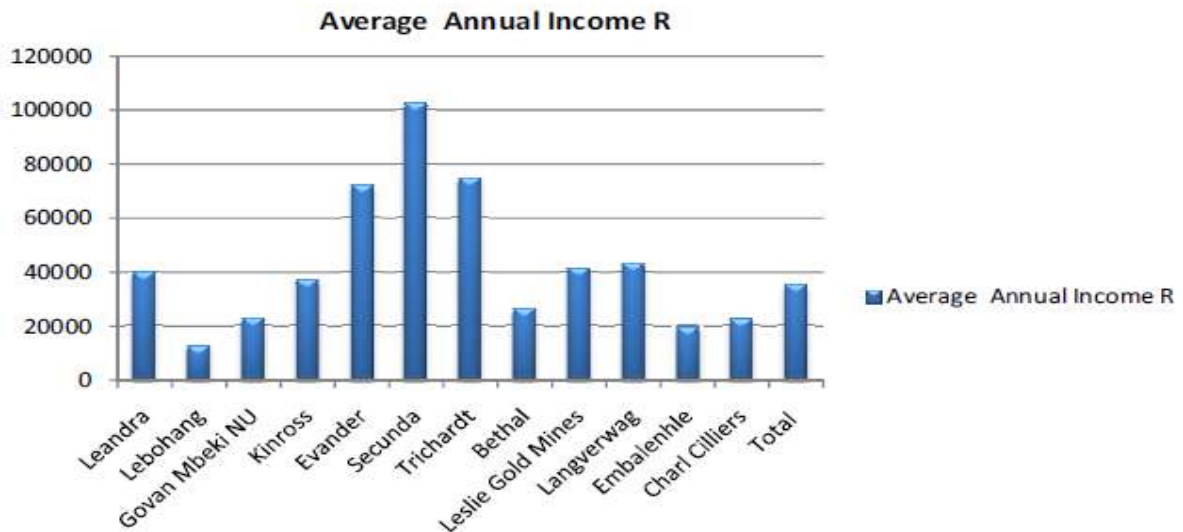
11.9.2.2 Economic Activities

This section shows the employment levels within Govan Mbeki Municipality in all economic sectors. Main sectors that contribute to the GMM's economy are listed below:

- Agriculture
- Mining
- Manufacturing
- Utilities ((generally referred to as “electricity” and “water”))
- Construction
- Trade
- Transport, storage and communication
- Financial and business services
- Social and community services

11. 9.2.3 Average Household Income per area

Figure 19: Average Annual Income Graph



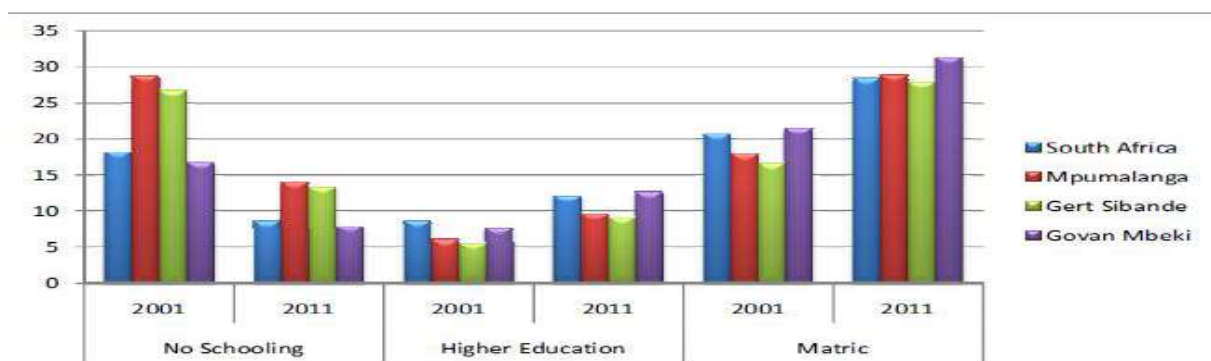
(Source: GMM SDF 2014-2034)

Based on the above graph, it is evident that average incomes in Secunda of R 102,648 and Evander of R 72,211 exceed the average for Govan Mbeki of R 35,335 by far. Very low average incomes are found in Embalenhle (R 19,599), Lebohang (R 12,594), Bethal Emzinoni (R26,387), Charl Cilliers (R22,581) and the nonurban areas (R22,929)

11.9.2.4 Educational Profile

According to the existing profiles and trends, it shows an improvement in education levels which will assist in eventually a higher absorption rate into the economy. See below the educational profile graph.

Figure 20: GMM Educational Profile Graph

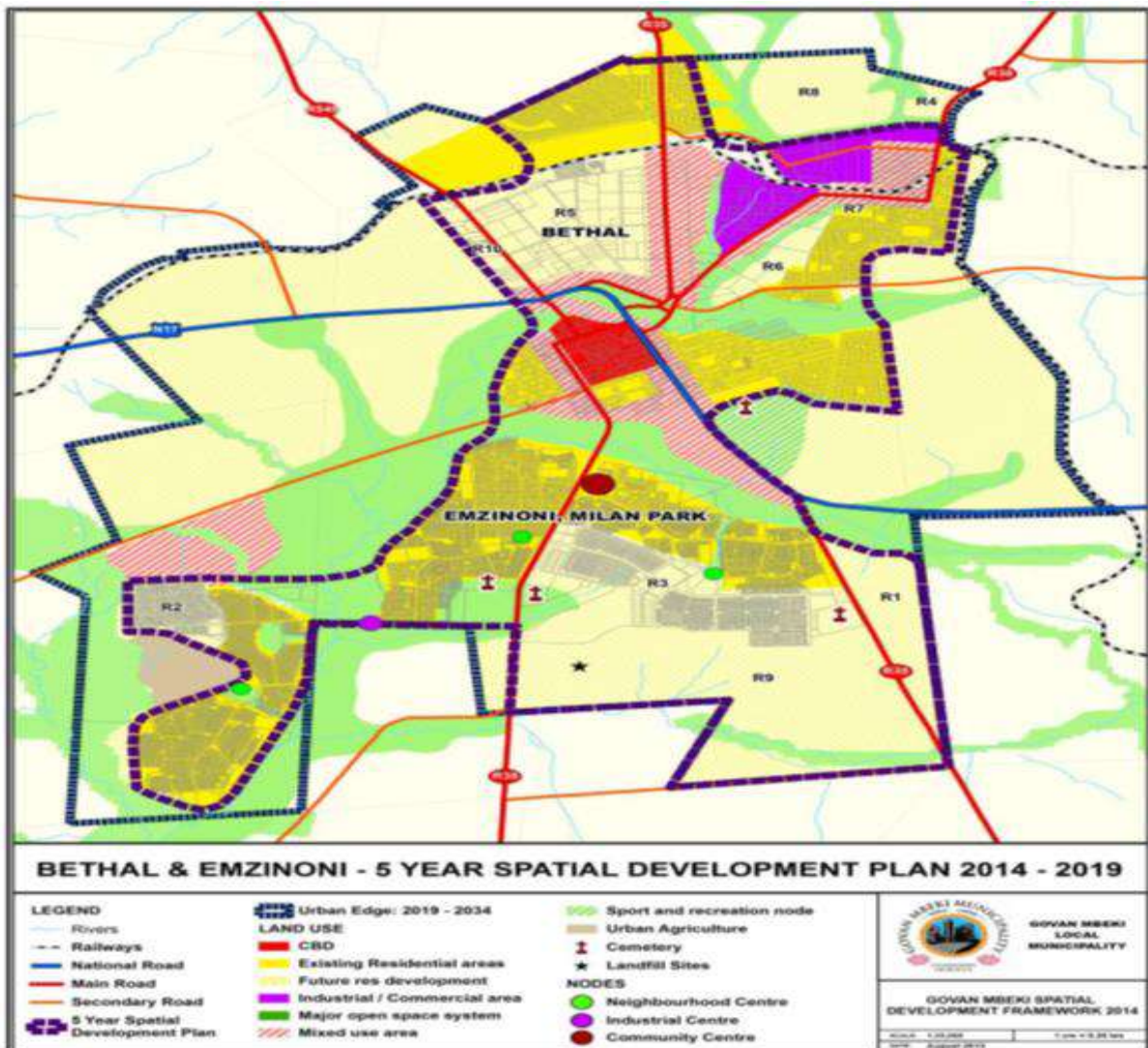


(Source: GMM SDF 2014-2034)

11.10 Planning

This section provides an overview of the 5 Year develop plan for the study area. The map below provides a snapshot of the earmarked sites for development over the period of 5 years. With the new developments planned, the need for electricity supply is unquestionable.

Figure 21: Bethal & Emzinoni Spatial Development Plan Map



Source: Demarcation Board 2013

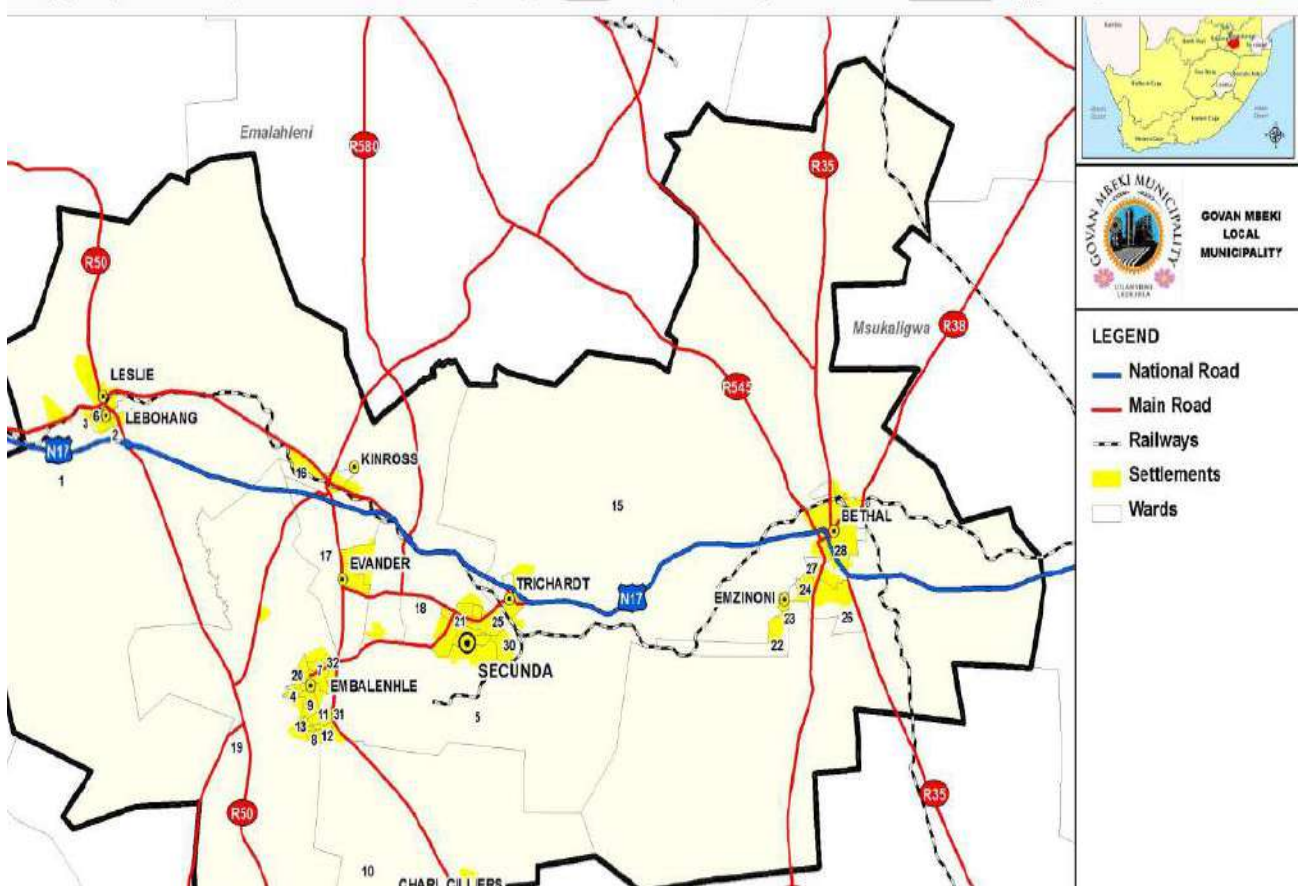
11.11 Existing Structures and Infrastructure

GMM Infrastructure conditions differ from one ward to another. Zooming into the study area which is located in Ward 22,23,24,26 and 28 the following major infrastructures amongst others exist: Roads, Sewage, Water, Waste and

Electricity. According to the GMM SDF, some wards require maintenance of roads, sewage system and waste removal services /facilities. The southern part of ward 26 has challenges in terms of electricity supply. The new residents are not electrified.

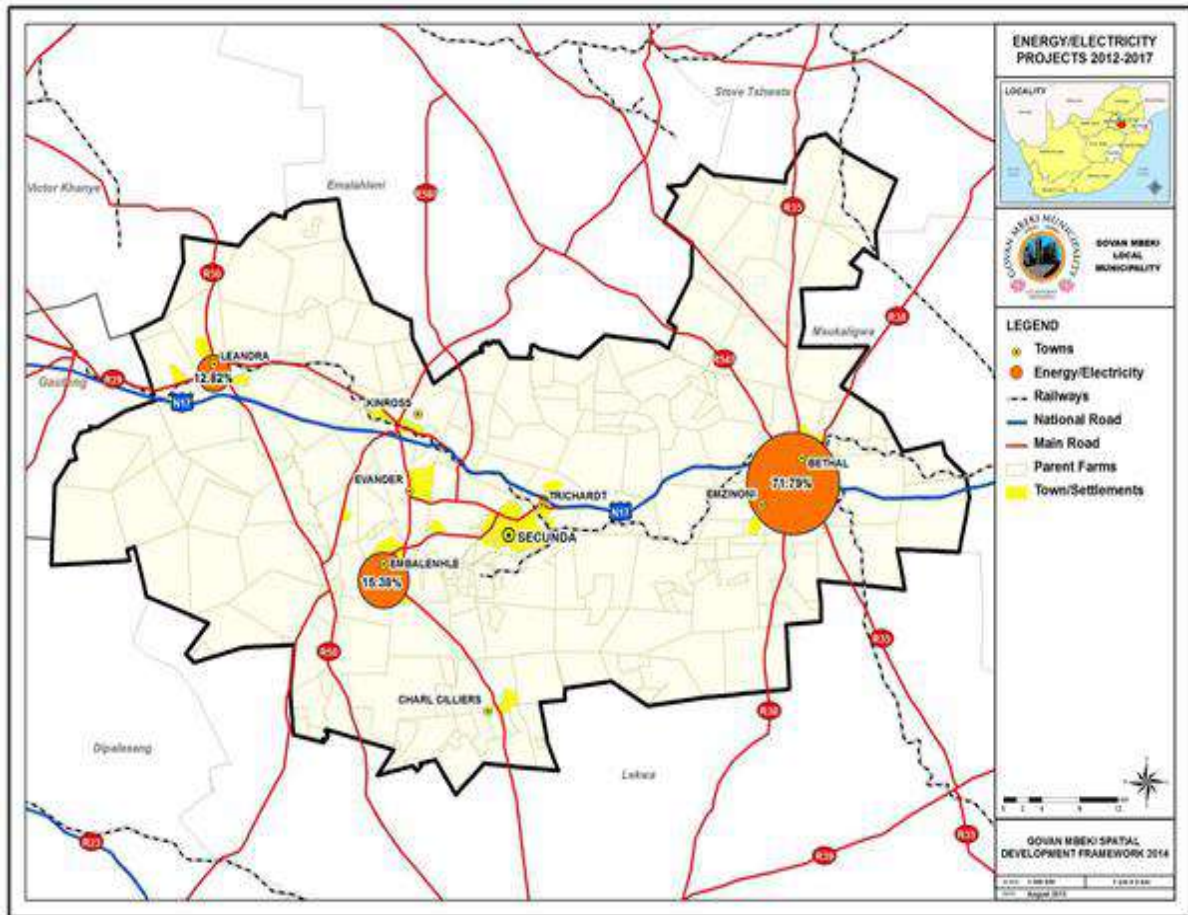
The Study area has also been targeted by the Municipality’s SDF 2014-2034, p70, for energy efficiency / electricity projects.

Figure 22: GMM Wards Map



(Source: GMM SDF 2014-2034)

Figure 23: GMM Energy / Electricity Map

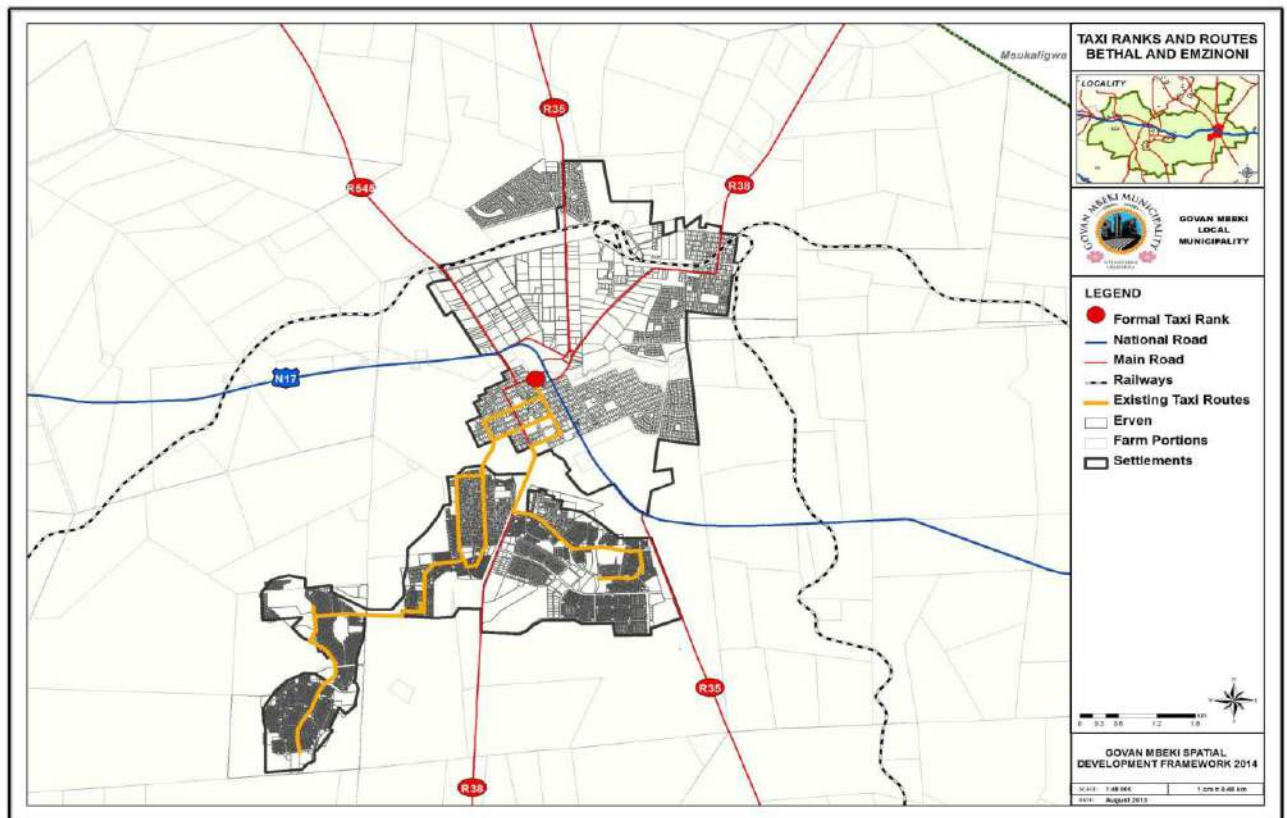


(Source: GMM SDF 2014-2034)

11.12 Transportation

According to the GMM SDF 2014-2034, Taxi Ranks and Routes map, transportation system seem to have covered most township areas. There is however, a need to still cover new residents in the study area.

Figure 24: GMM Transportation Map



(Source: GMM SDF 2014-2034)

11.13 Air quality

According to the Highveld Priority Area Air Quality Management Plan, 2011, Govan Mbeki Municipality (GMM) falls within the HPA, and was registered then, under the Atmospheric Pollution Prevention Act; Act No. 45 of 1965 (APPA) as one of the sources, to operate scheduled processes.

Industrial sources in total are by far the largest contributor of emissions in the HPA, accounting for 89% of PM₁₀, 90% of NO_x and 99% of SO₂.

11.14 Noise

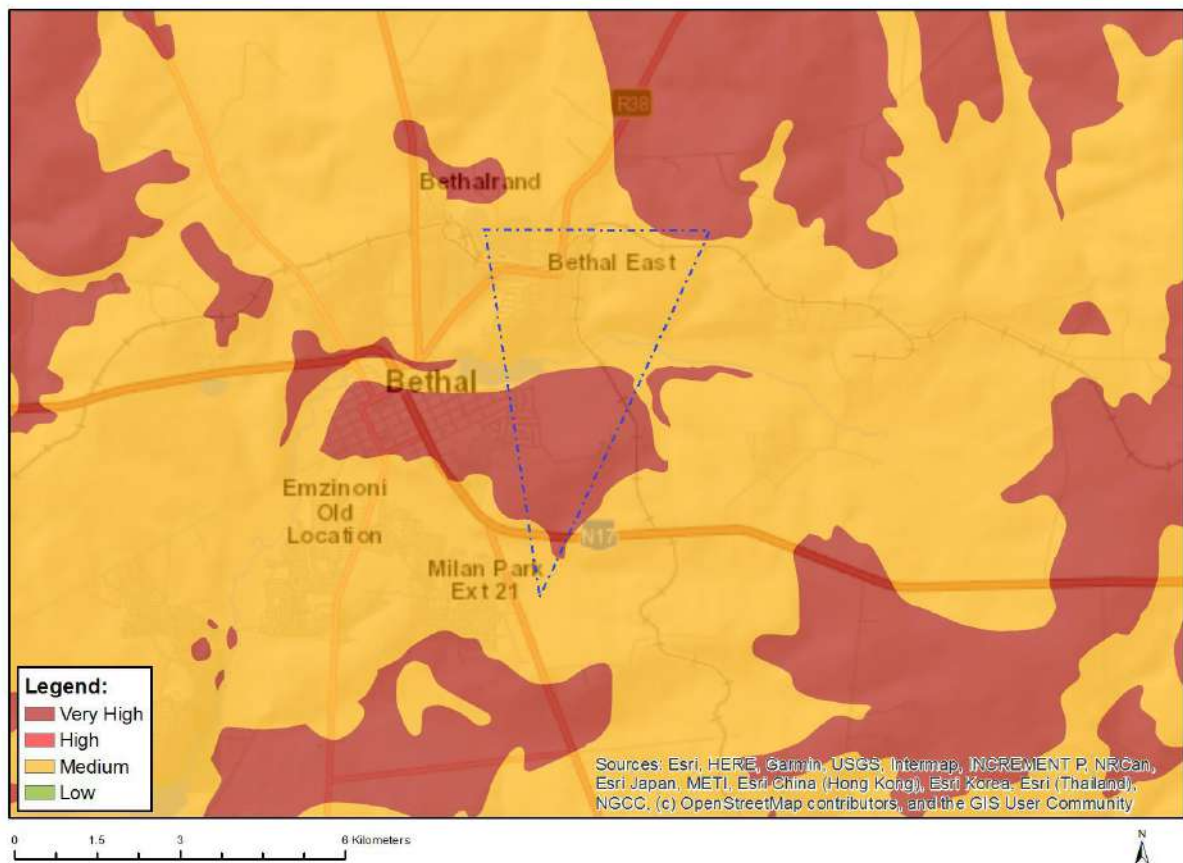
Noise in the study area would emanate mainly from vehicles traffic on the N17 and R35 routes, farming activities and other business activities such as (Bethal Truck Stop).

11.15 Cultural Heritage & Palaeontological Features

This chapter provides an overview of the Cultural Heritage & Palaeontological Features of the project's receiving environment. In order to comply with the regulations of the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) & 38 (1)a of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a screening report was conducted, which then informed the study conducted in this regard.

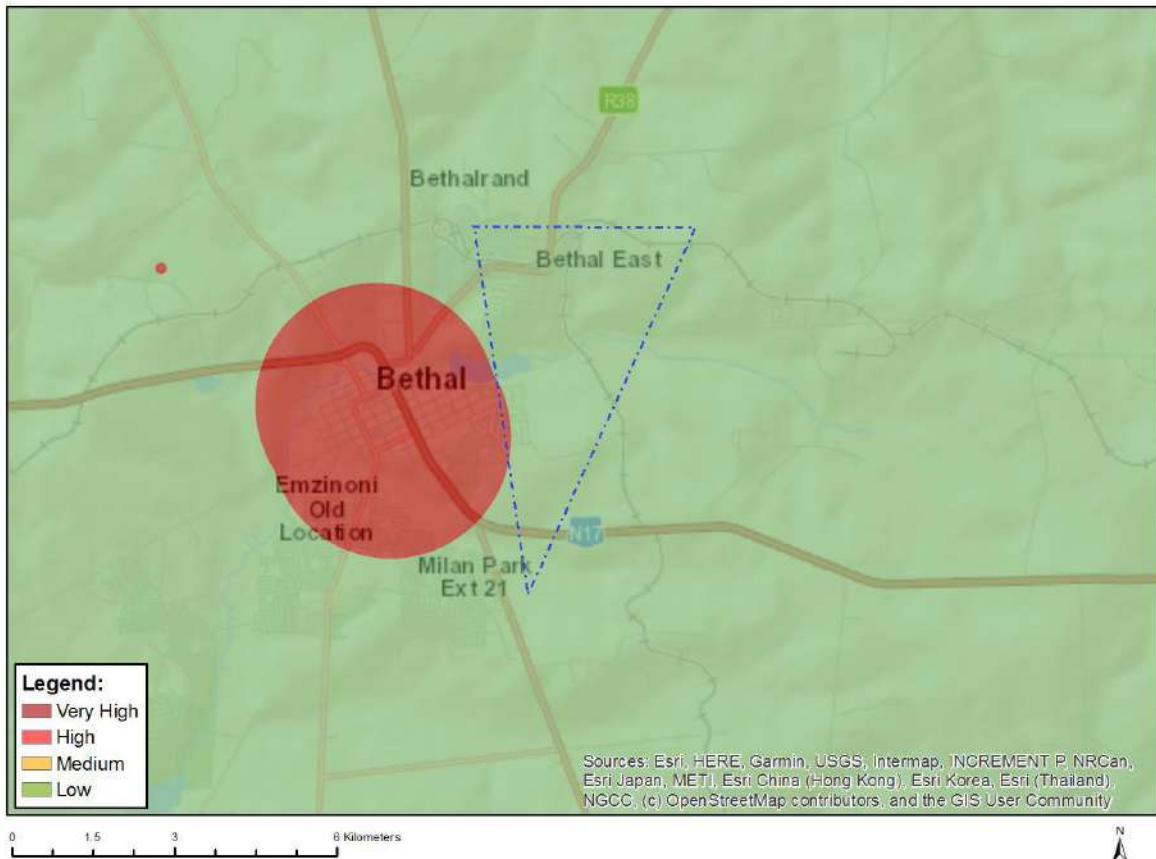
Based on the screening report, the study area has Medium - High sensitive palaeontological, Heritage & Cultural Features (See the figures below).

Figure 25: Palaeontological Features of the study area



(Source: DFFE_Screening report)

Figure 26: Heritage and Cultural Features of the study area



(Source: DFFE_Screening report)

In order to provide appropriate mitigation measures and to make an informed decision on the route selection and substation site selection, a specialist was appointed to conduct a study and provide recommendations (See the report attached Annexure K.

11.16 Health

11.16.1 Health Care Facilities

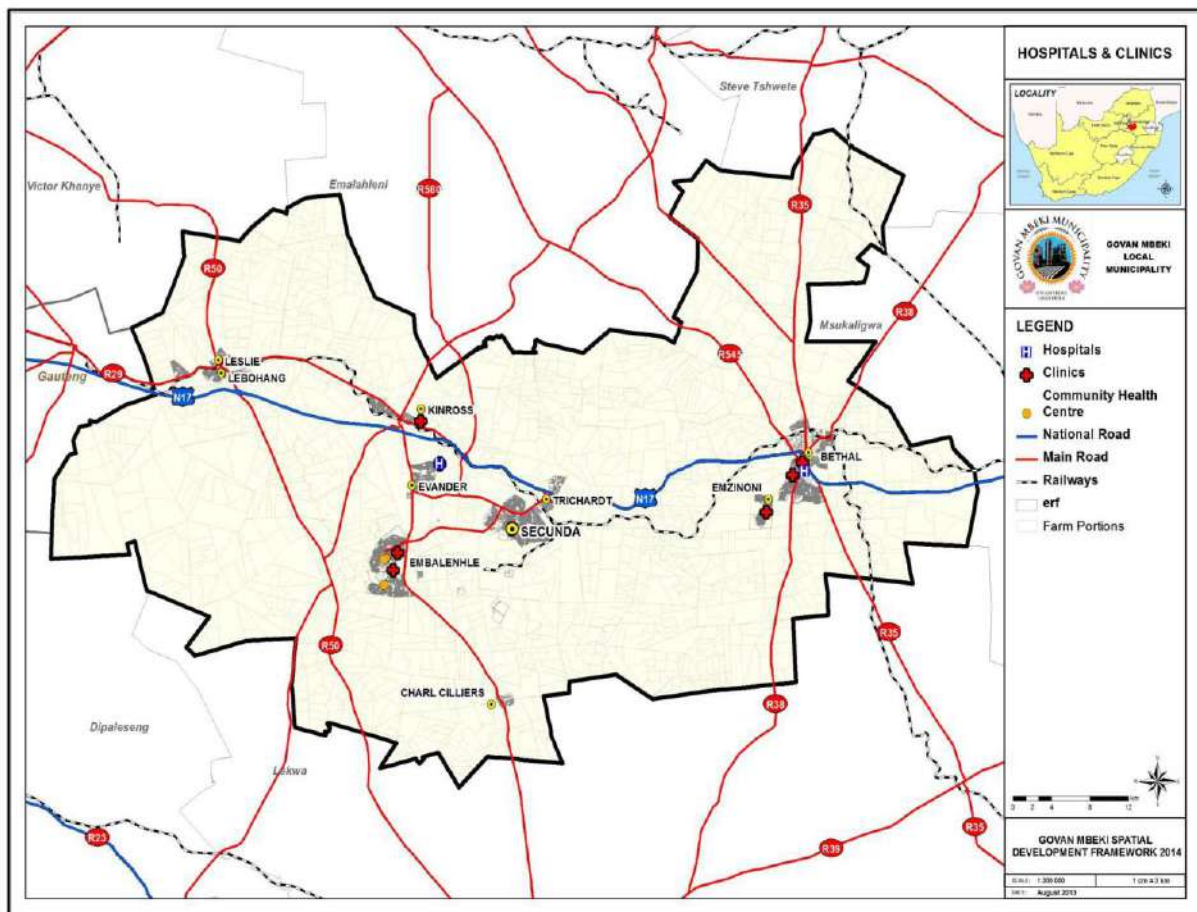
According to GMM SDF, the area seems to have sufficient Health Care Facilities. Looking at the numbers, the list below provides a good picture:

- 8x Clinics
- 3x Community Health Centres
- 2x District Hospitals
- 5x Mobile Services

- 4x EMS Stations
- 2x Correctional Centre

Based on the map below, the study area has three clinics, and other supporting health care facilities such as mobile services, but the informal section of this township will require additional services and facilities according to the SDF 2014-2034.

Figure 27: GMM Hospitals and Clinics Map



12. SPECIALIST STUDIES

12.1 Specialist Studies and Purpose

This section seeks to provide feedback on the studies conducted as part of the Basic Assessment Report. The studies were triggered by the Environmental

Screening conducted as a guide prior to conducting an impact assessment and the nature of the project.

The purpose for the studies done, was to address key project issues and further ensure compliance with applicable legal requirements. It must be noted that the results shared in this chapter and supportive sub-sections are a summary of findings / results of specialists studies done, and must be read in-conjunction with the full Specialists Reports provided in Annexure K for a better understanding.

12.2 List of Specialist Studies conducted and Compliance Statements

- Water Resources Impact Assessment (Compliance Statement)
- Terrestrial Ecology Assessment;
- Phase 1 Cultural Heritage Impact Assessment;
- Desktop Paleontological Assessment
- Avifaunal Assessment;
- Agricultural Impact Assessment;

The findings and recommendations from the above studies were used to complete the specific description of the receiving environment and provide relevant mitigation measures for the proposed development.

12.3 Water Resources Impact Assessment (Wetland Delineation)

The details of the specialist that undertook Water Resources Impact Assessment and Wetland delineation.

Company Name	PVS: Environmental Services
Name:	Dr. P.J. van Staden (PhD)
Qualifications:	Ecological Science, Environmental Science (PhD)
Professional Registration (Where Applicable)	Pri.Sci.Nat (400021/06)

12.3.1 Main Objective for the compliance statement

The aim of this study was to conduct an integrated ecological wetland assessment for the new Bethal eMzinoni 88 kV Powerline and supporting 40 MVA Substation at Milan Park Extension 21.

In order to achieve this aim, the following objectives were considered:

- The identification and the delineation of all wetland areas within the area under consideration for the abovementioned project,
- A description and characterisation of the identified wetland areas,
- Determination of the wetland ecological integrity (WET-Health) of the units;
- Determination of the Ecological Importance and Sensitivity of the units;
- The description of ecological services (WET-EcoServices) provided by the wetlands;
- An impact assessment of the construction of the 88 kV powerline and supporting 40 MVA Substation, and
- Provision of management and a mitigation measures for the identified impacts

12.3.2 Methodology used to acquire information:

- Maps were generated from 1:50 000 topographic maps and aerial photographs, onto which the wetland areas were identified and preliminary wetland boundaries were delineated at the desktop level. The identified wetlands were temporarily classified according to their Hydro- geomorphic (HGM) Unit determinants based on modification of the system proposed by Brinson (1993), and modified for use by Marneweck and Batchelor (2002) and subsequently revised by Kotze et al. (2004).
- The HGM Unit system of classification focuses on the hydro- geomorphic setting of wetlands which incorporates geomorphology; water movement into, through and out of the wetland; and landscape / topographic setting. Once wetlands have been identified, they are categorised into HGM Units as in Figure 5-1. HGM Units are then assessed individually for habitat integrity.

- The initial site investigation was undertaken on 8th February 2022 for orientation and to assess wetland integrity during the wet-season and to confirm the boundaries of the wetlands on site. This time of year is ideal for field investigations, as it coincides with the flowering-time of many of the plant species that occur in wetlands and animals are also most active. This also coincides with the time recommended by the Mpumalanga Parks and Tourism Agency (MPTA). The site visit included a concise evaluation of the current impacts on the wetland habitat on site, as well as the features that contribute to ecological integrity and functionality.

12.3.3 Key Findings of the Study

- The study area falls within the Quaternary Catchment C11H, forming part of the Upper Vaal River Water Management area.
- According to the National Freshwater Ecosystem Priority Areas (NFEPA), the wetland on site has been assigned a rank of 6 (indicating that it was not regarded as nationally significant).
- None of the wetlands on site fall within any important habitat according to the Mpumalanga C-plan and all are regarded as 'not required'. Wetlands were delineated based on desktop information and were classified into HGM units.
- A total of 760.7 ha of wetland habitat were delineated. The majority of wetlands identified belong to the channelled valley bottom wetlands (627.8 ha) in addition to floodplain, un-channelled valley bottom, hill-slope and artificial wetland units.
- Wetlands that showed connectivity to major watercourses were grouped into one main category for the integrity and functionality assessment, namely: the Blesbokspruit. The Blesbokspruit wetland was highly impacted on by damming and roads across the wetland and was allocated a PES of 'D' (largely modified).
- All valley bottom systems yielded similar results for the EcoServices assessment, with nutrient processing and flood attenuation scoring High values.

12.3.4 Impact Assessment

Please refer to section 13.9.1 of the report for details of the Impact Assessment.

13.3.5 Conclusion

If the new Bethal eMzinoni 88 kV Powerline and supporting new 40 MVA Substation is to commence, it is imperative that the impacts of development and operation on wetlands are thoroughly assessed in order to prevent loss of wetland habitat. Based on the low-risk nature of the proposed new Bethal eMzinoni 88 kV Powerline and supporting 40 MVA Substation project, as well as the fact that less than 10% of the site is comprised of wetlands, it can be deduced that the overall impacts of the new Bethal eMzinoni 88 kV Powerline and supporting 40 MVA Substation on the wetland habitat is expected to be minimal.

12.4 Terrestrial Ecology Assessment

12.4.1 The details of the specialist that undertook Terrestrial Ecology Assessment

Company Name	PVS: Environmental Services
Name:	Dr. P.J. van Staden (PhD)
Qualifications:	Ecological Science, Environmental Science (PhD)
Professional Registration (Where Applicable)	Pri.Sci.Nat (400021/06)

12.4.2 Objectives of the Study

The scope and objectives of the study is as follows:

- To identify and map the vegetation units as ecosystems that occurs on the proposed new 88 kV powerline and supporting 40 MVA Substation site at Milan Park Extension 21.

- To assess the ecological sensitivity of these ecosystems, comment on ecologically sensitive areas in terms of their biodiversity and, where needed, ecosystems function.
- To assess qualitatively and quantitatively the significance of the habitat components and current general conservation status of the site.
- To comment on connectivity with natural vegetation and habitats on adjacent sites.
- To recommend suitable buffer zones, if relevant.
- To provide a list of plant and vertebrate and invertebrate (Lepidoptera) fauna species that does or might occur on site that may be affected by the development, and to identify species of conservation concern.
- To highlight potential impacts of the proposed development on the vegetation, fauna and flora of the study area,
- To provide management recommendations that might mitigate negative and enhance positive impacts, should the proposed development be approved,
- A description of the vegetation found to be present along the proposed approximately 9.4 km new 88 kV powerline route between the existing Eskom Main Substation and the new supporting 40 MVA Substation in Milan Park Extension 2;
- A comparison of the findings of the vegetation on site with the regional vegetation expected to occur (Mucina & Rutherford, 2006) and the Mpumalanga Biodiversity Sector Plan (MBSP, 2015);
- Localities of plants or plant communities that are of conservation concern (e.g. Red Data listed species) that are likely to occur;
- Assessment of the expected impacts that the proposed development could have on the vegetation observed, as well as cumulative impacts on nearby sensitive vegetation communities – if present; and
- Recommendations to conserve possible threatened species or sensitive vegetation groupings if found to be present.

12.4.3 Methodology

- A desktop study of the available literature and relevant reports was made.
- The consultant conducted a site visit on 8th February 2022. The available roads near the site were driven using a 4x4 vehicle. Regular stops were made by the consultant to record diversity and veld conditions by walking random transects.
- Coordinates were taken at localities of not.

12.4.4 Key Findings of the Study

- According to the Mpumalanga Biodiversity Sector Plan, the proposed new 88 kV powerline between the existing Eskom Main substation and the new supporting 40 MVA Substation is not located within any threatened ecosystem (Critical Biodiversity Areas, important areas, as well as Ecological Support Areas (ESAs)).
- The land use between the existing Eskom Main Substation and the new proposed 88 kV powerline to the new supporting 40 MVA Substation does not vary significantly. The whole area consists of agricultural activities such as crop farming and stock grazing with urban development and recreation at the Bethal Dam.

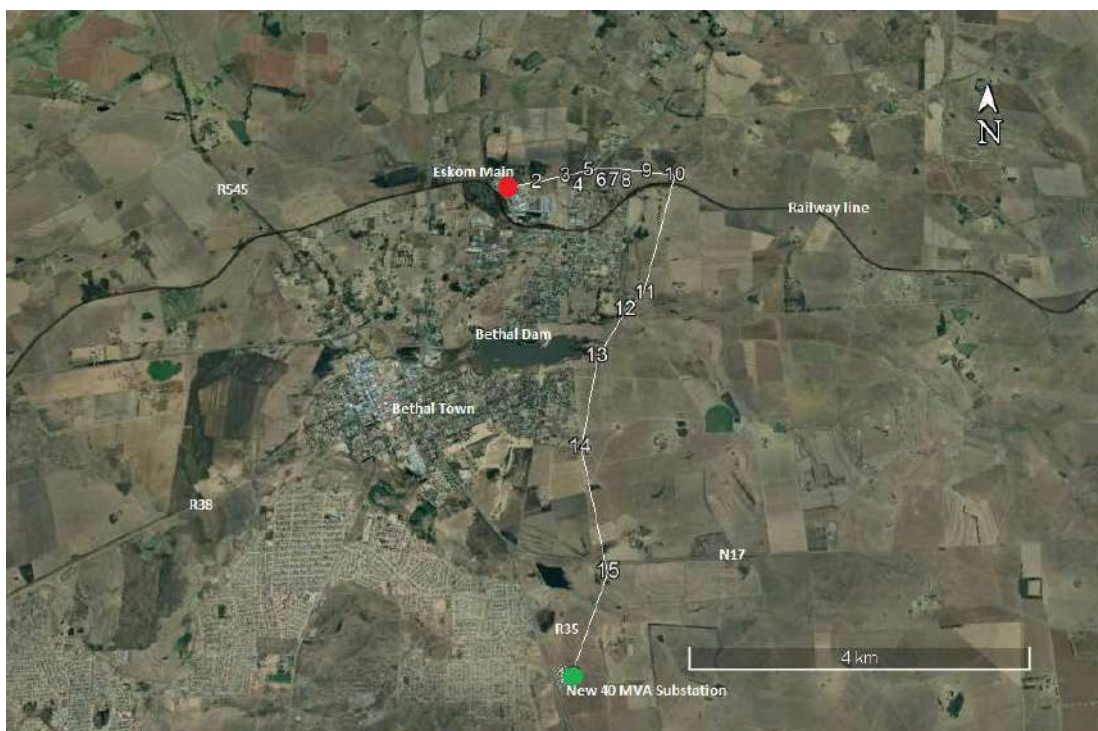
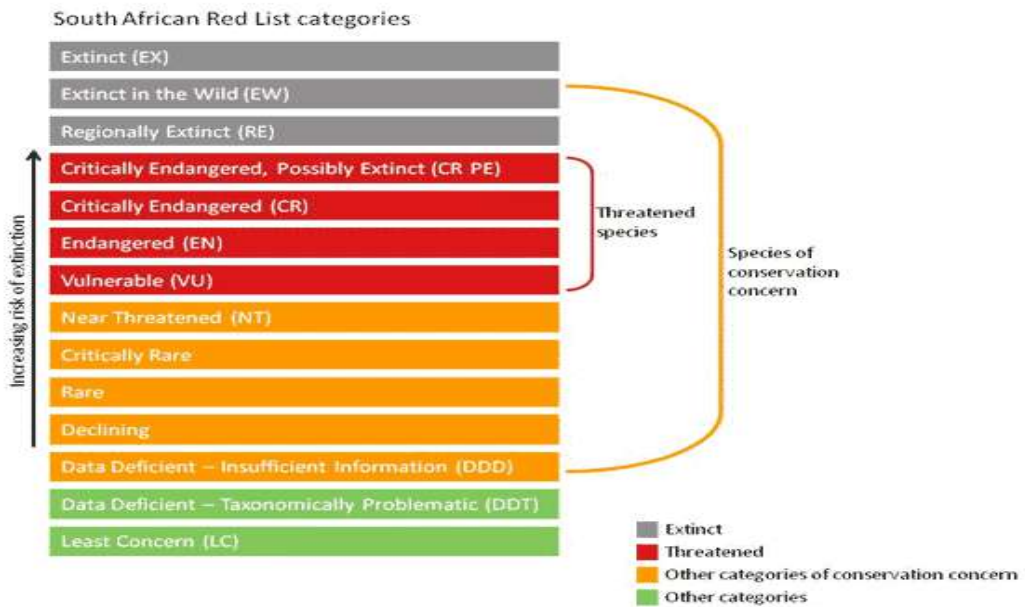


Figure 28: Land uses and transformed vegetation between the existing Eskom Main Substation (Red dot) and the new Supporting 40 MVA Substation (Green dot) with the proposed new 88 kV powerline route (White line) (Google Earth image, 2022)

- All of the transformed areas situated in between the northern portion of the existing Eskom Main Substation and the southern new supporting 40 MVA Substation 88 kV (approximately 9.4 km) powerline falls within areas of low vegetation sensitivity.

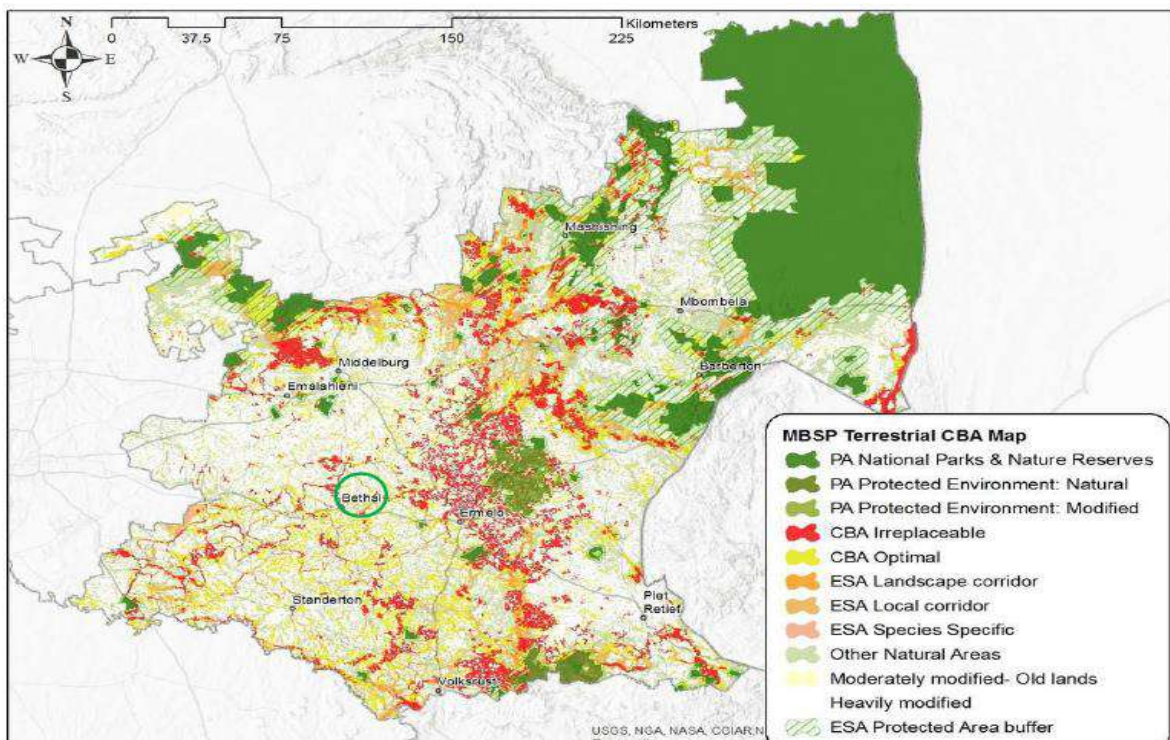
- There is some alien invasive plant species present due to the transformed state (Crop farming and stock grazing) of this vegetation units. No plants of conservation concern were recorded in the transformed land and due to past and current impacts none are expected to occur.
- Availability of Threatened or Protected Plant Species (TOPS): At the time of this assessment, no TOPS listed species was recorded within the proposed development footprint.
- Red and Orange listed plant species: No plants of conservation concern were found during the vegetation survey assessment between the existing Eskom Main Substation and the proposed new supporting 40 MVA Substation and new proposed erection of the Bethal eMzinoni 88 kV powerline.
- Provincially protected plants. No provincially protected plants were observed in the walked transects
- Plant species of conservation concern that might occur on the proposed 88 kV powerline and supporting 40 MVA Substation is:
 - Sensitive species 1252 (No name to be given – SANBI directive). This plant is listed as vulnerable by SANBI because it could be exploited commercially,
 - Sensitive species 41 (No name to be given – SANBI directive). This plant is listed as vulnerable by SANBI because it could be exploited commercially,
 - Sensitive species 41 (No name to be given – SANBI directive). This plant is listed as vulnerable by SANBI because it could be exploited commercially, and
 - Pachycarpus suaveolens: This plant is listed as vulnerable by SANBI because it could be exploited commercially.

Figure 29: Threatened species and species of conservation concern



- According to the specialist findings, the study area has a moderately - to heavily modified Biodiversity. The map below provides more details.

Figure 30: MBSP Terrestrial CBA Map



12.4.5 Impact Assessment

Please refer to section 13.8.1 of the report for details of the Impact Assessment.

12.4.6 Conclusions

According to the specialist study, the proposed development area falls within the area that transformation has taken place and will therefore not impact negatively on the biodiversity. Due to the transformed state of the vegetation through crop farming and stock grazing activities between the existing Eskom Main substation and the new 40 MVA Substation and new 88 kV powerline footprint no long-term impact on the “natural vegetation” is likely to occur.

Based on the above, It is suggested that the development of the proposed Bethal-eMzinoni 88 kV powerline and supporting 40 MVA Substation be supported with the condition that the lay-out be strictly followed and no changes be done to the lay-out without consultation of the biodiversity specialist. Any development on the property should be in accordance with the conservation policies of the relevant authorities and that Mitigation measures set out in the initial vegetation report is implemented as a minimum to limit the potential impacts on vegetation during construction and operation of the developments.

12.5 Phase 1 Cultural Heritage Impact Assessment

12.5.1 The details of the specialist that undertook Cultural Heritage Impact Assessment

Company Name	Mbofho Consulting
Name:	Edward Matenga
Qualifications:	PhD Archaeology (Uppsala/Sweden) MPhil, Archaeology (Uppsala), Certificate in International Training on the Conservation of Heritage Territories and Landscapes of Heritage Value (ICCROM / Rome)
Professional Registration (Where Applicable)	N/a

12.5.2 Objectives of the Study

Conduct a Cultural Heritage Impact Assessment for the proposed Bethal_Emzinoni 88KV powerline and 40 MVA Substation

12.5.3 Methodology

A ground survey was conducted on 7 February 2022

12.5.4 Key Findings of the Study

The heritage sensitivity of the property is summarised as follows:

- The Stone Age: No Stone Age sites or relics were found.
- The Iron Age: No Iron Age sites or relics were found.
- Buildings: There are no buildings in the servitude of the proposed power line.
- Burial Ground: There is large cemetery on the eastern outskirts of Emzinoni Township in which there are thousands of grave. The buffer separating the graves from the proposed substation is estimated to be more than 200 m which is twice the minimum breadth of the servitude regulated
- R35 Road from Bethal to Mogenzon which passes between the cemetery and the proposed substation site will act as a buffer as the development of the substation east of the road will not encroach into the buffer zone

12.5.5 Impact Assessment

Please refer to section 13.11.2 of the report for details of the Impact Assessment

12.5.6 Conclusions

The specialist concluded that the project should be allowed to go ahead with the following recommendation being made:

All feeder lines from the substation at Emzinoni into the township and other supporting infrastructure must avoid the cemetery with the application of a 100 m buffer zone as a minimum standard. The developer must be informed about this regulation before the location of the substation is confirmed.

12.6 Desktop Paleontological Assessment

12.6.1 The details of the specialist that undertook Desktop Paleontological Assessment

Company Name	Palaeontologist Consultant
Name:	Prof Marion Bamford
Qualifications:	PhD (Wits Univ, 1990); FRSSAf, mASSAf
Professional Registration (Where Applicable)	Palaeontological Society of Southern Africa

12.6.2 Objectives of the Study

- Conduct a Palaeontological Impact Assessment for the proposed Bethal_Emzinoni 88KV powerline and 40 MVA Substation
- To comply with the regulations of the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA).

12.6.3 Methodology

- **Desktop Study:** Consultation of geological maps, literature, palaeontological databases, published and unpublished records to determine the likelihood of fossils occurring in the affected areas was done. Sources included records housed at the Evolutionary Studies Institute at the University of the Witwatersrand and SAHRA databases.

12.6.4 Key Findings of the Study

Based on the observations of the archaeologist who did the walkdown, there are no rocky outcrops of Vryheid Formation rocks. With the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the soils and sands of the Quaternary or the dolerite.

12.6.5 Impact Assessment

Please refer to section 13.10.2 of the report for details of the Impact Assessment

12.6.6 Conclusions

According to the specialist the impact on the palaeontological heritage would be low and so the project should be authorised

12.7 Avifauna Study

12.7.1 The details of the specialist that undertook Desktop Avifauna Assessment

Company Name	PVS: Environmental Services
Name:	Dr. P.J. van Staden (PhD)
Qualifications:	Ecological Science, Environmental Science (PhD)
Professional Registration (Where Applicable)	Pri.Sci.Nat (400021/06)

12.7.2 Objectives of the Study included, but not limited to the following:

- To conduct the on-site Bird Habitat Assessment
- To identify localities of plants or plant communities that are of conservation concern (e.g. Red Data listed species) that are likely to occur;
- Assessment of the expected impacts that the proposed development could have on Avifauna
- Provide recommendations to conserve possible threatened species or sensitive vegetation groupings if found to be present

12.7.3 Methodology

Prior to the field visit, a desktop study of the available literature and relevant reports was made. The consultant conducted a site visit on 8th February 2022. The available roads near the site were driven using a 4x4 vehicle. Regular stops were made by the consultant to record diversity and veld conditions by walking random transects. Coordinates were taken at localities of note.

12.7.4 Key Findings of the Study

On-site Bird Habitat Assessment

- The principal habitat type detected on and/or adjacent to the site, and considered most relevant to bird ecology and community structure, was the grassland habitat. It appeared to be dominated by Themeda triandra and Eragrostis grass species and forbs also present.
- The cropland cultivation, Bethal dam and Blesbokspruit form prominent and well-defined habitats that support their own special biodiversity of plants and animals. Otherwise, the broader habitats adjacent to the study site are mainly extensions of those present on site, or mentioned specifically in the habitat types described on table 13 below.

Expected and Observed Bird Species Diversity

- An assessment was done and it was found that the 30 bird species have a high, medium or low probability of occurrence on site, based on the habitats available.
- The three different habitat types that were distinguished either supported or are expected to support somewhat different species of birds. Aerial feeding species, such as swifts, martins and swallows, were not assigned to a specific habitat on site, except for those habitats that offered potential nesting habitats, since they feed wherever aerial wind-borne plankton is available.

Threatened and Red-Listed Bird Species:

- No species of international and/or national conservation concern (Red Data species, IUCN/Birdlife International 2011, Barnes 2000), ranging from Near Threatened to Vulnerable, were considered as possible to occur on site, therefore, the proposed new Bethal eMzinoni 88 kV powerline and new supporting 40 MVA Substation, will not impact negatively on the avian fauna that occur in the 2629 AD BETHAL Grid

12.7.5 Impact Assessment

Please refer to section 13.15 of the report for details of the Impact Assessment

12.7.6 Conclusions

According to the specialist study findings, No red data bird species were identified on the site, while there is a remote possibility that sensitive species might occur on the proposed development area. The proposed development will not impact negatively on the habitat that it will occur on, because the footprint is small across the approximately 9.4 km 88 kV Powerline to the new supporting 40 MVA Substation and there is sufficient size of the existing habitat still in existence.

13. ENVIRONMENTAL IMPACT ASSESSMENT

13.1 General

This chapter addresses specific environmental impacts that could result during the different phases of the project. The pre-construction phase, the construction phase and operational phases of the proposed Bethal_Emzinoni 88KV powerline and a 40 MVA substation.

Impacts were identified based on the following:

- Evaluation of the Project's activities and components
- Impacts associated with listed activities contained in GN No. R983 and GR No. R985 of 4 December 2014, as amended, for which Environmental Authorisation have been applied for;
- Assessment of the receiving environment: Ecological, social, economic, biophysical and built environments;
- Comments received during public participation from IAPs and from government
- Results/ findings from specialist studies

13.2 Impacts associated with Listed Activities

The Proposed Bethal-Emzinoni 88KV powerline and the supporting infrastructures, outside an urban edge requires an Environmental Authorisation, in terms of the EIA Regulations of 2014 (as amended), which

The potential impacts associated with the key listed activities are provided in the table below.

Table 7: Listed Activities triggered by the project and their Impacts

Listed Activities Anticipated	Potential Environmental Impacts
<p>R.983 – Activity no. 11(i):</p> <p>The development 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>(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more;</p> <p>excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is —</p> <p>(a) temporarily required to allow for maintenance of existing infrastructure;</p> <p>(b) 2 kilometres or shorter in length;</p> <p>(c) within an existing transmission line servitude; and</p> <p>(d) will be removed within 18 months of the commencement of development.</p>	<p>The capacity of the proposed power lines will be 88 kilovolts, outside an urban area.</p> <p>Possible Impacts :</p> <ul style="list-style-type: none"> • Clearance of vegetation (Grass) in land associated with the construction footprint of the power lines, on land used for agricultural purposes, outside of an urban area. • Impact on agricultural land (It must be noted that the proposed project's footprint may not stop grazing activities. The project can be well integrated. • Socio-economic impacts associated with construction activities (Such as noise, visual impact etc) • Potential loss of sensitive environmental features (e.g. sensitive fauna and flora species).
<p>GN No. R.983 – Activity no. 27:</p> <p>The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-</p> <p>(i) the undertaking of a linear activity; or</p> <p>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p>	<p>The proposed development may cause clearance of indigenous vegetation associated with the construction footprint for the substations. The proposed substations will be approximately 100m x 100m.</p> <p>Possible Impacts:</p> <ul style="list-style-type: none"> • Clearance of areas consisting of indigenous vegetation associated with the construction

	<p>footprint of the substations and laydown areas.</p> <ul style="list-style-type: none"> • Visual impacts. • Soil destabilisation and subsequent erosion. • Possible Spread of alien and invasive species.
<p>GN No. R.985 – Activity no. 10 - (f)(ii)(aa):</p> <p>The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.</p> <p>Inside urban areas:</p> <p>(aa) Areas zoned for use as public open space;</p>	<p>Dangerous goods" that are likely to be associated with the project include fuel stores during the construction phase or hazardous chemical substances at the substation during the operational phase, located within 100 metres from the edge of a watercourse or wetland. Threshold of 30 m³ expected to be exceeded.</p> <p>NB: Threshold may be 55 m³, but final designs will confirm the capacity accordingly.</p> <p>Possible Impacts:</p> <ul style="list-style-type: none"> • Fire hazards • Oil / Chemical Spillages • Waste generation (Oil contaminated rags) • Health Impacts
<p>GN No. R.985 – Activity no. 4 - (f)(ii)(aa):</p> <p>The development of a road wider than 4 metres with a reserve less than 13,5 metres</p> <p>Inside urban areas:</p> <p>(aa) Areas zoned for use as public open space;</p>	<p>The proposed substation /Powerline may require an access road with a width between 4.5 – 5m.</p> <ul style="list-style-type: none"> • Potential loss of sensitive environmental features (e.g. sensitive fauna and flora species). • Visual impacts. • Soil destabilisation and subsequent erosion. • Proliferation of alien and invasive species.

13.3 Issues raised by Environmental Authorities and IAPs

Currently no issues raised by the authorities or interested and affected parties pertaining to the environmental Impacts of the proposed development.

13.4 Project Activities

The activities, aspects and Impacts listed below provide details of the project envisaged impacts. The Environmental Management Plan Report (EMPr) – found in Annexure G has provided mitigation measures.

13.4.1 Project Phase: Pre-construction

Activities related to Pre-Construction Phase (Powerline & Substation)	Activities	Aspects	Impacts
	Negotiations and agreements with the affected landowners regarding power line servitudes / corridors and landowner at substations sites.	Inadequate negotiation process	Social Impact (Project Failure/ Possible contraventions)
	Identification / registration of affected and interested stakeholders and authorities	Inadequate consultation process	Social Impact (Project Failure/ Possible legal contraventions)
	Fencing off substation sites	Vegetation clearance and improper compaction	Impact on flora, land degradation
	Procurement Process to ensure appointment of appropriate suppliers	Inadequate procurement process	Possible legal Contraventions
	Surveying & pegging of the route	Inadequate survey process	Social Impact Impact on Flora & Fauna Water Pollution Air Pollution
	Engineering Designs	Designs without environmental specifications	Social Impact Impact on Flora & Fauna Water Pollution Air Pollution
	Geotech Investigations	Inadequate survey process	Social Impact (geotechnical Impact on the building)

	Environmental Studies and acquisition of authorisation	Inadequate environmental and compliance monitoring process causing the project to start without required permits	Legal Contraventions
	Construction of site office and ablution facilities	Vegetation Clearance & Soil Erosion	Impact on flora Soil Degradation
	Investigation and confirmation of infrastructure routes	Inadequate Investigation process	Social Impact (Project Failure)
	Barricading of sensitive environmental features	Inadequate Investigation process	Impact on Flora/ Fauna /Impact on Water resources

13.4.2 Project Phase: Construction

Activities related to Construction Phase (Powerline & Substation)	Activities	Aspects	Impacts
	Site establishment	Site Clearance	Impact on Flora Soil Erosion Air Pollution (Dust) Social Impact (Agricultural Land)
	Preparation of access roads	Site clearance	Impact on Flora Soil Erosion Air Pollution (Dust)
	Access to water	Extraction of water from rivers / water bodies	Impact on water resources
	Establish construction laydown areas	Site clearance & digging	Impact on Flora Soil Erosion Air Pollution
	Bulk fuel storage	Inadequate storage of chemicals	Land pollution
	Delivery of construction material	Driving to the project sites (Usage of Heavy vehicles & machinery)	Social Impact (Health / Noise etc) Visual Impact
	Transportation of equipment, materials and personnel	Driving to the project sites (Usage of Heavy vehicles & machinery)	Social Impact (Health / Noise etc) Visual Impact
	Storage and handling of material	Inadequate storage of construction material	Visual Impacts

	Excavations for foundations and anchors of towers	Clearance of vegetation and causing the soil loose	Impact on Flora Soil Erosion Air Pollution (Dust)
	Concrete Works	In adequate usage of cement mixture	Land degradation
	Erection of steel structures	Digging and improper / lack compaction	Soil Erosion
	Construction of substation components	Site Clearance and digging	Impact on Flora Soil Erosion Air Pollution (Dust)
	Mechanical and Electrical Works	Inadequate operations and connections	Social Impact Safety Hazard
	Energy Usage	Misuse of energy	Impact on natural resources
	Material delivery and offloading	Usage of machinery to offload the material	Visual Impact Soil Pollution (Oil/chemical leakage)
	Stringing of distribution lines	Stringing work using different types of conductors	Visual Impact Noise Impact
	Stockpiling	Soil will be stockpiled for usage during construction phase	Visual Impact Soil Degradation /Pollution (Possible Leakage)
	Waste and wastewater management	In adequate Management of waste and wastewater	Land Pollution

13.4.3 Project Phase: Operation

Activities related to Operational Phase (Powerline & Substation)	Activities	Aspects	Impacts
	Powerline Maintenance	Driving to sites Vegetation clearance on the servitude	Air pollution (Dust & Emissions) Impact on Flora / Fauna Noise pollution
	Substation Maintenance	Driving to sites (Using diesel driven vehicles / trucks/ machinery)	Air pollution Impact on Flora/ Fauna Noise pollution

		Vegetation clearance around and inside the substation yard	
	Servitudes Maintenance (Road to the substation)	Driving to sites Vegetation clearance on the servitude	Air pollution (Dust) Impact on Flora Noise pollution
	Waste Generation (Domestic & Hazardous)	Improper storage and disposal of waste	Land Pollution and degradation Social Impacts (Health hazards)

13.5 Impact Assessment Methodology

13.5.1 Identification of Significant Rating

The quantitative Impact Assessment Methodology has been used. The environmental impacts associated with an aspect, are assessed by considering both the likelihood of an impact and its magnitude. Together they define the environmental impact. The likelihood and magnitude for each aspect are characterized as high, medium and low according to the following definitions and score ratings:

A LIKELIHOOD

HIGH	Routine or ongoing activity or impact. Is known to have occurred on routine basis in the past. Impacts associated with the aspects are likely to emerge soon. Impacts are unknown.	3
MEDIUM	Periodically; occurs once or twice a year. Impacts that are likely to occur within one year.	2
LOW	Very infrequent; every several years. Impacts associated with the aspects are several years away.	1

B MAGNITUDE

HIGH	Aspect has a recognized global and national environmental impact. Widespread or permanent ecological damage locally. Remediation would take longer than one year.	3
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	Could result in a major public health hazard. Magnitude is unknown.	
MEDIUM	Aspect could result in a major uncontained or sustained environmental release impacting on a regional or local environment only. Ecological damage can be remedied within one year. Health hazard to humans in the immediate vicinity, but not resulting in critical or fatal injury/illness.	2
LOW	Little or no ecological effect and no measurable impact on human health.	1

Three factors have been identified in the procedure as important areas to consider. Each factor is scored as 1, 2 or 3. For each category, the extreme scenarios (1 and 3) are described; the 2 rating is left to the judgement of the assessor.

C. REGULATORY SCRUTINY

HIGH	Very important. Regulated by legislation. High potential for regulatory action or limitations to operate (e.g. subject to regulatory inspections; past compliance problems). Voluntary commitments or quasi-regulated aspects.	3
MEDIUM	Important. Regulated, although legislation is not stiff.	2
LOW	Relatively unimportant. Little or no potential for regulatory action (e.g. not regulated; not a target of enforcement).	1

D. STAKEHOLDER INTEREST

HIGH	Very important to public and customers. Aspect has the potential to cause damage to corporate reputation. Ongoing dialogue has begun; negative perception; possibility for third party lawsuits. Customers expect superior performance by Eskom in managing this aspect.	3
MEDIUM	Important to public and customers. The aspect is likely to cause damage to corporate reputation.	2
LOW	Relatively unimportant; the public is unaware or is aware but it is not an issue. No threat to corporate image. Is not an issue with customers.	1

D. BUSINESS RISK/BENEFIT

HIGH	Aspect poses significant risk. Early response necessary. Industrial initiatives underway/developed. May have major impact on competitive position. May have a significant impact on value of Municipality assets. Score rating.	3
MEDIUM	Aspect is likely to pose risk. Score rating.	2
LOW	Aspect does not pose significant risk. No need for early response. No industry initiatives associated with aspect. Does not threaten competitive position. Does not affect values of Municipality assets	1

13.5.2 Determining Significant Environmental Aspects, Risks and Opportunities Environmental Objectives, and Environmental Management Programmes / or Action Plans

- a) The equation for calculating the significant environmental aspects score is: (likelihood x magnitude) + regulatory scrutiny + stakeholder interest + business risk/benefit) = overall score. The threshold for significance rating will be classified, as a guideline, as follows: **Low <5, Medium 5-10; High 11-18.**
- b) The aspects and their related impacts will be developed using the above methodology. In developing aspects and impacts mitigation measures before and after, shall be taken into consideration.

13.6 Impact Mitigation

13.6.1 Mitigation Hierarchy

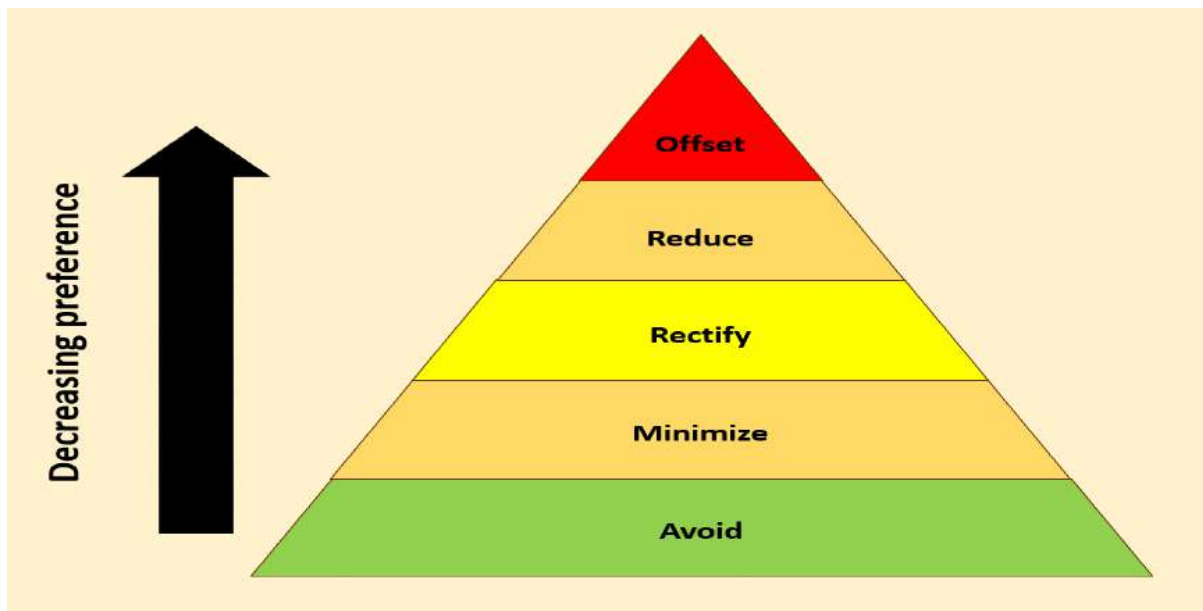
Impacts are to be managed by assigning suitable mitigation measures. According to DEAT (2006), the objectives of mitigation are to:

- Find more environmentally sound ways of executing an activity;
- Enhance the environmental benefits of a proposed activity;
- Avoid, minimise or remedy negative impacts; and
- Ensure that residual negative impacts are within acceptable levels.

Mitigation measures raised should always strive to meet following hierarchy –

- (1) Avoid;
- (2) reduce/ minimise;
- (3) rectify (rehabilitate or remediate);
- (4) Reduce and/ or
- (5) Offset (compensate for the environmental impacts).

Figure 31: Mitigation Measure Hierarchy



The proposed mitigation of the impacts associated with the Project includes specific measures identified environmental specialists, government legal requirements and environmental best practices.

13.6. 2 EMPr Framework

The purpose of Environmental Management Programme (EMPr) is “to describe how negative environmental impacts will be managed, rehabilitated and monitored and how positive impacts will be maximised during the life-cycle of a project. The content of an EMPr contains information set out in Appendix 4 of GN No. R. 982 of 4 December 2014. The EMPr of the proposed development is provided in Appendix G1 and G2 of the report.

13.7 Analysis of Significant Environmental Aspects and Impacts

Significant environmental impacts associated with the proposed project were identified through the evaluation of the following:

- Nature and profile of the receiving environment
- Operation of the power lines and substation
- Project-related factors / aspects and infrastructure.
- Potential sensitive environmental features and attributes
- Activities related with the project life-cycle (pre-construction, construction and operation);
- Findings from specialist studies

Socio-economic Environment	Pre-Construction / Construction Activities	Substation & Powerlines Construction activities	Socio-economic Impact (enhanced socio-economic development through job creation)	3	1	3	3	3	12	H	<p>Positive Impact : The proposed development will provide opportunities for employments (temporary and permanently where possible). The challenge of electricity shortage will be minimized, Economic state of the area will be enhanced, in general social economic status of the study area should be improved significantly. Although the project would not address all electricity problems in the area, but the development of the proposed powerline and substation will be to the betterment of GMM.</p>											Refer to the EMP (Annexure G) for specific mitigation measures
Topography	Pre-Construction / Construction Activities	Line /Substation construction	Visual/Aesthetic Impacts	3	2	2	3	3	14	H	<p>Professional services of a landscape architect should be employed, Green buffer zones should be reserved or created and maintained at critical areas surrounding the facilities (where necessary). Clearing of vegetation for servitudes should be restricted. The substation site should be properly screened to avoid / minimise visual impacts.</p>	2	1	2	2	2	8	M			Refer to the EMP (Annexure G) for specific mitigation measures	

Historical and Cultural Features	Pre-Construction / Construction Activities	Disturbance of Heritage sites / Paleontological Features	Social Impact	1	1	2	1	1	5 M	A heritage Impact study was done. According to the report Grave Yards / Cementries should be avoided, If archaeological sites are exposed during construction work, the contractor should immediately report to relevant authorities (e.g SAHRA) and construction activities should be stopped until assessment is conducted by relevant specialists and is safe to proceed.	1	1	2	1	1	5 L	Refer to Heritage / Cultural study done
Surface Water/ Hydrology	Pre-Construction / Construction Activities	Usage of Water and Possible contamination	Impact on natural resources	3	2	3	3	3	15 H	Quality of surface water and ground water on site should be managed & monitored. Minimise or avoid the encroachment of construction activities into riparian zones / wetlands. EMPr (Annexure G) should be used to address water management issues and pollution Control. Implement water use or water wastage minimisation Plans to ensure management supply & demand.	1	1	2	3	2	8 M	Refer to the Specialist Study Compliance Statement

Waste Management	Pre-Construction / Construction Activities	Improper storage of waste & disposal	Soil Pollution	2	3	3	3	3	3	15	H	Impacts to the environment caused by storm water and wastewater discharges during construction are avoided. Use EMPr (Annexure G) established to address all waste management issues.	1	1	2	1	1	5	L	Refer to the EMPr (Annexure G) for specific mitigation measures
			Social Impact	2	3	3	3	3	3	15	H		1	1	2	1	1	5	L	
			Ground water Pollution	2	3	3	3	3	3	15	H		1	1	2	1	1	5	L	
Noise/ Health	Pre-Construction / Construction Activities	Generation of Noise due to influx of people during construction phase/ Machinery usage/ Construction activities/ Drilling & Digging/ Veavy vehicles	Social Impact (Noise & Health)	3	1	3	3	2	11	H	Local residents should be notified of any potentially noisy activities, Stick to allowed working hours- should there be an overlap- affected neighbors must be informed, Construction site yards, concrete batching plants, asphalt batching plants, construction worker camps (accommodation) and other noisy fixed facilities should be located well away from noise sensitive zones. All construction vehicles and equipment are to be kept in good maintenance status. Operations should comply with the noise standard requirements of the Occupational Health and Safety Act (Act No 85 of 1993). Construction staff working in areas where the 8-hour ambient noise levels exceed 75dBA should wear ear protection equipment. All activities,	1	1	2	1	1	5	L	Refer to the EMPr (Annexure G) for specific mitigation measures	
Biodiversity (Flora & Fauna)	Pre-Construction / Construction Activities	Site Establishment / Constructio Activities	Impact on flora and fauna habitat	3	1	3	2	2	10	H		Adhere to rececommendations from the Terrestrial Biodiversity Study conducted and the EMPr (Annexure G)	1	1	2	1	1	5		L
Air Quality	Pre-Construction / Construction Activities	Vegetation clearance for Route Creation / Travelling to the project site - emissions	Air Pollution (Dust/ Vehicle emissions)	3	2	3	3	3	15	H		Adhere to rececommendations from the EMPr (Annexure G)conducted In this regard. Dust should be suppressed using water to minimise the impact. Diesel driven Vehicles should be services often.	1	1	2	1	1	5		L

Surface Water/ Ground Water/Hydrology	Pre-Construction / Construction Activities	Usage of Water and Possible contamination	Impact on natural resources	3	2	3	3	3	15	H	Quality of surface water and ground water on site should be managed & monitored. Minimise or avoid the encroachment of construction activities into riparian zones / wetlands. EMPr (Annexure G) should be used to address water management issues and pollution Control. Implement water use or water wastage minimisation Plans to ensure management supply & demand. There must not be any impact on the long term morphological dynamics of watercourses or estuaries; Existing crossing points must be favored over the creation of new crossings in reparation areas (including temporary access.	1	1	2	3	2	8	M	Refer to the Specialist Compliance Statement
Transportation	Operational Activities	Emmisions	Air Pollution	2	3	2	3	3	14	H	Use EMPr (Annexure G) established to manage air pollution related issues. Compliance with ambient air quality standards. Use Cleaner technology , Service vehicles often, Continual Maintenance of machineries.	1	1	2	1	1	5	L	Refer to the EMPr (Annexure G) for specific mitigation measures

AviFauna	Operational Activities	Operation of powerlines may cause Electrocutation of birds and animals	Impact on Fauna	2	3	2	3	3	14	H	Install bird flappers and Bird Guards to minimise possible electrocution and collision. Adhere to EMPr (Annexure G)	1	1	2	1	1	5	L	Refer to the EMPr (Annexure G) for specific mitigation measures
Biodiversity (Flora & Fauna)	Operational Activities	Vegetation Clearance during line & substation maintenance	Impact on Flora	2	3	3	3	3	15	H	Vegetation management plan should be established and used as a guide during maintenance phase. Acquire relevant vegetation clearance permits where necessary and ensure compliance. Use the established EMPr (Annexure G) for management of vegetation issues .	1	1	2	1	1	5	L	Refer to the EMPr (Annexure G) for specific mitigation measures
Waste Management	Operational Activities	Improper storage of waste & disposal (Domestic & Hazardous)	Soil Pollution	2	3	3	3	3	15	H	Wastes are appropriately stored, handled and safely disposed of at a recognised waste facility. Use the established EMPr (Annexure G) for management of waste issues .	1	1	2	1	1	5	L	Refer to the EMPr (Annexure G) for specific mitigation measures
			Social Impact	2	3	3	3	3	15	H		1	1	2	1	1	5	L	
			Ground water Pollution	2	3	3	3	3	15	H		1	1	2	1	1	5	L	

Land Use	Operational Activities	Fuel / Chemical Usage and Storage (possible Spillages)	Soil/ Land Pollution	2	3	2	3	3	14	H	Possible oil and hazardous substance spillages should be managed by - EP for accidental spillages, Containing oil/ Hazardous chemicals in bunded area, Ensuring storage permits are acquired for relevant authorities. Adhere to EMPr (Annexure G)	1	1	2	1	1	5	L	Refer to the EMPr (Annexure G) for specific mitigation measures
			Water Pollution	2	3	2	3	3	14	H	Monitoring groundwater levels and quality. Ensure proper clean-up in case of accidental spillages, Report incidents to relevant authorities	1	1	2	1	1	5	L	Refer to the EMPr (Annexure G) for specific mitigation measures
		Permanent Agricultural Land loss / Soil disturbance where the substation is built	Social Impact	2	3	2	3	3	14	H	Adhere to EMPr (Annexure G) established for the management of social impact related issues. •The site can be mitigated by doing the following: Immediate re-vegetation of any exposed or disturbed areas; • Re-vegetate using indigenous grass species seedlings. •Conduct maintenance work within the servitude area. • Regular monitoring to ensure the continued success of the process.	1	1	2	3	2	8	M	Refer to the EMPr (Annexure G) for specific mitigation measures
Water Resources/ Ground Water/ Hydrology	Operational Activities	Water Usage	Depletion of natural resources	2	3	2	3	3	14	H	Adhere to EMPr (Annexure G).Use appropriate water saving devices in building.	1	1	2	1	1	5	L	Refer to the EMPr (Annexure G) for specific mitigation measures
			Water Pollution (Possible oil spillages)	2	3	2	3	3	14	H	Monitoring groundwater levels and quality	1	1	2	1	1	5	L	
			Social Impact	2	3	2	3	3	14	H	Ensure the water sources adhere to drinking water standards for health puposes	1	1	2	1	1	5	L	

Existing Powerline & Infrastructure	Operational Activities	Inadequate maintenance of Powerlines / Substation	Soil and land Degradation	2	3	2	3	3	14	H	Mitigation measures and controls as stipulated in the EMPr (Annexure G) must be aghered to at all time.	1	1	2	1	1	5	L	Refer to the EMPr (Annexure G) for specific mitigation measures
			Social Impacts (Health & Safety)	2	3	2	3	3	14	H		1	1	2	1	1	5	L	
			Impact of Flora	2	3	2	3	3	14	H		1	1	2	1	1	5	L	
			Impact of fauna	2	3	2	3	3	14	H		1	1	2	1	1	5	L	
			Water Pollution	2	3	2	3	3	14	H		1	1	2	1	1	5	L	
			Air pollution	2	3	2	3	3	14	H		1	1	2	1	1	5	L	
Decommissioning	Dismatling and removal Activities	Inadequate removal of old materials, structures/ Equipments	Soil and land Degradation	2	3	2	3	3	14	H	Adhere to Mitigation measures and controls as stipulated in the EMPr (Annexure G) must be aghered to at all time. All decommissioning activities must adhere to relevant legislation, National, Provincially and Locally. Acquire Permits for all listed activities. Remove all material, equipments and rehabilitate the site accordingly.	1	1	2	1	1	5	L	Refer to the EMPr (Annexure G) for specific mitigation measures
			Social Impacts (Health & Safety)	2	3	2	3	3	14	H		1	1	2	1	1	5	L	
			Impact of Flora	2	3	2	3	3	14	H		1	1	2	1	1	5	L	
			Impact of fauna	2	3	2	3	3	14	H		1	1	2	1	1	5	L	
			Water Pollution	2	3	2	3	3	14	H		1	1	2	1	1	5	L	
			Air pollution	2	3	2	3	3	14	H		1	1	2	1	1	5	L	

13.8 Terrestrial Biodiversity

13.8.1 Impact Description:

The study conducted identified a number of activities that will be taking place throughout the life-cycle of the project, and further provided mitigation measures required to minimise or avoid the environmental impact.

Activities and potential environmental impact that are expected to take place are listed below:

Table 9: List of activities and potential environmental impacts

Activity	Nature of impact	Severity* 0 (low) – 10 (high) +ve or -ve	Likelihood** High/Medium/Low	Mitigation (See 12.1 of the Report)
Planning and Design Phase				
Legal & Policy Compliance	Compliance with acts/regulations	-8	High	M1
Construction impacts				
Storage of Hazardous Substances	Substrate contamination	-8	High	M2
Loss of Indigenous Vegetation	Substrate damage	-8	High	M6
Loss of Biodiversity	Substrate damage	-8	High	M6
Loss of Species of Conservation Concern	Substrate damage	-5	Medium	M6
Establishment of Alien Plant Species	Substrate damage	-5	Medium	M6
Loss of Critical Biodiversity Areas	Vegetation damage	-5	High	M6
Erosion	Substrate damage	-5	Medium	M3
Wildlife Mortalities	Vegetation change	-5	Medium	M5
Effect on the use and management of water	Servitude disturbance	-5	Medium	M4
Loss of conservation-significant taxa and/or changes in community structure	Substrate damage	-5	Medium	M6
Increased habitat fragmentation & loss of connectivity	Servitude disturbance	-5	Medium	M4
Electricity connection	Servitude disturbance	-5	Medium	M4
Operational impacts				
Storage of Hazardous Substances	Substrate contamination	±5	Medium	M2
Loss of Indigenous Vegetation	Loss of habitat	±3	Low	M6
Loss of Biodiversity	Loss of habitat	±3	Low	M6

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Loss of Species of Conservation Concern	Vegetation damage	±2	Low	M6
Establishment of Alien Plant Species	Substrate damage	±3	Low	M6
Loss of Critical Biodiversity Areas	Substrate damage	±3	Low	M6
Erosion	Substrate damage	±5	Medium	M3
Wildlife Mortalities	Vegetation change	±5	Medium	M5
Effect on the use and management of water	Servitude disturbance	±5	Medium	M4
Loss of conservation-significant taxa and/or changes in community structure	Substrate damage	±3	Low	M6
Increased habitat fragmentation & loss of connectivity	Servitude disturbance	±3	Low	M6
Electricity connection	Servitude disturbance	±3	Low	M4
Water management	Water wastage, contamination risk	±3	Low	M4
Faunal interference	Soiling/shorting/shading	±2	Low	M5
Vegetation management	Control of plant diversity/structure	±5	Medium	M6

*** Positive (+) or Negative (-) in the absence of mitigation. Severity score: 0-10, where 0 = no disassemble impact and 10 = extremely severe impact extending well beyond the immediate area of the proposed development**

13.8.2: Impact Assessment

Table 10a: Impact Assessment (without mitigation)

Impact by	Likelihood		Consequence			Rating
	Frequency of activity	Frequency of impact	Benefit/Severity of impact	Spatial/Population scope	Duration	
Container delivery	1	2	2	1	2	15 (Very low)
Vegetation disturbance	2	3	4	1	2	35 (Low)
Water supply	1	2	1	1	2	12 (Very low)
Electricity connection	1	2	1	1	2	12 (Very low)
Faunal disturbance	2	3	3	1	2	30 (Low)
Container delivery	1	2	2	1	2	15 (Very low)

Table 10b: Impact Assessment (with mitigation)

Impact by	Likelihood		Consequence			Rating
	Frequency of activity	Frequency of impact	Benefit/Severity of impact	Spatial/Population scope	Duration	
Container delivery	1	2	1	1	2	12 (Very low)
Vegetation disturbance	2	3	3	1	2	30 (Low)
Water supply	1	2	1	1	2	12 (Very low)
Electricity connection	1	2	1	1	2	12 (Very low)
Faunal disturbance	2	3	2	1	2	25 (Very low)
Container delivery	1	2	1	1	2	12 (Very low)

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Table 10c: Impact Assessment (without mitigation)

Impact by	Likelihood		Consequence			Rating
	Frequency of activity	Frequency of impact	Benefit/Severity of impact	Spatial/Population scope	Duration	
Water supply	1	2	1	1	2	12 (Very low)
Electricity connection	1	2	1	1	2	12 (Very low)
Staff facilities on site	2	3	3	1	2	30 (Low)
Access/maintenance/management	4	4	4	1	4	72 (Medium low)
Servitude management	2	3	4	1	2	35 (Low)
Water management	1	2	1	1	2	12 (Very low)
Faunal interference	4	2	2	1	4	42 (Low)
Vegetation management	4	4	4	1	4	72 (Medium low)

Table 10d: Impact Assessment (with mitigation)

Impact by	Likelihood		Consequence			Rating
	Frequency of activity	Frequency of impact	Benefit/Severity of impact	Spatial/Population scope	Duration	
Water supply	1	2	1	1	2	12 (Very low)
Electricity connection	1	2	1	1	2	12 (Very low)
Staff facilities on site	2	3	3	1	2	30 (Low)
Access/maintenance/management	4	4	4	1	4	72 (Medium low)
Servitude management	2	3	4	1	2	35 (Low)
Water management	1	2	1	1	2	12 (Very low)

Faunal interference	4	2	2	1	4	42 (Low)
Vegetation management	3	2	1	1	4	Low
	4	4	3	1	4	64 (Medium low)

Table 10e: Impact Assessment (without mitigation)

Impact by	Likelihood		Consequence			Rating
	Frequency of activity	Frequency of impact	Benefit/Severity of impact	Spatial/Population scope	Duration	
Material removal/recycling	2	2	3	1	1	20 (Very low)
Substrate repair	2	2	3	1	2	24 (Very low)
Vegetation restoration	2	3	3	1	2	30 (Low)
Facility conversion	2	2	3	1	2	24 (Very low)
Material removal/recycling	2	2	3	1	1	20 (Very low)
Substrate repair	2	2	3	1	2	24 (Very low)

Table 10f: Impact Assessment (with mitigation)

Impact by	Likelihood		Consequence			Rating
	Frequency of activity	Frequency of impact	Benefit/Severity of impact	Spatial/Population scope	Duration	
Material removal/recycling	1	1	2	1	1	8 (Very low)
Substrate repair	1	2	2	1	2	15 (Very low)
Vegetation restoration	2	3	2	1	2	25 (Very low)
Facility conversion	2	2	2	1	2	20 (Very Low)
Material removal/recycling	1	1	2	1	1	8 (Very low)

13.8.3 Specific Mitigation Measures

This section provides both specific and generic mitigation measures recommended by the biodiversity specialist to ensure the development takes place in a sustainable manner. The recommendation should be adhered to by all parties (Contractors/ ECO / SECO/ Applicant) throughout the life-cycle of the project.

M1 Legal and Policy Compliance

All necessary permitting and authorisations must be obtained prior to the commencement of any vegetation clearance and/or construction activities.

M2 Storage of Hazardous Substances and Waste Management

All hazardous substances such as diesel, pesticides and fertilisers must be stored in a bunded area with an impermeable surface beneath them. Spill kits must be kept onsite and maintained. Littering must be avoided, and sufficient waste bins must be provided on site. All general waste must be disposed in bins or waste skips labelled general waste and disposed of at nearest registered landfill.

M3 Erosion and Substrate damage

Vegetation clearance must be kept to the minimum and retained where possible to avoid soil erosion. Disturbed areas must be rehabilitated as soon as possible after construction. Since substrates in semi-arid areas are particularly sensitive to mechanical damage, with long-term negative effects on soil moisture and vegetation and biodiversity composition, all activities should be as limited in space and time as is consistent with efficient completion, operation and closure of the development. Wherever possible, any damaging activities (e.g. tracks, unloading/storage/ construction sites) should be located on the areas of lowest sensitivity (in this instance areas with the least grass and sand, and most resistant gravels) and only within the footprint of the development.

Minimize area cleared for construction and erection activities, including the areas used by staff during construction. Provide adequate ablution facilities to avoid using natural (sensitive) areas as toilets. Store topsoil from any cleared areas for subsequent resurfacing after closure. Allow only a single access route to each relevant section of the development and, within each section, always maintain only the minimum tracks necessary for operation and maintenance, with designated passing points so that effectively only a single track is created

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for 2-way traffic. Care must be taken that to prevent an overspill of construction and maintenance activities into sensitive areas.

M4 Servitude disturbance

Use existing distribution lines and servitudes wherever possible to avoid creating new disturbances. Wherever possible, place servitudes through areas of least sensitive habitat. Minimize tracks, use of heavy equipment and dumping of soil as far as possible to contain the area of substrate affected. Store separately any topsoil removed for later rehabilitation. Rehabilitate plant cover as a continual process, to maximize viability of the natural seedbank and reduce loss of topsoil during storage. Use only indigenous (to the area) plant material. Monitor rehabilitation success by comparing data from the servitude with that of surrounding habitats. Conduct monitoring during two seasons for each year. Construction staff must be restricted to an allocated area and should not gain access to sensitive habitat types. Provide adequate ablution facilities to avoid using natural (sensitive) areas as toilets.

M5 Fauna Mortalities

Aves are likely to be attracted to the pylons of the 88 kV powerlines some will in all likelihood be killed by flying into the powerlines or by building nests on the pylons. Monitor and report any animal interactions with all aspects of the pylons to management, to allow remedial action and also to compile databases relevant to other applications of the effects on these man-made habitats.

M6 Control of plant diversity/structure

Maintain a reporting system to record management decisions, actions, and results, based on project designs and technical assistance of the relevant specialists if necessary.

Monitor sample plots by fixed-point images both on and adjacent to the site prior to development and at intervals during operation to define and calibrate the vegetation and any changes that might develop. Base the rehabilitation of the site at closure on the management experience of the habitat before and during operation, to ensure that plant and biodiversity communities replicate the original state as closely as possible.

13.8.4 Generic Mitigation measures

An appropriate management authority must be contractually bound to implement the Environmental Management Plan (EMP) and Environmental Authorisation (EA) during the operational and restoration phases of the development. This authority should be identified and informed of their responsibilities in terms of the EMP and EA.

- Harvesting of any plant material is strictly prohibited. Staff shall only assist with the (necessary) removal of important plant species if requested to do so, under supervision identified on the proposed site.
- All staff should be advised (induction) by means of environmental awareness training on the significant importance of the area and its conservation importance.
- Intentional killing of any faunal species (including invertebrates) should be avoided by means of awareness programmes presented to the labour force. The labour force should be made aware of the conservation issues pertaining to the fauna and flora taxa occurring on the study site. Any person found deliberately harassing any animal in any way should face disciplinary measures, following the possible dismissal from the site.
- Any outside lighting (e.g. for security) should be designed to minimize impacts on fauna. All outside lighting should be directed away from sensitive areas. Fluorescent and mercury vapour lighting should be avoided and sodium vapour (yellow) lights should be used wherever possible. This will minimize attraction of invertebrates that fly at night being attracted to and killed at lights, and the effects of these losses on other fauna (for food) and flora (for pollination/dispersal). Lights and insects also attract insectivores and their predators.
- Chemicals and equipment for the treatment of fuel spillages must be available onsite at all times.
- Prevent introduction of alien plant species. Indigenous species already present in the area should be used during the rehabilitation phase.
- Where communication masts / cell phone towers / overhead lines (power lines or telephone lines) are to be constructed within/adjacent to the site, the Eskom-EWT strategic partnership should advise on appropriate mitigation measures.

- Underground cable installations along existing servitudes should be considered wherever possible.
- The design (including mitigation measures) and location of any proposed power lines (whether new alignments or refurbishment/upgrading of existing lines) should be endorsed by the bird conservation experts of the Eskom-EWT strategic partnership.
- Anti-collision devices such as bird flappers should be installed where power lines cross corridors, rivers or ridges.

13.8.5 Decommissioning phase

The aim of the decommissioning phase is to ensure that the site is in such condition that a landowner can again use the portions of their for livestock/game grazing after cessation of the 88 kV powerline and 40 MVA Substation. During the decommissioning phase, all involved parties will be informed about the planned schedule to close and remove the infrastructure, after an independent audit. Approval must be granted by all involved parties and the plan will be executed under strict supervision.

13.9 Aquatic Biodiversity (Wetland Delineation)

13.9.1 Impact Description

The Mpumalanga Biodiversity Conservation Plan (MBCP) is a plan developed conjointly by the Mpumalanga Tourism and Parks Agency (MPTA) and Department of Agriculture and Land Administration (DALA) to guide conservation and land-use decisions in the province in order to support sustainable development. The MPTA recognises that wetlands are specialised systems that perform ecological functions that are crucial for human and environmental welfare. According to the MBCP, the wetlands in the study area are regarded as 'not required' that implies that wetlands here have not been allocated any particular significance for meeting their requirements.

It is imperative to note that the desktop findings may differ from the actual results from field studies. The current impacts on wetlands in the Bethal Area (Figure 33)

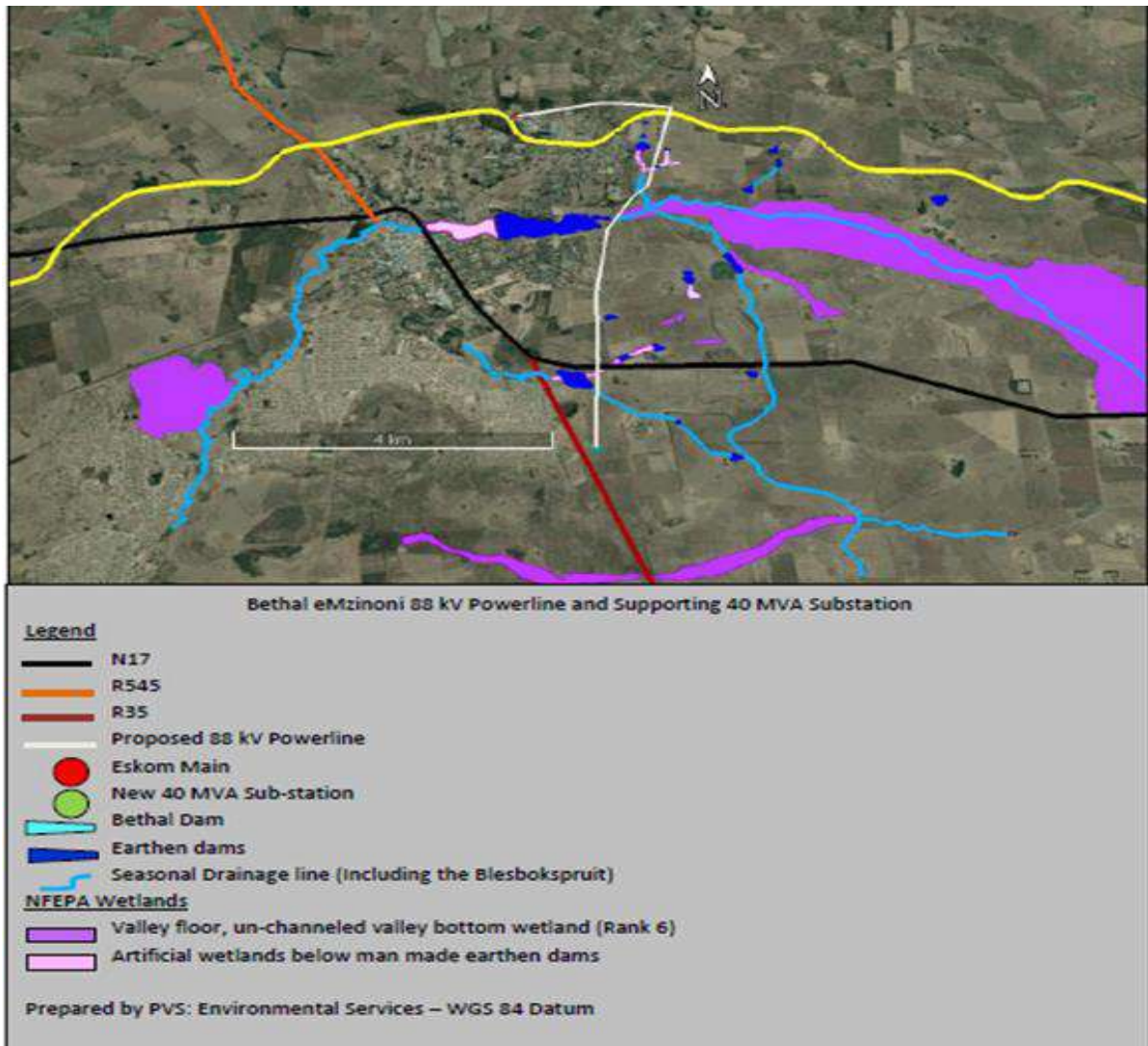


Figure 32: The new Bethal eMzinoni Powerline and Supporting new 40 MVA Substation, in relation to the NFEPA wetlands occurring in the Bethal area

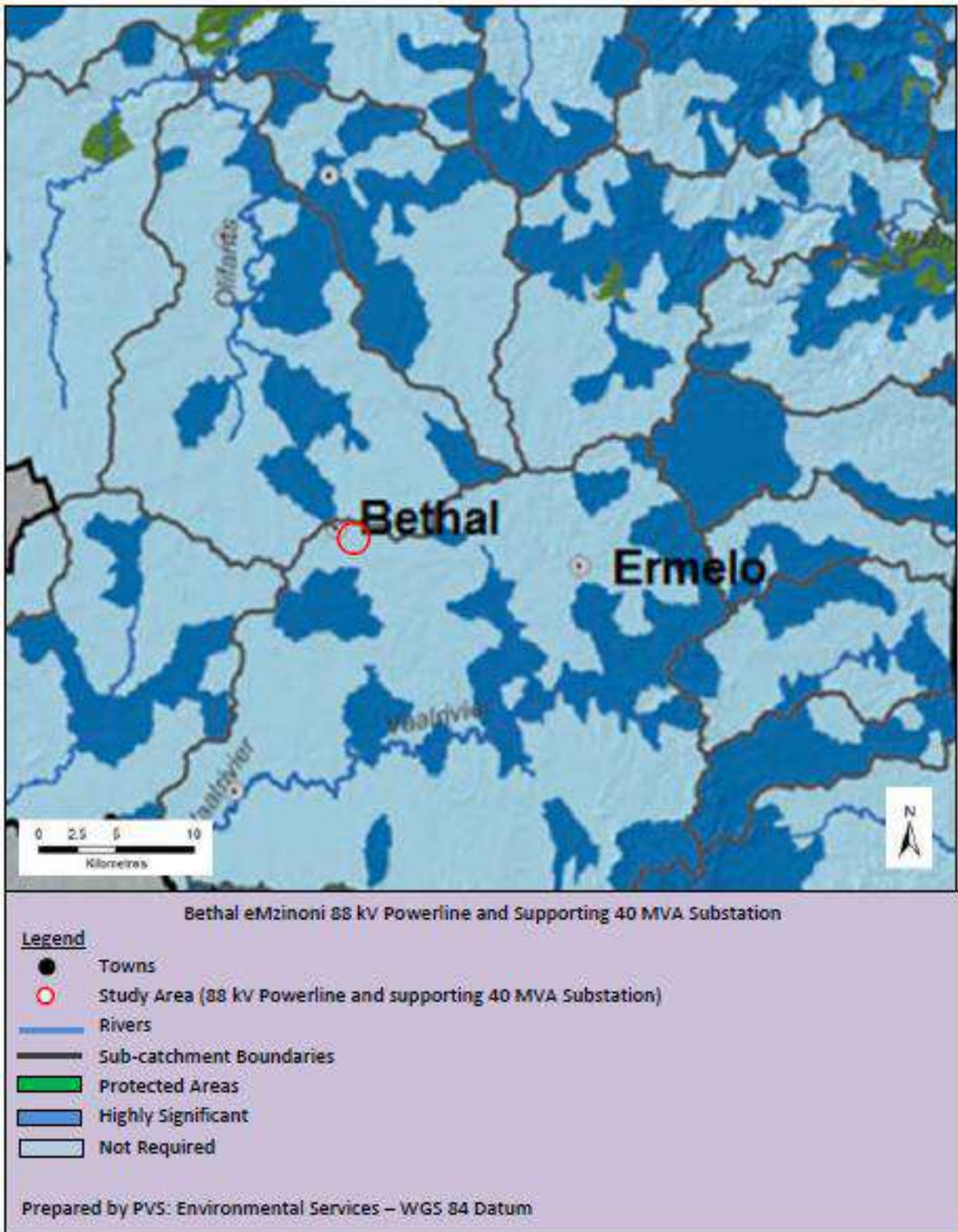


Figure 33: The new Bethal eMzinoni 88 kV Powerline and Supporting 40 MVA Substation study area in relation to the Mpumalanga C-plan

The wetland delineation was completed with the aid of aerial imagery, as well as verification in the field and is represented in Figure 34, and also represents the recommended buffers for protection around the wetlands on site.

The majority of wetlands identified in the Bethal eMzinoni 88 kV Powerline and Supporting new 40 MVA Substation project area can be classified as valley floor un-channeled valley bottom wetlands linked to streams associated with the Blesbokspruit. Based on the presence of artificial seepage wetlands in the area as well as valley bottom and earthen dam systems, it can be deduced that the wetlands are linked to both surface and groundwater sources

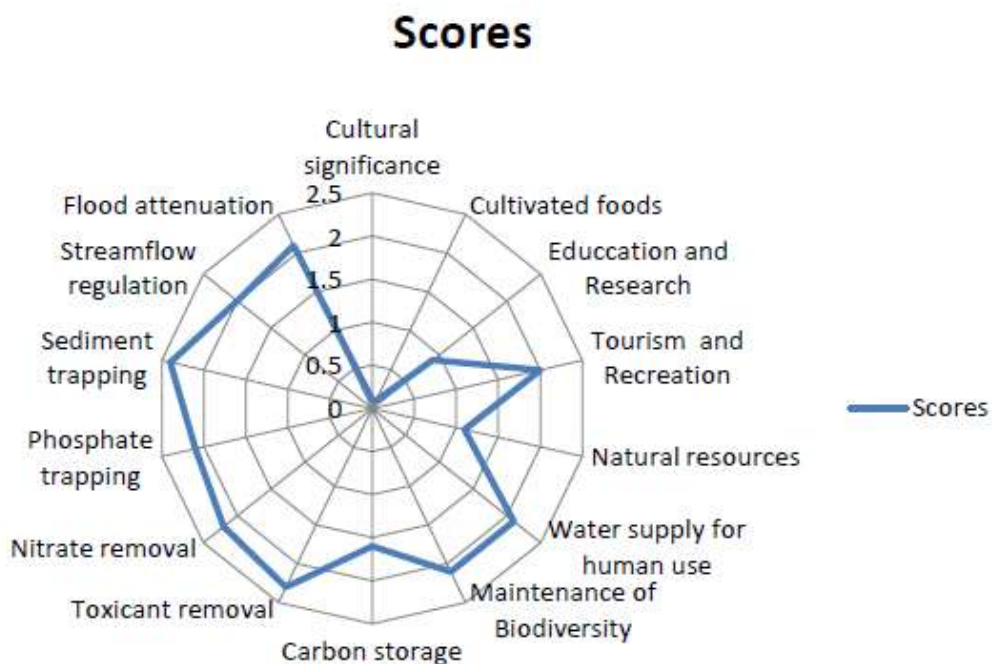
Table 11: Classification of wetlands into HGM units

HGM Unit	Area (ha)	% of total wetland
Earthen dams	47.1	6.20
Artificial Wetland	36.3	4.77
Un-channeled Valley Bottom	627.8	82.53
Bethal Dam	49.1	6.50
Total	760.7	100



Figure 34: Examples of impacts on wetland habitat integrity (A: damming of a channeled valley bottom on the Blesbokspruit system, B: culverts underneath the road of an un-channeled valley bottom, C: dam walls across wetlands were found to reach up to 2m in height (Blesbokspruit system) and D: Crops (1) infringing into the wetland habitat (2)

Figure 35: Radial plots of Eco-services provided for wetlands on site of the Blesbokspruit complex



Wetland EcoServices

The general features of each wetland unit were assessed in terms of functioning and the overall importance of the HGM unit was then determined at a landscape level. The results from the WET-EcoServices tool for the respective wetland units are presented below in Figure 35 above, and highlight that wetlands on site generally provide services that are rated as Low to High.

Pans were rated according to the following scale:

- <0.5 Low
- 0.5-1.2 Moderately Low
- 1.3-2.0 Intermediate
- 2.1-2.8 High
- >2.8 Very High

Valley bottom systems showed High scores for flood attenuation, nutrient processing and toxicant removal. Wetlands associated with the Blesbokspruit showed a significantly high score for sediment trapping and nutrient processing.

13.9.2 Impact Assessment

The current land-use activities within the study area are mainly maize (Zea maize). The continued agricultural activities onsite has resulted in the transformation of wetlands and areas adjacent to wetlands to a disturbed state, thus reducing biodiversity. This will promote processes of erosion and reduce the capacity of wetlands to produce EcoServices such as nutrient cycling, water purification and flood attenuation.

A loss of vegetation cover results in reduced surface roughness and lower infiltration of run-off. As a consequence, the formation of erosion gulleys and rills takes place, which can lead into wetland areas.

Issue 1: Direct loss of wetland areas

Loss of wetland areas has occurred within the project area as a result of crop farming. Soybean farms have encroached into the seepage areas and pan edges in order to maximise arable land area. As a result of the loss of wetland areas, the associated wetland vegetation has also been impacted.

- **Impact 1: Direct loss of wetland areas**
- **Impact 2: Loss of wetland vegetation.**

Issue 1	Direct loss of wetland areas				
Parameters	Severity	Spatial	Duration	Probability	Significance
Impact 1	Direct loss of wetland habitat				
Pre- Mitigation	Significant Impact (7)	Municipal (3)	Permanent (6)	Certain (7)	High (120)
Post- Mitigation	N/A				
Impact 2	Loss of Wetland vegetation				
Pre- Mitigation	Very Serious (5)	Local (2)	Permanent (6)	Certain (7)	Medium-High (100)
Post- Mitigation	N/A				

Issue 2: Loss of wetland integrity and functionality

The application of agrochemicals and pesticides for the cultivation of maize is likely to have resulted in contamination of water resources in the study area, which may have negative impacts on aquatic life and wetland-dependant plant and animal

- **Impact 3:** Contamination of surface water and loss of water quality improvement capacity

Issue 2	Loss of Wetland integrity				
Parameters	Severity	Spatial scale	Duration	Probability	Significance
Impact 3	<i>Contamination of surface water and loss of water quality improvement</i>				
Pre- Mitigation	Very Serious (5)	Regional (5)	Permanent (6)	Likely (5)	Medium-High (75)
Post- Mitigatio	N/A				

Cumulative impacts

If the risk of subsidence of unconsolidated sediments underlying wetlands is avoided, via proper management and adherence to the specifications of a geotechnical report, the proposed activity may be regarded as an insignificant contributor to the cumulative impacts on the water resources in the greater study area. Owing to the existing pressure on the water resources in the Upper Vaal catchment, however, the cumulative impacts of the proposed activity may be regarded as significant if subsidence is likely to occur. Wetlands are complex, interlinking systems and should be regarded on a large ecosystem-scale.

13.9.3 Recommendations and Mitigation Measures

According to the specialist findings, the low-risk nature of the proposed new Bethal eMzinoni 88 kV Powerline and Supporting 40 MVA Substation, as well as the fact that less than 10% of the site is comprised of wetlands, it can be deduced that the overall impacts of the new Bethal eMzinoni 88 kV Powerline and Supporting 40 MVA Substation on the wetland habitat is expected to be minimal. Although the surface infrastructure which is planned for this phase as yet, the potential risk of the new Bethal eMzinoni 88 kV Powerline and Supporting 40 MVA Substation is subsidence, It is recommended that a

geotechnical investigation is put in process in order to quantify this risk and that if the risk is likely, development be kept away from areas underlying wetland habitat. A preliminary Safety Factor of (>2) is recommended

13.9.4 Conclusion

Wetlands in the new Bethal eMzinoni 88 kV powerline and Supporting 40 MVA Substation at Milan Park Extension 21 study area are largely linked to streams associated with the Blesbokspruit tributaries and fall within the quaternary catchment C11H. This catchment coincides with the Upper Vaal River Water Management Area and has been assigned a general ecological state of 'C' – Low to Marginal.

Wetlands were delineated using the four indicators prescribed by DWAF (2005) and were found to cover an area of 760.7 ha. Two HGM units were identified on site, the majority belonging to the channeled valley bottom wetland type of the study area and were found to be largely altered due to the expansion of maize crops in their catchments.

For the integrity and functionality assessment, wetlands that showed connectivity were grouped into one complex according to the link to the respective major watercourse, namely: the Blesbokspruit. The frequency and scale of dams in the Blesbokspruit complex has caused a significant alteration to the natural state of wetlands associated with the parent watercourses. The impacts of damming are considerable with regards to geomorphology and hydrology and result in stream channel shortening, diversion as well as promoting the onset of erosional processes. With increased erosion, the floor of channels may become deeply incised and without regular replenishment of sediment sources, physical processes and habitat downstream may be negatively affected.

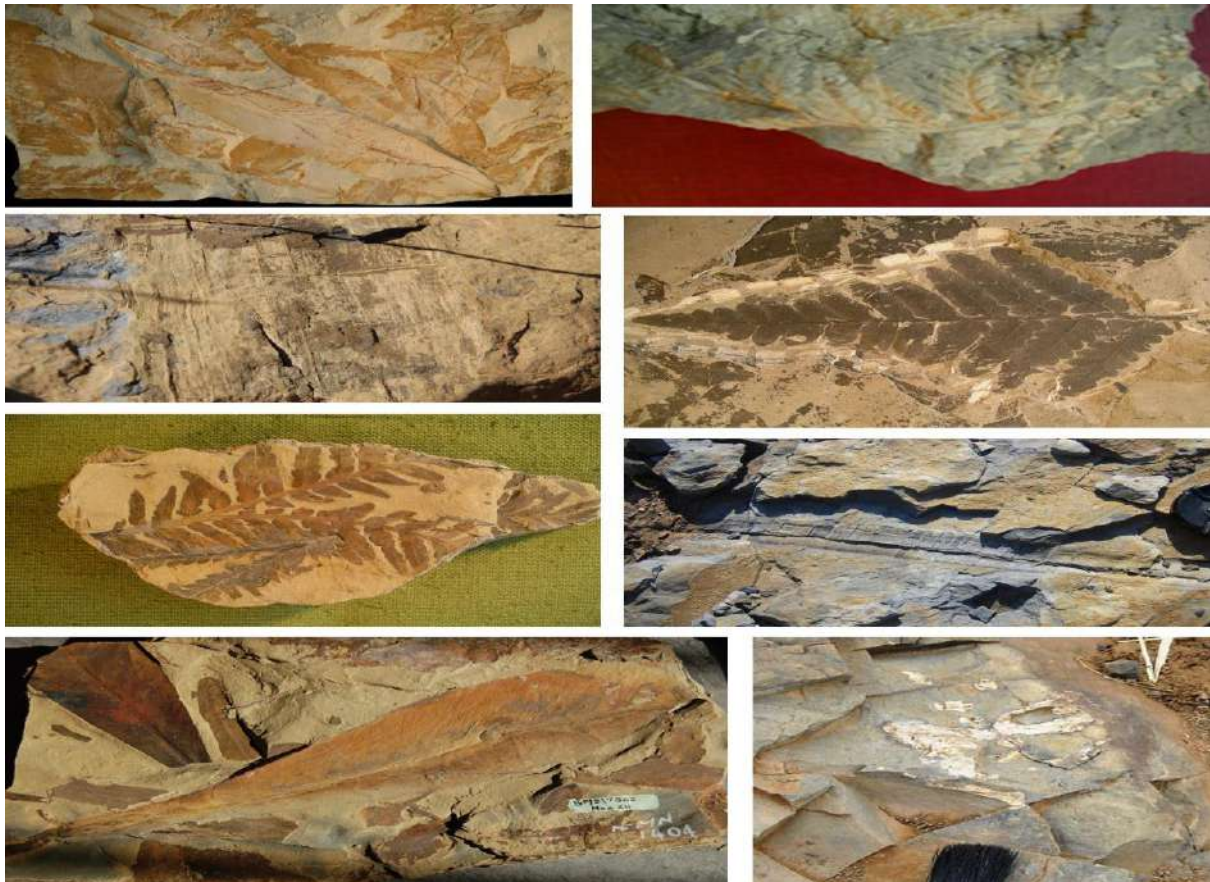
13.10 Paleontological

13.10. 1 Impact Description

Based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are igneous or are shales that could contain fossil plants. Furthermore, the material to be excavated is soil and this does not preserve fossils. Since there is an extremely small chance that fossils from the

nearby Vryheid Formation may be disturbed a Fossil Chance Find Protocol has been added to this report (13.11.3). Taking account of the defined criteria, the potential impact to fossil heritage resources is extremely low.

Figure 37: Photographs of fossil plants of the Glossopteris Flora, from the Vryheid Formation.



13.10.2 Impact Assessment

Table 11a: Criteria Used for ranking severity (Paleontological)

PART A: DEFINITION AND CRITERIA		
Criteria for ranking of the SEVERITY/NATURE of environmental impacts	H	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action.
	M	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints.
	L	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	L+	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	M+	Moderate improvement. Will be within or better than the recommended level. No observed reaction.
	H+	Substantial improvement. Will be within or better than the recommended level. Favourable publicity.
Criteria for ranking the DURATION of impacts	L	Quickly reversible. Less than the project life. Short term
	M	Reversible over time. Life of the project. Medium term
	H	Permanent. Beyond closure. Long term.
Criteria for ranking the SPATIAL SCALE of impacts	L	Localised - Within the site boundary.
	M	Fairly widespread – Beyond the site boundary. Local
	H	Widespread – Far beyond site boundary. Regional/national
PROBABILITY (of exposure to impacts)	H	Definite/ Continuous
	M	Possible/ frequent
	L	Unlikely/ seldom

Table 11b: Criteria Used for assessing severity (Paleontological)

PART B: IMPACT ASSESSMENT		
Severity/Nature	H	-
	M	Dolerite and soils do not preserve fossils; so far there are no records from the Vryheid Fm of plant or animal fossils in this region so it is very unlikely that fossils occur on the site. The impact would be negligible

	L
	L+	-
	H	-
	M	Dolerite and soils do not preserve fossils; so far there are no records from the Vryheid Fm of plant or animal fossils in this region so it is very unlikely that fossils occur on the site. The impact would be negligible
Duration	L	-
	M	-
	H	Where manifest, the impact will be permanent.
Spatial scale	L	Since the only possible fossils within the area would be fossil plants in the shales below ground of the Vryheid Fm, the spatial scale will be localised within the site boundary.
	M	-
	H	-
Probability	H	-
	M	It is extremely unlikely that any fossils would be found in the loose soils and sands that cover the area or in the dolerite that is most abundant. There might be fossils below ground from the Vryheid Formation that might be disturbed. Therefore, a Fossil Chance Find Protocol should be added to the eventual EMPr
	L	-

13.10.3 Recommendation / or Chance Find Protocol

Monitoring Programme for Palaeontology – to commence once the excavations and drilling activities begin

1. The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.
2. When excavations begin the rocks must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.

3. Photographs of similar fossils must be provided to the developer to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones (for example see Figure 5). This information will be built into the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
5. If there is any possible fossil material found by the developer/environmental officer then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
7. If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
8. If no fossils are found and the excavations have finished then no further monitoring is required.

13.11 Phase 1 Cultural Heritage

13.11.1 Impact Description

The heritage Impact study conducted revealed that there is a large cemetery located on the south-western side of the proposed option 1 substation (preferred site). The buffer separating the graves from the proposed substation is estimated to be more than 200 m which is twice the minimum breadth of the servitude regulated. It is also noted that the R35 Road from Bethal to Mogenzon which passes between the cemetery and the proposed option 1 substation site, will act as a buffer, as the development of the substation east of the road will not encroach into the regulated buffer zone.

13.11.2 Impact Assessment

The Table below was used for ranking the significance of the findings.

Table 12: Criteria for ranking Findings

	RANKING	TOPOLOGY AND SIGNIFICANCE	NO OF SITES
1	High	National and Provincial heritage sites (Section 7 of NHRA). All burials including those protected under Section 36 of NHRA. They must be protected.	
2	Medium A	Substantial archaeological deposits, buildings protected under Section 34 of NHRA. Footprint of early modern mining. These may be protected at the recommendations of a heritage expert.	
3	Medium B	Sites exhibiting archaeological characteristics of the area, but do not warrant further action after they have been documented.	
4	Low	Heritage sites which have been recorded, but considered of minor value relative to the proposed development.	
TOTAL			

13.11.3 Mitigation Measures Recommended:

- All feeder lines from the substation to Emzinoni x 11 Township and supporting infrastructure must avoid the cemetery with the application of a 100 m buffer zone as a minimum standard.
- The developer must be informed about this regulation before the location of the substation is confirmed.

13.12 AVIFAUNA (Part of the Terrestrial Report)

13.12.1 Impact Description

According to the specialist, although the habitat at the site occurs within the Grassland biome as identified for bird distributions (Allan et al. in Harrison et al. 1997) and more specifically the Soweto Highveld Grassland (Gm 8) vegetation type and the Eastern Highveld Grassland (Gm 12) vegetation type, Mucina & Rutherford 2006), most of the study site comprises natural habitats with the most disturbed areas around water points, farm houses, crop lands, access tracks and roads on and near the proposed development area.

The study area supports one structural habitat for faunal species, but is expected to host no threatened bird species, even if an endangered bird species were listed by SANBI, viz.

- Sensitive High (species 2 - no name to be given – SANBI directive). This bird is listed as endangered because of its population decreasing.,
- *Geronticus calvus* (Southern Bald Ibis) – Sensitive High because this bird is listed as vulnerable because it has a small population which is believed to be declining owing to habitat loss and degradation,
- *Tyto capensis* (African grass owl) – Sensitive Medium because this bird is listed as least concern, and
- *Circus ranivorus* (African Marsh Harrier) – Sensitive Medium because this bird is listed as vulnerable in South Africa due to wetland loss and fires during the breeding season.

No red data bird species were identified on site, while there is a remote possibility that sensitive species might occur on the proposed development area. The proposed development will not impact negatively on the habitat that it will occur on because the footprint is small across the approximately 9.4 km 88 kV Powerline to the new supporting 40 MVA Substation, and there is sufficient size of the existing habitat still in existence.

13.12.2 Impact Assessment

Table 13: Rating of recognised on-site avian habitats (site + 500 m buffer) for the proposed development

Avian Habitats	Conservation Priority					Sensitivity	
	High	Medium-High	Medium	Medium-Low	Low	High	Low
1. Grass land	X					X	
2. Wetland	X					X	
3. Bethal Dam		X					X

13.12.3 Mitigation Measures recommended

- The design (including mitigation measures) and location of any proposed power lines (whether new alignments or refurbishment /upgrading of existing lines) should be endorsed by the bird conservation experts of the Eskom-EWT strategic partnership.
- Anti-collision devices such as bird flappers should be installed where power lines cross corridors, rivers or ridges.

13.13 “No-Go” Impacts

No-go Alternative

The consideration for the No-go alternative was analysed based on the following; Current status que, the risk it poses both negative and positive impacts. The current load-shedding challenge is a reality at Govan Mbeki Municipality, especially at Bethal and Emzinoni township. Most businesses and residents are affected by the status que daily, and this has caused unhappiness and some businesses to shut. The challenge has been happening for some time now.

Considering the No-go option would mean everything will remain as is. Electricity shortage at the new residential area of Emzinoni township, and load-shedding will continue affecting businesses and residents. The physical and social environment where the new substation and power line is proposed will remain undisturbed, however the economic implications and social impact for this option will continue affecting the residents negatively.

The No-Go option is therefore not a suitable option for this project, given the negative impacts related to it.

13.14 Cumulative Impacts

European Environmental Agency define cumulative impacts (be it positive or negative, direct and indirect, long-term and short-term impacts) as impacts arising from a range of activities throughout an area or region, where each individual effect may not be significant if taken in isolation. Such impacts can arise from the growing volume of traffic, the combined effect of a number of agriculture measures leading to more intensive production and use of chemicals, etc. Cumulative impacts include a time dimension, since they should calculate the impact on environmental resources resulting from changes brought about by past, present and reasonably foreseeable future actions.

13.14.1 Cumulative Impacts caused by the proposed development

Currently there are no similar new developments taking place near the study area, except the existing Eskom powerlines and substation in Bethal. The following is expected during different phases of the project.

Table 15.1: Cumulative Impacts-Visual

Construction/ Operational Phases – Lines & substation sites		
Visual	Mitigations	
Possible Impacts	Construction Phase	Operational Phase
Visual change will occur as a result of the new distribution line	Use / share of existing servitudes & roads where possible	Treat the steel members of the distribution steel monopoles towers

		with a low gloss, galvanized paint to mitigate the initial shiny appearance of a new tower
The new powerline will be highly visible throughout most of the study area	The consolidation of powerlines in parallel servitudes is highly recommended and will have the greatest reduction in the severity of the impacts	
Viewer incidence is generally expected to be medium as the route passes through desolate areas and farms	Barricade / Screen areas used for storage of construction materials	
Without Mitigations	High	High
With Mitigations	Medium to low	Medium to low

Cumulative Impacts: It is expected to cause an increased visual intrusion along its linear length and comes closer to a visual intolerance threshold, but it is only during the construction phase, when the operational phase starts, with appropriate mitigations, the impact will be Medium to low

Table 15.2: Cumulative Impacts-Traffic

Construction/ Operational Phases – Line & substation sites		
Traffic	Mitigations	
Possible Impacts	Construction Phase	Operational Phase
- Traffic influx due to similar projects or other developments with similar traffic effect taking place during the sometime of project construction	Joint management of traffic management plans could be implemented, where possible	The operational phase will have minimal traffic impact due to reduction of influx
- Introduction of Heavy vehicle and machinery on site		
Without Mitigations	High	Medium
With Mitigations	Medium	Low

Cumulative Impacts: It is expected that traffic impact will still continue even after the development since new opportunities for employment and operational activities would have been created, but the impact should be low impact.

Table 14.3: Cumulative Impacts-Avifauna

Construction/ Operational Phases – Line & substation sites		
Avifauna	Mitigations	
Possible Impacts	Construction Phase	Operational Phase
- Increased Birds Electrocution	Installation of bird friendly devices like bird flappers /	Joint management of Avifauna management

	guards could minimise and also avoid the impacts	plans could be implemented, where possible
- Increased Birds Collisions	Installation of bird friendly devices, to increase visibility can help avoid collision	
- Habitat destruction or disturbance	-Avoid clearing vegetation unnecessarily	Adhere to available biodiversity legislation and policies
Without Mitigations	High	Low
With Mitigations	Medium	Low

Cumulative Impacts: The development of the new powerline and substation is expected to add to the risk of possible electrocution of avifaunal species and disturbance of habitat. The new line and the existing powerlines have potential to affect these species should mitigations proposed by the Terrestrial Biodiversity Specialist not taken into consideration. With mitigation measures in place the impacts can be avoided or minimised.

Table 14.4: Cumulative Impacts- Socio Economic Environment

Construction/ Operational Phases – Line & substation sites		
Socio Economic Environment	Mitigations / Benefits	
Possible Impacts (Positive)	Construction Phase	Operational Phase
<ul style="list-style-type: none"> - Job Creation - Enhancement of Economy - Improved energy supply - Reduction of loadshedding 	Construction: Increased creation of jobs and economic input into local businesses	Operational: Increased creation of jobs and economic input into local businesses

		Improved supply of electricity to new residents of Bethal & Emzinoni areas
Without Mitigations	High (Social Impact)	High (Social Impact)
With Mitigations	Medium	Medium

Cumulative Impacts: It is expected that opportunities for jobs will be created by the proposed development. The electricity supply is expected to improve to a certain degree due to the proposed development. The positive impact will be felt during both construction and operational phases.

14. Public Participation Process (PPP)

The PPP will be conducted based on the requirements of Chapter 6 of GN No. 982 of the 2014 EIA Regulations, as amended (07 April 2017) of the NEMA.

14.1 The purpose for PPP is as follows:

- To provide for the opportunity for all role players including potential and RI&APs, EAPs, state departments, organs of state, and the competent authority (CA) to obtain clear, accurate and understandable information about the environmental impacts of the proposed activity or implications of a decision;
- To provide for role- players to voice their support, concerns and questions regarding the project, application or decision.
- To provide the opportunity for role-players to suggest ways for reducing or mitigating any negative impacts of the project and for enhancing its positive impacts;
- To enable the person conducting PP to incorporate the needs, preferences and values of potential or I&AP's into its proposed development that becomes the subject of an application for an environmental authorization (EA);
- To provide opportunities for clearing up misunderstandings about technical issues, resolving disputes and reconciling conflicting interests;
- To encourage transparency and accountability in decision-making;

- to contribute toward maintaining a healthy, vibrant democracy; and
- To give effect to the requirement for procedural fairness of administrative action as contained in the Promotion of Administrative Justice Act, 2000 (Act No. 3 of 2000).

14.2 The Public Participation Process will involve the following:

- Site notices were be placed at noticeable and strategic points.
- At the earmarked sites and around the study area.
- Project notices were e-mailed to all identified Interested and affected parties, including Ward councillors of the area, authorities and relevant state departments
- The announcement notice was placed in the local newspapers (Ridge Times) on the 8th of February. The public was given until the 8th of March to register as I&AP's.
- IIDs was distributed to potential I&AP's
- The dominating language living in the study area speak isiZulu language. This community was addressed using the local radio Ikwewezi , and also reached through councillors'
- Public meeting to explain the outcome of the BA study conducted and mitigations is planned on the 6 / or 7th of April 2022.
- EmpowerMachite, Govan Mbeki Municipality (GMM) and CRRenewables Social Media Platforms (e.g Facebook) were used to share the content of the notice

14.3 Public Review Process:

Registered IAPs are to review and comment on the draft documents which will be lodged at the following place for review from the **18th March -20th April 2022** (two more days added due to the two holidays in between).

To see the evidence of what has been done to date, please refer to **Appendix C**.

15. Considering the best practicable environmental option (BPEO) for the proposed development

Kindly refer to section 4.3 for the BPEO for the proposed development and motivation.

16. Conclusion

16.1 Compliance Statement

Based on the specialist study's findings, assessment of the project life-cycle's possible or potential impacts and the implementation of mitigation measures aimed at either preventing, reducing and minimising possible significant impacts, It is recommended that the project be considered for authorisation

Further, looking at the cumulative impacts, it is unlikely that any of the assessed impacts would result in spatial and temporal cumulative change. With mitigation measures, all the envisaged and assessed cumulative impacts can be regarded as marginal or minimal. The significance of cumulative impacts can be further reduced should existing infrastructure servitudes and access roads /tracks used.

Based on alternatives assessed, Option 1 Substation and Option 1 Powerline are recommended to be granted Environmental Authorisation to satisfy the purpose and need of the proposed project on condition that EMPr and all mitigation measures recommended by the Environmental Specialists in the BAR are implemented. The services of an Independent ECO to audit compliance at all project phases should be mandatory. All necessary Environmental Authorisations in terms of NEMA legislation and other relevant legislations such as SAHRA, NWA regulations on GA/ WULA and NFA regulations on vegetation clearance be acquired prior to construction activities.

17. References

- ECC European Environmental Agency : <https://www.eea.europa.eu/> (Online)
- 2011 Highveld Priority Area Air Quality Management Plan, 2011
- 2014-2034 Govan Mbeki Spatial Development Framework
- DFFE Transvaal Nature Conservation Ordinance Act No. 12 of 1983
- Eskom Dx Standard for Bush Clearance and Maintenance within Overhead Powerline Servitudes, Eskom, South Africa.
- DFFE Environmental Impact Assessment Regulations in terms of the National Environmental Management Act (Act No. 107 of 1998) Government Notice No. R.326 in the Government Gazette No. 40772 of 07 April 2017
- DMER Electricity Regulation Act No. 4 of 2006. Integrated Energy Plan
- DMER The Mineral and Petroleum Resources and Development Act No. 28 of 2002. Pretoria: Department of Minerals and Energy.
- NWS National Water Act No. 36 of 1998.
- SANBI, 2010 Further Development of a Proposed National Wetland Classification System for South Africa. Primary Project Report. Prepared by the Freshwater Consulting Group (FCG) for the South African National Biodiversity Institute, SANBI, Pretoria.
- Swanepoel C.M, and Barnard R.O. 2007. Discussion paper: Wetlands in Agriculture. ARC Report Number GW/A/2007/43.
- Water Research Commission, 2008. Wetlands Research Programme: Wetland rehabilitation (WRC Project No. K5/1408).WRC Report TT 341/08.