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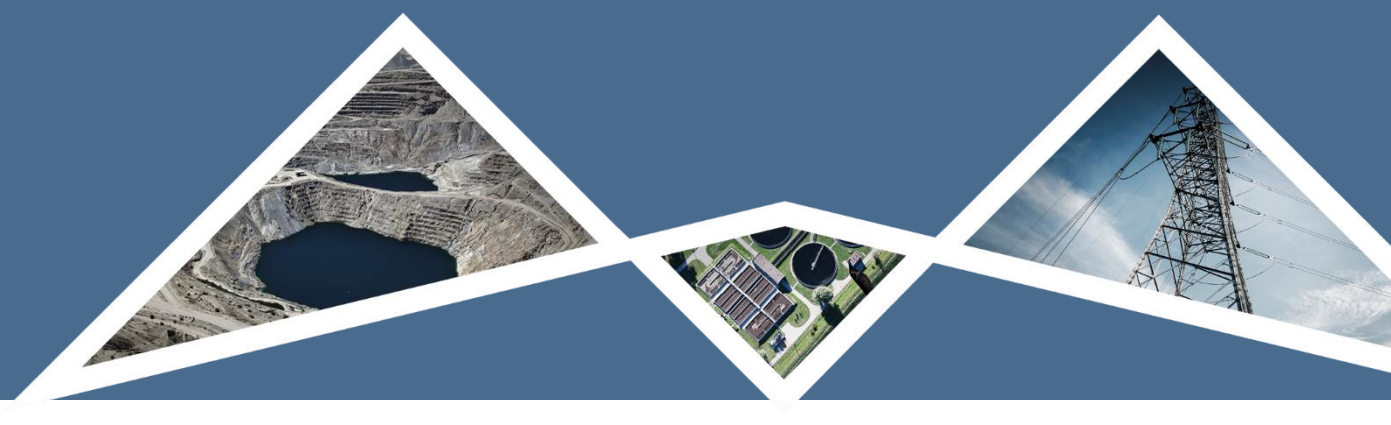
SCOPING REPORT

ESKOM BLANCO NETWORK STRENGTHENING: NARINA 400/132KV SUBSTATION AND DROERIVIER-PROTEUS 400KV LINE LOOP-INS WITHIN THE GARDEN ROUTE DISTRICT MUNICIPALITY OF THE WESTERN CAPE PROVINCE



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1 EXECUTIVE SUMMARY

This non-technical executive summary provides a high-level overview of this environmental Scoping Report. The reader is urged to consult later sections of this report should more specific information or detail be required on various aspects.

1.1 PROJECT OVERVIEW

Eskom Holdings SOC Ltd. (Eskom) holds a prominent role as the primary electricity producer in South Africa. Eskom is structured as a vertically integrated entity with licensing authority for electricity generation, transmission, and distribution throughout South Africa. The National Transmission Company (NTC) a wholly owned subsidiary of Eskom, known as Eskom Transmission, operates and maintains the transmission network. Additionally, the company manages the transmission network, distributing electricity at high voltages to various vital customers and distributors. The strategic planning for the expansion of the transmission network falls under the jurisdiction of the Grid Planning and Development Department within the Transmission Group.

Eskom through their Transmission Grid Planning and Development division have identified transformation constraints at Proteus Main Transmission Substation (MTS) as well as the sub-transmission constraints experienced on the network supplying the Blanco area located near George in the Western Cape Province. To resolve the network constraints, strengthening options were considered of which the establishment of a new 400/132kV MTS known as Narina substation with associated loop-in loop-out (LILO) powerlines to link the proposed Narina MTS to the existing Eskom Transmission (Tx) and Distribution (Dx) grids was recommended.

1.2 NEED FOR THE PROJECT

Eskom through their transmission grid planning and development division identified transformation and sub-transmission constraints at the Proteus Main Transmission Substation located in the Western Cape Province. Eskom Transmission Grid Planning investigated possible solutions to address transformation constraints at Proteus MTS as well as the sub-transmission constraints experienced on the network supplying the Blanco area near George. Network strengthening options such as reinforcing and/or upgrading the Proteus – Blanco sub-transmission network were considered; ultimately, the establishment of a new 400/132kV Narina MTS within or close to the Blanco area with associated loop-in loop-out powerlines was considered the best option to resolve the network constraints.

1.3 PROPOSED INFRASTRUCTURE

This section provides the infrastructure description of the proposed Eskom Narina Substation Project.

1.3.1 SUBSTATION

An electrical substation can be defined as a facility where voltage is transformed (commonly referred to as stepped up or down), from high to low voltages (or the reverse) using transformers. The proposed Narina substation is specifically designed to step-down the voltage from 400kV to 132kV. Substations are located throughout the whole electrical grid, from the power stations all the way to the distribution grid. The substations near the power stations contain the transformers that step-up the electricity in order to reduce energy loss during its transmission over long distances, the substations before sub-transmission lines step-down the electricity to lower voltages, and Dx substations connect the sub-transmission lines to distribution lines.

The transmission system's primary role is to transport electricity in bulk from wherever it is generated to load centres throughout South Africa and the region. From these load centres, the distribution networks owned by Eskom, the metros, and municipalities deliver electricity to individual end users. The system has to be expanded and reinforced to connect new loads and more sources of generation to the grid, as well as to meet the growing needs of customers (TDP, 2020-2029). The proposed substation will be a transmission substation and will comprise of standard electrical equipment such as transformers, reactors, busbars, isolators, etc.

1.3.2 TRANSMISSION POWERLINES

Transmission lines are the physical structures that conduct high voltage electricity (i.e., bulk transfer of electrical energy). Transmission lines are distinct from the local distribution of electricity to customers (referred to as distribution). The network of transmission lines throughout South Africa provides for the bulk transport of power from source areas (i.e., power stations) to the demand areas over large distances. The proposed study areas have existing high voltage (400kV) transmission lines located northward and eastward of the proposed substation location alternatives in the Blanco and Outeniqua study areas, respectively. It is proposed that the Narina substation will be connected to the existing high voltage transmission powerline through a loop in-loop out powerline connection to the existing 400kV transmission line.

1.3.3 DISTRIBUTION POWERLINES

Distribution of electricity refers to the final stage of the electrical grid which distributes electricity to homes, industry, and other customers. The power level is reduced by step-down transformers, which lower the voltage of the electricity from dangerous levels (over 1 kV) to safer levels (100 - 400 V). The entire distribution grid includes lines, poles, transformers, and switching and protection circuits that deliver safe electrical power. The proposed Narina substation will also need to be connected to the distribution network in the area. This will be done through 132kV powerlines (likely double circuit monopole structures) between the existing Blanco Dx substation and the proposed Narina Tx substation. There is an existing 132kV powerline corridor located south and east of the proposed substation location alternatives within the Blanco and Outeniqua study areas, respectively. It is proposed, depending on the final location of the Narina substation that the new 132kV powerlines follow the existing corridors to the Blanco substation to minimise environmental impacts as far as possible.

1.4 SCOPING REPORT AND SPECIALIST STUDIES

This Scoping Report represents the “Scoping Phase: of the environmental authorisation application process and the term “scoping” refers to the process of determining the spatial and temporal boundaries of the proposed project. In broad terms, the objectives of the Scoping Process are to:

- Confirm the process to be followed and opportunities for stakeholder engagement;
- Clarify the project scope to be covered;
- Identify and confirm alternatives as well as preferred alternatives where relevant;
- Describe the need and motivation of the project; and
- Identify the key impacts to be addressed in the impact assessment phase and the approach to be followed in addressing these issues (Plan of Study for EIA phase).

A public consultation process is undertaken during this scoping phase which includes:

- The competent authority involved in the decision-making for this application as well as other government departments or organs of state that may have an interest in or be affected by this project;
- The affected landowners as well as public and NGOs to ensure that local, regional and national issues are well understood.

Any comments or issues raised as part of the legislated Scoping Report 30-day comment period will be captured in an Issues and Responses Report as an appendix to the Final Scoping Report, which will be submitted to the Department of Forestry, Fisheries and the Environment (DFFE) for decision-making (i.e. approval or rejection).

Several specialist studies have been commissioned to investigate key issues and impacts that require further investigation and preliminary baseline information and specialist inputs from these studies are included in this report while the detailed final specialist studies will be included in the EIAR. A list of the preliminary specialist studies that will be undertaken is included below and any additional studies that may be identified during the consultation process will be considered and included in the EIA phase:

- Agricultural Potential including Soils and Land Capability
- Aquatic and Wetlands
- Geotechnical (Desktop)
- Heritage, Archaeological and Palaeontology
- Socio-Economic
- Terrestrial Biodiversity including Avifauna
- Town Planning (Desktop)
- Traffic
- Visual

1.5 IMPACTS IDENTIFIED AND PRELIMINARY ASSESSMENT

A list of biophysical and socio-economic impacts that have been identified during this scoping phase as well as the preliminary pre-mitigation environmental risk, post mitigation environmental risk and final significance when applying a priority factor is presented below and these will be interrogated further in the EIA phase.

Discipline	Impact	Phase	Pre-mitigation ER	Post-mitigation ER	Final Significance
Biodiversity	**Blanco**				
	Destruction, further loss and fragmentation of the vegetation community	Construction	-18	-13	-16,3
	Introduction of alien species, especially plants	Construction	-11	-8,3	-9,3
	Erosion due to storm water runoff and wind	Construction	-11	-6,8	-9,3
	Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration and poaching).	Construction	-9	-7,5	-8,4
	Environmental pollution due to potential leaks, discharges, pollutant leaching into the surrounding environment	Construction	-14	-8,3	-9,3
	Continued fragmentation, further loss and fragmentation of the vegetation community	Operation	-8,3	-7,5	-9,4
	Vegetation loss due to erosion and encroachment by alien invasive plant species	Operation	-9,8	-7,5	-9,4
	Potential leaks, discharges, pollutant from activities leaching into the surrounding environment	Operation	-8,3	-7,5	-8,4
	Continued displacement and fragmentation of the faunal community (including threatened or protected species) due to ongoing anthropogenic disturbances (noise, dust and vibrations) and habitat degradation/loss (litter, road mortalities and/or poaching).	Operation	-9,8	-8,3	-9,3
	Loss of water resources	Construction	-12	-7,5	-9,4
	Degradation of resources, impaired functionality	Construction	-10,5	-8,3	-10,3
	Deterioration of resource integrity	Construction	-10,5	-8,3	-10,3

Discipline	Impact	Phase	Pre-mitigation ER	Post-mitigation ER	Final Significance
	Degradation of resources, impaired functionality	Operation	-8,3	-6,8	-6,8
	Deterioration of resource integrity	Operation	-6,8	-6	-6
	Loss of land capability	Construction	-13	-9	-11,3
	Deterioration of land capability	Construction	-9	-9	-11,3
	Loss of land capability	Operation	-15	-8,3	-8,3
	Deterioration of land capability	Operation	-9	-7,5	-8,4
	Outeniqua				
	Destruction, further loss and fragmentation of the vegetation community	Construction	-15	-13	-14,6
	Introduction of alien species, especially plants	Construction	-11	-8,3	-9,3
	Erosion due to storm water runoff and wind	Construction	-11	-6,8	-7,6
	Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration and poaching).	Construction	-9	-7,5	-8,4
	Environmental pollution due to potential leaks, discharges, pollutant leaching into the surrounding environment	Construction	-14	-8,3	-9,3
	Continued fragmentation, further loss and fragmentation of the vegetation community	Operation	-8,3	-7,5	-9,4
	Vegetation loss due to erosion and encroachment by alien invasive plant species	Operation	-8,3	-5	-6,3
	Potential leaks, discharges, pollutant from activities leaching into the surrounding environment	Operation	-8,3	-7,5	-8,4
	Continued displacement and fragmentation of the faunal community (including threatened or protected species) due to ongoing anthropogenic disturbances (noise, dust and vibrations) and habitat degradation/loss (litter, road mortalities and/or poaching).	Operation	-9,8	-8,3	-9,3
	Loss of water resources	Construction	-9	-6	-6
	Degradation of resources, impaired functionality	Construction	-9	-7,5	-8,4
	Deterioration of resource integrity	Construction	-9	-7,5	-8,4
	Degradation of resources, impaired functionality	Operation	-6,8	-5,3	-5,3
	Deterioration of resource integrity	Operation	-6	-5,3	-5,3
	Loss of land capability	Construction	-11	-8,3	-8,3
	Deterioration of land capability	Construction	-8,3	-8,3	-8,3
	Loss of land capability	Operation	-14	-6,8	-7,6
	Deterioration of land capability	Operation	-9	-6,8	-7,6
Heritage & Palaeontology	**Blanco**				
	Destruction of unidentified heritage finds	Construction	-6	-2,5	-3,1
	Impact on Palaeontology	Construction	-2	-1	-1,3
	Destruction of unidentified heritage finds	Construction	-6	-2,5	-3,1
	Impact on possible heritage finds	Construction	-11,3	-6,5	-8,1
	Impact on Palaeontology	Construction	-2	-1	-1,3

Discipline	Impact	Phase	Pre-mitigation ER	Post-mitigation ER	Final Significance
	Destruction of unidentified heritage finds	Construction	-6	-2,5	-3,1
	Impact on Palaeontology	Construction	-2	-1	-1,3
	Destruction of unidentified heritage finds	Construction	-6	-2,5	-3,1
	Impact on Palaeontology	Construction	-2	-1	-1,3
	Destruction of unidentified heritage finds	Construction	-6	-2,5	-3,1
	Impact on Palaeontology	Construction	-2	-1	-1,3
	Destruction of unidentified heritage finds	Construction	-6	-2,5	-3,1
	Impact on possible heritage finds	Construction	-11,3	-6,5	-8,1
	Impact on Palaeontology	Construction	-2	-1	-1,3
	Outeniqua				
	Destruction of unidentified heritage finds	Construction	-6	-3	-3,4
	Impact on possible heritage finds	Construction	-6	-3	-3,4
	Impact on Palaeontology	Construction	-10,5	-3	-3,4
	Impact on Cultural Landscape	Construction	-6,8	-4,5	-5,6
	Destruction of unidentified heritage finds	Construction	-6	-3	-3,4
	Impact on possible heritage finds	Construction	-6	-3	-3,4
	Impact on Palaeontology	Construction	-10,5	-3	-3,4
	Impact on Cultural Landscape	Construction	-12	-11	-13,8
	Destruction of unidentified heritage finds	Construction	-6	-3	-3,4
	Impact on possible heritage finds	Construction	-6	-3	-3,4
	Impact on Palaeontology	Construction	-10,5	-3	-3,4
	Impact on Cultural Landscape	Construction	-6,8	-9	-11,3
	Destruction of unidentified heritage finds	Construction	-6	-3	-3,4
	Impact on possible heritage finds	Construction	-6	-3	-3,4
	Impact on Palaeontology	Construction	-10,5	-3	-3,4
	Impact on Cultural Landscape	Construction	-12	-11	-13,8
	Destruction of unidentified heritage finds	Construction	-6	-3	-3,4
	Impact on possible heritage finds	Construction	-6	-3	-3,4
	Impact on Palaeontology	Construction	-10,5	-3	-3,4
	Impact on Cultural Landscape	Construction	-12	-11	-13,8
Socio-Economy	**Blanco**				
	Economic distortions	Planning	-3,5	-3,5	-3,5
	Delayed Investment spending	Planning	-6	-5,3	-5,3
	Resettlement	Construction	-3,3	-3,3	-3,3
	Employment	Construction	6	8	8
	Population influx	Construction	-8,3	-8,3	-8,3
	Community health	Construction	-7,5	-6,8	-6,8
	Nuisance factors	Construction	-6,8	-6	-6
	Employment	Operation	7,5	10	10
	Impact on agriculture	Operation	-8,3	-8,3	-8,3
	Impact on tourism	Operation	-10,5	-10,5	-10,5
	Health and safety impacts	Operation	-5,5	-5	-5
	Sense of place and property values	Operation	-8,3	-8,3	-8,3
	Stable electricity	Operation	14	14	14
	Spatial policy alignment	Operation	9	9	9
	Disruption of power supply	Decommissioning	-15	-15	-15
	Nuisance factors	Decommissioning	-6,8	-6	-6
	Economic distortions	Planning	-3,5	-3,5	-3,5
	Delayed Investment spending	Planning	-6	-5,3	-5,3
	Resettlement	Construction	-14	-13	-13
	Employment	Construction	6	8	8

Discipline	Impact	Phase	Pre-mitigation ER	Post-mitigation ER	Final Significance
	Population influx	Construction	-8,3	-8,3	-8,3
	Community health	Construction	-7,5	-6,8	-6,8
	Nuisance factors	Construction	-6	-6	-6
	Employment	Operation	7,5	10	10
	Impact on agriculture	Operation	-8,3	-8,3	-8,3
	Impact on tourism	Operation	-9,8	-9,8	-9,8
	Health and safety impacts	Operation	-5,5	-5	-5
	Sense of place and property values	Operation	-7,5	-7,5	-7,5
	Stable electricity	Operation	14	14	14
	Spatial policy alignment	Operation	9	9	9
	Disruption of power supply	Decommissioning	-15	-15	-15
	Nuisance factors	Decommissioning	-6	-5,3	-5,3
	Economic distortions	Planning	-3,5	-3,5	-3,5
	Delayed Investment spending	Planning	-6	-5,3	-5,3
	Resettlement	Construction	-3,3	-3,3	-3,3
	Employment	Construction	6	8	8
	Population influx	Construction	-8,3	-8,3	-8,3
	Community health	Construction	-6,8	-6,8	-6,8
	Nuisance factors	Construction	-6,8	-6,8	-6,8
	Employment	Operation	7,5	10	10
	Impact on agriculture	Operation	-8,3	-8,3	-8,3
	Impact on tourism	Operation	-9	-9	-9
	Health and safety impacts	Operation	-5,5	-5	-5
	Sense of place and property values	Operation	-9	-9	-9
	Stable electricity	Operation	14	14	14
	Spatial policy alignment	Operation	8,3	8,3	8,3
	Disruption of power supply	Decommissioning	-15	-15	-15
	Nuisance factors	Decommissioning	-6,8	-6	-6
	Economic distortions	Planning	-3,5	-3,5	-3,5
	Delayed Investment spending	Planning	-6	-5,3	-5,3
	Resettlement	Construction	-3,3	-3,3	-3,3
	Employment	Construction	6	8	8
	Population influx	Construction	-8,3	-8,3	-8,3
	Community health	Construction	-6,8	-6,8	-6,8
	Nuisance factors	Construction	-6,8	-6,8	-6,8
	Employment	Operation	7,5	10	10
	Impact on agriculture	Operation	-8,3	-8,3	-8,3
	Impact on tourism	Operation	-9	-9	-9
	Health and safety impacts	Operation	-5,5	-5	-5
	Sense of place and property values	Operation	-9	-9	-9
	Stable electricity	Operation	14	14	14
	Spatial policy alignment	Operation	8,3	8,3	8,3
	Disruption of power supply	Decommissioning	-15	-15	-15
	Nuisance factors	Decommissioning	-6	-6	-6
	Economic distortions	Planning	-6,8	-6	-6
	Delayed Investment spending	Planning	-6	-5,3	-5,3
	Resettlement	Construction	-3,3	-3,3	-3,3
	Employment	Construction	6	8	8
	Population influx	Construction	-8,3	-8,3	-8,3
	Community health	Construction	-6,8	-6,8	-6,8
	Nuisance factors	Construction	-7,5	-7,5	-7,5
	Employment	Operation	7,5	10	10
	Impact on agriculture	Operation	-8,3	-8,25	-8,25
	Impact on tourism	Operation	-9,8	-9,8	-9,8
	Health and safety impacts	Operation	-5,5	-5	-5
	Sense of place and property values	Operation	-9	-9	-9
	Stable electricity	Operation	14	14	14
	Spatial policy alignment	Operation	8,3	8,3	8,3
	Disruption of power supply	Decommissioning	-15	-15	-15
	Nuisance factors	Decommissioning	-7,5	-6,8	-6,8
	Outeniqua				
	Economic costs	Planning	-8,3	-8,3	-8,3
	Employment	Construction	7	7	7

Discipline	Impact	Phase	Pre-mitigation ER	Post-mitigation ER	Final Significance
	Population influx	Construction	-7,5	-7,5	-7,5
	Nuisance factors	Construction	-5,3	-5,3	-5,3
	Employment	Operation	10	10	10
	Impact on agriculture	Operation	-8,3	-8,3	-8,3
	Sense of place and property values	Operation	-8,3	-8,3	-8,3
	Stable electricity supply	Operation	12	12	12
	Disruptions in power supply	Decommissioning	-15	-15	-15
	Nuisance factors	Decommissioning	-5,3	-5,3	-5,3
	Economic costs	Planning	-8,3	-8,3	-8,3
	Employment	Construction	7	7	7
	Population influx	Construction	-8,3	-8,3	-8,3
	Nuisance factors	Construction	-6	-6	-6
	Employment	Operation	10	10	10
	Impact on agriculture	Operation	-9	-9	-9
	Sense of place and property values	Operation	-9	-9	-9
	Stable electricity supply	Operation	12	12	12
	Disruptions in power supply	Decommissioning	-15	-15	-15
	Nuisance factors	Decommissioning	-6	-6	-6
	Economic costs	Planning	-8,3	-8,3	-8,3
	Employment	Construction	7	7	7
	Population influx	Construction	-7,5	-7,5	-7,5
	Nuisance factors	Construction	-6	-6	-6
	Employment	Operation	10	10	10
	Impact on agriculture	Operation	-9	-9	-9
	Sense of place and property values	Operation	-8,3	-8,3	-8,3
	Stable electricity supply	Operation	12	12	12
	Disruptions in power supply	Decommissioning	-15	-15	-15
	Nuisance factors	Decommissioning	-6	-6	-6
	Economic costs	Planning	-8,3	-8,3	-8,3
	Employment	Construction	7	7	7
	Population influx	Construction	-9	-9	-9
	Nuisance factors	Construction	-6	-6	-6
	Employment	Operation	10	10	10
	Impact on agriculture	Operation	-9	-9	-9
	Sense of place and property values	Operation	-8,3	-8,3	-8,3
	Stable electricity supply	Operation	12	12	12
	Disruptions in power supply	Decommissioning	-15	-15	-15
	Nuisance factors	Decommissioning	-6	-6	-6
	Economic costs	Planning	-8,3	-8,3	-8,3
	Employment	Construction	7	7	7
	Population influx	Construction	-8,3	-8,3	-8,3
	Nuisance factors	Construction	-5,3	-5,3	-5,3
	Employment	Operation	10	10	10
	Impact on agriculture	Operation	-8,3	-8,3	-8,3
	Sense of place and property values	Operation	-8,3	-8,3	-8,3
	Stable electricity supply	Operation	12	12	12
	Disruptions in power supply	Decommissioning	-15	-15	-15
	Nuisance factors	Decommissioning	-5,3	-5,3	-5,3
Traffic	**Blanco/Outeniqua**				
	Deterioration of road network condition	Construction	-11	-6,8	-6,8
	Increase in dust along unsurfaced gravel access roads	Construction	-6,8	-4	-4
	Increase in peak hour traffic volumes	Construction	-9	-6	-6
	Impact of abnormal loads	Construction	-12	-7,5	-7,5
	Deterioration of road network condition	Operation	-5,5	-4	-4
	Increase in dust along unsurfaced gravel access roads	Operation	-4,5	-4	-4
	Increase in peak hour traffic volumes	Operation	-4,5	-4	-4

Discipline	Impact	Phase	Pre-mitigation ER	Post-mitigation ER	Final Significance
	Impact of abnormal loads	Operation	-5,5	-4	-4
	Deterioration of road network condition	Construction	-11	-6,8	-6,8
	Increase in dust along unsurfaced gravel access roads	Construction	-6	-3,5	-3,5
	Increase in peak hour traffic volumes	Construction	-9	-6	-6
	Impact of abnormal loads	Construction	-12	-7,5	-7,5
	Deterioration of road network condition	Operation	-5,5	-4	-4
	Increase in dust along unsurfaced gravel access roads	Operation	-4	-3,5	-3,5
	Increase in peak hour traffic volumes	Operation	-4,5	-4	-4
	Impact of abnormal loads	Operation	-5,5	-4	-4
	Deterioration of road network condition	Construction	-11	-6,8	-6,8
	Increase in dust along unsurfaced gravel access roads	Construction	-6	-3,5	-3,5
	Increase in peak hour traffic volumes	Construction	-9	-6	-6
	Impact of abnormal loads	Construction	-12	-7,5	-7,5
	Deterioration of road network condition	Operation	-5,5	-4	-4
	Increase in dust along unsurfaced gravel access roads	Operation	-4	-3,5	-3,5
	Increase in peak hour traffic volumes	Operation	-4,5	-4	-4
	Impact of abnormal loads	Operation	-5,5	-4	-4
	Deterioration of road network condition	Construction	-11	-6	-6
	Increase in dust along unsurfaced gravel access roads	Construction	-6	-6,8	-6,8
	Increase in peak hour traffic volumes	Construction	-9	-3,5	-3,5
	Impact of abnormal loads	Construction	-13	-4	-4
	Deterioration of road network condition	Operation	-4,5	-7,5	-7,5
	Increase in dust along unsurfaced gravel access roads	Operation	-4	-4,5	-4,5
	Increase in peak hour traffic volumes	Operation	-4,5	-4,5	-4,5
	Impact of abnormal loads	Operation	-4,5	-6	-6
	Deterioration of road network condition	Construction	-11	-6,8	-6,8
	Increase in dust along unsurfaced gravel access roads	Construction	-6,75	-4	-4
	Increase in peak hour traffic volumes	Construction	-9	-6	-6
	Impact of abnormal loads	Construction	-12	-7,5	-7,5
	Deterioration of road network condition	Operation	-5,5	-4	-4
	Increase in dust along unsurfaced gravel access roads	Operation	-4,5	-4	-4
	Increase in peak hour traffic volumes	Operation	-4,5	-4	-4
	Impact of abnormal loads	Operation	-5,5	-4	-4
Visual	Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed infrastructure.	Construction	-21,3	-9,8	-11,0

1.6 PUBLIC PARTICIPATION

The public participation process for this application has been undertaken in accordance with the requirements of the NEMA EIA Regulations, and in line with the principles of Integrated Environmental Management (IEM). IEM implies an open and transparent participatory process, whereby stakeholders and other I&APs are afforded

an opportunity to comment on the project and have their views considered and included as part of project planning.

The PPP commenced on 15 February 2024 with an initial notification and call to register for a minimum period of 30 days. The initial notification was undertaken in English, Afrikaans and isiXhosa and was given in the following manner:

- Registered letters, faxes, emails and sms's: Notification were distributed to all pre-identified I&APs including government organisations, NGOs, relevant municipalities, ward councillors, landowners and other organisations that may be interested or affected.
- Advertisements describing the proposed project and EIA process were published in the George Herald and Oudtshoorn Courant Newspapers with circulation in the vicinity of the study areas. The initial advertisements were placed in both newspapers in English, Afrikaans and isiXhosa on 15 February 2024 with a government gazette published (also in 3 languages) on 16 February 2024.
- A1 Correx site notices in English, Afrikaans and IsiXhosa were placed at 30 locations within and around the application areas from 15 February 2024 to 16 February 2024.
- A3 posters in English, Afrikaans and IsiXhosa were placed at local public gathering places in George (George Public Library, Blanco Library, George Police Station, and George Post Office).

Notification regarding the availability of this Scoping Report for public review was given in the following manner to all registered I&APs:

- Registered letters with details on where the scoping report can be obtained and/or reviewed, public meeting date and time, EIMS contact details as well as the public review comment period;
- Facsimile notifications with information similar to that in the registered letter described above; and/or
- Email notifications with a letter attachment containing the information described above.

The scoping report will be available in hard copy at the George public library and on the EIMS website (www.eims.co.za/public-participation) for public review from the 8th of March 2024 to the 9th of April 2024 for a period of at least 30 days.

2 INTRODUCTION

Eskom Holdings SOC Ltd. (Eskom) holds a prominent role as the primary electricity producer in South Africa. Eskom is structured as a vertically integrated entity with licensing authority for electricity generation, transmission, and distribution throughout South Africa. The National Transmission Company (NTC) a wholly owned subsidiary of Eskom, known as Eskom Transmission, operates and maintains the transmission network. Additionally, the company manages the transmission network, distributing electricity at high voltages to various vital customers and distributors. The strategic planning for the expansion of the transmission network falls under the jurisdiction of the Grid Planning and Development Department within the Transmission Group.

Eskom through their Transmission Grid Planning and Development division have identified transformation constraints at Proteus Main Transmission Substation (MTS) as well as the sub-transmission constraints experienced on the network supplying the Blanco area located near George in the Western Cape Province. To resolve the network constraints, strengthening options were considered of which the establishment of a new 400/132kV MTS known as Narina substation with associated loop-in loop-out (LILO) powerlines to link the proposed Narina MTS to the existing Eskom Transmission (Tx) and Distribution (Dx) grids was recommended.

Environmental Impact Management Services (Pty) Ltd. (EIMS) has been appointed by Eskom to provide the Environmental Assessment Practitioner (EAP) services to assist with undertaking the necessary application processes (including the statutory public participation) and to compile and submit the required documentation in support of an application for Environmental Authorisation (EA) in accordance with the National Environmental Management Act (NEMA)- Listed activity:

- GNR 983: Activity 11, 12, 14, 19, 24, 27, 28 and 56.
- GNR 984: Activity 9 and 15.
- GNR 945: Activity 4, 12, 14, 15 and 18.

The proposed study area for the Eskom Blanco Network Strengthening: Narina Substation (hereafter referred to as the Narina substation project) is located approximately 8km northwest of George in the Western Cape Province. The centre point of the proposed study area is approximately 33°57'34.82"S and 22°20'12.12"E. An additional study area is also being assessed in the Outeniqua area. This study area is located approximately 26km northwest of George and its centre point is approximately 33°45'53.30"S and 22°21'21.94"E (See Figure 1).

A full Scoping and Environmental Impact Assessment (S&EIR) process is being undertaken for this project based on triggered listed activities within the Environmental Impact Assessment (EIA) Regulations of 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended) (NEMA). The proposed project does not fall within any of the gazetted strategic transmission corridors and therefore not subject to reduced Basic Assessment or Standard Registration processes.

The Blanco area is supplied from Proteus 400/132kV substation which forms part of the Southern Cape Customer Load Network (CLN) situated in the Western Grid. Proteus substation is supplied from the Northeast generation from Hydra MTS via Droerivier MTS. The required area size for substation location is 600m x 600m to account for current and future needs/plans. The length of the Tx and Dx powerlines associated with the Narina substation will be determined by the approved substation location.

2.1 REPORT STRUCTURE

This report has been compiled in accordance with the 2014 NEMA EIA Regulations, as amended. A summary of the report structure, and the specific sections that correspond to the applicable regulations, is provided in Table 1 below.

Table 1: Report structure

Environmental Regulation	Description – NEMA Regulation 982 (2014) as amended	Section in Report
Appendix 2(1)(a):	Details of – i. The Environmental Assessment Practitioner (EAP) who prepared the report; and ii. The expertise of the EAP, including a curriculum vitae;	Section 2.2 Appendix 1
Appendix 2(1)(b):	The location of the activity. Including – i. The 21-digit Surveyor General code of each cadastral land parcel; ii. Where available, the physical address and farm name; iii. Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Section 3 Table 4
Appendix 2(1)(c):	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is – i. A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or ii. On a land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Figure 1 Figure 2 Figure 3
Appendix 2(1)(d):	A description of the scope of the proposed activity, including – i. All listed and specified activities triggered; ii. A description of the activities to be undertaken, including associated structures and infrastructure;	Table 5 Section 4
Appendix 2(1)(e):	A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	Section 6

Environmental Regulation	Description – NEMA Regulation 982 (2014) as amended	Section in Report
Appendix 2(1)(f):	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 7 Section 8
Appendix 2(1)(g):	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including – i. Details of all alternatives considered; ii. Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; iii. A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; iv. The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; v. The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts – a. Can be reversed; b. May cause irreplaceable loss or resources; and c. Can be avoided, managed or mitigated; vi. The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; vii. Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; viii. The possible mitigation measures that could be applied and level of residual risk; ix. The outcome of the site selection matrix; x. If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and xi. A concluding statement indicating the preferred alternatives, including preferred location of the activity;	Section 8 Section 9 Section 10 Section 11 Section 11.1 Section 11.3 Section 11.3 Section 8
Appendix 2(1)(h):	A plan of study for undertaking the environmental impact assessment process to be undertaken, including –	Section 13

Environmental Regulation	Description – NEMA Regulation 982 (2014) as amended	Section in Report
	i. A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity; ii. A description of the aspects to be assessed as part of the environmental impact assessment process; iii. Aspects to be assessed by specialists; iv. A description of the proposed method of assessing the environmental aspects, including a description of the proposed method assessing the environmental aspects to be assessed by specialists; v. A description of the proposed method of assessing duration and significance; vi. An indication of the stages at which the competent authority will be consulted; vii. Particulars of the public participation process that will be conducted during the environmental impact assessment process; and viii. A description of the tasks that will be undertaken as part of the environmental impact assessment process; ix. Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored;	
Appendix 2(2)(i)	An undertaking under oath or affirmation by the EAP in relation to – i. The correctness of the information provided in the report; ii. The inclusion of comments and inputs from stakeholders and interested and affected parties; and iii. Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	Section 15
Appendix 2(2)(j):	An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	Section 16
Appendix 2(2)(k):	Where applicable, any specific information required by the competent authority; and	N/A
Appendix 2(2)(l):	Any other matter required in terms of section 24(4)(a) and (b) of the Act.	N/A

2.2 DETAILS OF THE EAP

EIMS is appointed by Eskom Holdings SOC Ltd. to assist in preparing and submitting the Environmental Authorisation application, Scoping and EIA Reports, and undertaking a Public Participation Process (PPP) in support of the proposed Eskom Blanco Network Strengthening: Narina Substation Project. EIMS is a private and independent environmental management-consulting firm that was founded in 1993. EIMS has in excess of 30 years' experience in conducting EIA's, including EIA's relating to electricity transmission and distribution. Please refer to the EIMS website (www.eims.co.za) for examples of EIA documentation currently available. In terms of Regulation 13 of the EIA Regulations (GNR 982) as amended, an independent EAP, must be appointed by the applicant to manage the application. EIMS and the compiler of this report are compliant with the definition of an EAP as defined in Regulations 1 and 13 of the EIA Regulations, as well as Section 1 of the NEMA. This includes, inter alia, the requirement that EIMS is:

- Objective and independent;
- Has expertise in conducting EIA's;
- Comply with the NEMA, the environmental regulations and all other applicable legislation;
- Considers all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

The contact details of the EIMS EAP who compiled this Report are as follows:

Table 2: EAP Details.

Name	**Sikhumbuzo Mahlangu**
Tel No:	+27 11 789 7170
Fax No:	+27 86 571 9047
E-mail:	narina@eims.co.za
Professional Registrations:	Professional Natural Scientist with the South African Council for Natural Scientific Professions - SACNASP (400429/13). Professional Environmental Assessment Practitioner with Environmental Assessment Practitioners Association of South Africa – EAPASA (2022/4554).

Sikhumbuzo holds a BSc. Master's degree in Zoology (Aquatic Health) from the University of Johannesburg. He is an aquatic and research scientist with over 2 years' experience, and over 13 years' experience as an environmental scientist. He has completed certificate courses in Environmental Management Systems (ISO 14001: 2015) and Environmental Law with the North-West University. He has also completed an advanced course on Tools for Wetland Assessments as well as Aquifer Hydraulics and Groundwater Monitoring. His expertise lies mainly in environmental impact assessments, environmental management, auditing, monitoring, surface and ground water quality assessments, biomonitoring, wetland assessments, reporting and project management.

Sikhumbuzo has played a vital role in providing advice on general environmental management issues on site to construction projects such as Transnet New Multi Product Pipeline (NMPP), Mokolo Crocodile Water Augmentation Project Phase 1 (MCWAP1), Enel Green Power Karusa and Soetwater Wind Farms and Eskom Kusile Power Station Project among others. He has also been involved on numerous projects in the energy, mining and infrastructure development sectors as well as management and preparation of documentation required for Integrated Water Use Licence Applications (IWULA). He has also played a role in assisting and advising various contractors and developers on the practical implementation of Water Use Licences, Environmental Management Plans, conditions of Environmental Authorisations and the South African Environmental Legislation in general.

2.3 SPECIALISTS

As part of this EIA application, a number of specialist studies have been commissioned to investigate key impacts that require further investigation (refer to Table 3).

Table 3: List of specialist studies to inform this EIA application.

Specialist Discipline	Company/Organisation
Avifauna	The Biodiversity Company
Terrestrial Ecology	The Biodiversity Company
Agricultural Potential	The Biodiversity Company
Soils and Land Capability	The Biodiversity Company
Aquatic and Wetlands	The Biodiversity Company
Heritage, Archaeological and Palaeontology	PGS Heritage
Socio-Economic	Southern Economic Development
Visual	LOGIS
Geotechnical	Geo Rock Consulting
Town Planning	KiPD
Traffic	SMEC

The specialist studies involved the gathering of data relevant to identifying and assessing preliminary environmental impacts that may occur as a result of the proposed project. These preliminary impacts were assessed according to pre-defined impact rating methodology (Section 11.1). Preliminary mitigation / management measures to minimise potential negative impacts or enhance potential benefits are put forward in this Scoping Report and finalised during the EIA phase based on public input and specialist final considerations of all available information. Detailed specialist reports will be completed and used to inform the EIA level phase of the study.

3 DESCRIPTION OF THE PROPERTY

Details of the application area, the location as well as the properties are included in Table 4 below.

Table 4: Locality details

Application Area (Ha)	The proposed substation application area/footprint will cover an area of ~36 hectares. The length of the proposed loop-in and loop-out lines will be determined by the preferred location alternative in the EIA phase.
Magisterial District	The study areas of the proposed project largely fall within the George Local Municipality with a slight overlap into the Oudtshoorn Local Municipality, in the Garden Route District Municipality, Western Cape Province.
Distance and direction from	Two study areas are proposed, one in the Blanco area and the other in the Outeniqua area. The proposed Blanco study area is ~8km northwest of the town of George in the

nearest towns	Western Cape Province and the geographic coordinates at the approximate centre of the application area are 33°57'34.82"S; 22°20'12.12"E. The proposed Outeniqua study area is ~26km northwest of the town of George in the Western Cape Province and the geographic coordinates at the approximate centre of the application area are ~33°45'53.30"S; 22°21'21.94"E.

Farm Name, Number and Portion as well as 21-digit Surveyor General Code

Farm Name, Number and Portion	21 Digit Surveyor General Code
Diepe Kloof 226 (18)	C02700000000022600018
Diepe Kloof 226 (28)	C02700000000022600028
Diepe Kloof 226 (3)	C02700000000022600003
Diepe Kloof 226 (37)	C02700000000022600037
Diepe Kloof 226 (41)	C02700000000022600041
Farm 27 (2)	C02700000000002700002
Farm 27 (20)	C02700000000002700020
Farm 27 (6)	C02700000000002700006
Farm 309 (2)	C02700000000030900002
Farm 315 (0)	C02700000000031500000
Farm 318 (5)	C02700000000031800005
Farm 318 (6)	C02700000000031800006
Farm 318 (69)	C02700000000031800069
Farm 318 (70)	C02700000000031800070
Farm 323 (0)	C02700000000032300000
Farm 328 (0)	C02700000000032800000
Geelhoutboom 217 (14)	C02700000000021700014
Geelhoutboom 217 (21)	C02700000000021700021
Geelhoutboom 217 (3)	C02700000000021700003
Geelhoutboom 217 (32)	C02700000000021700032
Geelhoutboom 217 (34)	C02700000000021700034
Geelhoutboom 217 (37)	C02700000000021700037
Geelhoutboom 217 (38)	C02700000000021700038
Geelhoutboom 217 (43)	C02700000000021700043
Geelhoutboom 217 (45)	C02700000000021700045
Geelhoutboom 217 (46)	C02700000000021700046
Geelhoutboom 217 (48)	C02700000000021700048
Geelhoutboom 217 (51)	C02700000000021700051
Geelhoutboom 217 (54)	C02700000000021700054
Geelhoutboom 217 (57)	C02700000000021700057
Geelhoutboom 217 (61)	C02700000000021700061
Geelhoutboom 217 (62)	C02700000000021700062
Geelhoutboom 217 (66)	C02700000000021700066
Geelhoutboom 217 (7)	C02700000000021700007
Geelhoutboom 217 (70)	C02700000000021700070
Geelhoutboom 217 (71)	C02700000000021700071
Geelhoutboom 217 (72)	C02700000000021700072
Geelhoutboom 217 (73)	C02700000000021700073

	Geelhoutboom 217 (9)	C02700000000021700009
	Geelhoutboomsberg 342 (0)	C02700000000034200000
	Geelhoutboomsberg 342 (1)	C02700000000034200001
	Geelhoutboomsberg 342 (3)	C02700000000034200003
	Klippedrif 81 (11)	C02700000000008100011
	Klippedrif 81 (12)	C02700000000008100012
	Klippedrif 81 (15)	C02700000000008100015
	Klippedrif 81 (8)	C02700000000008100008
	Klyne Fontyn 218 (15)	C02700000000021800015
	Klyne Fontyn 218 (17)	C02700000000021800017
	Klyne Fontyn 218 (19)	C02700000000021800019
	Klyne Fontyn 218 (28)	C02700000000021800028
	Klyne Fontyn 218 (31)	C02700000000021800031
	Klyne Fontyn 218 (4)	C02700000000021800004
	Klyne Fontyn 218 (40)	C02700000000021800040
	Klyne Fontyn 218 (41)	C02700000000021800041
	Klyne Fontyn 218 (43)	C02700000000021800043
	Klyne Fontyn 218 (44)	C02700000000021800044
	Klyne Fontyn 218 (47)	C02700000000021800047
	Klyne Fontyn 218 (55)	C02700000000021800055
	Kouwdouw 88 (18)	C02700000000008800018
	Kouwdouw 88 (19)	C02700000000008800019
	Kouwdouw 88 (20)	C02700000000008800020
	Kouwdouw 88 (21)	C02700000000008800021
	Kouwdouw 88 (37)	C02700000000008800037
	Kouwdouw 88 (52)	C02700000000008800052
	Kouwdouw 88 (55)	C02700000000008800055
	Kouwdouw 88 (59)	C02700000000008800059
	Kouwdouw 88 (61)	C02700000000008800061
	Kouwdouw 88 (72)	C02700000000008800072
	Palmiet Drift 80 (2)	C02700000000008000002
	Palmiet Drift 80 (6)	C02700000000008000006
	Palmiet Drift 80 (7)	C02700000000008000007
	Platte Kloof 131 (0)	C02700000000013100000
	Waboomskraal Noord 87 (1)	C02700000000008700001
	Waboomskraal Noord 87 (10)	C02700000000008700010
	Waboomskraal Noord 87 (2)	C02700000000008700002
	Waboomskraal Noord 87 (3)	C02700000000008700003
	Waboomskraal Noord 87 (5)	C02700000000008700005
	Waboomskraal Noord 87 (6)	C02700000000008700006
	Waboomskraal Noord 87 (7)	C02700000000008700007
	Waboomskraal Noord 87 (9)	C02700000000008700009

The farms and portions included within the application area are depicted in Figure 3.

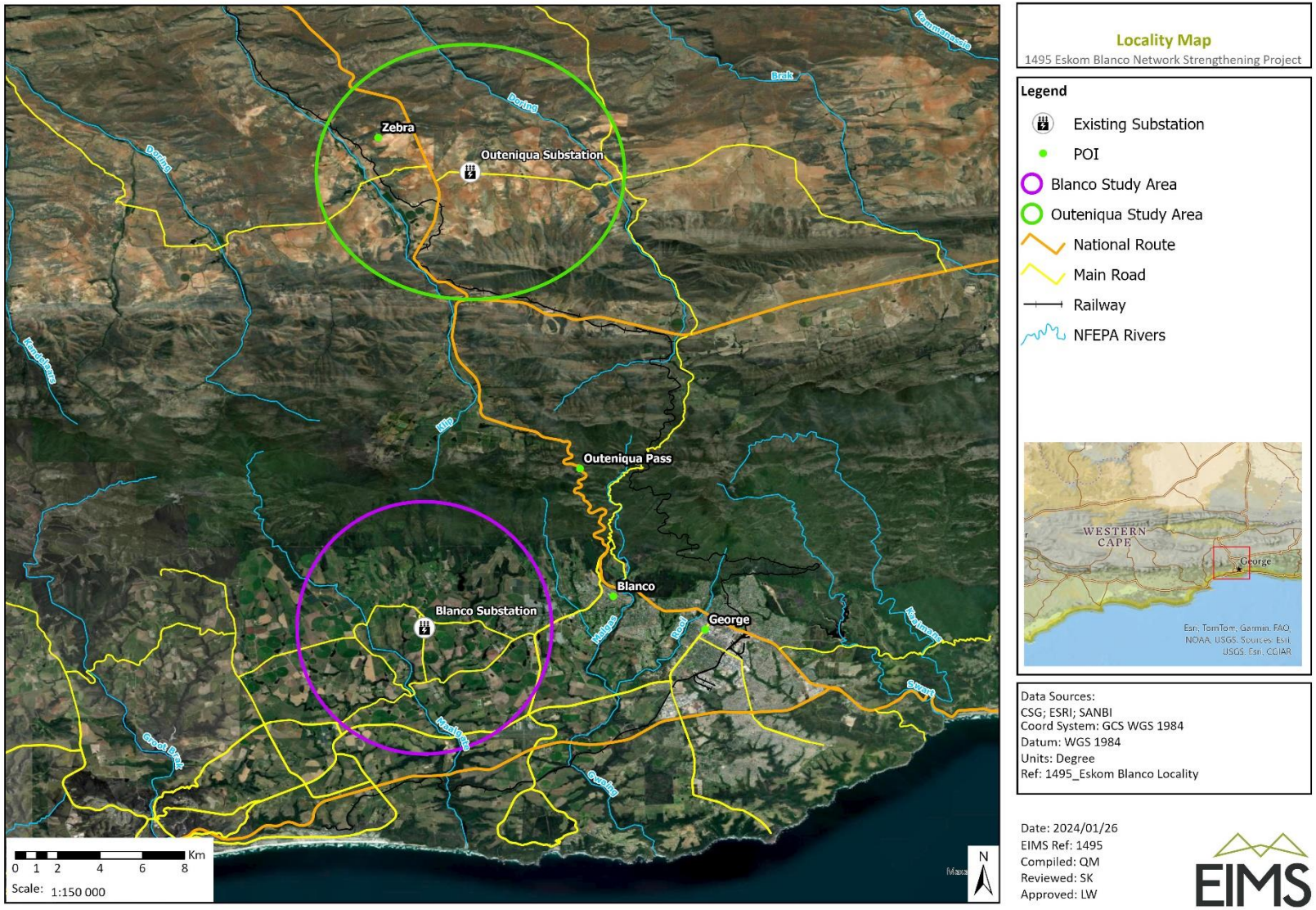

Figure 1: Eskom Narina substation study area.

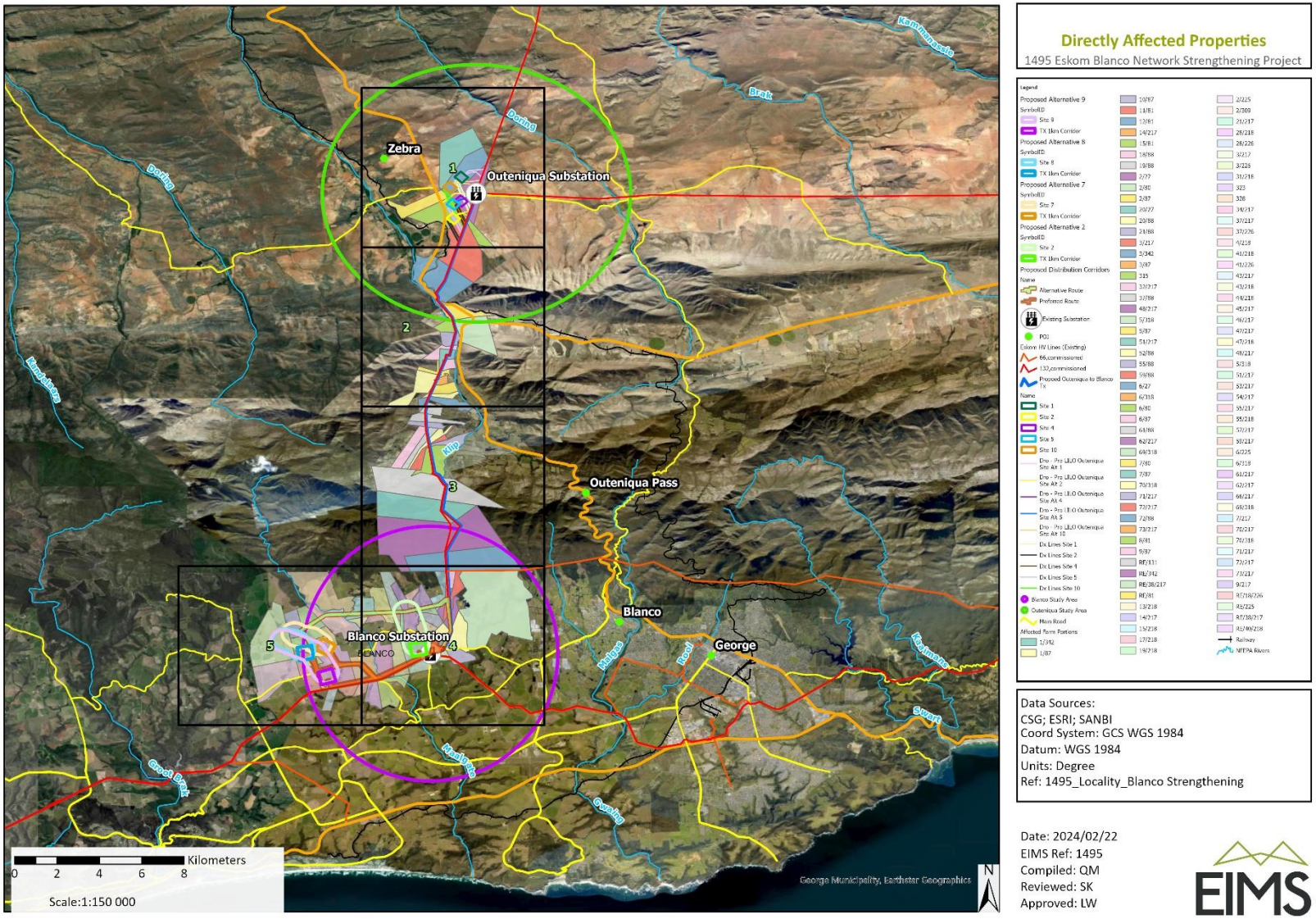

Figure 2: Overview of parent farms and portions included in the application area.

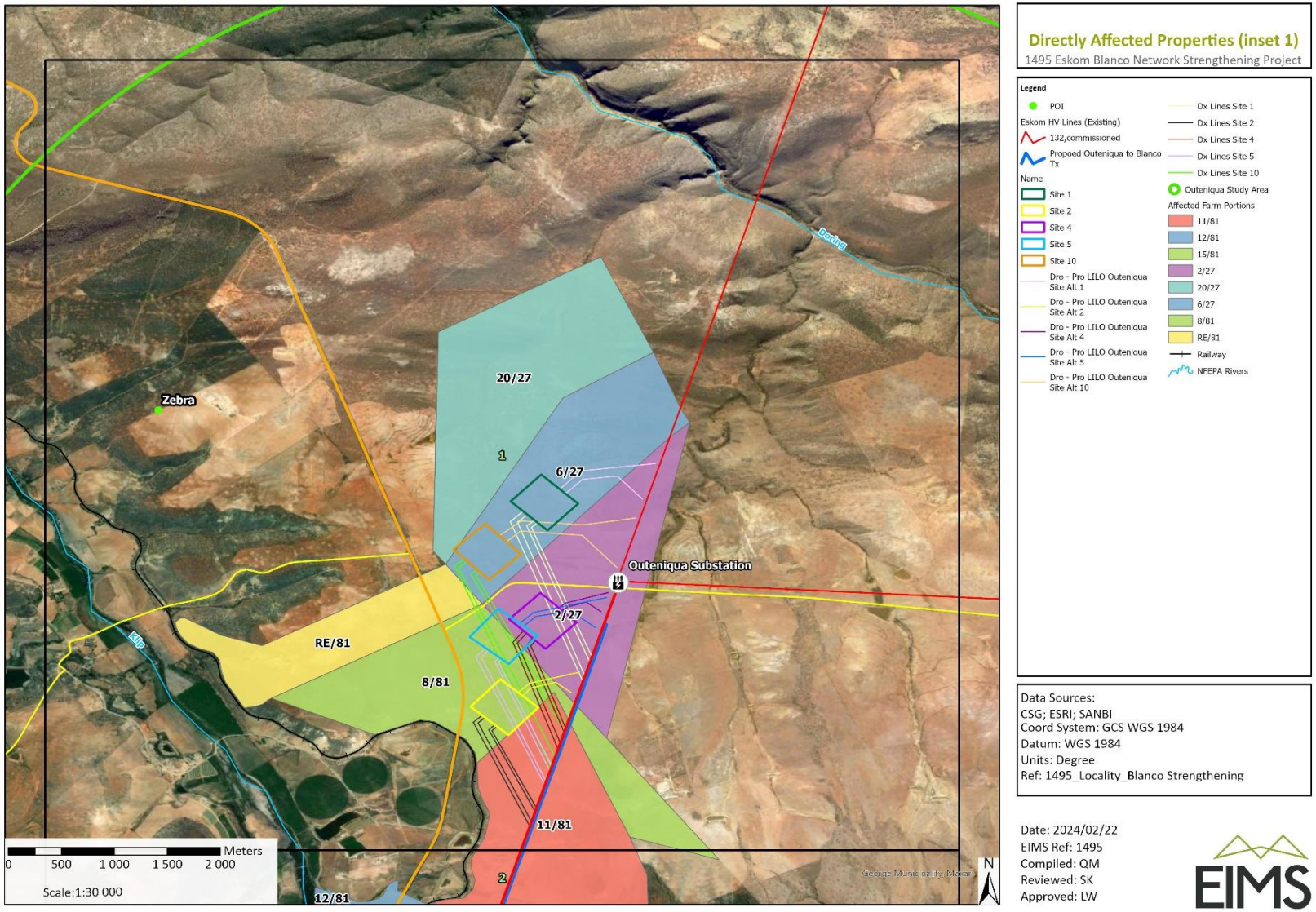

Figure 3: Inset 1 map of parent farms and portions included in the application area.

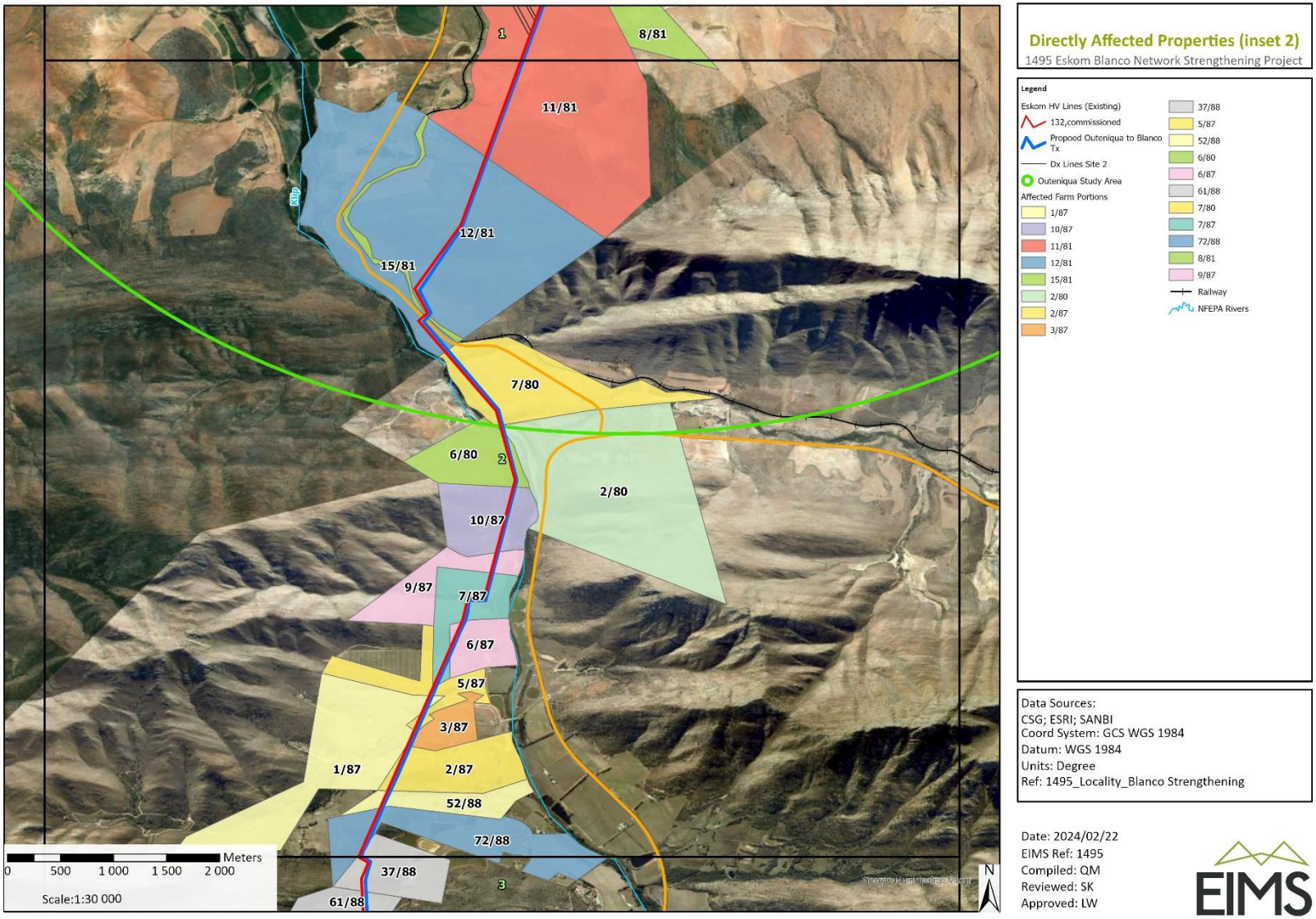

Figure 4: Inset 2 map of parent farms and portions included in the application area.

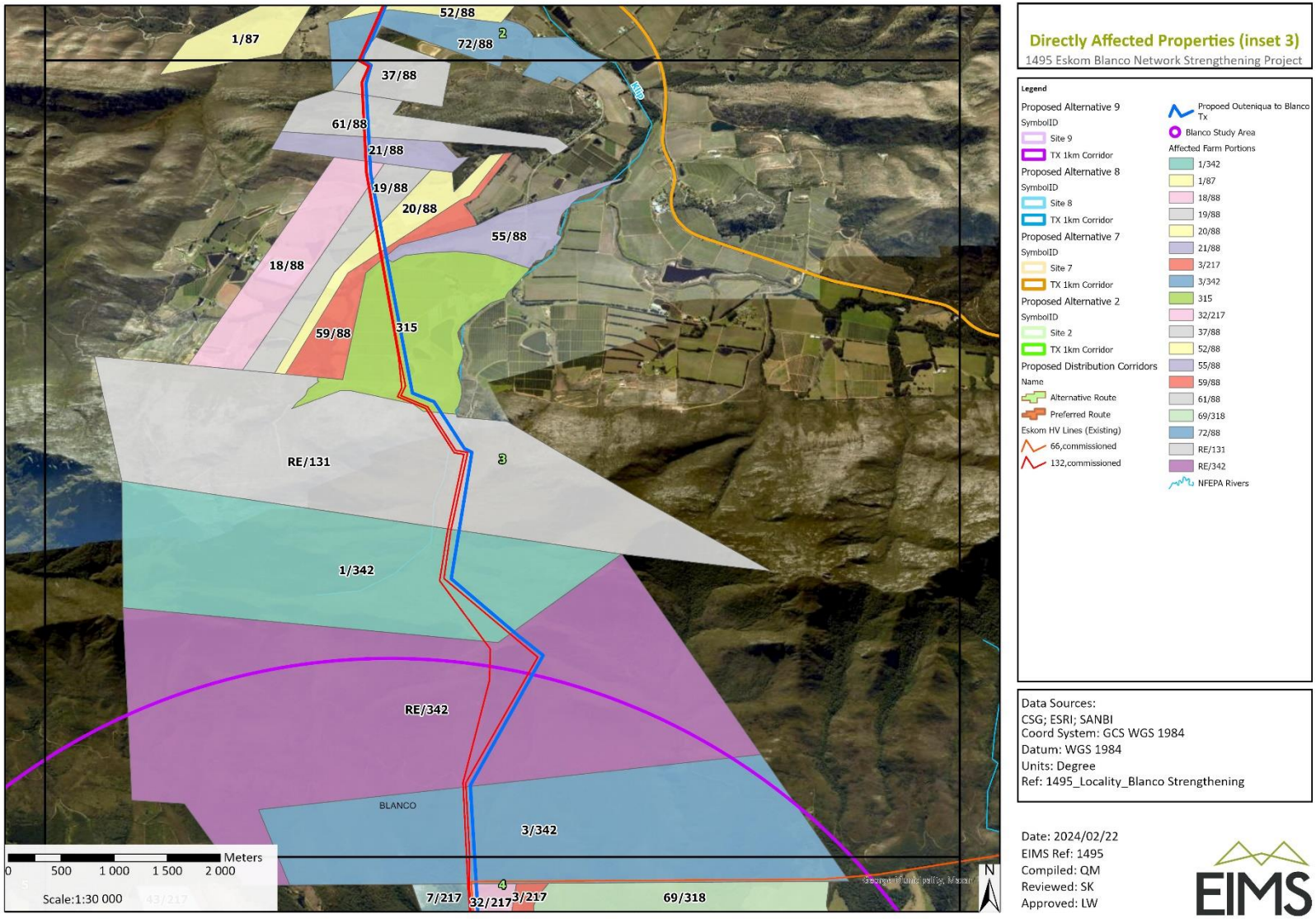

Figure 5: Inset 3 map of parent farms and portions included in the application area.

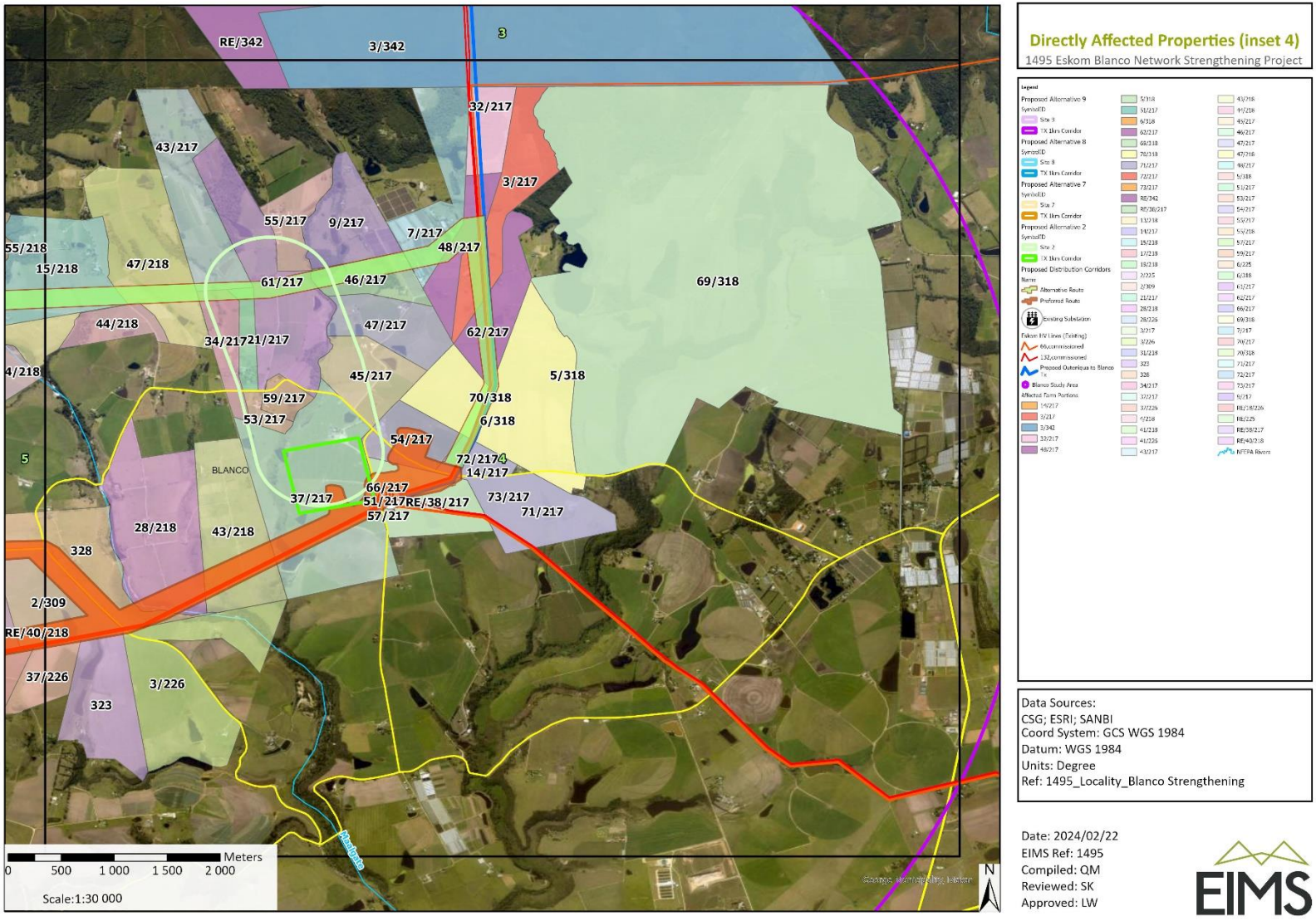

Figure 6: Inset 4 map of parent farms and portions included in the application area.

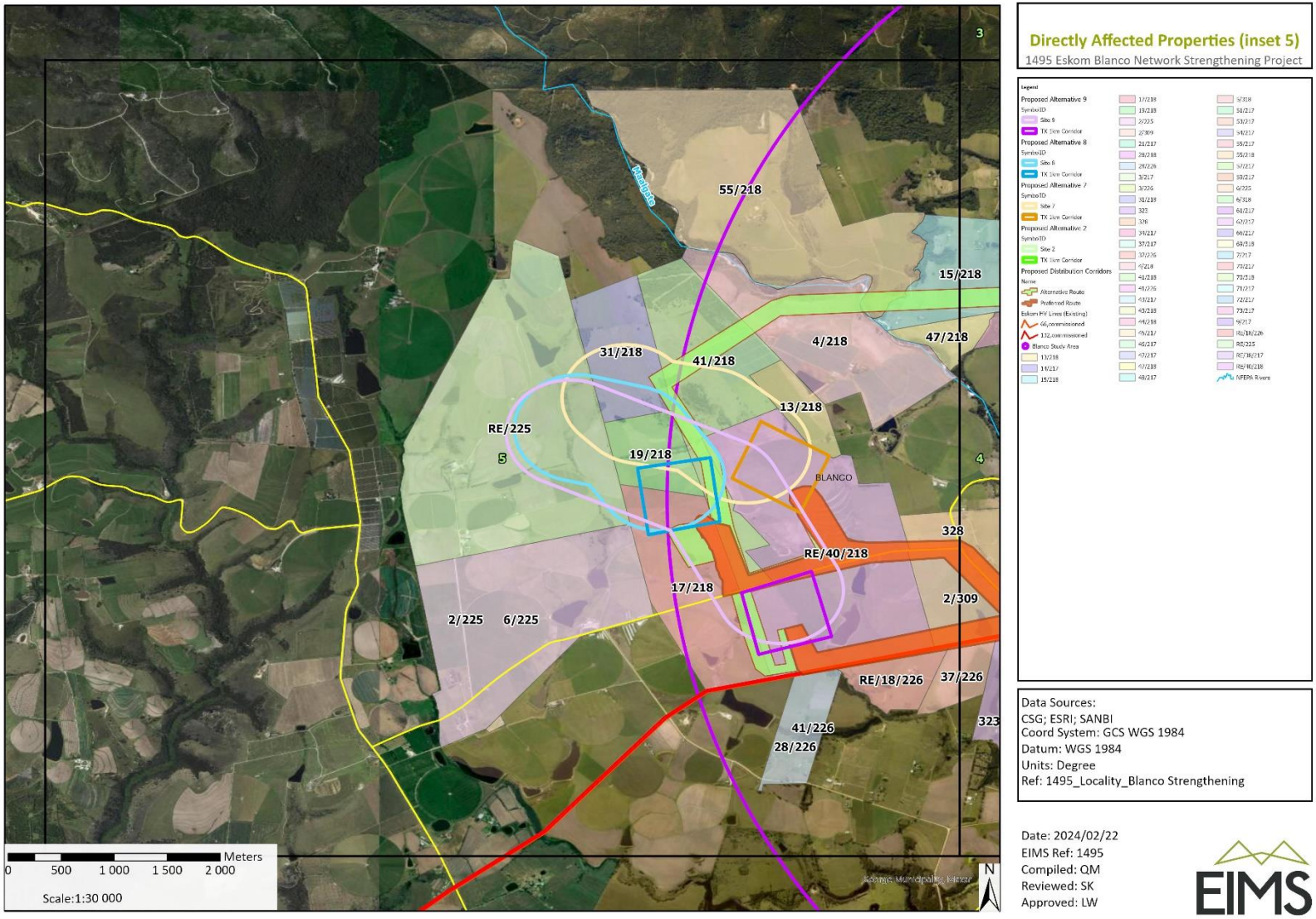

Figure 7: Inset 5 map of parent farms and portions included in the application area.

4 DESCRIPTION AND SCOPE OF THE PROPOSED ACTIVITY

This section contains a description of the project history followed by a detailed description of the proposed Eskom Narina Substation Project with its associated infrastructure. At the end of this section, the applicable listed activities relating to the project are presented.

4.1 BRIEF PROJECT HISTORY

A previous EIA together with its associated specialist investigations was undertaken in 2013 by Strategic Environmental Focus (Pty) Ltd (SEF) for the proposed Eskom Narina Substation Project. The EIA study was finalised in February 2016 and the EA was granted on the 1st of September 2016 by the then National Department of Environmental Affairs (DEA). Figure 8 below depicts alternatives considered during this EIA and ultimately alternative 5 was approved. The validity of the EA was subsequently extended from 3 to 5 years, through an amendment application submitted by Eskom. Both the EA and subsequent amendment were appealed by I&APs on various grounds; however, these were dismissed by the Minister.

Geelhoutboom Estates being one of the appellants to the approved EA launched an application in February of 2018 in the Western Cape High Court for the review and setting aside of the EA that was granted. The respondents (Eskom, the Minister and chief director of environmental affairs) withdrew their opposition to the review. The EA has since lapsed, and Eskom has decided to redo the EA application process for the above-mentioned project.

4.2 PROJECT DESCRIPTION

This section provides a description of the proposed Eskom Narina Substation Project. The aim of the description is to describe the activities that are planned, and where relevant, highlight any additional EA approval requirements. The project description is also aimed at facilitating the readers understanding of the project related activities, their extent (spatial and temporal) and resultant impacts, where relevant.

4.2.1 PROPOSED ESKOM NARINA SUBSTATION PROJECT

Eskom Holdings SOC Ltd., through their Transmission Grid Planning division have identified transformation constraints at Proteus MTS as well as the sub-transmission constraints on the network supplying the Blanco area located in the Western Cape Province. Eskom Transmission Grid Planning investigated various possible solutions to address these constraints. To resolve the network constraints, network strengthening options were considered including but not limited to:

- Option 1: Increase transformation capacity at Droerivier MTS and build a new 135 km Droerivier-Diesseldorp double circuit 132 kV line.
- Option 2: Increase transformation capacity at Proteus MTS and reinforce the Proteus-Blanco sub-transmission network.
- Option 3 (Recommended): Establish a new 2 x 500MVA, 400/132 kV MTS in the Blanco Area.

The establishment and operation of a new 400/132kV Narina MTS with associated LILO powerlines close to the load centre (i.e. central distribution point) located within the Blanco area was ultimately found to be the best technical solution. The required area size for substation location is 600m x 600m to account for current and future needs/plans. The length of the turn-in lines (loop-in loop-out on the Droerivier Proteus 400kV line and the Proteus Blanco 132kV line) will be determined by the approved substation location.

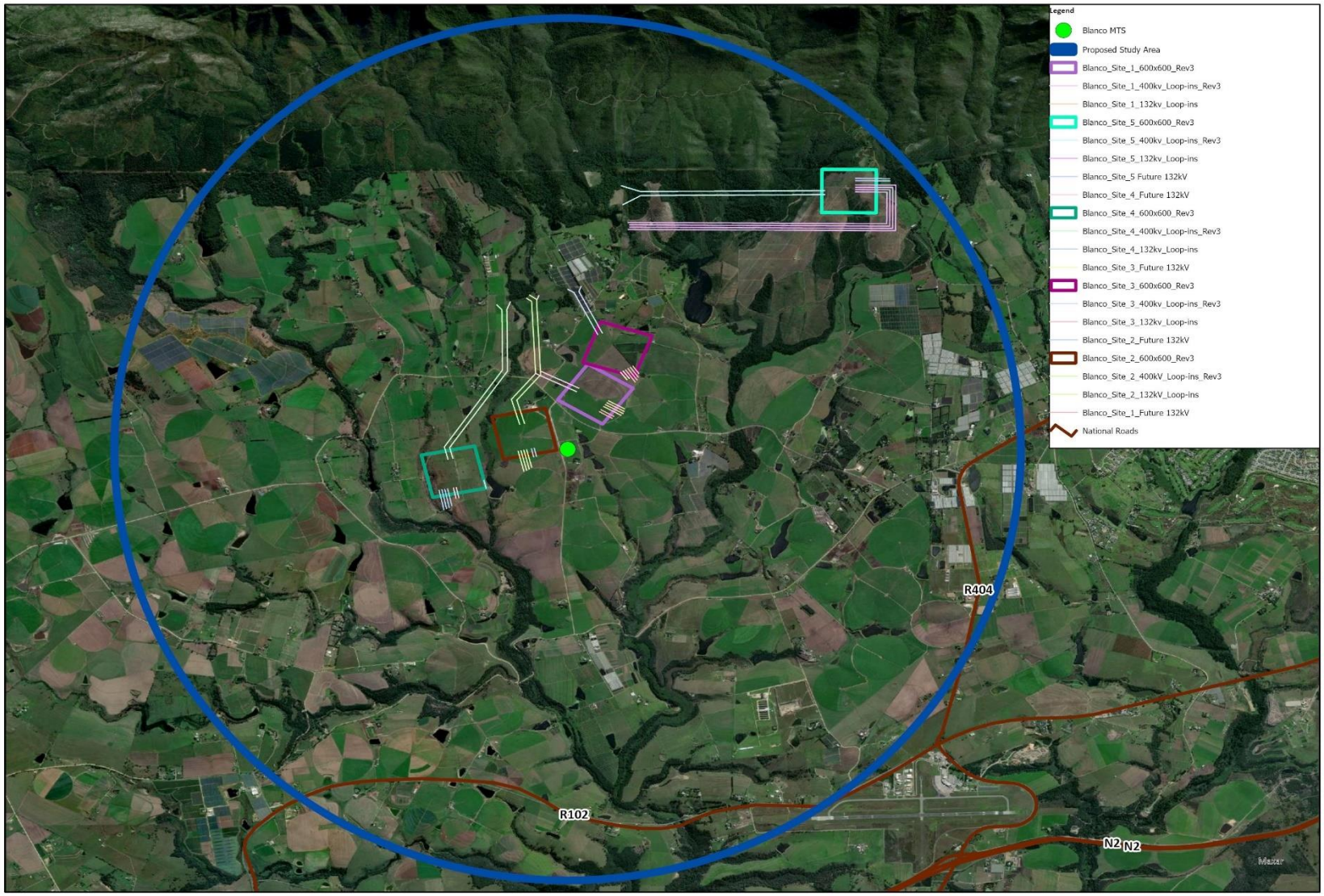

Figure 8: Alternatives considered in the previous study.

4.2.2 SUBSTATION

An electrical substation can be defined as a facility where voltage is transformed (commonly referred to as stepped up or down), from high to low voltages (or the reverse) using transformers. The proposed Narina substation is specifically designed to step-down the voltage from 400kV to 132kV. Substations are located throughout the whole electrical grid, from the power stations all the way to the distribution grid. The substations near the power stations contain the transformers that step-up the electricity in order to reduce energy loss during its transmission over long distances, the substations before sub-transmission lines step-down the electricity to lower voltages, and Dx substations connect the sub-transmission lines to distribution lines.

The transmission system's primary role is to transport electricity in bulk from wherever it is generated to load centres throughout South Africa and the region. From these load centres, the distribution networks owned by Eskom, the metros, and municipalities deliver electricity to individual end users. The system has to be expanded and reinforced to connect new loads and more sources of generation to the grid, as well as to meet the growing needs of customers (TDP, 2020-2029). The proposed substation will be a transmission substation and will comprise of standard electrical equipment such as transformers, reactors, busbars, isolators, etc.

4.2.3 TRANSMISSION LINES

Transmission lines are the physical structures that conduct high voltage electricity (i.e., bulk transfer of electrical energy). Transmission lines are distinct from the local distribution of electricity to customers (referred to as distribution). The network of transmission lines throughout South Africa provides for the bulk transport of power from source areas (i.e., power stations) to the demand areas over large distances. The proposed study areas have existing high voltage (400kV) transmission lines located northward and eastward of the proposed substation location alternatives in the Blanco and Outeniqua study areas, respectively. It is proposed that the Narina substation will be connected to the existing high voltage transmission powerline through a loop in-loop out powerline connection to the existing 400kV transmission line. The type of tower structure likely to be utilised for the 400kV Loop-in Loop-out power lines are the 518-tower series utilised on a majority of Eskom transmission lines.

4.2.4 DISTRIBUTION LINES

Distribution of electricity refers to the final stage of the electrical grid which distributes electricity to homes, industry, and other customers. The power level is reduced by step-down transformers, which lower the voltage of the electricity from dangerous levels (over 1 kV) to safer levels (100 - 400 V). The entire distribution grid includes lines, poles, transformers, and switching and protection circuits that deliver safe electrical power. The proposed Narina substation will also need to be connected to the distribution network in the area. This will be done through 132kV powerlines (likely double circuit monopole structures) between the existing Blanco Dx substation and the proposed Narina Tx substation. There is an existing 132kV powerline corridor located south and east of the proposed substation location alternatives within the Blanco and Outeniqua study areas, respectively. It is proposed, depending on the final location of the Narina substation that the new 132kV powerlines follow the existing corridors to the Blanco substation to minimise environmental impacts as far as possible.

5 LISTED AND SPECIFIED ACTIVITIES TRIGGERED

The NEMA and NWA listed activities triggered by the proposed Eskom Narina Substation Project are presented in Table 5 below.

Table 5: Applicable Listed Activities

Activity No	Activity Description	Applicability
NEMA LISTING NOTICE 1		
NEMA GNR 983 Activity 11	The development of facilities or infrastructure for the transmission and distribution of electricity- (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or	The project will include the construction of 2 X 132kV integration power lines, linking the existing

Activity No	Activity Description	Applicability
	(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more; excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is- (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.	Blanco substation to the newly proposed Narina substation.
NEMA GNR 983 Activity 12	The development of- (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or **(ii) infrastructure or structures with a physical footprint of 100 square metres or more;** where such development occurs- (a) within a watercourse; (b) in front of a development setback; or **(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;-** excluding- (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; (ee) where such development occurs within existing roads, road reserves or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.	The required area size for the substation location is 600m x 600m to account for current and future needs/plans. The total physical footprint required for the substation development will be 360 000m^2.
NEMA GNR 983 Activity 14	The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	During construction fuel tanks may be required. Volume to be confirmed in the EIA phase.
NEMA GNR 983 Activity 19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving- (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase	The development of the substation and associated infrastructure may require infilling or excavation of material of more than 10 cubic metres from or in a watercourse. To be determined during the EIA phase once the specialist assessments and final substation location have been concluded.

Activity No	Activity Description	Applicability
	the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.	
NEMA GNR 983 Activity 24	The development of a road- (i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; but excluding a road- (a) which is identified and included in activity 27 in Listing Notice 2 of 2014; (b) where the entire road falls within an urban area; or (c) which is 1 kilometre or shorter.	Access roads for construction and maintenance purposes may be required. To be determined during the EIA phase once the specialist assessments and final substation location have been concluded.
NEMA GNR 983 Activity 27	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- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	The required area size for substation location is 600m x 600m to account for current and future needs/plans. The total physical footprint required for the substation development will be ~36 hectares. There may be a need to clear more than 1 hectare of indigenous vegetation depending on where the substation is located.
NEMA GNR 983 Activity 28	Residential, mixed, retail, commercial, **industrial** or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.	Development of the proposed substation (~36 hectares) may possibly take place on land that is/was used for agriculture.
NEMA GNR 983 Activity 56	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre- (i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 metres; excluding where widening or lengthening occur inside urban areas.	Existing roads will be used as far as possible during construction and operation of the proposed facility. However, there may be a need to expand/widen these existing roads. To be assessed in the EIA phase.
NEMA LISTING NOTICE 2		
NEMA GNR 984 Activity 9	The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex excluding the development of bypass infrastructure for the	The project entails construction of a substation and associated 400kV loop in and loop out

Activity No	Activity Description	Applicability
	transmission and distribution of electricity where such bypass infrastructure is- (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	power lines outside an urban area.
NEMA GNR 984 Activity 15	The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	The required area size for substation location is 600m x 600m to account for current and future needs/plans. The total physical footprint required for the substation development will be ~36 hectares. There may be a need to clear more than 20 hectares of indigenous vegetation depending on where the proposed substation is located.
NEMA LISTING NOTICE 3		
NEMA GNR 985 Activity 4	The development of a road wider than 4 metres with a reserve less than 13,5 metres. i. Western Cape i. Areas zoned for use as public open space or equivalent zoning; ii. Areas outside urban areas; (aa) Areas containing indigenous vegetation; (bb) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined; or iii. Inside urban areas: (aa) Areas zoned for conservation use; or (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority.	Existing roads will be used as far as possible during construction and operation of the proposed facility. However, there may be a need to construct new roads that are wider than 4 metres.
NEMA GNR 985 Activity 12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. i. Western Cape i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within critical biodiversity areas identified in bioregional plans; iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; or	The required area size for substation location is 600m x 600m to account for current and future needs/plans. The total physical footprint required for the substation development will be ~36 hectares. There may be a need to clear more than 300 m^2 of indigenous vegetation depending on where the substation is located.

Activity No	Activity Description	Applicability
	v. On land designated for protection or conservation purposes in an Environmental Management Framework adopted in the prescribed manner, or a Spatial Development Framework adopted by the MEC or Minister.	
NEMA GNR 985 Activity 14	The development of- (i) dams or weirs, where the dam or weir, including Infrastructure and water surface area exceeds 10 square metres; or (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs- (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. i. Western Cape i. Outside urban areas: (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) World Heritage Sites; (dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (ee) Sites or areas listed in terms of an international convention; (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (gg) Core areas in biosphere reserves; or (hh) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined.	The required area size for substation location is 600m x 600m to account for current and future needs/plans. The total physical footprint required for the substation development will be ~36 hectares. There may be a need to construct within a watercourse or within 32 metres of a watercourse.
NEMA GNR 985 Activity 15	The transformation of land bigger than 1000 square metres in size, to residential, retail, commercial, industrial or institutional use, where, such land was zoned open space, conservation or had an equivalent zoning, on or after 02 August 2010. f. Western Cape i. Outside urban areas, or ii. Inside urban areas: (aa) Areas zoned for conservation use or equivalent zoning, on or after 02 August 2010; (bb) A protected area identified in terms of NEMPAA, excluding conservancies; or (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act as adopted by the competent authority.	The required area size for substation location is 600m x 600m to account for current and future needs/plans. The total physical footprint required for the substation development will be ~36 hectares. There may be a need to construct within land that was zoned open space, conservation or had an equivalent zoning. To be determined during the EIA phase.
NEMA GNR 985 Activity 18	The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre. i. Western Cape i. Areas zoned for use as public open space or equivalent zoning; ii. All areas outside urban areas:	Existing roads will be used as far as possible during construction and operation of the proposed facility. However, there

Activity No	Activity Description	Applicability
	(aa) Areas containing indigenous vegetation; (bb) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined; or iii. Inside urban areas: (aa) Areas zoned for conservation use; or (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority.	may be a need to expand/widen these existing roads.
NWA Section 21 Activities		
NWA Section 21 (c&i)	Impeding or diverting the flow of water in a watercourse and/or altering the bed, banks, course or characteristics of a watercourse.	Powerlines and associated infrastructure (due to their linear nature) may be constructed within the regulated area of a watercourse.

6 POLICY AND LEGISLATIVE CONTEXT

This section provides an overview of the governing legislation identified which may relate to the proposed project. The primary legal requirement for this project stems from the need for an EA to be granted by the competent authority, which is the DFFE, in accordance with the requirements of the NEMA. In addition, there are numerous other pieces of legislation governed by many acts, regulations, standards, guidelines and treaties on an international, national, provincial and local level, which should be considered in order to assess the potential applicability of these for the proposed activity. The key legislation applicable to this project is discussed in the subsections below.

6.1 CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA

The constitution of any country is the supreme law of that country. The Bill of Rights in chapter 2 section 24 of the Constitution of South Africa Act (Act No. 108 of 1996) makes provisions for environmental issues and declares that: *"Everyone has the right -*

a) to an environment that is not harmful to their health or well-being; and

b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:

***i.** prevent pollution and ecological degradation;*

***ii.** promote conservation; and*

iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development".

The EIA and associated impact mitigation actions are conducted to fulfil the requirement of the Bill of Rights.

6.2 THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA)

The main aim of the National Environmental Management Act, 1998 (Act 107 of 1998 – NEMA) is to provide for co-operative governance by establishing decision-making principles on matters affecting the environment. In terms of the NEMA EIA Regulations, the applicant is required to appoint an EAP to undertake the EIA process, as well as conduct the public participation process towards an application for EA. In South Africa, EIA's became a legal requirement in 1997 with the promulgation of regulations under the Environment Conservation Act (ECA). Subsequently, NEMA was passed in 1998. Section 24(2) of NEMA empowers the Minister and any MEC, with the concurrence of the Minister, to identify activities which must be considered, investigated, assessed and reported on to the competent authority responsible for granting the relevant EA. On 21 April 2006, the Minister of Environmental Affairs and Tourism (now Department of Forestry, Fisheries and the Environment – DFFE) promulgated regulations in terms of Chapter 5 of the NEMA. These regulations, in terms of the NEMA, were

amended a number of times between 2010 and 2022. The NEMA EIA Regulations, 2014, as amended, are applicable to this project.

The objective of the EIA Regulations is to establish the procedures that must be followed in the consideration, investigation, assessment and reporting of the listed activities that are triggered by the proposed project. The purpose of these procedures is to provide the competent authority with adequate information to make informed decisions which ensure that activities which may impact negatively on the environment to an unacceptable degree are not authorised, and that activities which are authorised are undertaken in such a manner that the environmental impacts are managed to acceptable levels.

In accordance with the provisions of Sections 24(5) and Section 44 of the NEMA the Minister has published Regulations (GN R. 982) pertaining to the required process for conducting EIA's in order to apply for, and be considered for, the issuing of an EA. These EIA Regulations provide a detailed description of the EIA process to be followed when applying for EA for any listed activity.

An environmental Scoping and Impact Assessment process is reserved for activities which have the potential to result in significant impacts which are complex to assess. Scoping and Impact Assessment studies accordingly provide a mechanism for the comprehensive assessment of activities that are likely to have more significant environmental impacts. Figure 9 below provides a graphic representation of all the components of a full EIA process. The listed activities the proposed project triggers and consequently requires authorisation prior to commencement are detailed in Section 5 (Table 5).

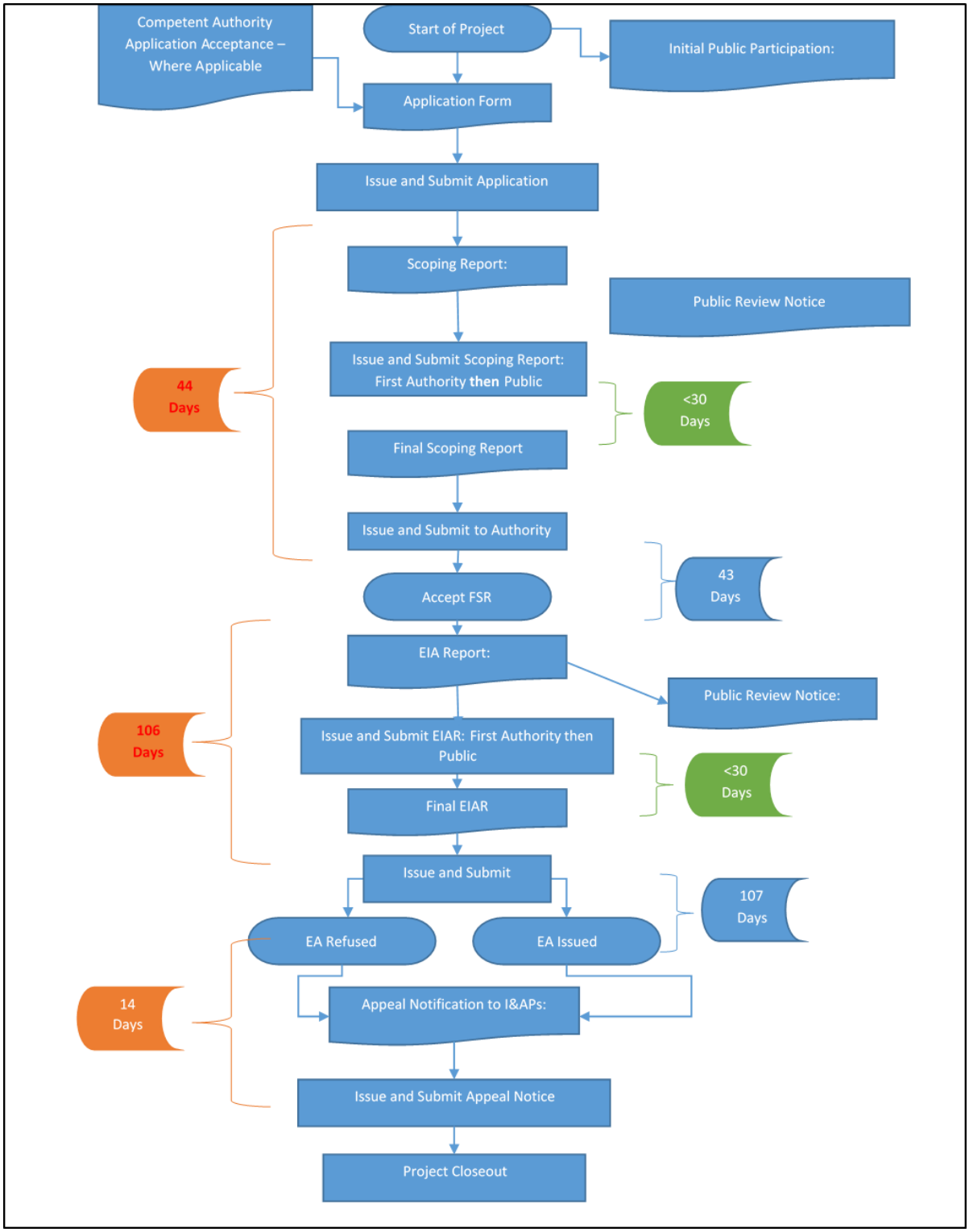

Figure 9: EIA process diagram.

6.3 THE NATIONAL WATER ACT (NWA)

The National Water Act, 1998 (Act 36 of 1998 – NWA) makes provision for two types of applications for water use licences, namely individual applications and compulsory applications. The NWA also provides that the responsible authority may require an assessment by the applicant of the likely effect of the proposed licence on the resource quality, and that such assessment be subject to the NEMA EIA Regulations. A person may use water if the use is –

- Permissible as a continuation of an existing lawful water use (ELWU);
- Permissible in terms of a general authorisation (GA);
- Permissible under Schedule 1; or
- Authorised by a licence.

These water use processes are described in Figure 10.

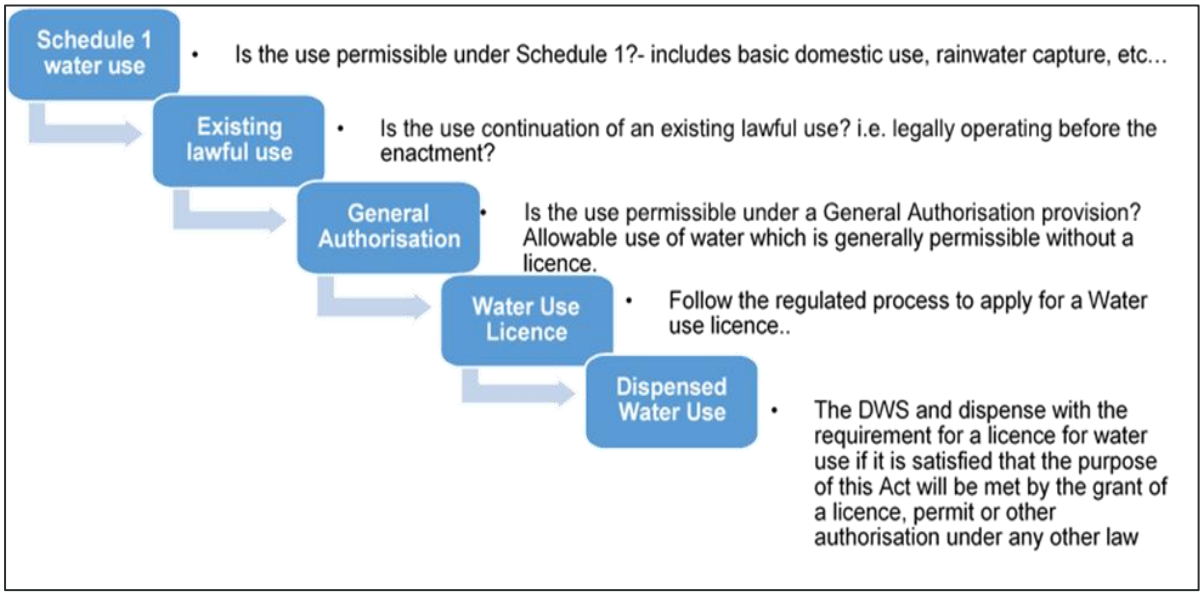

Figure 10: Authorisation processes for new water uses.

The NWA defines 11 water uses in Section 21 of the Act. A water use may only be undertaken if authorised by the Department of Water and Sanitation (DWS). The water uses for which an authorisation or licence can be issued include:

a) Taking water from a water resource;

b) Storing water;

c) Impeding or diverting the flow of water in a watercourse;

d) Engaging in a stream flow reduction activity contemplated in section 36;

e) Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);

f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduits;

g) Disposing of waste in a manner which may detrimentally impact on a water resource;

h) Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;

i) Altering the bed, banks, course or characteristics of a watercourse;

j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and

k) Using water for recreational purposes.

The proposed Eskom Narina Substation Project includes development of a transmission substation and linear infrastructure (Powerlines) which may invariably impact on water resources in certain areas. The main water

use that will be applicable is the Section 21 (c&i) uses for activities within the regulated area of a watercourse. A watercourse is defined in terms of the Act as follows:

a) a river or spring;

b) a natural channel in which water flows regularly or intermittently;

c) a wetland, lake or dam into which, or from which, water flows; and

d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse,

and a reference to a watercourse includes, where relevant, its bed and banks;

The regulated area of a watercourse for section 21(c) or (i) of the Act water uses is similarly defined in terms of the Act as follows:

a) The outer edge of the 1 in 100-year flood line and/or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam;

b) In the absence of a determined 1 in 100-year flood line or riparian area the area within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (subject to compliance to section 144 of the Act); or

c) A 500 m radius from the delineated boundary (extent) of any wetland or pan.

As part of this EIA process, specialist input will be utilised to delineate the watercourses and based on this input, the relevant water uses will be identified and applied for.

6.3.1 CATCHMENT MANAGEMENT STRATEGIES

South Africa is divided into nineteen Water Management Areas (WMAs). The delegation of water resource management from central government to catchment level is achieved by establishing Catchment Management Agencies (CMAs) at WMA level. Each CMA progressively develops a Catchment Management Strategy (CMS) for the protection, use, development, conservation, management and control of water resources within its WMA. This is to ensure that on a regional scale, water is protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner for the benefit of all persons. The main instrument that guides and governs the activities of a WMA is the CMS which, while conforming to relevant legislation and national strategies, provides detailed arrangements for the protection, use, development, conservation, management and control of the region's water resources. According to the DWS water management areas delineations, the proposed Eskom Narina Substation Project is situated in primary catchment (K) and the resource management falls under the Breede-Gouritz Water Management Areas (WMA 8) which spans large portions of the Western Cape Province, and minor overlaps into the Northern and Eastern Cape. The project area is situated within quaternary catchments K30A and K30B, falls within hydrological zone D.

6.4 THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT (NEMWA)

On 2 June 2014, the National Environmental Management: Waste Amendment Act came into force. Waste is accordingly no longer governed by the MPRDA but is subject to all the provisions of the National Environmental Management: Waste Act, 2008 (NEMWA).

Section 16 of the NEMWA must also be considered which states the following:

1. A holder of waste must, within the holder's power, take all reasonable measures to-

    a) "*Avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated;*

    b) Reduce, re-use, recycle and recover waste;

    c) Where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;

d) Manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour, or visual impacts;

e) Prevent any employee or any person under his or her supervision from contravening the Act; and

f) *Prevent the waste from being used for unauthorised purposes.*"

These general principles of responsible waste management will be incorporated into the requirements in the EMPr to be implemented for this project. Waste can be defined as either hazardous or general in accordance with Schedule 3 of the NEMWA (2014) as amended. "Schedule 3: Defined Wastes" has been broken down into two categories – Category A being hazardous waste; and Category B being general waste.

In order to attempt to understand the implications of these waste groups, it is important to ensure that the definitions of all the relevant terminologies are defined:

- Hazardous waste: means "*any waste that contains organic or inorganic elements or compounds that may, owning to the inherent physical, chemical or toxicological characteristic of that waste, have a detrimental impact on health and the environment and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles*."
- Residue deposits: means "*any residue stockpile remaining at the termination, cancellation or expiry of a prospecting right, mining right, mining permit, exploration right or production right*."
- Residue stockpile: means "*any debris, discard, tailings, slimes, screening, slurry, waste rock, foundry sand, mineral processing plant waste, ash or any other product derived from or incidental to a mining operation and which is stockpiled, stored or accumulated within the mining area for potential re-use, or which is disposed of, by the holder of a mining right, mining permit or, production right or an old order right, including historic mines and dumps created before the implementation of this Act*."
- 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; inert waste; or any waste classified as non-hazardous waste in terms of the regulations made under Section 69*."

Furthermore, the NEMWA provides for specific waste management measures to be implemented, as well as providing for the licensing and control of waste management activities. The Eskom Narina Substation Project is not expected to trigger any listed waste activities; however, general principles of responsible waste management will be incorporated into the requirements in the EMPr to be implemented for this project.

6.5 THE NATIONAL ENVIRONMENTAL MANAGEMENT AIR QUALITY ACT (NEMAQA)

The National Environmental Management: Air Quality Act (Act No. 39 of 2004 as amended – NEMAQA) is the main legislative tool for the management of air pollution and related activities. The Object of the Act is:

- To protect the environment by providing reasonable measures for –
  - i. the protection and enhancement of the quality of air in the republic;
  - ii. the prevention of air pollution and ecological degradation; and
  - iii. securing ecologically sustainable development while promoting justifiable economic and social development; and
- Generally, to give effect to Section 24(b) of the constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and well-being of people.

The NEMAQA mandates the Minister of Environment to publish a list of activities which result in atmospheric emissions and consequently cause significant detrimental effects on the environment, human health and social

welfare. The Listed Activities and Minimum National Emission Standards were published on the 22nd of November 2013 (Government Gazette No. 37054).

According to the NEMAQA, air quality management control and enforcement is in the hands of local government with District and Metropolitan Municipalities as the licensing authorities. Provincial government is primarily responsible for ambient monitoring and ensuring municipalities fulfil their legal obligations, with national government primarily as policy maker and co-ordinator. Each sphere of government must appoint an Air Quality Officer responsible for co-ordinating matters pertaining to air quality management. Given that air quality management under the old Act was the sole responsibility of national government, local authorities have in the past only been responsible for smoke and vehicle tailpipe emission control.

6.5.1 NATIONAL DUST CONTROL REGULATIONS

Dust fallout is assessed for nuisance impact and not for inhalation health impact. The National Dust Control Regulations (Department of Environmental Affairs, 2013) prescribes measures for the control of dust in residential and non-residential areas. Acceptable dust fallout rates are measured (using American Standard Testing Methodology (ASTM) D1739:1998 or equivalent) at and beyond the boundary of the premises where dust originates. In addition to the dust fallout limits, the National Dust Control Regulations prescribe monitoring procedures and reporting requirements. Dust that may be created from the Eskom Narina substation project (including but not limited to the construction phase) will be managed in accordance with these Regulations.

6.6 THE NATIONAL HERITAGE RESOURCES ACT (NHRA)

The National Heritage Resources Act (Act 25 of 1999 – NHRA) stipulates that cultural heritage resources may not be disturbed without authorisation from the relevant heritage authority. Section 34(1) of the NHRA states that, "*no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority…*" The NHRA is utilised as the basis for the identification, evaluation and management of heritage resources and in the case of Cultural Resource Management (CRM) those resources specifically impacted on by development as stipulated in Section 38 of NHRA, and those developments administered through the NEMA, MPRDA and the Development Facilitation Act (FDA) legislation. In the latter cases the feedback from the relevant heritage resources authority is required by the State and Provincial Departments managing these Acts before any authorisations are granted for a development. The last few years have seen a significant change towards the inclusion of heritage assessments as a major component of Environmental Impact Processes required by the NEMA and MPRDA.

The NEMA 23(2)(b) states that an integrated environmental management plan should, "*…identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage*". A study of subsections (23)(2)(d), (29)(1)(d), (32)(2)(d) and (34)(b) and their requirements reveals the compulsory inclusion of the identification of cultural resources, the evaluation of the impacts of the proposed activity on these resources, the identification of alternatives and the management procedures for such cultural resources for each of the documents noted in the Environmental Regulations. A further important aspect to be taken into account of in the EIA Regulations under the NEMA relates to the Specialist Report requirements (Appendix 6 of EIA Regulations 2014, as amended).

The MPRDA defines 'environment' as it is in the NEMA and, therefore, acknowledges cultural resources as part of the environment. Section 39(3)(b) of this Act specifically refers to the evaluation, assessment and identification of impacts on all heritage resources as identified in Section 3(2) of the NHRA that are to be impacted on by activities governed by the MPRDA. Section 40 of the same Act requires the consultation with any State Department administering any law that has relevance on such an application through Section 39 of the MPRDA. This implies the evaluation of Heritage Assessment Reports in Environmental Management Plans or Programmes by the relevant heritage authorities.

In accordance with the legislative requirements and EIA rating criteria, the regulations of the South African Heritage Resources Agency (SAHRA) and Association of Southern African Professional Archaeologists (ASAPA) have also been incorporated to ensure that a comprehensive and legally compatible Heritage Report is compiled.

6.7 NATIONAL ENVIRONMENTAL MANAGEMENT BIODIVERSITY ACT (NEMBA)

NEMBA is the most recent legislation pertaining to alien invasive plant (AIP) species. In August 2014, the list of Alien Invasive Species was published in terms of the NEMBA. The Alien and Invasive Species Regulations were published in the Government Gazette No. 44182, 24th of February 2021. The legislation calls for the removal and / or control of AIP species (Category 1 species). In addition, unless authorised thereto in terms of the NWA, no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse. Below is a brief explanation of the three categories in terms of the NEMBA:

- Category 1a: Invasive species requiring compulsory control. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.
- Category 1b: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.
- Category 2: Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones.
- Category 3: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

Note that according to the Alien and Invasive Species Regulations, a person who has under his or her control a category 1b listed invasive species must immediately:

- Notify the competent authority in writing.
- Take steps to manage the listed invasive species in compliance with:
    - Section 75 of the NEMBA;
    - The relevant invasive species management programme developed in terms of regulation 4; and
    - Any directive issued in terms of section 73(3) of the NEMBA.

The provisions of this Act have been considered and where relevant will be incorporated into the proposed mitigation measures and requirements of the EMPr.

6.8 THE CONSERVATION OF AGRICULTURAL RESOURCES ACT (CARA)

The Conservation of Agricultural Resources (Act 43 of 1983) aims to provide for the conservation of the natural agricultural resources of the Republic by the maintenance of the production potential of land, by the combating and prevention of erosion and weakening or destruction of the water sources, and by the protection of the vegetation and the combating of weeds and invader plants. In order to achieve the objectives of this Act, control measures related to the following may be prescribed to land users to whom they apply:

- The cultivation of virgin soil;
- The utilisation and protection of land which is cultivated;
- The irrigation of land;
- The prevention or control of waterlogging or salination of land;

- The utilisation and protection of vleis, marshes, water sponges, water courses and water sources;
- The regulating of the flow pattern of run-off water;
- The utilisation and protection of the vegetation;
- The grazing capacity of veld, expressed as an area of veld per large stock unit;
- The maximum number and the kind of animals which may be kept on veld;
- The prevention and control of veld fires;
- The utilisation and protection of veld which has burned;
- The control of weeds and invader plants;
- The restoration or reclamation of eroded land or land which is otherwise disturbed or denuded;
- The protection of water sources against pollution on account of farming practices;
- The construction, maintenance, alteration or removal of soil conservation works or other structures on land; and
- Any other matter which the Minister may deem necessary or expedient in order that the objects of this Act may be achieved.

Further, different control measures may be prescribed in respect of different classes of land users or different areas or in such other respects as the Minister may determine. Preliminary impacts on the agriculture and soil, biodiversity and water resources have been identified with regards to this project, and mitigation and management measures recommended. These will be updated during the EIA phase of this project as and where necessary.

6.9 THE SPATIAL PLANNING AND LAND USE MANAGEMENT ACT (SPLUMA)

The Spatial Planning and Land Use Management (Act 16 of 2013 – SPLUMA) is set to aid effective and efficient planning and land use management. The SPLUMA was developed to legislate for a single, integrated planning system for the entire country. Therefore, the Act provides a framework for a planning system for the country and introduces provisions to cater for development principles; norms and standards; inter-governmental support; Spatial Development Frameworks (SDFs) across national, provincial, regional and municipal areas; Land Use Schemes (LUS); and municipal planning tribunals.

6.10 ENVIRONMENT CONSERVATION ACT (ECA)

The Environment Conservation Act (Act 73 of 1989 – ECA) was, prior to the promulgation of the NEMA, the backbone of environmental legislation in South Africa. To date the majority of the ECA has been repealed by various other Acts, however Section 25 of the Act and the Noise Regulations (GN R. 154 of 1992) promulgated under this section are still in effect. These Regulations serve to control noise and general prohibitions relating to noise impact and nuisance.

6.10.1 NOISE CONTROL REGULATIONS, 1992 (GN R.154)

In terms of section 25 of the ECA, the National Noise Control Regulations (GN R. 154 – NCRs) published in Government Gazette No. 13717 dated 10 January 1992, were promulgated. The NCRs were revised under GN R. 55 of 14 January 1994 to make it obligatory for all authorities to apply the regulations. Provincial noise control regulations have been promulgated in Gauteng, Free State and Western Cape Provinces.

The NCRs will need to be considered in relation to the potential noise that may be generated mainly during the construction phase of the proposed project. The two key aspects of the NCRs relate to disturbing noise and noise nuisance.

Section 4 of the Regulations prohibits a person from making, producing or causing a disturbing noise, or allowing it to be made produced or caused by any person, machine, device or apparatus or any combination thereof. A disturbing noise is defined in the Regulations as "*a noise level which exceeds the zone sound level or if no zone sound level has been designated, a noise level which exceeds the ambient sound level at the same measuring point by 7 dBA or more*."

Section 5 of the NCRs in essence prohibits the creation of a noise nuisance. A noise nuisance is defined as "*any sound which disturbs or impairs or may disturb or impair the convenience or peace of any person".* The South African National Standard 10103 also applies to the measurement and consideration of environmental noise and should be considered in conjunction with these Regulations.

6.10.2 NOISE STANDARDS

There are a few South African scientific standards (SABS) relevant to noise from mines, industry and roads. They are:

- South African National Standard (SANS) 10103:2008 – 'The measurement and rating of environmental noise with respect to annoyance and to speech communication';
- SANS 10210:2004 – 'Calculating and predicting road traffic noise';
- SANS 10328:2008 – 'Methods for environmental noise impact assessments';
- SANS 10357:2004 – 'The calculation of sound propagation by the Concave method';
- SANS 10181:2003 – 'The Measurement of Noise Emitted by Road Vehicles when Stationary'; and
- SANS 10205:2003 – 'The Measurement of Noise Emitted by Motor Vehicles in Motion'.

The relevant standards use the equivalent continuous rating level as a basis for determining what is acceptable. The levels may take single event noise into account, but single event noise by itself does not determine whether noise levels are acceptable for land use purposes. With regards to SANS 10103:2008, the recommendations are likely to inform decisions by authorities, but non-compliance with the standard will not necessarily render an activity unlawful per se.

6.11 OTHER APPLICABLE ACTS AND LOCAL OR INTERNATIONAL GUIDELINES

Other applicable acts and guidelines include the National Veld and Forest Fire Act 101 of 1998; the Western Cape Provincial Spatial Development Framework (SDF), Garden Route District Municipality, the George and Oudtshoorn Local Municipality Integrated Development Plans. The Western Cape SDF notes that the shortest-distance approach to the alignment of transmission lines raises issues of visual blight, unviable shaped land parcels, need for access roads and destruction of cultural landscapes. Where possible, future power lines should be aligned within existing and proposed combined road and/or rail linkage corridors that impact on the remainder of the landscape, especially if such alignment will not impact on cultural and scenic landscapes. Care should also be taken to avoid bird migration routes (Barbour, 2014).

The Integrated Development Plan (IDP) of the Garden Route District Municipality (2022) focuses on bulk infrastructure development and coordination including a focus on water augmentation and road maintenance, renewable and locally generated energy, amongst other things. The George Local Municipality IDP for 2021/22 highlights the objective of providing and delivering rural infrastructure and services for electricity. In addition, the municipal planning documents such as the Local Municipality By-laws are also applicable to the project.

7 NEED AND DESIRABILITY OF THE PROPOSED ACTIVITY

Eskom through their transmission grid planning and development division identified transformation and sub-transmission constraints at the Proteus Main Transmission Substation located in the Western Cape Province. Eskom Transmission Grid Planning investigated possible solutions to address transformation constraints at Proteus MTS as well as the sub-transmission constraints experienced on the network supplying the Blanco area

near George. Network strengthening options such as reinforcing and/or upgrading the Proteus – Blanco sub-transmission network were considered; ultimately, the establishment of a new 400/132kV Narina MTS within or close to the Blanco area with associated loop-in loop-out powerlines was considered the best option to resolve the network constraints. The establishment of a new 400/132kV Narina MTS is preferred for the following reasons:

- It caters for load growth on the distribution 132kV network;
- It de-loads Proteus MTS;
- Resolves sub-transmission N-1 voltage[1] and thermal loading constraints;
- It results in the highest saving in system losses on the 132kV network; and
- Lowest life cycle cost option.

The needs and desirability analysis component of the "Guideline on need and desirability in terms of the EIA Regulations (Notice 819 of 2014)" includes, but is not limited to, describing the linkages and dependencies between human well-being, livelihoods and ecosystem services applicable to the area in question, and how the proposed development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.). Table 6 present the needs and desirability analysis undertaken for the project.

[1] A power system design principle that ensures that the system can continue operating even if one of its components fails.

Table 6: Needs and desirability analysis for the proposed Eskom Narina Substation Project.

Ref No.	Question	Answer
1	**Securing ecological sustainable development and use of natural resources**	
1.1	How were the ecological integrity considerations taken into account in terms of: Threatened Ecosystems, Sensitive and vulnerable ecosystems, Critical Biodiversity Areas, Ecological Support Systems, Conservation Targets, Ecological drivers of the ecosystem, Environmental Management Framework, Spatial Development Framework (SDF) and global and international responsibilities.	A number of specialist studies have informed this application and environmental impact assessment and include: • Avifauna Study • Terrestrial Biodiversity Study • Aquatic and Wetland Study • Agricultural Potential • Soils and Land Capability These studies assisted in identifying any Threatened Ecosystems, Sensitive and vulnerable ecosystems, Critical Biodiversity Areas, Ecological Support Areas, Conservation Targets and Ecological drivers of the ecosystem. Where sensitive species or ecosystem drivers were identified, relevant mitigation measures were put forward to prevent or minimise the impacts.
1.2	How will this project disturb or enhance ecosystems and / or result in the loss or protection of biological diversity? What measures were explored to avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?	The nature of this project means that it covers an area of about 36 ha for the proposed substation and a couple of kilometres (exact distances dependant on approved alternative) of overhead lines. Where infrastructure is to be constructed or installed in natural areas, various measures are put forward to mitigate the impacts on biological diversity. The mitigation measures have been developed in consultation with the relevant specialists as mentioned above. Existing and future alien and invasive species will be controlled which will enhance the opportunities for indigenous and beneficial species in the environment.
1.3	How will this development pollute and / or degrade the biophysical environment? What measures were explored to either avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?	
1.4	What waste will be generated by this development? What measures were explored to avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and / or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?	This development will possibly generate various general and hazardous waste, the majority of which will be generated during the construction phase. The general waste will be stored in designated areas and through the process of recovery and recycling, the volume of general waste being disposed to landfill will be minimised. The hazardous portion of the waste stream will also be adequately stored prior to disposal at a suitably licenced hazardous waste disposal facility. Safe disposal certificates will be obtained from the disposal facility used.
1.5	How will this project disturb or enhance landscapes and / or sites that constitute the nation's cultural heritage? What measures were explored	A specialist heritage and palaeontological study has been commissioned in order to identify sites of cultural heritage or palaeontological significance. The identified

Ref No.	Question	Answer
	to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?	sites including suitable buffers will be identified as highly sensitive / no-go areas to prevent adverse impacts in these areas. In addition to the above, a chance find procedure will be put forward by the specialist should any unidentified sites of cultural heritage or palaeontological significance be identified during the construction process.
1.6	How will this project use and / or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?	Refer to the identified impacts, their assessment and recommended mitigation measures in Section 11 of this Scoping Report. This aspect will be further explored in the EIA phase and findings thereof presented in the EIA Report and EMPr.
1.7	How will this project use and / or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and / or impacts on the ecosystem jeopardise the integrity of the resource and / or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?	
1.7.1	Does the proposed project exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)?	The project serves to expand the existing transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development. As such, there will be minimal use of natural resources associated with the proposed project. Therefore, the proposed project will provide an opportunity for the Blanco/George area to have reliable and stable electricity supply for local development.
1.7.2	Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used?	
1.7.3	Do the proposed location, type and scale of development promote a reduced dependency on resources?	As mentioned above, the project serves to expand the existing transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development. The location, type and scale of the proposed development thus promotes a reduced dependency on the use of open fires for heating and cooking in rural areas.
1.8	How were a risk-averse and cautious approach applied in terms of ecological impacts:	

Ref No.	Question	Answer
1.8.1	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	In order to prevent repetition, the reader is directed to the assumptions and limitations presented in Section 14.
1.8.2	What is the level of risk associated with the limits of current knowledge?	The level of risk is considered low at this stage and will be further interrogated during the EIA phase (where applicable).
1.8.3	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	As preferred substation and associated powerlines infrastructure may not be approved in the high-quality agricultural land (i.e. Blanco area), an alternative study area together with numerous specialist studies are being conducted as part of this EIA process in order to identify areas of high sensitivity and even no-go areas. In this manner, a risk-averse and cautious approach is able to be more fully realised in future project planning.
1.9	**How will the ecological impacts resulting from this development impact on people's environmental right in terms following?**	
1.9.1	Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	The application and proposed development footprint occur predominantly on properties that are commercial agricultural concerns. The substation and powerline structure placing will be discussed and agreed with each affected landowner prior to commencement of construction and where necessary, appropriate compensation negotiated. Furthermore, as mentioned above, this EIA process has been undertaken at a more strategic level assessment of the receiving environment within proposed development corridors which allows input from numerous specialist disciplines to identify highly sensitive or no-go areas which can then be excluded from development where necessary. The positive impact of job creation has been identified by the socio-economic specialist.
1.9.2	Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?	
1.10	Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?	A low impact on third party wellbeing, livelihoods and ecosystem services is foreseen at this stage of this application as the predominant land use of the affected properties is commercial agriculture as mentioned above, and the site sensitivities from a socio-economic and biophysical point of view will be identified prior to the final placement of infrastructure.
1.11	Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives / targets / considerations of the area?	As described above, this project is anticipated to have a low overall impact on the ecological integrity objectives or targets as consideration of these aspects will be undertaken prior to final placement of infrastructure.
1.12	Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?	As part of the scoping phase, suitable alternatives are being considered and will be finalised in the EIA phase once due consideration of alternatives has been completed. Therefore, at this stage of the application process, this aspect is yet to be concluded.

Ref No.	Question	Answer
1.13	Describe the positive and negative cumulative ecological / biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?	Refer to Section 11 of this report.
2	**Promoting justifiable economic and social development**	
2.1	**What is the socio-economic context of the area, based on, amongst other considerations, the following:**	
2.1.1	The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks or policies applicable to the area,	Details of the IDP's for the Garden Route District Municipality (GDM) as well as the George and Oudtshoorn Local Municipalities are included in Section 10.4.18. The Applicant will make use of labourers from the local community as far as possible. The proposed project will promote and support the sustainability of existing business; and assist in increasing local beneficiation and shared economic growth, through extending the transmission and distribution of electricity in the region.
2.1.2	Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),	
2.1.3	Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and	
2.1.4	Municipal Economic Development Strategy ("LED Strategy").	
2.2	Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?	Refer to the impact assessment in Section 11 in this report.
2.2.1	Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?	The proposed project will indirectly assist with providing reliable access to electricity for all and support local economic development. This will complement the local socio-economic initiatives identified for the area.
2.3	How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	Refer to the public participation process undertaken to date in Section 9 of this Scoping Report. Public participation and consultation will continue during the EIA phase as described in Section 13.7. The impacts will be further explored in the EIA phase and findings thereof presented in the EIA Report and EMPr.
2.4	Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?	Refer to the impact assessment and mitigation measures in Section 11 of this report.
2.5	**In terms of location, describe how the placement of the proposed development will:**	
2.5.1	Result in the creation of residential and employment opportunities in close proximity to or integrated with each other.	Refer to Section 8 details of alternatives considered, in this report.
2.5.2	Reduce the need for transport of people and goods.	
2.5.3	Result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms of public transport),	

Ref No.	Question	Answer
2.5.4	Compliment other uses in the area,	The Narina substation project is a network strengthening project and will be an extension of the existing transmission infrastructure. It therefore will complement the existing activities in the area.
2.5.5	Be in line with the planning for the area.	Refer to item 2.1.1 of this table (above).
2.5.6	For urban related development, make use of underutilised land available with the urban edge.	Not applicable. The proposed project is not located in an urban area.
2.5.7	Optimise the use of existing resources and infrastructure,	The Narina substation project will be an extension of the existing Eskom transmission infrastructure and therefore will complement the existing activities and resources in the area as well as improve the overall local and regional transmission grid which will ultimately benefit end users of electricity.
2.5.8	Opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),	
2.5.9	Discourage "urban sprawl" and contribute to compaction / densification.	This project is located in a rural setting and is not anticipated to have an impact on or any control over urban sprawl in the nearby towns
2.5.10	Contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,	Refer to items 2.5.7 – 2.5.9 of this table (above).
2.5.11	Encourage environmentally sustainable land development practices and processes	The proposed end land use for the Narina substation project will be developed with efforts made towards being environmentally sustainable in the long term. One of the key aspects to ensuring long term land sustainability will be to locate the substation in the most suitable area (through this EIA process) and ensure successful rehabilitation of disturbed areas following construction where necessary.
2.5.12	Take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),	Refer to item 1.7.3 of this table (above). The proposed project is associated with the expansion of the electricity transmission network close to the Blanco load centre for current and future electricity users. The alternative location analysis will ultimately identify the most suitable site for the substation to prevent undue impacts as far as possible.
2.5.13	The investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential).	The proposed project will indirectly allow Eskom to continue contributing to the local, regional and national Gross Domestic Product (GDPs), and also on the local communities through continued supply of reliable electricity for economic development and to employment of employees and local contractors.
2.5.14	Impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and	A specialist heritage impact assessment will inform the positioning of the substation and associated transmission lines to prevent undue impacts on heritage or archaeological resources. Refer to the impact assessment in Section 11 of this report.

Ref No.	Question	Answer
2.5.15	In terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	The proposed project will indirectly contribute to continued employment in the region.
2.6	**How was a risk-averse and cautious approach applied in terms of socio-economic impacts:**	
2.6.1	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	Refer to Section 14 of this report.
2.6.2	What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?	The level of risk is low as the project is not expected to have far reaching negative impacts on socio-economic conditions.
2.6.3	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	This assessment has identified the potential socio-economic risks which will be further refined once more public input is received. None of the limits of knowledge are considered significant in terms of the identification and mitigation of impacts on the socio-economic environment.
2.7	**How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:**	
2.7.1	Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	Refer to the impact assessment in Section 11 of this report. Both positive and negative socio-economic impacts have been identified and relevant mitigation measures put forward to reduce negative impacts and enhance positive impacts as far as practicable.
2.7.2	Positive impacts. What measures were taken to enhance positive impacts?	
2.8	Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socioeconomic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	
2.9	What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	
2.10	What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	

Ref No.	Question	Answer
2.11	What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	The potential impact on existing land uses has been identified from the start of this application process and an assessment of this impact as well as mitigation measures put forward to prevent undue negative impacts in this regard. Refer to the impact assessment in Section 11 of this report.
2.12	What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	Refer to the impact assessment in Section 11 of this report. The EIA and EMPr will specify timeframes within which mitigation measures must be implemented.
2.13	**What measures were taken to:**	
2.13.1	Ensure the participation of all interested and affected parties.	Notwithstanding the detailed description of the stakeholder consultation process included in Section 9 of this report, the consultation process has been undertaken in 3 languages (English, Afrikaans and IsiXhosa). Furthermore, public and focus group meetings will be undertaken during the Scoping and EIA phase consultation during which any additional consultation requirements of the I&APs will be identified and addressed where necessary.
2.13.2	Provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,	
2.13.3	Ensure participation by vulnerable and disadvantaged persons,	
2.13.4	Promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means,	
2.13.5	Ensure openness and transparency, and access to information in terms of the process,	
2.13.6	Ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge,	
2.13.7	Ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein will be promoted?	
2.14	Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	
2.15	What measures have been taken to ensure that current and / or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the	Workers will be educated on a regular basis as to the environmental and safety risks that may occur within their work environment. Furthermore, adequate measures will be undertaken to ensure that the appropriate personal protective

Ref No.	Question	Answer
	work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	equipment is issued to workers based on the areas that they work and the requirements of their job. Their right to refuse work (if considered dangerous) will be included in the education programme.
2.16	**Describe how the development will impact on job creation in terms of, amongst other aspects:**	
2.16.1	The number of temporary versus permanent jobs that will be created.	It is not anticipated that many permanent jobs will be created; rather, temporary jobs will be created during the construction phase of the development.
2.16.2	Whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area).	
2.16.3	The distance from where labourers will have to travel.	It is anticipated that labourers will be traveling from the neighbouring farms and the greater George area (~50 km at most).
2.16.4	The location of jobs opportunities versus the location of impacts.	
2.16.5	The opportunity costs in terms of job creation.	
2.17	**What measures were taken to ensure:**	
2.17.1	That there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment.	The Scoping and EIA Process requires governmental departments to communicate regarding any application. In addition, all relevant departments are notified at various phases of the project by the EAP.
2.17.2	That actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures.	
2.18	What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	Environmental attributes that may be impact by this project have been identified and where relevant, specialist input has been solicited to ensure that a rigorous impact assessment process is undertaken. Where positive impacts on the interests of the public have been identified (e.g. job creation, etc.), mitigation measures are put forward to enhance positive impacts and/or reduce negative impacts.
2.19	Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	Refer to the impact assessment and mitigation measures in Section 11 of this report. During the EIA phase, the updated / site specific EMPr will be shared which will provide additional evidence as to how this aspect has been addressed.
2.20	What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	A rehabilitation plan which details the costs of remedying pollution and environmental degradation will be developed during the EIA phase.
2.21	Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	Refer to Section 8 which contains a description of the process followed to reach the proposed preferred site.

Ref No.	Question	Answer
2.22	Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?	Refer to the impact assessment and mitigation measures in Section 11 of the EIA Report.

8 PROJECT ALTERNATIVES

The identification of alternatives is a key aspect of the success of the scoping process. All reasonable and feasible alternatives must be identified and screened to determine the most suitable alternatives to consider and assess in the EIA phase. There are however some significant constraints that must be considered when identifying feasible alternatives for a project of this scope. Such constraints include financial, social and environment related issues that will be discussed in the evaluation of the alternatives. Alternatives can typically be identified according to:

- Activity alternatives;
- Location alternatives;
- Design and layout alternatives;
- Process alternatives; and
- The No Action alternative (No-go Alternative).

For any alternative to be considered feasible such an alternative must meet the need and purpose of the development proposal without presenting an overall significant high negative associated impact. Essentially, alternatives represent different means of meeting the general purpose and need of the proposed project through the identification of the most appropriate and feasible method of development, all of which are discussed below.

Alternatives can also be distinguished into discrete or incremental alternatives. Discrete alternatives are overall development options, which are typically identified during the pre-feasibility, feasibility and/or scoping phases of the EIA process (DEAT; 2004). Incremental alternatives typically arise during the EIA process and are usually suggested as a means of addressing identified impacts. These alternatives are closely linked to the identification of mitigation measures and are not specifically identified as distinct alternatives.

8.1 ACTIVITY ALTERNATIVES

Activity alternatives refer to alternative activities on a designated site. Activity alternatives are often referred to as project alternatives, such alternatives involve considering a change in the proposed nature of the activity / development. The type of development on a site is usually dependent on the ultimate objectives of the project applicant as well as the specific constraints that a specific site may impose. An activity alternative is typically considered once a definitive location has been identified and alternative land-use activities are considered.

The current land uses within the proposed Blanco study area and surroundings comprise largely of extensive and high value agriculture, pastures, forestry, guest houses / B&Bs, wedding venue and the existing Eskom Blanco substation with its associated distribution and transmission powerlines. The Geelhoutboom area is identified as tourist area and forms part of the Hops Route. It has a unique sense of place situated between the Outeniqua Mountains and the Indian Ocean. The area contains a number of farm-based B&Bs and is popular area for mountain biking (George LM, 2019).

The land uses within the proposed Outeniqua study area and surroundings comprise largely of grazing/game areas and some dryland crop (mainly wheat) production. There are however some patches of land under irrigation. Most of the agriculture-related structures and buildings are located in the far western section of the project area with a concentration of structures in the vicinity of the Zebra community that hosts an historic farmhouse/guest house of the 1870s a church and Klipdrift primary school.

Eskom's primary role is to generate and transport electricity in bulk from wherever it is generated to load centres throughout South Africa and the region. Eskom as an entity does not partake in any of the typical land-uses in the area besides the power and electricity related activities. Therefore, no feasible and reasonable activity alternatives can be taken forward to the EIA phase for further assessment.

8.2 LOCATION ALTERNATIVES

Location alternatives can apply to the entire proposed project (e.g. the strategic decision to locate the substation in this region) as well as the specific individual components of the proposed development (e,g, the specific location within the study area). A study area with a radius of 6km from the existing Blanco substation was defined by Eskom. An additional study area, also with a 6km radius from the existing Outeniqua substation is also being assessed. It is important to note that these study areas would need to be extended in the event that no suitable alternative/ preferred site can be identified within the confines of these designated areas (which can only be determined at the end of the EIA phase assessment). A preliminary sensitivity mapping exercise with inputs from specialists was undertaken to identify possible locations for the proposed substation.

With reference to the need and desirability of the project, it has been determined by Eskom that there is a specific need for a substation within this area in order to put into effect the regional grid strengthening solutions required. Therefore, an entirely different location within South Africa is not a feasible alternative however site-specific location alternatives for the substation infrastructure can be considered and are discussed in more detail in the subsections below.

8.2.1 SUBSTATION SITES

With respect to the identification and assessment of location alternatives within the designated study areas, EIMS has undertaken a spatial sensitivity and screening exercise in order to identify, at a high level, the most suitable areas within the study areas for the location of a substation. The required area for the substation location is 600m x 600m to account for current and future needs/plans. Using the preliminary spatial sensitivity maps, EIMS together with Eskom and the appointed specialists undertook a team site inspection of the Blanco study area on the 8th of June 2022 to identify possible locations for the proposed substation. A total of nine possible locations for the placement of the substation were identified during the site visit. A ranking system was applied where each specialist and Eskom technical team was requested to rank each site from most preferred to least preferred, this then reduced the sites to five most feasible Blanco substation (BSS) location alternatives numbered 1, 2, 7, 8 and 9 as shown in in Figure 3. These substation location alternatives shall be referred to as:

- **BSS1** (located on Farm 318 (Portion 6) & Geelhoutboom 217 (Portions 45 & 54))
- **BSS2** (located on Geelhoutboom 217 (Portion 37))
- **BSS7** (located on Klyne Fontyn 218 (Portion 40))
- **BSS8** (located on Klyne Fontyn 218 (Portions 17, 19 & 41))
- **BSS9** (located on Klyne Fontyn 218 (Portions 17 & 40))

The affected landowners of the five site alternatives were then engaged by Eskom in an effort to introduce the proposed project and enter into negotiations with regards to possibly locating the proposed substation on one of these properties. This effort was however met with a negative response from all the affected landowners who, through their attorneys indicated that their clients would under no circumstances consent to the construction of the proposed substation or any associated infrastructure on the properties. At this early stage in the project, the success of identifying a suitably feasible site in the Blanco area was uncertain and therefore an alternative study area was put forward in the Outeniqua area approximately 20km north of the Blanco study area.

EIMS together with Eskom and the appointed specialists undertook a second team site inspection to the Outeniqua study area on the 27th of September 2023 to assess its suitability for the proposed substation development. A total of thirteen possible locations for the placement of the substation were identified during the site visit. A ranking system was also applied to these alternatives where each specialist and Eskom technical team was requested to rank each site from most preferred to least preferred based on their individual specialities, this then reduced the sites to five most feasible Outeniqua substation (OSS) location alternatives numbered 1, 2, 4, 5 and 10 as shown in in Figure 4. These substation location alternatives shall be referred to as:

- **OSS1** (located on Zout Kloof 27 (Portion 2))
- **OSS2** (located on Klippedrif 81 (Portion 2))
- **OSS4** (located on Zout Kloof 27 (Portion 2))
- **OSS5** (located on Klippedrif 81 (Portion 8) & Zout Kloof 27 (Portion 2))
- **OSS10** (located on Zout Kloof 27 (Portions 6 & 20))

All five of these substation alternatives will be assessed in more detail from a biophysical and socio-economic perspective in the EIA phase. Furthermore, the sensitivity mapping undertaken during this scoping phase will likely be updated during the EIA phase once detailed specialist site investigations are undertaken and further public input has been received. Preliminary engagements with the affected landowners of the above-mentioned five site alternatives have started and will continue through to the EIA phase.

8.2.2 POWERLINE ROUTES

Further to the above substation site location alternative description, the powerline routes (Tx and Dx) are largely dependent on the location of the proposed substation and existing powerline corridors in order to connect the proposed Narina substation to the local electricity grid. The final length of the Tx loop-in loop-out powerlines will be determined by the location and orientation of the Narina substation. The shortest route and/or the one that leads to the least environmental impact would be preferred. As such, powerline routes will be developed in or alongside existing servitudes where possible.

To cater for the additional load of the new Narina substation within the Outeniqua study area, the existing 132kV Dx powerline between the Outeniqua and Blanco substations will either need to be upgraded or rebuilt. Should a rebuild be necessary, the new Dx line will follow / be constructed parallel to the existing servitude as far as possible. Therefore, no location alternatives are to be assessed other than the sensitivity planning approach.

8.3 DESIGN AND LAYOUT ALTERNATIVES

Design and layout alternatives ensure the consideration of different design and spatial configurations of the proposed development within a specific location, in order to enhance the positive impacts and to reduce the negative impacts. The proposed Narina substation development is located in an area with several significant environmental aspects that will be considered in the determination of the final substation and powerline routes. As such, due consideration has been given to the placement and orientation of required infrastructure and activities in relation to the environmental aspects and any other technical factors. During the EIA phase, the following will be considered in the design and planning philosophies of the Narina substation infrastructure and activities:

- Environmental sensitivity and constraints;
- Energy and water efficiency; and
- Compliance with statutory requirements.

The layout of the proposed substation infrastructure, access roads, and associated powerline structures will undergo a micro siting exercise whereby environmental features on site as well as current land uses, and infrastructure are considered towards ensuring that the proposed Narina project activities avoid areas of high environmental sensitivity and minimise infringement on existing infrastructure where possible. The outcomes of the detailed EIA phase assessments and updated environmental sensitivity mapping, have been included in the final layout selections and various design plans. Furthermore, where feasible, mitigation and management measures to address the selected design and or layout aspect, will be included in the Narina substation site specific EMPr development in the EIA phase.

8.4 PROCESS ALTERNATIVES

Process alternatives imply the investigation of alternative processes or technologies that can be used to achieve the same goal for the proposed Narina substation development. This includes using environmentally friendly

designs or materials and reusing scarce resources like water and non-renewable energy sources. Many process alternatives will be defined and implemented as incremental alternatives during the EIA process and in the EMPr. Specific process alternatives which could be considered further include:

- Use of environmentally friendlier alternatives to typical mineral oils in the substation transformers, if possible;
- Utilisation of waste sorting and recycling programmes during the construction and operation phases for both the substation and the powerlines;
- Use of indoor/underground substation as opposed to a conventional outdoor substation; and
- Use of alternative pylon tower designs for the powerlines.

Transformer oils are used for the purposes of insulation and cooling of the windings within the transformer. The oils typically used are mineral oils which remain stable at the specific operating temperatures of the transformer. Traditional transformer oils contain polychlorinated biphenyls (PCB's) and are flammable however the phasing out of PCB materials is legislated under NEMA GNR 549 of 2014 and therefore Eskom currently utilises PCB free mineral based oil. It is EIMS's understanding that there are alternatives available such as silicon-based or fluorinated hydrocarbon transformer oils which may provide a feasible environmentally friendly substitute to conventional mineral oil, whilst remaining stable and reducing the fire hazards. The potential alternatives to conventional mineral oils will be discussed and assessed further in the EIA phase.

It is anticipated that there may be significant volumes of wastes generated (including general waste and hazardous wastes) during the construction process of the substation and the powerlines. In addition, there is likely to be waste materials generated as a result of general maintenance and repair during the operational phases of the substation and the powerlines (e.g. old transformer oils, repaired insulators/ conductors, etc). With reference to the Waste Act (59 of 2009), there is a general legal obligation on all relevant persons to reduce, re-use, recycle and recover wastes. In this regard the alternative of implementing waste sorting and recycling will be considered a general obligation throughout the construction and operational phases. The principles of responsible waste management will be entrenched in the EIA process, the mitigation measures, and specified in the EMPr. This alternative will therefore be considered further as an incremental alternative.

Substations are usually constructed as open-air surface facilities, underground, or inside a building structure. It is understood that indoor substations are generally utilised in built up urban areas where there is significant sensitivity to noise from the transformers, for aesthetic purposes, or to protect the facility and associated infrastructure from extreme weather conditions. The proposed Narina substation is a large facility which would require significant capital expense to locate within an indoor facility. In addition, the visual intrusion of a building structure covering the required area (±36ha) is anticipated to be similar or greater than a conventional outdoor substation, especially considering the rural nature of the receiving environment. Lastly there are no climate/ weather related hazards expected in this study area that would necessitate protection of the facility. An indoor substation is not considered a feasible alternative for this project.

Underground substations are typically utilised when surface area is unavailable or in instances where the source of the electricity is underground (e.g. hydropower stations), neither of which is the case for the proposed Narina substation. Underground substations also come with challenges, such as higher construction and maintenance costs, potential difficulties in access for repairs, and longer construction times. An underground substation is not considered feasible for this project.

Eskom utilises a range of pylon tower designs when erecting Tx and Dx powerlines. It is EIMS's understanding that the extent and magnitude of the potential impact related to the construction of the towers is similar regardless of which design is utilised. The only potential benefit which may be considered would be the aesthetic differences related to the different designs. These alternative designs will be considered by the appointed Visual Impact Specialist and reported on during the EIA.

Should any additional process alternatives be identified during this study, these will be defined and will be implemented as incremental alternatives and included in the site specific EMPr update during the EIA phase.

8.5 NO GO ALTERNATIVE

The “No Go” or “No Action” alternative refers to the alternative of not embarking on the proposed project at all. This alternative would imply that the current status quo without the proposed Narina substation project would continue. It is important to note that the No Go alternative is the baseline against which all other alternatives and the development proposal are assessed.

When considering the No Go alternative, the impacts (both positive and negative) associated with any other specific alternative, or the current project proposal would not occur and in effect the impacts of the No Go alternative are therefore inadvertently assessed by assessing the other alternatives. In addition to the direct implications of retaining the status quo there are certain other indirect impacts, which may occur should the No Go alternative be followed. The No Go alternative as a specific alternative is not considered feasible for the reasons stated in Table 7 below.

Table 7: Advantages and disadvantages of the no-go alternative.

Advantages	Disadvantages
No additional disturbance of land and this specific development related negative impacts.	• Load on the existing Proteus substation would continue to grow which would result in further instability in the local grid operation. • Decreased chances of future distribution growth and supply to customers which will indirectly restrict or reduce further economic growth in the region. • Positive impacts associated with the proposed Eskom Narina substation project will not occur such as some employment creation (albeit mostly during construction) and availability of a more stable and capable grid to allow for future economic expansion in the region. Refer to Section 7 for more details with regards to the Need and Desirability of the proposed project, as well as Section 11 for impacts identified and proposed mitigation measures particularly those related to socio-economic factors.

8.6 SENSITIVITY PLANNING APPROACH

As described in Section 8.2 above, the sensitivity planning approach will guide the final location of the proposed substations, powerlines and related infrastructure. Based on input from the various specialists as well as feedback from the public, the final sensitivity map will be presented in the EIA phase which will delineate no-go areas as well as high, medium and low sensitive areas. The EMPr will additionally provide mitigation measures in the form of limitations on where infrastructure can be placed.

8.7 ALTERNATIVE ASSESSMENT SUMMARY

Table 8 describes the advantages and disadvantages of the alternatives identified above. The alternatives will be compared to each other as well as with the No-Go alternative. Table 8 further details which alternatives are to be taken forward for further investigation in the EIA phase.

Table 8: Alternative assessment summary.

Alternative Category	Alternative	Alternative Description Summary	Advantages	Disadvantages/ Risks	Carried into EIA
Location Alternatives	BSS1	Blanco substation alternative located on Farm 318 (Portion 6) & Geelhoutboom 217 (Portions 45 & 54)	Well positioned within proximity of the existing Blanco substation. Relative ease of integration without extensive/expensive powerline network.	The sites are located on commercial agricultural land and will impact on a centre pivot. Overlaps with various sections of CBA's and ESA's. Adjacent property value impacts – linked to impact on livelihoods. Competing land uses (i.e., wedding venues, tourism attraction)	**No**
	BSS2	Blanco substation alternative located on Geelhoutboom 217 (Portion 37)			**No**
	BSS7	Blanco substation alternative located on Klyne Fontyn 218 (Portion 40)	Most of the site habitat is transformed (i.e. cultivated with little to no natural vegetation remaining).		**No**
	BSS8	Blanco substation alternative located on Klyne Fontyn 218 (Portions 17, 19 & 41)			**No**
	BSS9	BSS9 located on Klyne Fontyn 218 (Portions 17 & 40)			**No**
	OSS1	Outeniqua Substation alternative located on Zout Kloof 27 (Portion 2)	Well positioned within proximity of the existing Tx and Outeniqua – Blanco Dx lines. Relative ease of Tx integration without extensive/expensive powerline network.	May require an additional 23 km of a 132kV line to be built across the Outeniqua mountains.	**Yes**
	OSS2	Outeniqua Substation alternative located on Klippedrif 81 (Portion 2)			**Yes**
	OSS4	Outeniqua Substation alternative located on Zout Kloof 27 (Portion 2))		Overlaps with sections of ESAs. May require an additional 23 km of a 132kV line to be built across the	**Yes**

Alternative Category	Alternative	Alternative Description Summary	Advantages	Disadvantages/ Risks	Carried into EIA
	OSS5	Outeniqua Substation alternative located on Klippedrif 81 (Portion 8) & Zout Kloof 27 (Portion 2)		Outeniqua mountains.	**Yes**
	OSS10	OSS10 located on Zout Kloof 27 (Portions 6 & 20)		May require an additional 23 km of a 132kV line to be built across the Outeniqua mountains.	**Yes**
Layout Alternatives	Based on a sensitivity mapping of the substation and powerline layout, any unacceptably high-risk areas will be delineated as no-go areas.				**Yes**
Process Alternatives	Transformer oils	Use of environmentally friendlier alternatives to typical mineral oils in the substation transformers, if possible.	Biodegradable, thus reducing the environmental impact and cost of cleanup. High flash and fire point, improving operator safety. .	Critical limitations and concerns include esters' pour point, viscosity, oxidative stability, and ionization resistance.	**Yes**
	Waste management	Utilisation of waste sorting and recycling programmes during the construction and operation phases for both the substation and the powerlines.	Reduction of waste to landfill volumes and overall carbon footprint.	Additional waste management costs.	**Yes**
	Indoor / underground substations	Use of indoor/underground substation as opposed to a conventional outdoor substation.	Reduction in noise pollution from the transformers. Lesser visual impacts.	Significantly more costly and would still come with the bio-physical impacts associated with open air substations in the construction phase. Furthermore, both the input and output networks of the proposed substation are located above ground.	**No**
	Pylon Tower design	Use of alternative pylon tower designs for the powerlines.			**Yes**
No-Go Alternative	No-Go	The proposed Narina substation project will not take place at all.	No environmental impacts as a result of the Narina substation project.	No benefits with respect to job creation and also no direct and indirect	**Yes**

Alternative Category	Alternative	Alternative Description Summary	Advantages	Disadvantages/ Risks	Carried into EIA
				socio-economic benefits created for the local and regional economies.	

9 STAKEHOLDER ENGAGEMENT

The Public Participation Process (PPP) is a requirement of several pieces of South African legislation and aims to ensure that all relevant Interested and Affected Parties (I&APs) are consulted, involved and their comments are considered, and a record included in the reports submitted to the Authorities. The process ensures that all stakeholders are provided this opportunity as part of a transparent process which allows for a robust and comprehensive environmental study. The PPP for the proposed project needs to be managed sensitively and according to best practises to ensure and promote:

- Compliance with international best practice options;
- Compliance with national legislation;
- Establishment and management of relationships with key stakeholder groups; and
- Involvement and participation in the environmental study and authorisation/approval process.

As such, the purpose of the PPP and stakeholder engagement process is to:

- Introduce the proposed project;
- Explain the authorisations required;
- Explain the environmental studies already completed and yet to be undertaken (where applicable);
- Solicit and record any issues, concerns, suggestions, and objections to the project;
- Provide opportunity for input and gathering of local knowledge;
- Establish and formalise lines of communication between the I&APs and the project team;
- Identify all significant issues for the project; and
- Identify possible mitigation measures or environmental management plans to minimise and/or prevent negative environmental impacts and maximize and/or promote positive environmental impacts associated with the project.

9.1 GENERAL APPROACH TO PUBLIC PARTICIPATION

The PPP for the proposed project has been undertaken in accordance with the requirements of the NEMA EIA Regulations (2014), and in line with the principles of Integrated Environmental Management (IEM). IEM implies an open and transparent participatory process, whereby stakeholders and other I&APs are afforded an opportunity to comment on the project and have their views considered and included as part of project planning.

At the start of the application process, an initial I&AP database was compiled based on known key I&AP's (previous Eskom Narina application, affected landowners, Organs of State, etc.), Windeed searches and other stakeholder databases. The I&AP database includes amongst others, landowners, communities, regulatory authorities and other special interest groups. The database will be continually updated as and when new I&AP's show interest in the application.

9.2 LIST OF PRE-IDENTIFIED ORGANS OF STATE/ KEY STAKEHOLDERS IDENTIFIED AND NOTIFIED

National, Provincial and Local Government Authorities as well as State Owned Entities (SOE's) were notified of the proposed project and include:

- Eskom Holdings SOC Limited
- Western Cape Department of Agriculture
- Western Cape Department of Environmental Affairs and Development Planning
- Western Cape Department of Cooperative Governance and Traditional Affairs
- Western Cape Department of Transport and Public Works
- Western Cape Department of Water and Sanitation
- Heritage Western Cape
- Garden Route District Municipality
- George Local Municipality
- Oudtshoorn Local Municipality
- National Department of Agriculture, Land Reform and Rural Development
- National Department of Forestry, Fisheries and Environment
- National Department of Transport
- National Department of Water and Sanitation
- South African Heritage Resources Agency
- South African National Biodiversity Institute
- South African National Roads Agency Limited
- Transnet SOC Limited

Non-Governmental Organisations (NGOs) and Non-Profit Organisations (NPOs) including:

- Afriforum
- Birdlife South Africa
- Centre for Environmental Rights
- Endangered Wildlife Trust
- Federation for Sustainable Environment
- Greenpeace Africa
- Wildlife and Environment Society of South Africa
- World Wildlife Fund

In addition to the above, attempts to consult with directly affected landowners, adjacent landowners, community and farming representatives, occupiers of land, etc. were made. A total of 30 site notices and a number of A3 posters were placed in and around the study areas in an attempt to solicit input from any I&AP's who's contact details were not available at the start of this application.

9.3 INITIAL NOTIFICATION

The PPP commenced on 15th of February 2024 with an initial notification and call to register for a period of 30 days. The initial notification was undertaken in English, Afrikaans and isiXhosa and was given in the following manner:

9.3.1 REGISTERED LETTERS, FAXES AND EMAILS

Notification letters, faxes, and emails were distributed to all pre-identified I&APs including government organisations, NGOs, relevant municipalities, ward councillors, landowners and other organisations that might be interested or affected.

The notification letters included the following information to I&APs:

- The purpose of the proposed project;
- High level list of anticipated activities to be authorised;
- Scale and extent of activities to be authorised;
- Information on the intended substation construction to enable I&APs to assess/surmise what impact the activities will have on them or on the use of their land;
- Details of the affected properties (including details of where a locality map and other information could be obtained in the 3 languages);
- Summary of the relevant legislation pertaining to the application process;
- Initial registration period timeframes; and
- Contact details of the EAP.

9.3.2 NEWSPAPER ADVERTISEMENTS / GOVERNMENT GAZETTE

Advertisements describing the proposed project and EIA process were published in the George Herald Newspaper and the Oudtshoorn Courant Newspaper with circulation in the vicinity of the study areas. Advertisement of the proposed project was also published in the Western Cape Provincial Gazette. The initial advertisements were placed in the in English, Afrikaans and isiXhosa on the 15th and 16th of February 2024. The newspaper adverts included the following information:

- Project name;
- Applicant name;
- Project location;
- Nature of the activity and application;
- Where additional information could be obtained; and
- Relevant EIMS contact person and contact details for the project.

9.3.3 SITE NOTICE PLACEMENT

A1 Correx site notices in English, Afrikaans and isiXhosa were placed at 30 locations within and around the application areas on the 15th of February 2024. The on-site notices included the following information:

- Project name;
- Applicant name;
- Project location and alternatives;
- Map of proposed project area;

- Project description;
- Legislative requirements; and
- Relevant EIMS contact person and contact details for the project.

9.3.4 POSTER PLACEMENT

A3 posters in English, Afrikaans and isiXhosa were placed at local public gathering places in George (George Police Station, George Post Office, George and Blanco Public Libraries). The notices and posters afforded I&APs who may be interested in the project with the opportunity to register for the project as well as to submit any issues/queries/concerns and indicate the contact details of any other potential I&APs that should be contacted. The contact person at EIMS and contact details were stated on the posters. Comments/concerns and queries were encouraged to be submitted in either of the following manners:

- Electronically (fax, email);
- Telephonically; and/or
- Written letters (postal).

9.3.5 AVAILABILITY OF SCOPING REPORT

Notification regarding the availability of this Scoping Report for public review was given in the following manner to all registered I&APs:

- Registered letters with details on where the scoping report can be obtained and/or reviewed, public meeting date and time, EIMS contact details as well as the public review comment period;
- Facsimile notifications with information similar to that in the registered letter described above; and/or
- Email notifications with a letter attachment containing the information described above.

The scoping report will be available in hard copy at the George public library and on the EIMS website (www.eims.co.za/public-participation) for public review from the 8th of March 2024 to the 9th of April 2024 for a period of at least 30 days.

10 ENVIRONMENTAL ATTRIBUTES AND BASELINE ENVIRONMENT

A baseline assessment of the receiving environment upon which an activity or development is proposed is an important aspect of the EIA process as it provides a description of the current status and trends in environmental factors of a proposed project against which predicted changes can be compared and evaluated, as well as baseline information against which the potential impacts can be monitored. The baseline environmental attributes include biophysical, socio economic, and cultural aspects of a project area, which are presented below for the proposed study areas.

10.1 TOPOGRAPHY

The overall topography of both the Blanco and Outeniqua project areas is generally flat to occasionally waving and gentle sloping topography with slopes becoming steeper towards the Outeniqua Mountains. The project area is traversed by several perennial and non-perennial rivers. Various wetland systems and dams occur within the project area. The Keur River which becomes the Malgas River is found south of the Outeniqua Pass, the Norga River flows southwards through the centre of the area and the Moeras River occur on the western boundary (Refer to Figure 11 and Figure 12).

10.2 DRAINAGE AND CATCHMENT

The Blanco project area is situated almost entirely in the K30A quaternary catchment with a slight overlap into the K30B quaternary catchment (Figure 13), within the Breede-Gouritz Water Management Areas (WMA 8). The Witelsrivier flows in north-south direction between sites 1/2 and the remaining three sites. The project area is located in K30A-9087 Sub Quaternary Reaches (SQR), for the Maalgate system.

The Outeniqua project area is situated mostly in the J34F quaternary catchment with a slight overlap into the J35B quaternary catchment, also within the Breede-Gouritz Water Management Areas (WMA 8). The Doring River flows north of the Outeniqua project area, and to the south the Klip River. The project area is located mostly in the J34F-08863 (Doring system) Sub Quaternary Reaches (SQR).

10.3 CLIMATE

The George region experiences an annual rainfall of around 662mm, spread across all months. Rainfall is at its lowest in June, with only 36mm, and peaks in March, reaching 78mm. Average daily maximum temperatures vary throughout the year, ranging from 18.2°C in July to 27.6°C in February. July marks the coldest month, with nighttime temperatures averaging 6.2°C.

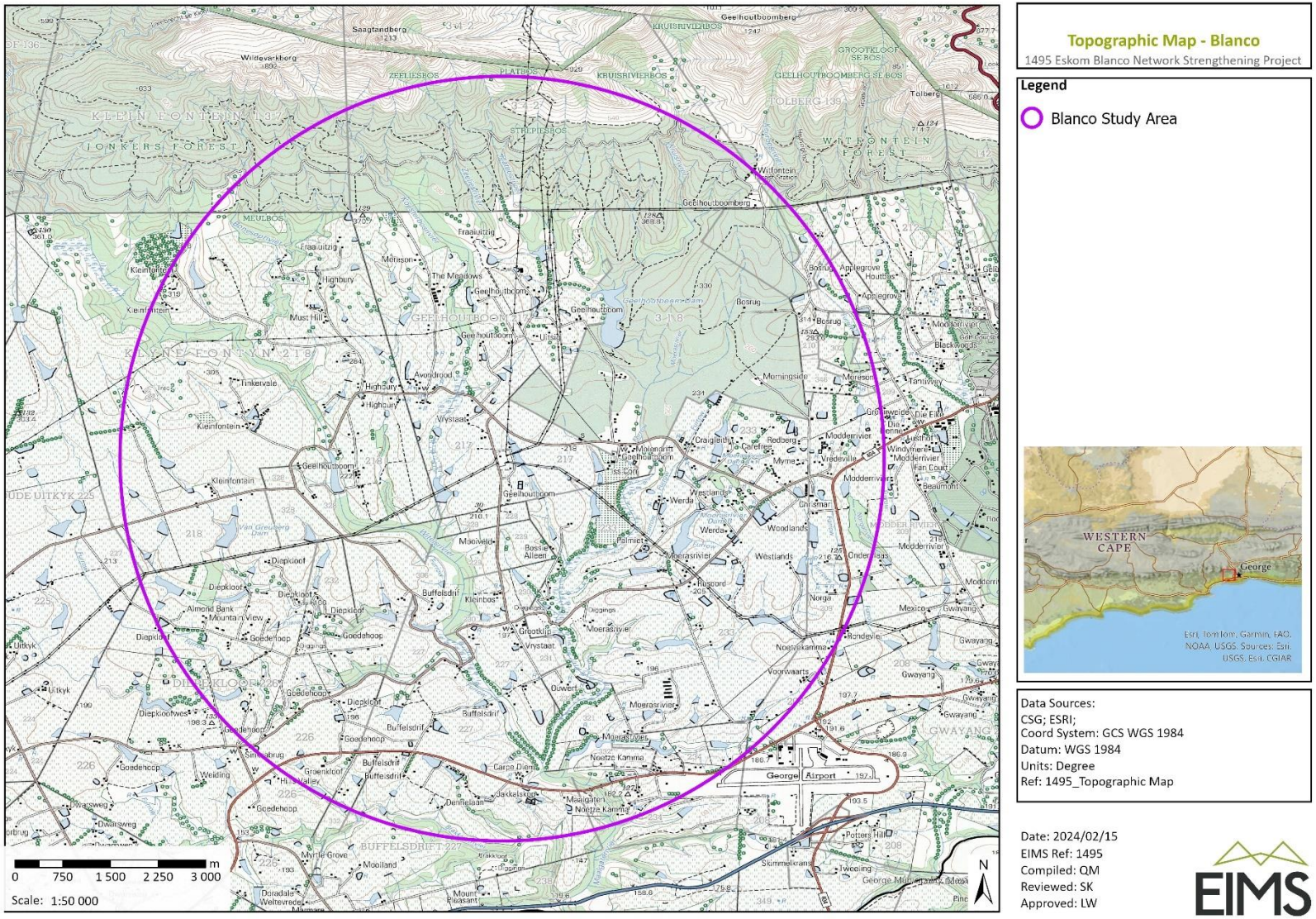

Figure 11: Topographical cross-sections of the greater Blanco project area.

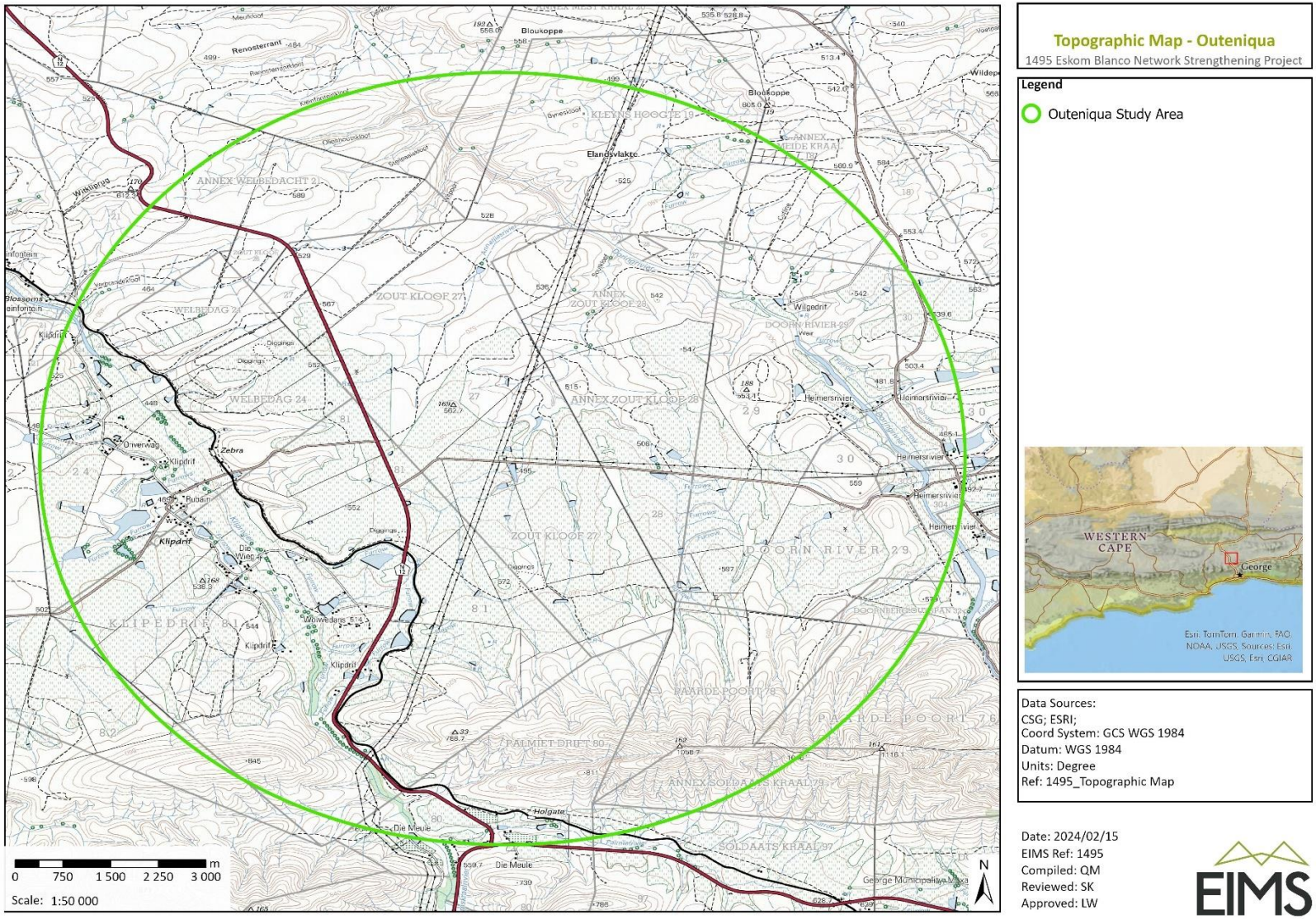

Figure 12: Topographical cross-sections of the greater Outeniqua project area.

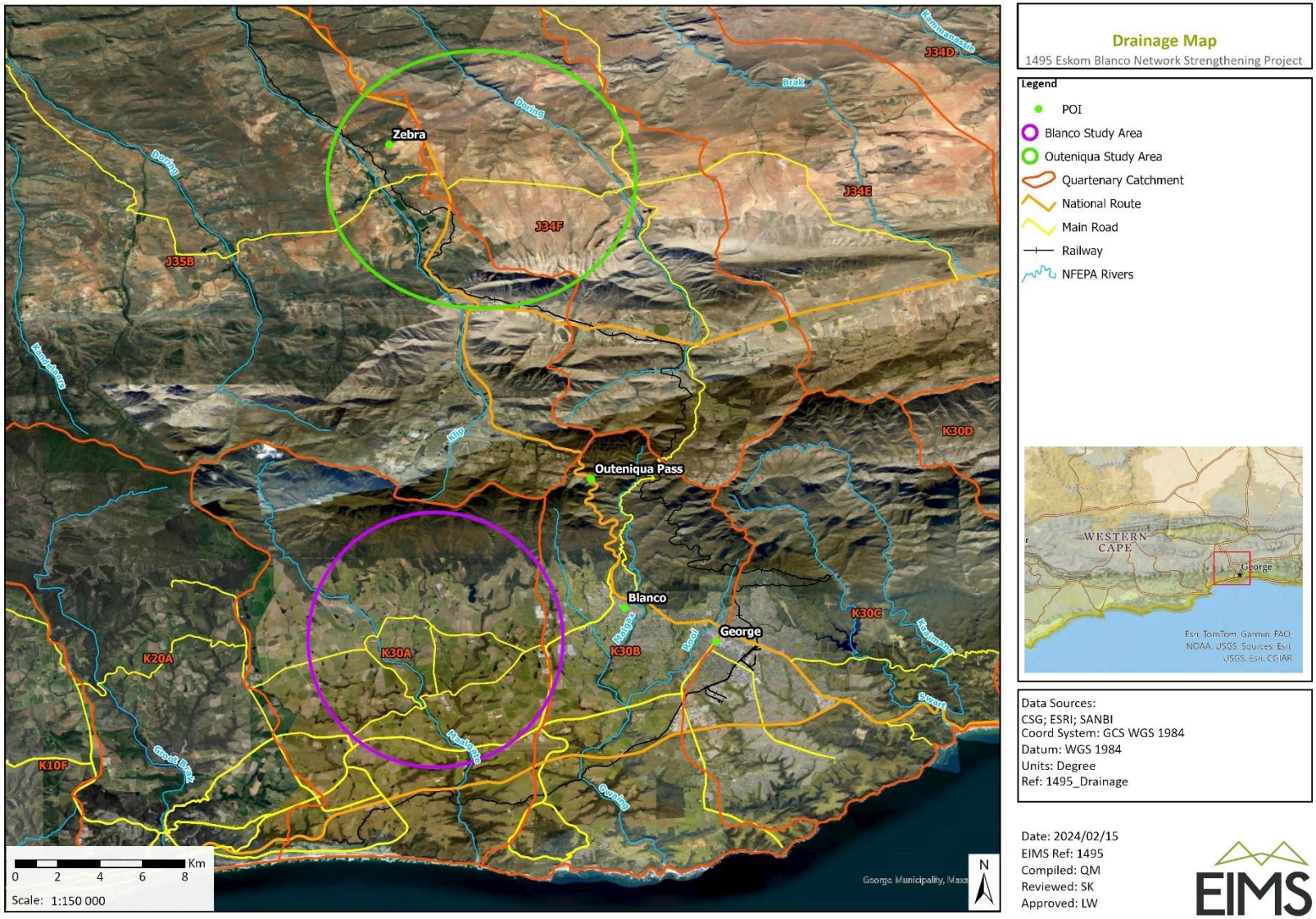

Figure 13: Study area in relation to quaternary catchments and drainage areas.

10.4 SOCIO-ECONOMIC

According to the National Environmental Management Act (NEMA, 1998) environment refers to the surroundings in which humans exist. When viewing the environment from a socio-economic perspective the question can be asked what exactly the social environment is. Different definitions for social environment exist, but a clear and comprehensive definition that is widely accepted remains elusive. Barnett & Casper (2001) offers the following definition of human social environment:

> *"Human social environments encompass the immediate physical surroundings, social relationships, and cultural milieus within which defined groups of people function and interact. Components of the social environment include built infrastructure; industrial and occupational structure; labour markets; social and economic processes; wealth; social, human, and health services; power relations; government; race relations; social inequality; cultural practices; the arts; religious institutions and practices; and beliefs about place and community. The social environment subsumes many aspects of the physical environment, given that contemporary landscapes, water resources, and other natural resources have been at least partially configured by human social processes. Embedded within contemporary social environments are historical social and power relations that have become institutionalized over time. Social environments can be experienced at multiple scales, often simultaneously, including households, kin networks, neighbourhoods, towns and cities, and regions. Social environments are dynamic and change over time as the result of both internal and external forces. There are relationships of dependency among the social environments of different local areas, because these areas are connected through larger regional, national, and international social and economic processes and power relations."*

Environment-behaviour relationships are interrelationships (Bell, Fisher, Baum & Greene, 1996). The environment influences and constrains the behaviour of people, but behaviour also leads to changes in the environment. The impacts of a project on people can only be truly understood if their environmental context is understood. The baseline description of the social environment will include a description of the area within a provincial, district and local context that will focus on the identity and history of the area as well as a description of the population of the area based on a number of demographic, social and economic variables.

The baseline Socio-Economic inputs were provided by An Kritzinger from The Southern Economic Development (SED). A detailed Socio-Economic specialist report will be completed and used to inform the EIA level phase of the study.

10.4.1 DESCRIPTION OF THE AREA

The city of George is the administrative seat of both the George Local Municipality (GLM) and the Garden Route District Municipality (previously Eden District Municipality). The municipal area is located on both sides of the national road N2. The municipal area consists of various fragmented areas including George main town and Blanco west of the town centre (both north of the N2), the large predominantly Coloured and Black townships of Pacaltsdorp and Thembalethu (south of the N2); various coastal areas to the south of the town (e.g. Wilderness; Herold's Bay, Victoria Bay) as well as rural areas such as Geelhoutboom, Herold, Hansmoeskraal and Waboomskraal, as well as Uniondale and Haarlem (George LM, 2019).

The Blanco study area falls within the Geelhoutboom area (5km west of Blanco), located in the rural Ward 22 and 23 of GLM that includes a number of other rural areas west of George-town and Blanco. These areas are Diepkloof, Sinksabrug, Waboomskraal, Harold, Bo-Dorp and Camphersdrif. All the identified location alternatives are however located in Ward 22. The baseline description of the environment will include these areas. Figure 14 shows the location of the Blanco study area. The Outeniqua study area is located on the western border of GLM and the south-eastern border Oudtshoorn Local Municipality (OLM) in the Garden Route District. The project area falls both in the western ward 25 of GLM and the south-eastern ward 12 of OLM (Figure 15).

Agriculture remains the key economic activity in in both study areas. Activities include dairy, fresh produce (e.g. berry farming and vegetables) and hops. The Geelhoutboom area is identified as tourist area and forms part of the Hops Route. It has a unique sense of place situated between the Outeniqua Mountains and the Indian Ocean.

The area contains a number of farm-based B&Bs and is popular area for mountain biking (George LM, 2019). The Outeniqua study area is mainly characterised by grazing/game areas and some dryland crop (mainly wheat) production. There are however some patches of land under irrigation. Most of the agriculture-related structures and buildings are located in the far western section of the project area with a concentration of structures in the vicinity of the Zebra community that hosts an historic farmhouse/guest house of the 1870s a church and Klipdrift primary school.

Economic activities in the project area revolves around game/ostrich farming and some dryland and irrigated field crops. Zebra farmhouse to the west also provides tourism accommodation and there are two farm stalls on the southern edges of the project area.

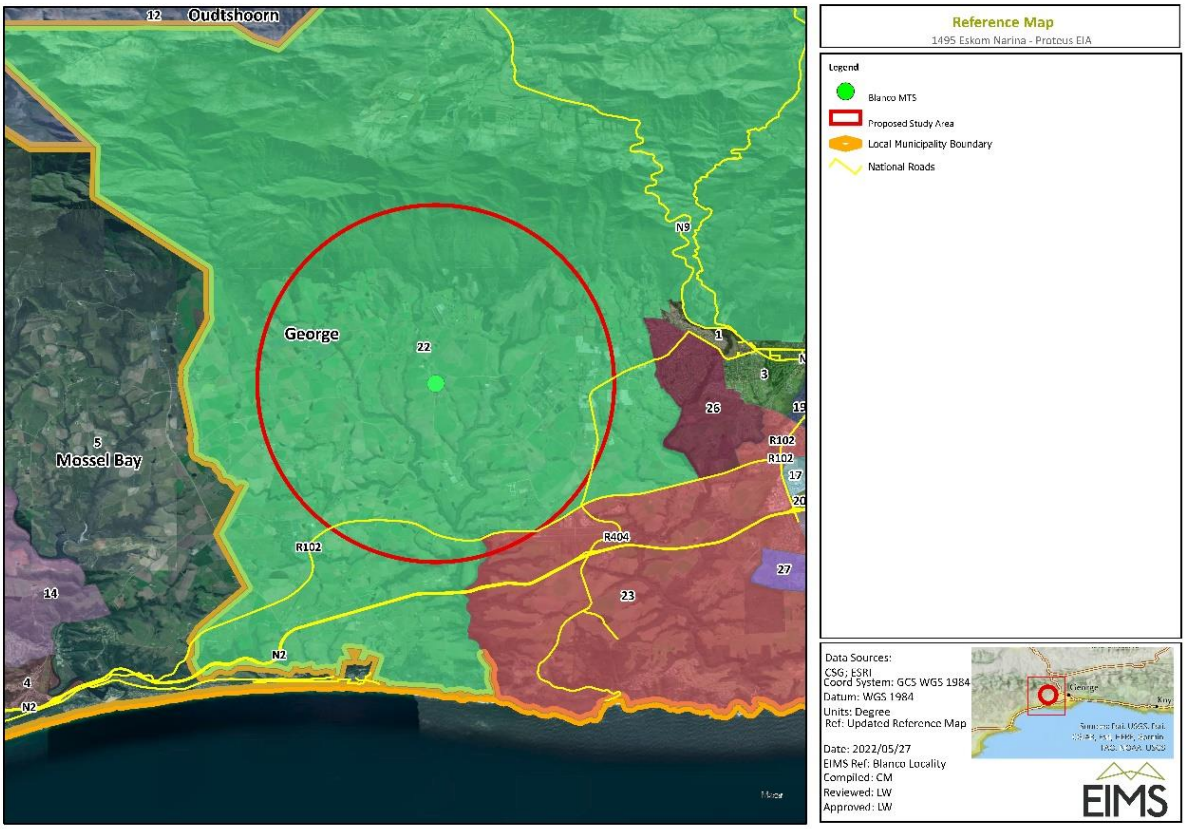

Figure 14: Location of the Blanco study area in relation to Municipal Wards.

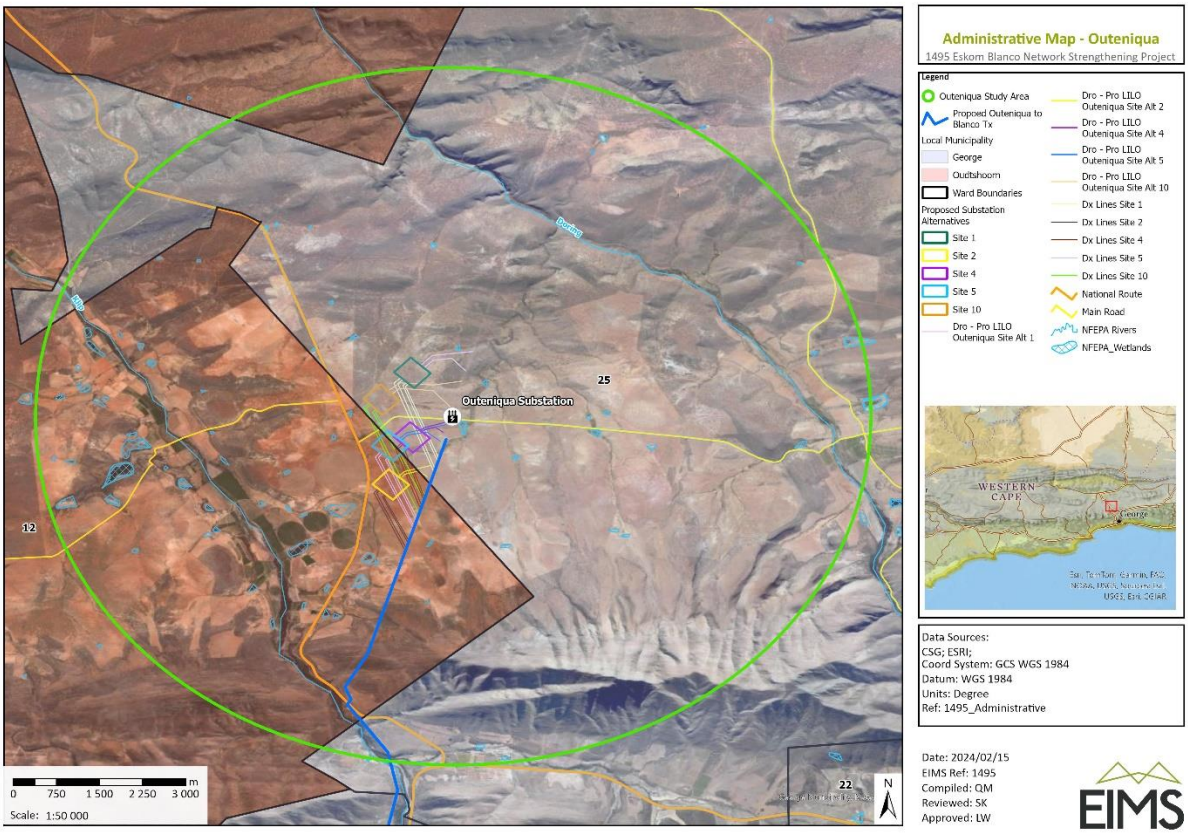

Figure 15: Location of the Outeniqua study area in relation to Municipal Wards.

10.4.2 GARDEN ROUTE DISTRICT MUNICIPALITY

The Garden Route District Municipality (GRDM) is situated in the south-eastern part of the Western Cape and GRDM covers an area of approximately 23 331km². It shares borders with four other district municipalities that include the Central Karoo to the North, Cape Winelands and Overberg to the West, and the Cacadu to the East. Apart from this, the municipality comprises of seven local municipalities, all which fall within the boundaries of Garden Route District municipality. Local Government institutions within the boundaries of Garden Route District Municipality, include Bitou, Knysna, George, Mossel Bay, Hessequa, Kannaland and Oudtshoorn municipalities (www.gardenroute.gov.za).

10.4.3 GEORGE LOCAL MUNICIPALITY

The George Local Municipality (GLM) is the third largest municipality, in terms of population, in the Western Cape Province. The municipality serves 294 929 people from 85 931 households (Statistics SA 2023) across 28 wards including Uniondale and Wilderness – with service hinterlands geographically separated from the main city area George. Small rural or tourism settlements include Haarlem, Waboomskraal, Uniondale, Touwsranten, Hoekwil – and various hamlets and rural places like Avontuur, De Vlugt, Herold and Noll. Coastal areas include Herold's Bay, Victoria Bay, Wilderness, Kleinkrantz, and Gwaing. The municipal area is 5191km² and spans the Southern Cape and Little Karoo regions of the Western Cape Province. The area administered by the George Municipality forms part of the larger Garden Route District Municipality's jurisdictional area (www.george.gov.za).

10.4.4 OUDTSHOORN LOCAL MUNICIPALITY

The Oudtshoorn Local Municipality (OLM) lies within the boundaries of the Eden District Municipality in the Western Cape Province. Since 5 December 2000, the Oudtshoorn municipal area includes the larger settlements of Oudtshoorn, Dysselsdorp, and De Rust, and the smaller rural settlements of Volmoed, Schoemanshoek, Spieskamp, Vlakteplaas, Grootkraal, De Hoop, and Matjiesrivier. The Greater Oudtshoorn area is nestled at the

foot of the Swartberg mountains in the heart of the Little Karoo region of the Western Cape. According to Census 2011, Oudtshoorn Local Municipality has a total population of 95 933 (www.statssa.co.za).

10.4.5 DESCRIPTION OF THE POPULATION

The baseline description of the population will take place on three levels, namely provincial, district and local. Impacts can only truly be comprehended by understanding the differences and similarities between the different levels. The baseline description will focus on the George Local Municipality and the Oudtshoorn Local Municipality in the Garden Route District Municipality in the Western Cape Province, as these are the areas that will be most affected by the proposed project. Where possible, the data will be reviewed on a ward level – Ward 22 of the George LM and Ward 12 & 25 of the Oudtshoorn LM. The data used for the socio-economic description was sourced from Stats SA, Census 2011 and 2016.

The following points regarding Census 2011 must be kept in mind (www.statssa.co.za):

- Comparisons of the results of labour market indicators in the post-apartheid population censuses over time have been a cause for concern. Improvements to key questions over the years mean that the labour market outcomes based on the post-apartheid censuses must be analysed with caution. The differences in the results over the years may be partly attributable to improvements in the questionnaire since 1996 rather than to actual developments in the labour market. The numbers published for the 1996, 2001, and 2011 censuses are therefore not comparable over time and are different from those published by Statistics South Africa in the surveys designed specifically for capturing official labour market results.
- For purposes of comparison over the period 1996–2011, certain categories of answers to questions in the censuses of 1996, 2001 and 2011, have either been merged or separated.
- The tenure status question for 1996 has been dropped since the question asked was totally unrelated to that asked thereafter. Comparisons for 2001 and 2011 do however remain.
- All household variables are controlled for housing units only and hence exclude all collective living arrangements as well as transient populations.
- When making comparisons of any indicator it must be considered that the time period between the first two censuses is five years and that between the second and third census is ten years. Although Census captures information at one given point in time, the period available for an indicator to change is different.

10.4.6 DEMOGRAPHIC PROFILE

According to the Community Survey 2016, the population of South Africa is approximately 55,7 million and has shown an increase of about 7.5% since 2011. The household density for the country is estimated on approximately 3.29 people per household, indicating an average household size of 3-4 people (leaning towards 3) for most households, which is down from the 2011 average household size of 3.58 people per household. Smaller household sizes are in general associated with higher levels of urbanisation.

The Blanco project area is characterised by low population densities with only 21 people recorded per square kilometre in Ward 22 of GLM; compared to the national average of 45 people and the average of 40 people in GLM in general (Stats SA, 2011 and 2016). Based on municipal population growth rates, close to 9,000 people could have resided in Ward 22 of GLM in 2016. As indicated by the relatively low portion of females and the high percentage of people in their economically productive years (18-64 years) in Table 9 below, GLM and the project area could have experienced historic high rates of influx of migrants attracting to job opportunities in the local area. Between 2011 and 2016 population growth rates appear to have normalised and were on par with national population growth rates.

The Outeniqua project area is characterised by much lower densities of between 3 people per square km (GLM Ward 25) and 8 people (OLM Ward 12). The lower portions of the population falling in the labour force in these two wards could also suggest to some out-migration from the local area.

Table 9: Basic Demographics of the Local Area, 2011 and 2016

AREA	Population	Population growth	Households	Household growth	Average house-hold size	% Females	% Pop aged 18-64
	2016	2011-2016	2016	2011-2016	2016	2016	2016
GLM Ward 22	8,940	-	3,020	-	3,2	49,9%	61,3%
George LM	208,238	1,5%	62,723	2,4%	3,3	50,6%	60,6%
GLM Ward 25	9,330	-	2,730	-	3,9	50,6%	59,2%
OLM Ward 12	6,560	-	1,410	-	4,7	50,2%	55,8%
Oudtshoorn LM	97,509	0,3%	23,363	0,8%	4,2	52,0%	57,3%
Western Cape	6,279,731	1,5%	1,933,878	2,6%	3,2	50,7%	61,5%
South Africa	55,653,654	1.5%	16,923,309	2.4%	3.3	51.0%	57,2%

Source: Stats SA (2011 and 2016). Ward information was based on municipal trends between 2011 and 2016

In both project areas, as is the case nationally, households grew at a much higher rate than the population due to the splitting off of households into smaller units. This, in turn, place an additional pressure on the municipality to keep pace with municipal service delivery and eradicate backlogs.

10.4.7 HEALTH

Tuberculosis TB levels in GLM and OLM are significantly higher than national averages. While Antiretroviral Treatment (ART) patients per capita is fairly high in GLM, they are far below the national average in OLM, signifying that OLM patients with HIV/AIDS could be under-treated or receiving treatment outside OLM. In terms of public healthcare facilities, the George municipal area had 14 primary healthcare clinics (PHC) in 2019, slightly more at 6,6 clinics per 100 000 people compared to the national average of 6 clinics per 100 000 people. While OLM has a higher per capita ratio of PHCs, there is a lack of Community Health Care Centres (CHC) (operating longer hours and providing more services than PHC clinics) in GLM and OLM. Table 10 shows than George LM and Oudtshoorn LM have a relative high ratio of ambulances per 10 000 people compared to the national ratio.

Table 10: Basic Health Indicators, 2019

Indicator	George LM	Oudtshoorn LM	South Africa
PHC Clinics / 100 000 persons	6,6	8,2	6,0
CHC facilities as % of PHC clinics	14%	0%	25%
Ambulances per 10 000 people	2,2	2,0	0,4
HIV/AIDS ART patients per 100 000 people	9,469	1,999	8,475
TB cases per 100 000 people	786	988	350

Source: Western Cape Government (2019 and 2021)

On a tertiary healthcare level there is a district hospital, a regional hospital as well as 6 antiretroviral treatment clinics/ treatment sites and 22 tuberculosis clinics/ treatment sites. The tertiary health centres (hospitals) serve the larger region and not only George LM. The population residing in both project areas would use tertiary healthcare facilities in the larger George area.

10.4.8 EDUCATION PROFILE AND WORKFORCE SKILLS LEVELS

Table 11 below shows the relatively high contribution that medium / semi-skilled workers make to the total workforce of GLM and OLM compared to provincial and national averages. The skilled component of the workforce of GLM and OLM is however lower than the national and especially the provincial average. In the Blanco area, the skilled workforce in Ward 22 of GLM is however significantly above the national and GLM averages while, at the same time, also having a relatively high portion of unskilled workers. In the Outeniqua area there is a large portion of the workforce that would fall in the unskilled category in GLM Ward 25 and OLM Ward 12 while only between 2% and 4% of the workforce could be considered as skilled.

Table 11: Education levels of the Adult Population, 20 years plus, 2016.

Education level	Less than Secondary Education (unskilled)	Completed Secondary Education (semi-skilled)	Tertiary Education (Skilled)	Total
GLM Ward 22	54%	37%	9%	100%
George LM	54%	38%	8%	100%
GLM Ward 25	72%	26%	2%	100%
OLM Ward 12	73%	23%	4%	100%
Oudtshoorn LM	58%	37%	6%	100%
Western Cape	54%	36%	10%	100%
South Africa	56%	36%	8%	100%

Source: Stats SA (2011 and 2016). Ward information was based on municipal trends between 2011 and 2016

In 2018, the learner-teacher ratio in GLM was at 21,1 leaners per teacher below the national average of 24,9 learners per teacher, indicating to a sufficient number of teachers in the municipal area. However, in general, GLM and OLM could experience a lack of school infrastructure compared to national averages. In 2018, the average number of primary schools in the GLM was 1,5 per 10 000 people compared to the national average of 3,8 per 10,000 people. Similarly, there were less than 1 secondary school per 10,000 people in the municipal area compared 3,3 secondary schools per 10,000 people nationally (Municipal Demarcation Board, 2018).

George's matric pass rate decreased slightly from 80% in 2018 to 78% in 2020 however still above the national pass rate of 76% in 2020. OLM's matric pass rate also showed a decline since 2018 from 82% in 2018 to 78% in 2020 (Western Cape Government, 2021).

In the Blanco project area, there are 2 primary schools in the direct vicinity of the project site. Children in the project area largely attend secondary schools in the vicinity of George central town since there are no secondary schools in the project area. In the Outeniqua project area, there is 1 primary school (Klipdrift) but no secondary schools and children would attend secondary schools in George, Oudtshoorn or elsewhere.

In contrast to the situation with schools, there are a relatively large number of tertiary educational institutions in the municipal area compared to the municipal population 0,8 per 10,000 people compared to 0,03 nationally. It should however be kept in mind that GLM serves the larger region in terms of tertiary educational facilities.

10.4.9 BASIC MUNICIPAL SERVICE DELIVERY

Despite the relatively high incidence of informal housing in GLM, basic service delivery in terms of piped water inside the house; improved sanitation, access to electricity and regular waste removal services are higher than national averages.

As indicated in Table 12 below, regular access to waste removal services is lower in Ward 22 where the project is located since it is a rural ward that on the main is not serviced by municipal waste removal services. Access to improved sanitation is also lower than the municipal and provincial averages. Most of the households in the Geelhoutboom area are however staying in formal houses with most of the informal settlements in the lower income areas south of the N2 (Stats SA, 2011).

Despite lower in-migration rates the wards in the Outeniqua study area have a slightly higher prevalence of households in informal households. This could be due to more former farm workers being evicted from farms, especially in OLM ward 12. In both municipal areas (GLM Ward 25 and OLM Ward 12) other municipality service delivery levels are comparable and even slightly better than in GLM Ward 22. In general, however, OLM have larger municipal service delivery backlogs than GLM despite lower household growth in the area.

Table 12: Access of Households to Basic Services, 2011 and 2016

Category	GLM Ward 22	GLM	GLM Ward 25	OLM Ward 12	OLM	WC	RSA
Informal houses (shacks), 2016	-	15%	-	-	8%	17%	13%
Informal houses (shacks), 2011	2%	14%	5%	12%	10%	17%	13%
Piped water inside the house 2016	-	75%	-	-	83%	81%	42%
Access to improved sanitation, 2011	71%	95%	80%	73%	84%	97%	63%
Electricity backlogs, 2016	-	1%	-	-	5%	2%	7%
Regular waste removal services, 2016	-	94%	-	-	89%	89%	57%
Regular waste removal services, 2011	25%	87%	50%	41%	76%	89%	59%

Source: Stats SA (2011 and 2016)

10.4.10 COMMUNITY SAFETY

In 2019/20 some 9,536 crime cases were reported in GLM, the majority 54% reported in the George precinct; 25% reported in Thembelethu precinct and 21% in Pacaltsdorp precinct. As is the case nationally, reported crimes in the area declined slightly since 2011. The per capita crime rates in GLM were higher than national per capita crime rates as indicated in Table 6 below (SAPS, 2020).

Table 13: Crime Statistics, 2019

AREA	George LM	Oudtshoorn LM	South Africa
Per Capita Crime Rate (2019) per 1000 people	44	50	36
Increase in Reported Crimes (2011-2019) (average per annum)	-0,2%	0,3%	-0,6%

Source: SAPS (2020) and George LM (2021)

In GLM contact crimes (crimes against the person) made the highest contribution of 29% towards reported crimes in 2019, slightly lower than its 32% national contribution. Property-related crimes made the second highest contribution towards reported crimes in GLM in 2019 namely 25% compared to 24% nationally. Crimes related to drug/alcohol abuse contributed 15% towards total reported crimes, slightly higher than its 14% contribution nationally (SAPS, 2020).

Limited violent civil protest actions were recorded in GLM the past few years. The last major recorded action was in 2018 in Thembeluthu when inhabitants of Thembalethu burnt tyres in section of the N2 in protest of lack of housing, electricity, and other basic municipal services (News24, 2018). In 2022 a smaller protest broke out

between local taxi drivers who claimed they have not been consulted in the roll-out of the new integrated public transport ('Go George') system (EWN, 2022).

The per capita crime rate was higher in OLM than in GLM and nationally. There was furthermore a slight increase in reported crimes, since 2011, compared to the decline nationally and in GLM. Contact crimes made the highest contribution (41%) while drug/alcohol related crimes contributed close to 26% to crimes reported, much higher than in GLM and nationally.

10.4.11 THE STRUCTURE OF THE LOCAL ECONOMY

In 2018, the economy of GLM was valued at R17.9 billion (current prices), employing around 83 000 people. The economy grew at an average annual real rate of 1.9 % between 2014 and 2018 mostly to be attributed to the positive annual growth rate of 2.4 % achieved by the tertiary sector (George LM, 2021).

In 2019, the OLM economy was valued at 5,9 billion (current prices), employing close to 30,200 people in 2019. The economy grew at an average annual real rate of 1.0 % between 2015 and 2019 mostly to be attributed to the positive annual growth rate of 4 % achieved by the finance sector. The manufacturing sector also showed strong growth of 1,7% per annum in this period (Western Cape Government, 2021). The main economic sectors in terms of output and employment output in both municipal areas are listed in Table 14 below.

Table 14: Sector contribution to output (GVA) and employment, 2018

Sectors	GVA	Employment	GVA	Employment
	% share in GLM	% share in GLM	% share in OLM	% share in OLM
Agriculture & Forestry	3,7%	9,8%	4,7%	13,9%
Mining	0,2%	0,0%	0,1%	0,0%
Total Primary	**3,8%**	**9,8%**	**4,8%**	**13,9%**
Manufacturing	15,0%	9,5%	18,7%	11,8%
Electricity	3,4%	0,4%	5,7%	0,6%
Construction	5,5%	6,0%	4,7%	4,7%
Total Secondary	**23,9%**	**16,0%**	**29,1%**	**17,1%**
Trade and accommodation	18,5%	25,5%	17,3%	23,1%
Transport	11,6%	4,9%	7,6%	3,4%
Finance	26,9%	20,8%	19,6%	13,9%
Services	15,4%	22,9%	21,7%	28,5%
Total Tertiary	**72,3%**	**74,2%**	**66,1%**	**68,9%**
Total	**100,0%**	**100,0%**	**100,0%**	**100,0%**

Source: George LM (2021) and Western Cape Government (2021)

As indicated in Table 14 above, the tertiary sector plays a major role in GLM. As regional service centre the Greater George urban area is the economic hub of the municipal economy, with substantial service, commercial

and light industrial sectors. The town and surrounding area are also well-known for its world-class golf courses, including Fancourt (close to Blanco), George Golf Course and Oubaai. Other key George tourism assets are linked to the areas scenic natural and agricultural landscapes, its location along the Garden Route, Tsitsikamma National Park and coastal area (George LM, 2021).

The services, financial and trade sectors (tertiary economy) are mainly concentrated in a triangle of opportunity comprising of the existing CBD Business node, the emerging Kraaibosch / Blue Mountain Commercial Node, and the Pacaltsdorp Industrial Node south of the N2. The N2 forms a major barrier between poorer neighbourhoods in the south and better resourced neighbourhoods in the north (George LM, 2019).

The role of the Agriculture, Forestry and fishing sector declined from around 13% to total GVA in 1995 to only 4% in 2018. Despite its declining share, the sector in GLM still contributes more to the local economy than its share nationally. About 12% of the land in GLM is used for Agriculture, the larger portion (80%) dryland agriculture. The agricultural sector furthermore plays a potentially important role due to its links to the manufacturing sector (agro-processing). A strong existing dairy cluster could be developed further against the increased importance of the Southern Cape in South Africa's dairy production. In recent years new agricultural products emerged in the local area (e.g. avocados and macadamia nuts). Many of the niche agricultural products are grown in the Geelhoutboom area (George LM, 2021).

The agricultural sector furthermore plays an important role in the local tourism sector. The Outeniqua Tourism Association (OTA) currently promotes a number of routes, among which the Outeniqua Country Hop Route (including the Geelhoutboom area). These include strawberry and herb farms, cheese and candle making, strawberry picking and horse riding. The intention is to create a Route through the municipal region that is based on the successful Midlands Meander in the KZN Midlands (George LM, 2021).

As indicated in Table 14 above, while the tertiary sector also dominates the OLM economy, the primary and secondary sectors play a relatively larger role than on GLM. The large role of the service sector also shows the large role played by the government sector and other services in the local economy.

10.4.12 ROAD INFRASTRUCTURE

The provincial paved network in the Garden Route in general has good coverage, but the gravel network is in a poorer condition. There is furthermore a critical shortage of capital for road rehabilitation and maintenance (Garden Route District Municipality, 2022).

As indicated in Table 15 below, the larger percentage of roads within George LM is paved while only 19% is unpaved. More than half (52%) of the road infrastructure is situated in George central town. The majority of gravel roads in GLM are situated in Thembalethu, Wilderness, the rural areas (including Geelhoutboom) and Uniondale. The roads adjacent to all five identified sites are gravel roads. Site 1 is the closest to a paved road (Geelhoutboom road).

Table 15: George LM Road Length by Surface Type

AREA	km length of road	% gravel
Total GLM	481	19,1%
George (central town)	252	1,2%
Pacaltsdorp	52	7,7%
Thembalethu	66	47,0%
Wilderness	48	50,0%
Uniondale	21	57,1%

AREA	km length of road	% gravel
Rural areas (including Geelhoutboom)	42	43,6%

Source: George LM (2021)

Apart from the municipal road infrastructure, GLM has two national roads that transverse the area, namely the coastal N2 that splits GLM into a northern and southern section and links it to the City of Cape Town. The R404, a provincial road, links the airport to Blanco and traverse the eastern border of the Blanco project area.

The scenic N12/N9/R64 passes through the Outeniqua pass and links GLM to Oudtshoorn and Gauteng and traverses the Outeniqua project area. According to the George IDP (2021) the road maintenance budget of the municipality is well above the recommended 2,5% asset value (George LM, 2021).

10.4.13 ENERGY INFRASTRUCTURE

Approximately 100 % of formally surveyed erven in the George LM electricity licenced areas, have access to grid-based electricity. New housing developments and unserved informal erven pose a challenge in terms of future electricity supply. There are, for example, almost 5 000 informal houses in Thembalethu without electricity (George LM, 2021).

Eskom have indicated that there is a need to up-grade the existing power supply and distribution network in the area in order to meet the energy needs associated with future economic growth and development in the Southern Cape region. Apart from the current project, a new Main Intake Substation (66/11 kV) is also due for construction in Thembalethu over the next 4 financial years (George LM, 2021).

The above inflation increases in Bulk Supply (Eskom) tariffs coupled with load shedding, has necessitated George LM to explore alternative energy sources. Various existing exercises such as a Request for Proposals aimed at possible energy investments by Independent Power Producers (IPP's) and a research project done by the CSIR on behalf of George LM, to determine the ideal energy mix for George, will be concluded in the 2019/20 financial year (bid).

10.4.14 WATER INFRASTRUCTURE

George Municipality is a Water Services Authority (WSA) in terms of the Water Services Act 108 of 1997. In 2019 the municipality received a Blue Drop and Green Drop rating of 83% and 85% respectively indicating a fair performance in terms of drinking water quality and the latter to final treated effluent quality (George LM, 2021).

The Garden Route Dam (fed by the Swart and Kat Rivers) are the main source of raw water for GLM. The supply of raw water is constantly under threat especially during summer months and the Western Cape Spatial Development Framework (2020 amendment) highlights the Garden Route area as a water scarce area within the Western Province.

The aging infrastructure poses significant risks and are manifested in the regular service delivery interruption caused by infrastructure failures in the form of water pipe bursts, sewerage blockages, pothole formation etc. The growing numbers of indigent households can be seen as impediment to the funding of critical and strategic infrastructure (George LM, 2021).

According to the George IDP (2021) the water infrastructure maintenance budget of the municipality is well above the recommended 2,5% asset value. The departments responsible for water infrastructure operations and maintenance however experiences chronic personnel shortages the past few years with a vacancy rate of almost 50% with a large portion of the services delivered by external contracted service providers (George LM, 2021).

According to the Garden Route District IDP (2022) the district in general has limited water resources and options for future growth. To address this, increased water conservation and demand management are urgent. The sanitation infrastructure priority is to rehabilitate and upgrade infrastructure assets. However, most municipalities (including OLM) experience a chronic shortage of capital for water and sanitation projects.

10.4.15 THE LOCAL LABOUR FORCE

In 2011 the majority of the labour force in GLM was employed in the formal economy (63%) with close to the 80% of the labour force in Ward 22 (Blanco project area) employed in the formal economy (Stats SA, 2011). This ratio is significantly higher than the national ratio of formal employment in 2011 of 53%. As a consequence, the unemployment rate is much lower in GLM compared to the national economy with unemployment rates of 14% recorded in 2011 and 2019 compared to national rates as indicated in Table 16 below. The unemployment rates are still much lower in Ward 22 of GLM.

The Outeniqua project area is characterised by much higher unemployment rates in OLM Ward 12. While GLM Ward 25 reported much lower unemployment rates than the GLM and national averages in 2011, unemployment rates in this ward were still higher than in GLM Ward 22 of of the Blanco Project area. In addition, a much lower portion of the employed in GLM Ward 25 was employed in the formal economy, i.e. 68% compared to the 80% in GLM Ward 22.

Table 16: Unemployment (official) rates, 2011 and 2019

AREA	2011	2019
George Ward 22	4,6%	-
George LM	14,5%	14,7%
GLM Ward 25	10,1%	-
OLM Ward 12	28,3%	-
Oudtshoorn LM	25,3%	25,0%
Western Cape	21,2%	20,9%
South Africa	23,8%	29,1%

Source: Based on Stats SA (2011, 2019) and Western Cape Government (2021)

10.4.16 INCOME AND POVERTY LEVELS

With unemployment rates being the major determinant of poverty rates, it follows that poverty rates in Ward 22 are below average for GLM as well as provincial and national averages as indicated in Table 17 below. With lower skill levels, lower employment in the formal economy and higher unemployment rates, poverty rates were also much higher in the OLM Wards 12 & 25 when compared to those in the ward area GLM Ward 22.

Table 17: Poverty Rates, 2011 (households below the lower bound poverty level)

AREA	Poverty rate (% of households below the LPL level)
George Ward 22	23,4%
George LM	32,8%
GLM Ward 25	31,7%
OLM Ward 12	42,9%
Oudtshoorn LM	44,6%

AREA	Poverty rate (% of households below the LPL level)
Western Cape	32,4%
South Africa	44,5%

Source: Stats SA (2011) Note: LPL = the lower bound poverty line that makes full provision for all basic needs including food, clothing, shelter and basic education, roughly less than R500 per person per month in 2011.

10.4.17 LOCAL PROPERTY PRICES

The Blanco project area is in general characterised by very high value agricultural land varying between R200 000 and R450 000 per hectare, with averages around R230 000 (based on property reports of the area). Based on interviews with property agents in the local area, the agricultural properties across Geelhoutboom are more or less the same with properties closer to the Outeniqua mountain possibly selling at slightly higher premiums because of views and greater access to water. According to the local property owners, proximity to power lines or substations are unlikely to influence the premium property prices in the Geelhoutboom area much. There is however a minority view that a new and larger substation could have some effect on the value of adjacent properties especially in Greenfields areas.

While farm prices are influenced by a host of factors (e.g. availability of water, energy, ploughed fields, accessibility, distance from social amenities) the average value of land on the northern side of the Outeniqua mountains (Outeniqua project area) is expected to be much lower than in the Geelhoutboom area. Since there are too many unknown variables that can influence the land prices of the different sites, it is assumed that the price of property within the project area would be fairly homogenous.

10.4.18 LOCAL DEVELOPMENT PRIORITIES

The most important local development priorities relevant to the local area are summarised below.

The Western Cape Provincial Spatial Development Framework (PSDF) (2020 amended) spatial objectives include:

- **Growing the Western Cape economy:** A relevant sub-directive is securing the agricultural economy and the vulnerability of farm workers and diversifying rural livelihood and income earning opportunities.
- **Using infrastructure investment as primary lever to bring about the required urban and rural spatial transitions**
- **Improving oversight of the sustainable use of the Western Cape's spatial assets:** A relevant directive being to safeguard the Western Cape's unique cultural, scenic and coastal resources, on which the tourism economy depends. The 2019 PSDF furthermore notes the vital importance of tourism to the Provincial economy. It further notes that scenic routes (such as the N2) and the adjacent countryside are memorable gateways to the Garden Route; that urban development has already substantially detracted from its visual quality, and that no further deterioration should therefore be permitted. The following policy directive is applicable (Western Cape Spatial Development Framework, 2009): *HR26 (…) transmission lines (…) should be aligned along existing and proposed transport corridors rather than along point-to-point cross-country routes* (Mandatory directive)

The PSDF notes that the shortest-distance approach to the alignment of transmission lines raises issues of visual blight, unviable shaped land parcels, need for access roads and destruction of cultural landscapes. Where possible, future power lines should be aligned within existing and proposed combined road and/or rail linkage corridors that impact on the remainder of the landscape, especially if such alignment will not impact on cultural and scenic landscapes. Care should also be taken to avoid bird migration routes (Barbour, 2014)

The Integrated Development Plan (IDP) of the Garden Route District Municipality (2022) focuses on the following priorities:

- Growing and inclusive district economy with a focus on the agriculture, film and tourism sectors.
- Bulk infrastructure development and coordination including a focus on water augmentation and road maintenance renewable and locally generated energy.
- Sustainable environmental management (e.g. green energy, biodiversity).
- Skills development.

The George LM Integrated Development Plan for 2021/22 (George LM 2021) highlights the following relevant strategic objectives for the local area:

- **Develop & grow George with relevant objectives including:**
    - Preserving the natural and agrarian assets of the municipal area for food security; the tourism and agricultural sectors (including the assets of the Geelhoutboom area).
    - Job creation through the Expanded Public Works Programme (EPWP) with a specific focus on communities with lower income levels (mainly located south of the N2).
    - Safeguarding natural and agrarian assets against development pressures.
- **Provide affordable quality services (bulk infrastructure).**
- **Provide and deliver rural infrastructure and services for electricity with relevant objective including:**
    - Maintenance and upgrading that sustain and improve the current condition of electrical infrastructure.
    - Ensure sufficient electricity capacity for planned developments (built environment) that are feasible.
    - Generate alternative energy.

The Oudtshoorn IDP (2020) acknowledges the agricultural and resource base of the Oudtshoorn economy. It furthermore acknowledges the diverse landscapes that underpin the tourism economy of the municipality, with scenic routes and passes being the R62, the R328, and the Swartberg and Meiringspoort passes. Landscapes of significance include inter alia the northern foothills of the Outeniquaberg where the Outeniqua study area is situated.

10.5 CULTURAL AND HERITAGE RESOURCES

The baseline Heritage and Palaeontology inputs were provided by Wouter Fourie from PGS Heritage. Detailed specialist reports will be completed and used to inform the EIA level phase of the study. The specialist report will contain a detailed writeup of the historical and archaeological overview of the local and regional environment.

Based on the historical and archaeological overview, the previous assessments undertaken in the area as well as the desktop work undertaken as part of this application (above mentioned specialist study), the heritage assessment findings are summarised below:

- No pre-colonial archaeological heritage could be identified during the scoping phase for both areas of study.
- No visible graves could be identified in the proposed site alternatives during the scoping phase for both areas.
- There are 2 structures identified in the footprint area of the proposed site 2 substation alternative for the Blanco area.
- Several farmsteads and structures are identified in the footprint area of the proposed transmission powerline corridor alternatives for the Blanco area.

- The Cultural Landscape component of the Outeniqua sites indicates that sites 1 and 4 are more preferred from a heritage perspective.

Objects depicted in the heritage sensitivity map include structures and farmsteads (Figure 16 and Figure 17). Observation of the previous heritage reports has shown that graves are in abundance near farmsteads. This factor needs to be held in consideration regarding any of the alternatives. Several Archaeological Impact Assessments in the broader area of George indicate that generally, archaeological traces of Stone Age origin occur in low densities and are very thinly and randomly dispersed over the surrounding landscape (Kaplan, 2009). A Heritage Impact Assessment (HIA) must be conducted during the EIA phase for the preferred site alternative and transmission powerline corridors to confirm or refute heritage resources' existence.

According to the Palaeosensitivity Map available on the South African Heritage Resources Information System database (SAHRIS), the Palaeontological Sensitivity of the proposed Blanco study area is mostly rated as Insignificant/Zero (grey) and low (blue) (Figure 18). No further palaeontological studies are required in terms of the Blanco substation area however field-based assessments will be required for the Outeniqua substation alternatives in the EIA phase. If the alternative transmission powerline corridor is chosen, then a protocol for finds would be required for the low sensitivity areas.

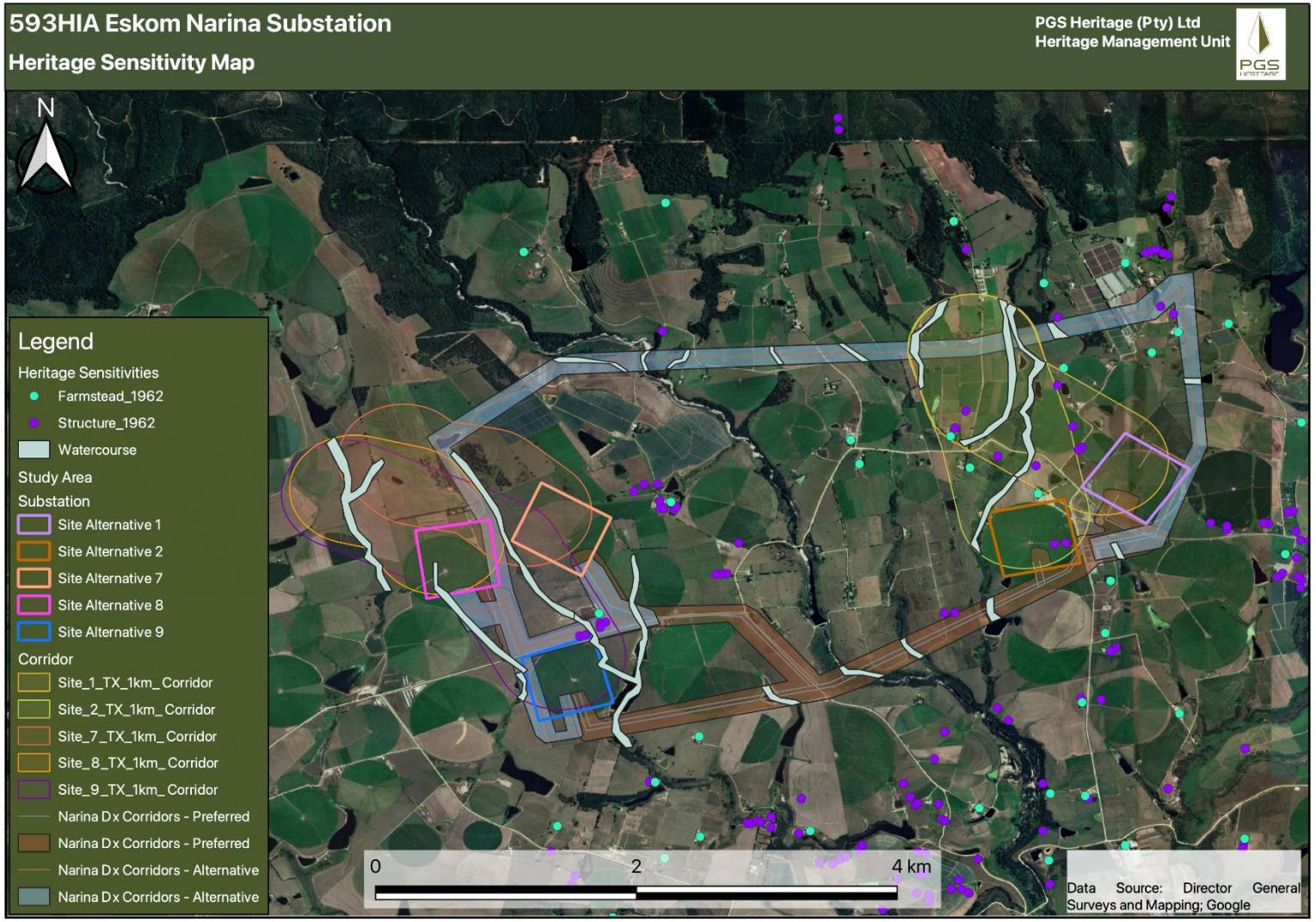

Figure 16: Heritage Sensitivity Map indicating possible sensitive areas within and adjacent to the Blanco study area.

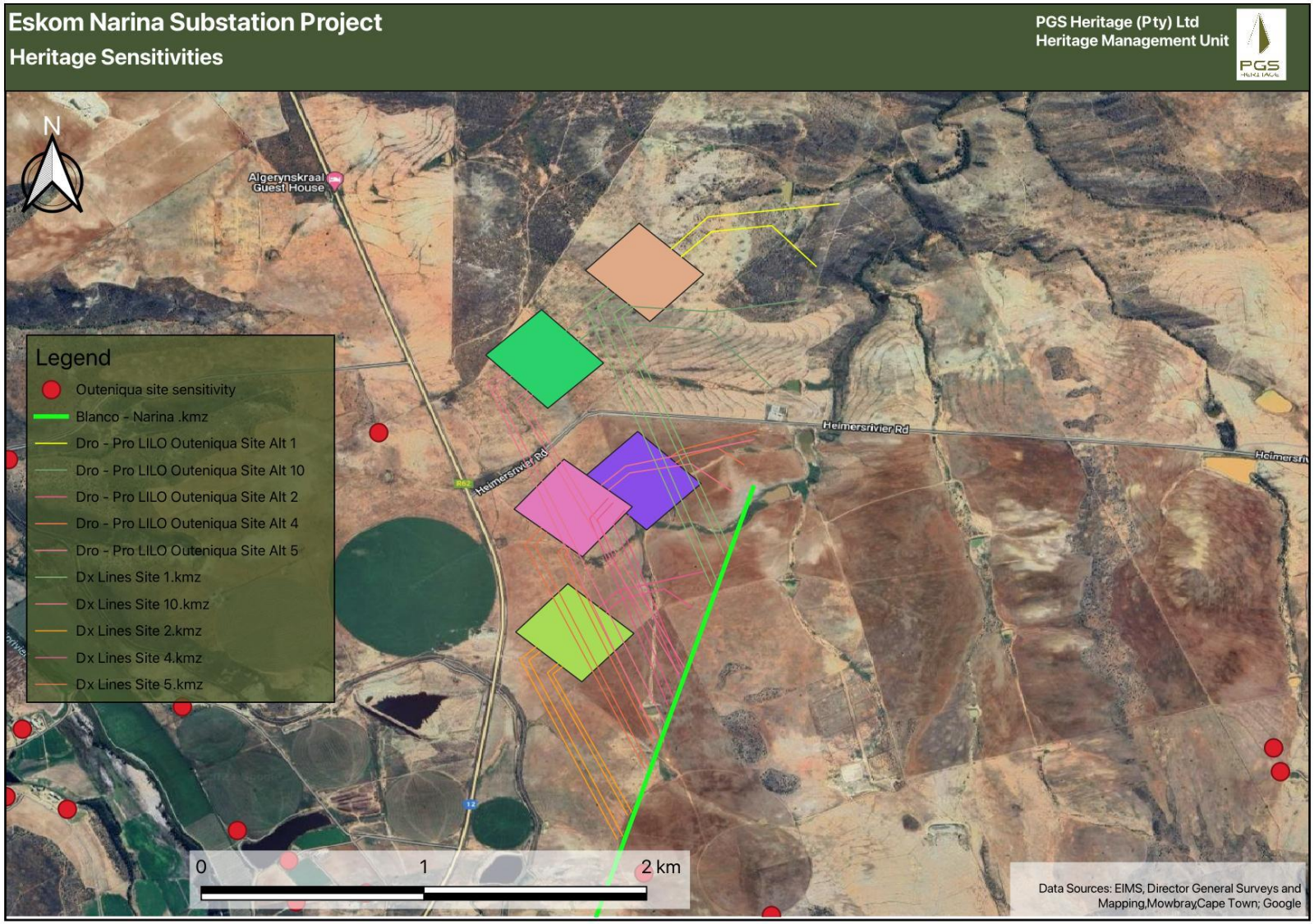

Figure 17: Heritage Sensitivity Map indicating possible sensitive areas within and adjacent to the Outeniqua study area.

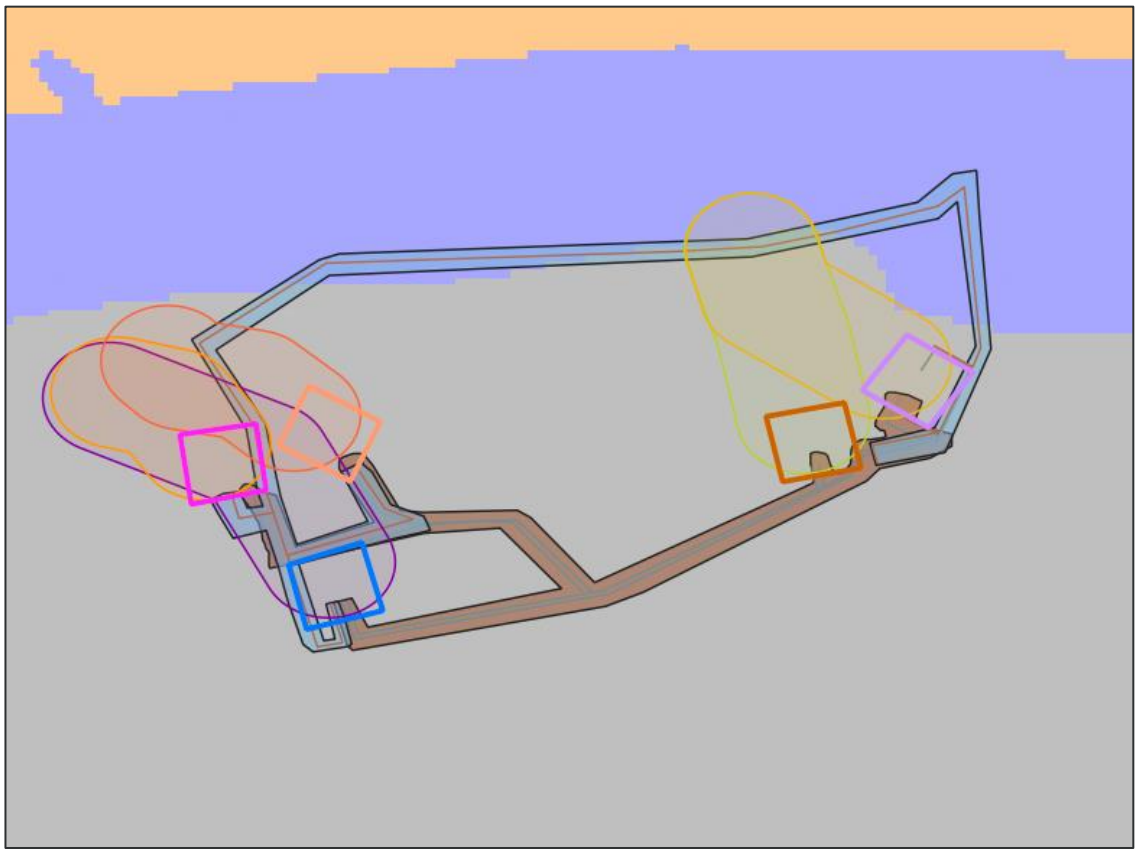

Figure 18: Extract of the 1: 250 000 SAHRIS Palaeosensitivity Map (Council of Geosciences), overlain with the location of the Blanco study area.

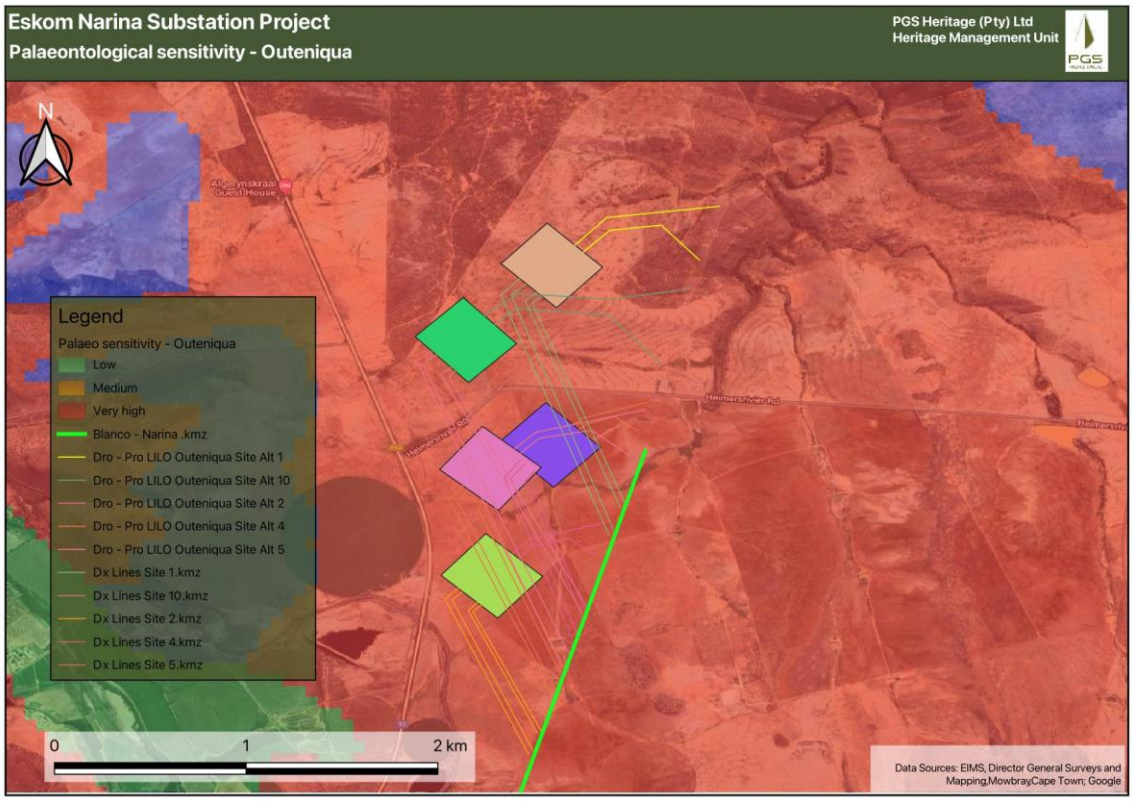

Figure 19: Extract of the 1: 250 000 SAHRIS Palaeosensitivity Map (Council of Geosciences) overlain with the location of the Outeniqua study area.

Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 20: Key to the SAHRIS palaeontological map.

10.6 GEOLOGY

The Regional Geology is extracted from the 1:250 000 Oudtshoorn Map (Figure 21 and Figure 22). The underlying geology of the Blanco area comprises of andalusite schist of the Saasveld Member of the Kaaimans Formation, gneissic granite of the Maalgaten Granite Suite, and quartz sandstone of the Penisula Formation of the Nardouw Sub-Group of the Table Mountain Group of the Cape Supergroup. The underlying geology of the Outeniqua area comprises of sandstone, feldspathic sandstone minor shale and greywacke rocks of the Bokkeveld Group and Table Mountain Group of the Cape Supergroup (Toerien and Roby, 1979).

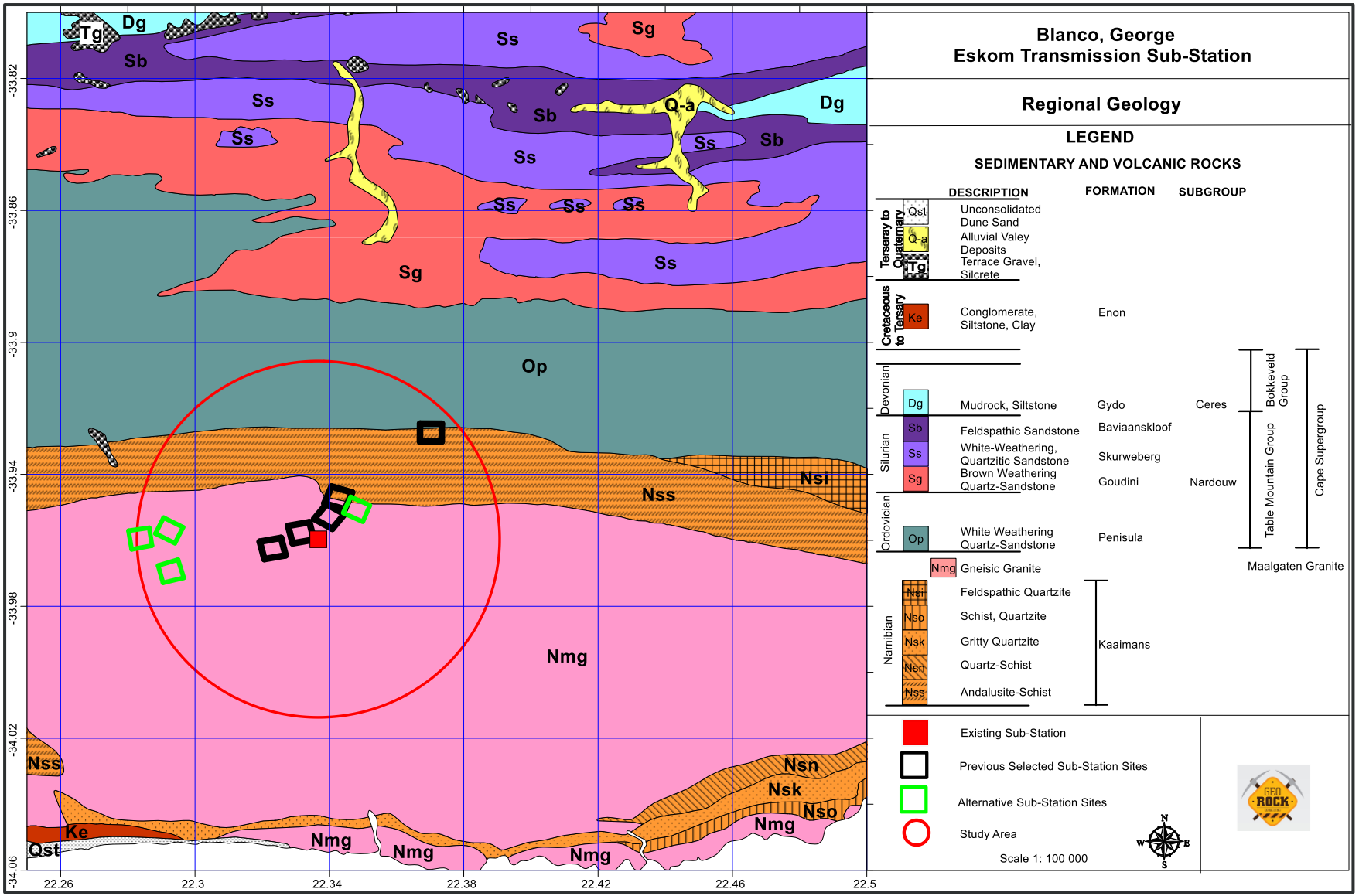

Figure 21: Regional Geological map extracted from 1:250 000 3322 Oudtshoorn map, 1979, Geological Survey, Toerien and Roby.

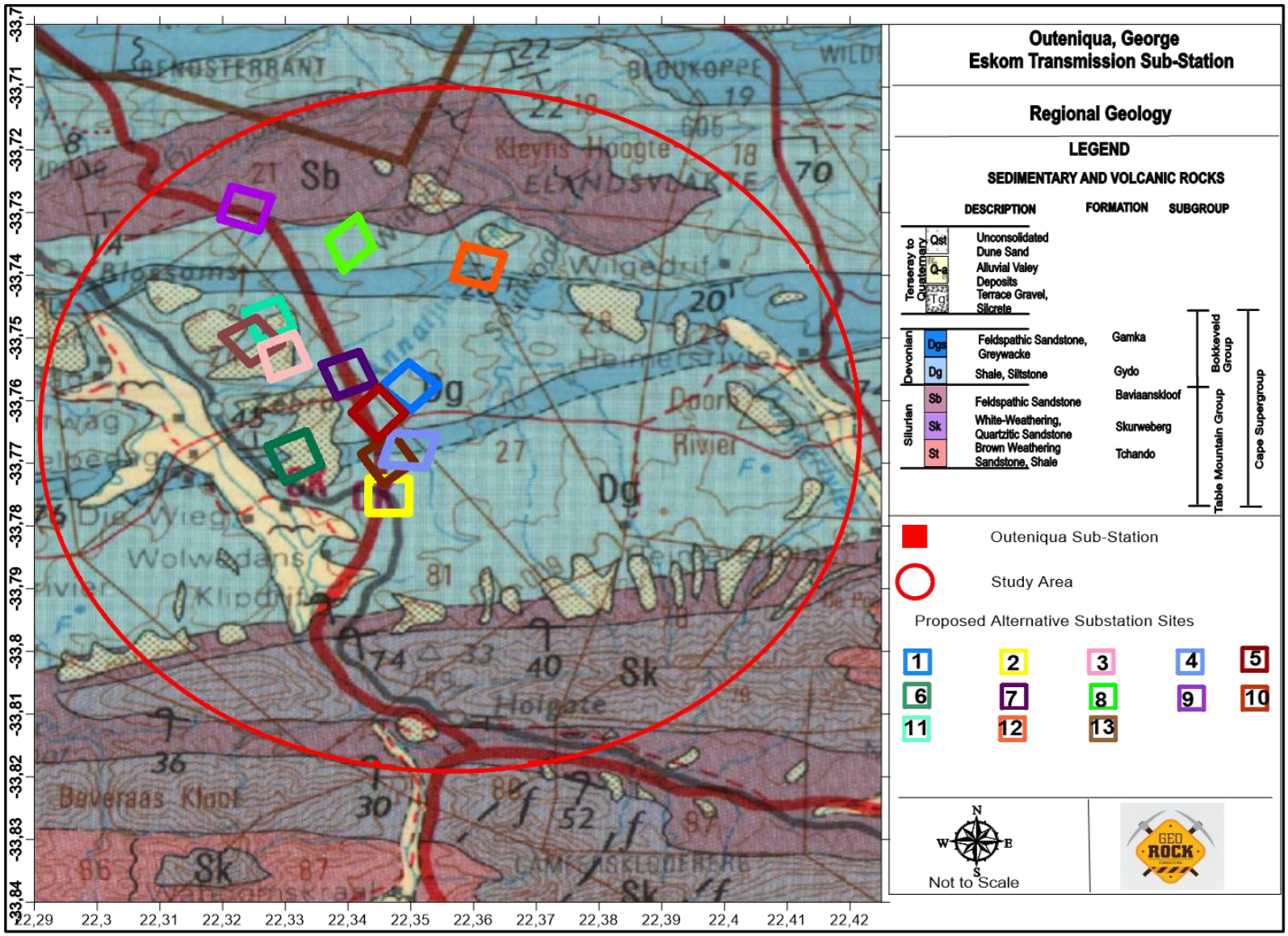

Figure 22: Regional Geological map extracted from 1:250 000 3322 Oudtshoorn map, 1979, Geological Survey, Toerien and Roby.

The soils within the Blanco project area are predominantly duplex soils with yellow B-Horizons, prismacutanic and pedocutanic horizonz. Areas within valley-bottom and wetlands with permanent and seasonal high-water tables are associated with the Champagne soil forms in the northern section of the target area.

The soils within the Outeniqua project area are predominantly sandy, gravelly soils with yellow B-Horizons. Areas within valley-bottom and wetlands with permanent and seasonal high-water tables are associated with clayey soils. The soils can be shallow where the bedrock is not deep. Soils with ferricrete and silcrete in the B-Horizons are common.

10.7 SOILS AND LAND CAPABILITY

The geology of the Blanco area is characterised by the Granites and gneisses of the Mokolian Kamieskroon Gneiss and Stalhoek Complex. Soils are skeletal, shallow and sandy (Mucina and Rutherford, 2006). The round-top mountains and broad-shoulder ridges dominated by granite domes and slabs support the vegetation in this area soils varying from shallow to deep. Darker chroma soils are common in this region with the Db land types prominently featuring.

According to the land type database (Land Type Survey Staff, 1972 - 2006), the Blanco project area is characterised by the Db 33 and Db 118 land types. The Db land type consists of Prismacutanic and pedocutanic surface horizons being dominant, associated to duplex soils with high clay contents. The red colours are not common in the surface of these soils. The Db 33 and Db 118 land types consists of Estcourt, Longlands, and/or Oakleaf soil forms according to the Soil Classification Working Group, (1991) with the possibility of other soils occurring throughout the landscape. The terrain is also characterised with stream beds. Lime is generally absent within the entire landscape. The land terrain units for the featured land types are illustrated from Figure 23 and Figure 24 with the expected soils illustrated in Table 18: Soils expected at the respective terrain units within the Db 33 land type (Land Type Survey Staff, 1972 - 2006)Table 18 and Table 19, respectively.

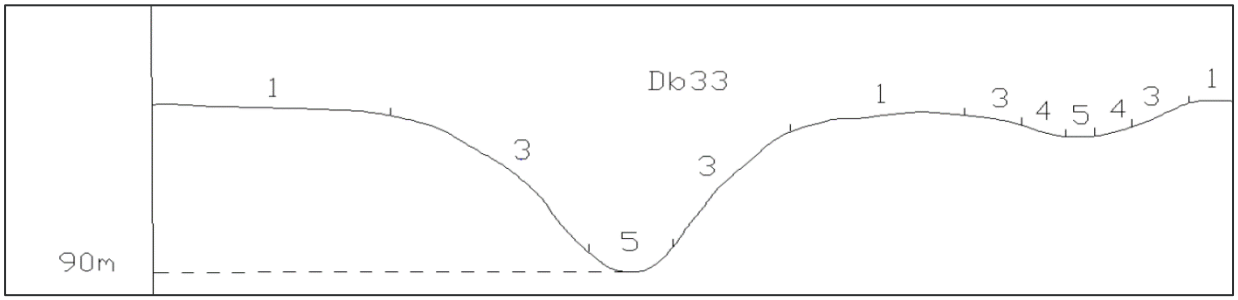

Figure 23: Illustration of the Db 33 land type terrain units (Land Type Survey Staff, 1972 - 2006)

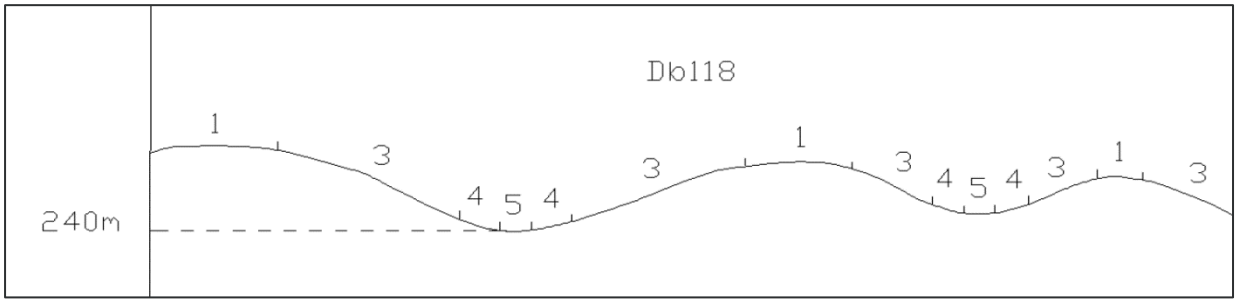

Figure 24: Illustration of the Db 118 land type terrain units (Land Type Survey Staff, 1972 - 2006)

Table 18: Soils expected at the respective terrain units within the Db 33 land type (Land Type Survey Staff, 1972 - 2006)

Terrain units			
1 (40%)	**3 (50%)**	**4 (5%)**	**5 (5%)**

Estcourt	60%	Estcourt	50%	Longlands	30%	Stream beds	50%
Sterkspruit	20%	Sterkspruit	10%	Sterkspruit	30%	Westleigh	40%
Longlands	5%	Longlands	10%	Estcourt	20%	Longlands	10%
Kroonstad	5%	Kroonstad	10%	Westleigh	20%		
Swartland	5%	Glenrosa	10%				
Hutton	1%	Swartland	5%				
		Wasbank	5%				
		Bare Rocks	2%				
		Mispah	2%				
		Hutton	1%				

Table 19: Soils expected at the respective terrain units within the Db 118 land type (Land Type Survey Staff, 1972 - 2006)

Terrain units							
1 (35%)		**3 (45%)**		**4 (15%)**		**5 (5%)**	
Estcourt	25%	Estcourt	30%	Estcourt	30%	Oakleaf	50%
Sterkspruit	10%	Kroonstad	20%	Sterkspruit	25%	Kroonstad	20%
Mispah	7%	Sterkspruit	15%	Kroonstad	20%	Dundee	20%
Bare Rocks	5%	Coarse deposits	15%	Vilafontes	10%	Estcourt	10%
Kroonstad	5%	Vilafontes	5%	Coarse deposits	10%		
Vilafontes	5%	Swartland	5%	Oakleaf	5%		
Swartland	5%	Glenrosa	5%				
Glenrosa	3%	Mispah	4%				

The geology of the Outeniqua area, located in the Eastern Little Karoo, is characterized by mudstones, siltstones and fossiliferous shales of the Devonian Bokkeveld Group and the Kirkwood Formation, as well as conglomerates of the Enon Formation (Mucina and Rutherford, 2006). Varying structures and textures of soil develop over this geology but predominantly loamy-silty types. Ag and Fc are both dominant land types for the region.

According to the land type database (Land Type Survey Staff, 1972 - 2006), the Outeniqua project area is characterised by the Fc 42 and Fc 44 land type. The Fc 42 and FC 44 land types are dominated with Oakleaf, Swartland, Glenrosa and Mispah soil forms, as well as being associated with the occurrence of other soils in the landscape (SA Soil Working Group, 2018). The Fc 42 landtype consists mainly of shale and siltstone (Bokkeveld Group) – above this local terrace gravel, silcrete, ferricrete and alluvium is present. The Fc 44 landtype is characterized by siltstone, shale and argillaceous sandstone (Bokkeveld Group), as well as subordinate quartzitic and feldspathic sandstone (Table Mountain Group), and sometimes terrace gravel and silcrete (Land Type Survey Staff, 1972 - 2006).

The land terrain units for the featured land types are illustrated from Figure 25 and Figure 26 with the expected soils illustrated in Table 20 and Table 21, respectively.

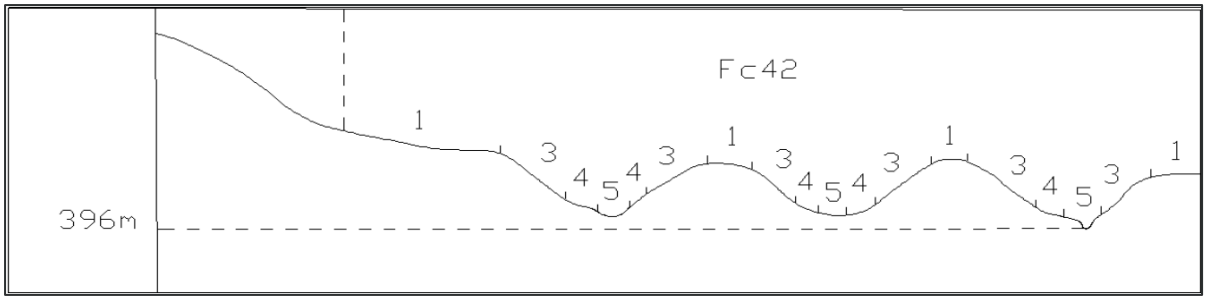

Figure 25: Illustration of the Fc 42 land type terrain units (Land Type Survey Staff, 1972 - 2006)

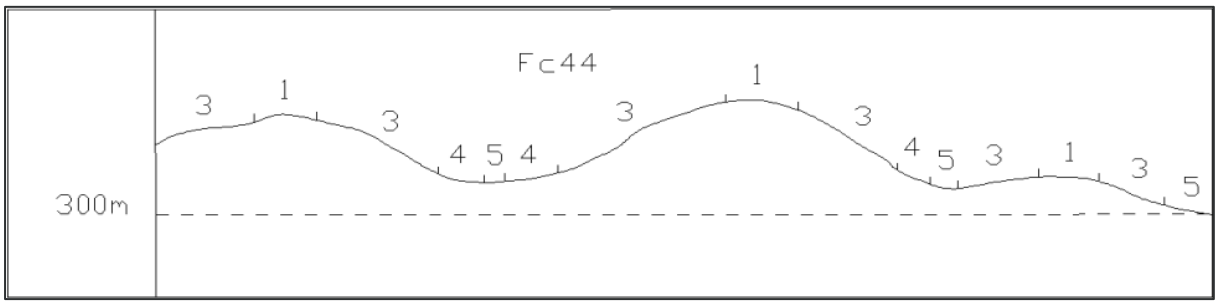

Figure 26: Illustration of the Fc 44 land type terrain units (Land Type Survey Staff, 1972 - 2006)

Table 20: Soils expected at the respective terrain units within the Fc 42 land type (Land Type Survey Staff, 1972 - 2006)

Terrain units							
1 (30%)		**3 (52%)**		**4 (8%)**		**5 (10%)**	
Glenrosa	30%	Glenrosa	30%	Swartland	45%	Oakleaf	60%
Bare Rock	20%	Swartland	25%	Hutton	30%	Dundee	20%
Mispah	15%	Mispah	20%	Glenrosa	15%	Westleigh	10%
Hutton	10%	Bare Rock	15%	Mispah	10%	Hutton	10%
Swartland	5%	Hutton	10%				

Table 21: Soils expected at the respective terrain units within the Fc 44 land type (Land Type Survey Staff, 1972 - 2006)

Terrain units							
1 (30%)		**3 (55%)**		**4 (8%)**		**5 (7%)**	
Mispah	30%	Glenrosa	30%	Glenrosa	35%	Oakleaf	70%
Bare Rock	20%	Hutton	30%	Hutton	25%	Dundee	10%
Glenrosa	20%	Bare Rock	15%	Swartland	20%	Westleigh	10%
Hutton	15%	Swartland	13%	Mispah	10%		
Swartland	5%	Mispah	12%	Oakleaf	5%		
				Bare Rock	5%		

10.7.1 LAND CAPABILITY

As part of the desktop assessment, soil information was obtained using published South African Land Type Data. Land type data for the site was obtained from the Institute for Soil Climate and Water (ISCW) of the Agricultural Research Council (ARC) (Land Type Survey Staff, 1972 - 2006). The land type data is presented at a scale of 1:250 000 and comprises the division of land into land types. In addition, a Digital Elevation Model (DEM) as well as the slope percentage of the area was calculated. Table 22 presents a summary (or overview) of land capability attributes for the assessment of the Blanco sites, and Table 23 describes the Outeniqua sites.

Table 22: Summary of land capability attributes for the Blanco sites.

	Description
A1	• The slope of the area varies from < 10%, to most of the site regarded to be 'flat'. • The land capability class for the site is Moderate Low to Moderate. • The presence of a cultivated pivot in the site, resulting in a Very High crop sensitivity. • Similar extent of Medium and High erosion risk areas.
A2	• The slope of the area varies from < 10%, to most of the site regarded to be 'flat'. • The land capability class for the site is Moderate Low to Moderate. • The presence of a cultivated pivot in the site, resulting in a Very High crop sensitivity. • Similar extent of Medium and High erosion risk areas.
A7	• The slope of the area varies from 10%, with a similar extent of the site considered to be 'flat'. • The land capability class for the site is Moderate Low to Moderate. • The presence of a cultivated pivot in the site, resulting in a Very High crop sensitivity. • Similar extent of Medium and High erosion risk areas.
A8	• This site has more variance in slope when compared to the other sites. • The land capability class for the site is Moderate Low to Moderate. A small portion is classified as Very Low to Low. • The presence of a cultivated pivot in the site, resulting in a Very High crop sensitivity. • Predominantly High erosion risk, with the northern portion associated with potential Very High erosion risk.
A9	• A generally 'flatter' topography is associated with the site, this topography is more uniform. • The land capability class for the site is Moderate Low to Moderate. • The presence of a cultivated pivot in the site, resulting in a Very High crop sensitivity. • Similar extent of Medium and High erosion risk areas

Table 23*:* Summary of land capability attributes for the Outeniqua sites

	Description
1	• The land capability class for the site is Very Low to Low. • Annual crop cultivation / plant pastures rotation present, resulting in a High crop sensitivity.

	• Predicted soil loss (erosion) is moderate throughout.
10	• The land capability class for the site is Very Low to Moderate. • "Dx Lines Site 10" crosses two areas with a Moderate-High land capability sensitivity. • Annual crop cultivation / plant pastures rotation present, resulting in a High crop sensitivity. • Predicted soil loss (erosion) is moderate throughout.
2	• The land capability class for the site is Very Low to Moderate. • Annual crop cultivation / plant pastures rotation present, resulting in a High crop sensitivity. • Predicted soil loss (erosion) is moderate throughout.
4	• The land capability class for the site is Very Low to Moderate. • Annual crop cultivation / plant pastures rotation present, resulting in a High crop sensitivity. • Predicted soil loss (erosion) is moderate throughout.
5	• The land capability class for the site is Very Low to Moderate. • Annual crop cultivation / plant pastures rotation present, resulting in a High crop sensitivity. • "Dx Lines Site 5" crosses an area with a Moderate-High land capability sensitivity. • Predicted soil loss (erosion) is moderate throughout.

According to DAFF (2017), eight land capability classes were identified throughout the Blanco project area (Figure 27). These land capability classes are classified as having "Very Low to "Low" (land capability classes 1 to 5) sensitivities with the land capability classes 6 to 8 regarded as having "Moderately Low to "Moderate" sensitivities. Also featured were land capability classes 9 to 10, with a "Moderate-High" sensitivity.

Figure 27: Land capability of the Blanco project area (DAFF, 2017)

As noted by the relevant DAFF (2017) screening report, ten land capability classes were identified throughout the Outeniqua project area (Figure 28). The land capability classes range from “Very Low to “Low” (land capability classes 1 to 5) sensitivities, classes 6 to 8 regarded as having “Moderately Low to “Moderate” sensitivities, and classes 9 to 10 having “Moderate to High” sensitivities.

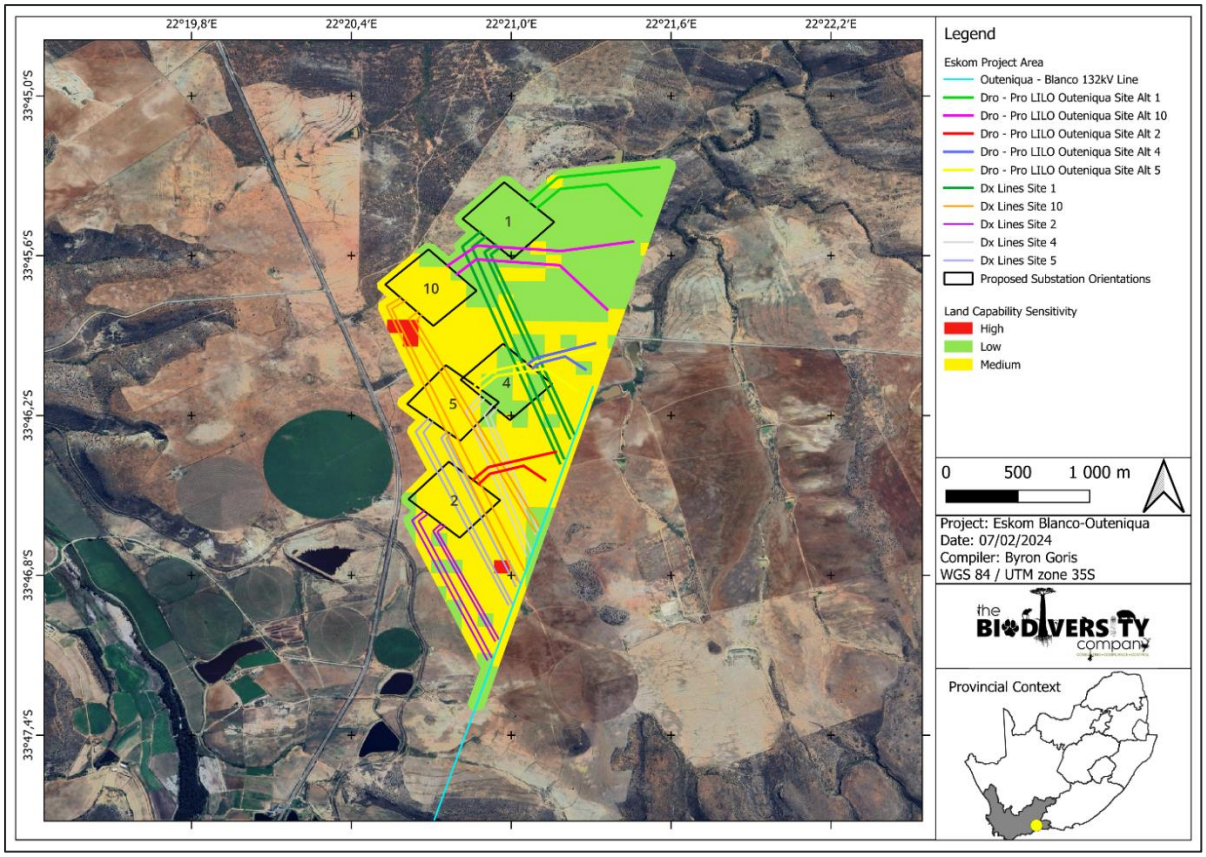

Figure 28: Land capability of the Outeniqua project area (DAFF, 2017)

10.7.2 LAND SENSITIVITIES

The field crop boundary sensitivities for the Blanco project area includes large portions of land with a “High” sensitivity, and crop pivot areas rated as “Very High”. All potential sites cross land of both sensitivities (Figure 29).

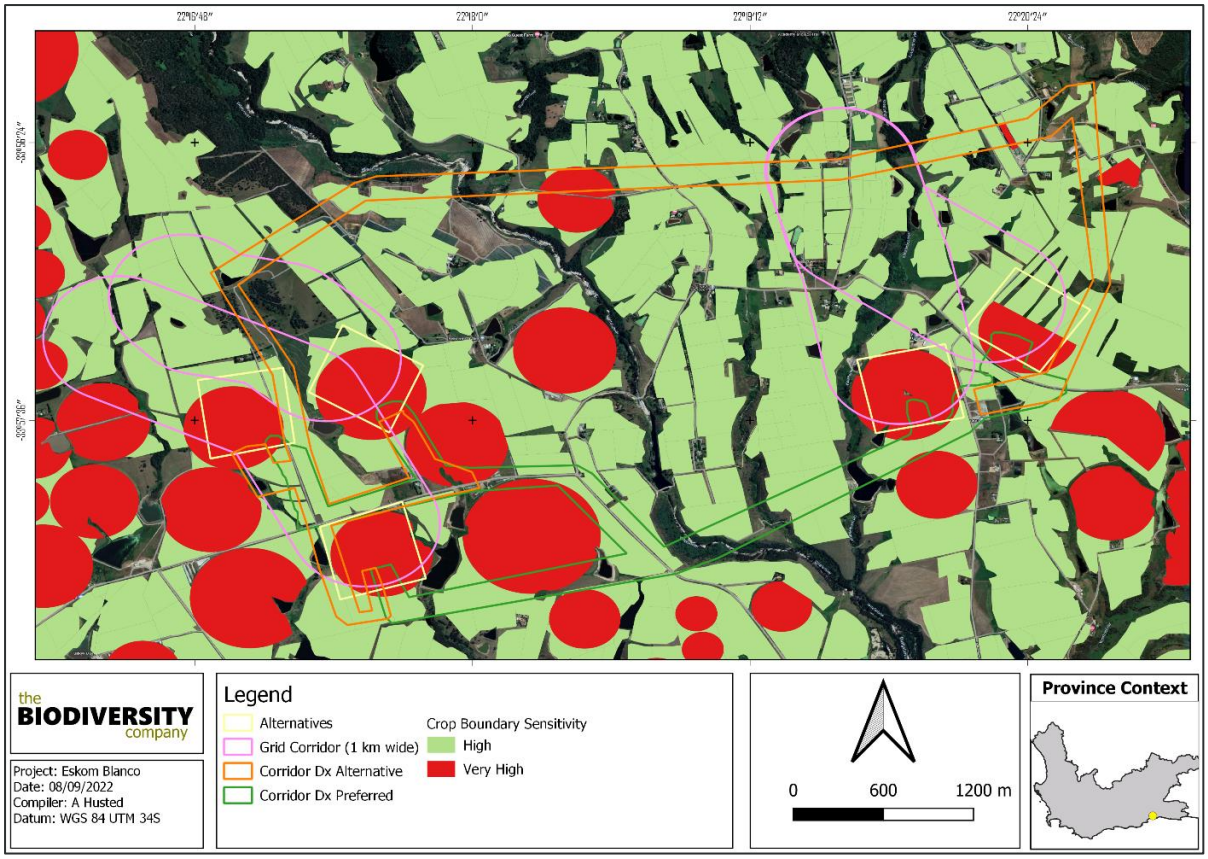

Figure 29: Field Crop boundary sensitivities of the Blanco project area (DAFF, 2017)

The field crop boundary sensitivities for the Blanco project area are mostly land with a “High” sensitivity and is the only sensitivity rating represented in this location (Figure 30).

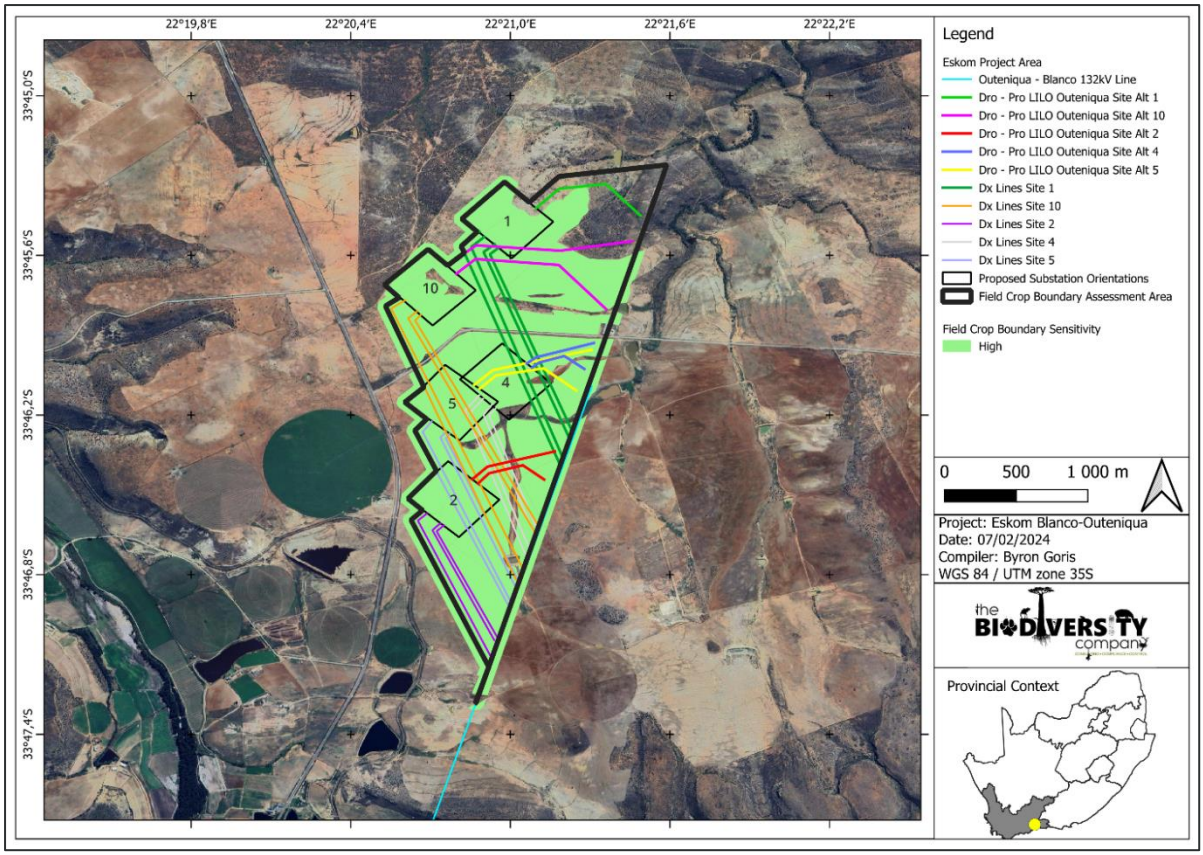

Figure 30: Field Crop boundary sensitivities of the Outeniqua project area (DAFF, 2017)

The agriculture theme sensitivity as indicated in the Blanco screening report is predominantly a combination of "Very High" and "High" sensitivities. Areas of "Medium" sensitivity appears to be aligned with the watercourses, with isolated areas of "Low" sensitivity interspersed across the area. It is worth noting that "Very High" sensitivity areas within the project area are associated with existing pivot circles.

In the Outeniqua project area, the agriculture theme sensitivity indicated in the associated screening report is "High" for most of the land but does include some area of a "Low" sensitivity. The area of low agricultural sensitivity is mostly limited to the northern reaches of the project where the "Dro - Pro LILO Outeniqua Site Alt 1" lines and "Substation orientation 1" have been located.

10.8 TERRESTRIAL BIODIVERSITY

The baseline Terrestrial Biodiversity inputs were provided by a specialist from The Biodiversity Company (TBC). The baseline terrestrial biodiversity (flora and fauna) findings are presented in the subsections below.

10.8.1 ECOLOGICALLY IMPORTANT LANDSCAPE FEATURES

Existing ecologically relevant data layers were incorporated into a GIS to establish how the proposed project might interact with any ecologically important entities. Emphasis was placed around the following spatial datasets:

- National Biodiversity Assessment 2018 (Skowno *et al*, 2019) (NBA) - The purpose of the NBA is to assess the state of South Africa's biodiversity based on best available science, with a view to understanding trends over time and informing policy and decision-making across a range of sectors. The NBA deals with all three components of biodiversity: genes, species, and ecosystems; and assesses biodiversity and ecosystems across terrestrial, freshwater, estuarine and marine environments. The two headline indicators assessed in the NBA are:

- **Ecosystem Threat Status (ETS)** – indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. The revised red list of threatened ecosystems was developed between 2016 and 2021 incorporating the best available information on terrestrial ecosystem extent and condition, pressures and drivers of change. The revised list (known as the **Red List of Ecosystems (RLE) 2022**) is based on assessments that followed the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa (Mucina and Rutherford 2006; with updates described in Dayaram et al., 2019). The revised list identifies 120 threatened terrestrial ecosystem types (55 Critically Endangered, 51 Endangered and 14 Vulnerable types). The revised list was published in the Government Gazette (Gazette Number 47526, Notice Number 2747) and came into effect on 18 November 2022; and
- **Ecosystem Protection Level** – indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.

- Protected areas - South Africa Protected Areas Database (SAPAD) (DEA, 2021) – The SAPAD Database contains spatial data pertinent to the conservation of South African biodiversity. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. SAPAD is updated on a continuous basis and forms the basis for the Register of Protected Areas, which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003.
- National Protected Areas Expansion Strategy (NPAES) (SANBI, 2016) – The NPAES provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are large, intact and unfragmented and therefore, of high importance for biodiversity, climate resilience and freshwater protection.
- Conservation/Biodiversity Sector Plan:

The **Western Cape Biodiversity Sector Plan** was completed in 2017 for the Western Cape Department of Environmental Affairs and Planning (WCDEAP) (WCBSP, 2017). The purpose of the biodiversity sector plan was to develop the spatial component of a bioregional plan (i.e., map of Critical Biodiversity Areas and associated land-use guidelines). A Western Cape Critical Biodiversity Area map was produced as part of this plan and sites were assigned to the following CBA categories based on their biodiversity characteristics, spatial configuration, and requirement for meeting targets for both biodiversity pattern and ecological processes:

- Critical Biodiversity Area 1 (CBA1);
- Critical Biodiversity Area 2 (CBA2);
- Ecological Support Area 1 (ESA1);
- Ecological Support Area 2 (ESA2); and
- Other Natural Area (ONA).

Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (NCDENC, 2010).

Figure 33 shows the BLANCO project area superimposed on the Terrestrial CBA maps. The project area overlaps with various CBA 1's, ESA 1's, and ESA 2's.

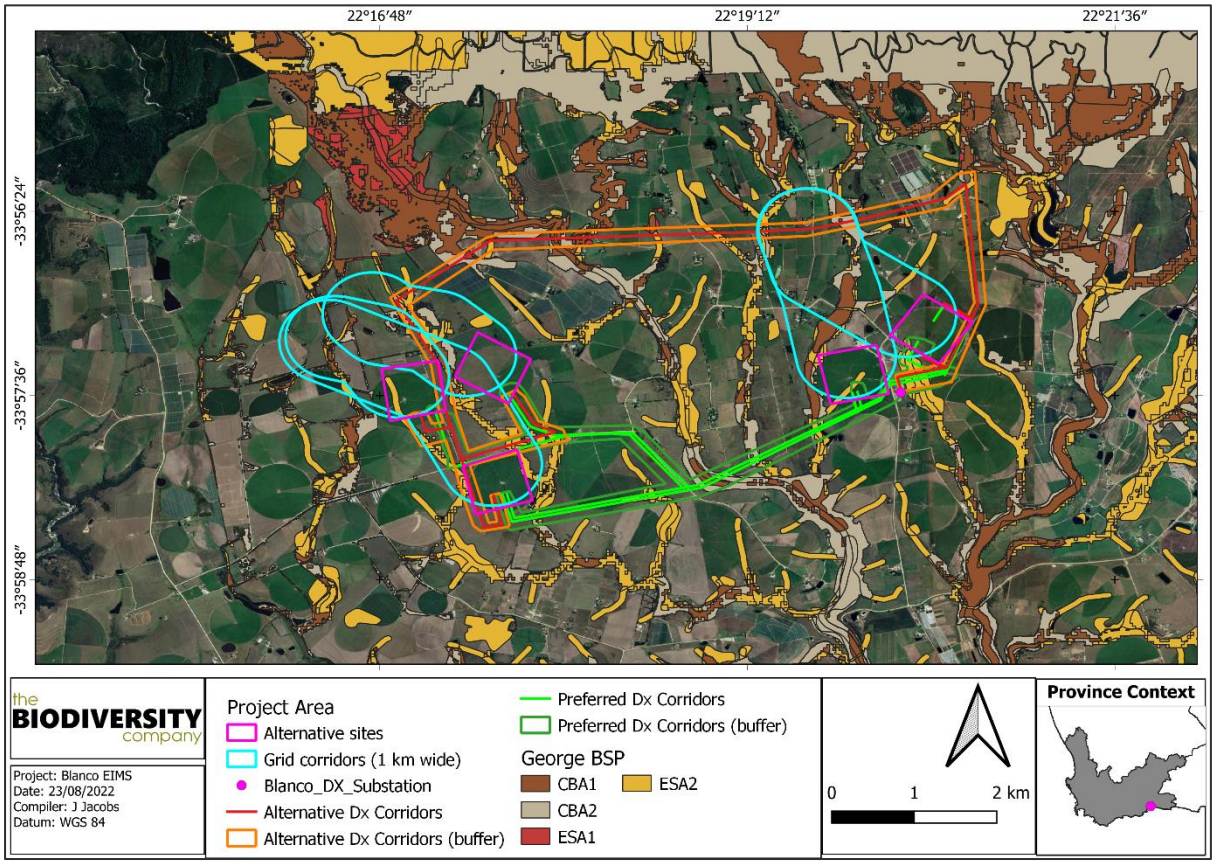

Figure 31: Map illustrating the locations of CBAs in the Blanco project area.

Figure 34 shows the Outeniqua project area superimposed on the Terrestrial CBA maps. The project area does not overlap with any CBAs but overlaps with one ESA1 and one ESA2.

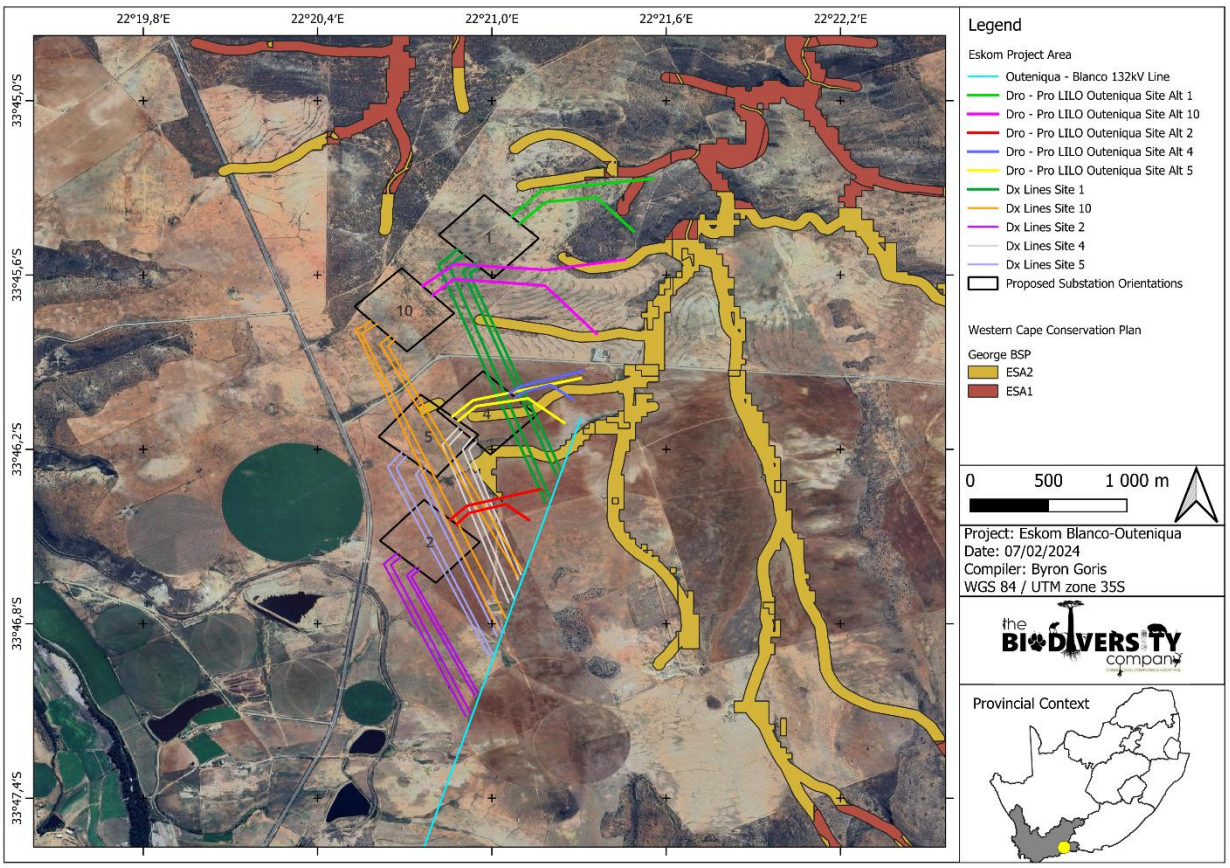

Figure 32: Map illustrating the locations of CBAs in the Outeniqua project area.

Ecological Support Areas (ESA's) are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services (SANBI, 2017). Critical Biodiversity Areas and Ecological Support Areas may be terrestrial or aquatic.

Other Natural Areas (ONAs) consist of all those areas in good or fair ecological condition that fall outside the protected area network and have not been identified as CBAs or ESAs. A biodiversity sector plan or bioregional plan must not specify the desired state/management objectives for ONAs or provide land-use guidelines for ONAs (Driver *et al.,* 2017).

Important Bird and Biodiversity Areas (IBAs) (BirdLife South Africa, 2017) – IBAs constitute a global network of over 13 500 sites, of which 112 sites are found in South Africa. IBAs are sites of global significance for bird conservation, identified through multi-stakeholder processes using globally standardised, quantitative and scientifically agreed criteria; and

South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (Van Deventer *et al.,* 2018) – A SAIIAE was established during the NBA of 2018. It is a collection of data layers that represent the extent of river and inland wetland ecosystem types and pressures on these systems.

The GIS analysis pertaining to the relevance of the proposed project to ecologically important landscape features is summarised in Table 24.

Table 24: Summary of relevance of the Blanco and Outeniqua proposed project sites to ecologically important landscape features.

Desktop Information Considered	Blanco: Relevant/Irrelevant	Outeniqua: Relevant/Irrelevant
Land Cover	Relevant – Necessary to consider the most recent anthropogenic and ecological land cover types	Relevant – Necessary to consider the most recent anthropogenic and ecological land cover types
Ecosystem Threat Status	Relevant – Overlaps with a Critically Endangered ecosystem and a Vulnerable ecosystem.	Relevant – Overlaps with an Endangered ecosystem.
Ecosystem Protection Level	Relevant – Overlaps with a Not Protected ecosystem and a Poorly Protected ecosystem.	Relevant – Overlaps with a Not Protected ecosystem.
Critical Biodiversity Area	Relevant – The project area overlaps with various CBA 1's, ESA 1's, and ESA 2's.	Relevant – The project area overlaps with an ESA2. 'Substation 1' powerlines would cross an ESA1.
Protected Areas	Relevant – Overlaps with the Garden Route Biosphere Reserve.	Relevant – Overlaps with Gouritz Cluster Biosphere Reserve.
National Protected Areas Expansion Strategy	Irrelevant – The project area does not overlap with any NPAES Priority Focus Areas.	Irrelevant – The project area does not overlap with any NPAES Priority Focus Areas.
Important Bird and Biodiversity Areas	Relevant – The project area is approx. 3 km south to the Outeniqua Mountains IBA.	Relevant – The project area is approx. 5 km north of the Outeniqua Mountains IBA.
REDZ	Irrelevant – The project area does not overlap with any Renewable Energy Development Zones.	Irrelevant – The project area does not overlap with any Renewable Energy Development Zones.
Strategic Transmission Corridors (EGI)	Irrelevant – The project area does not overlap with any Powerline Corridors.	Irrelevant – The project area does not overlap with any Powerline Corridors.

10.8.2 PROTECTED AREAS

According to the protected area spatial datasets from SAPAD (2021) and SACAD (2021), the Blanco project area overlaps with the Garden Route Biosphere Reserve (Figure 33) which is a protected area. The project area is also located 0.9 km East from the Gouritz Cluster Biosphere Reserve which is a protected area.

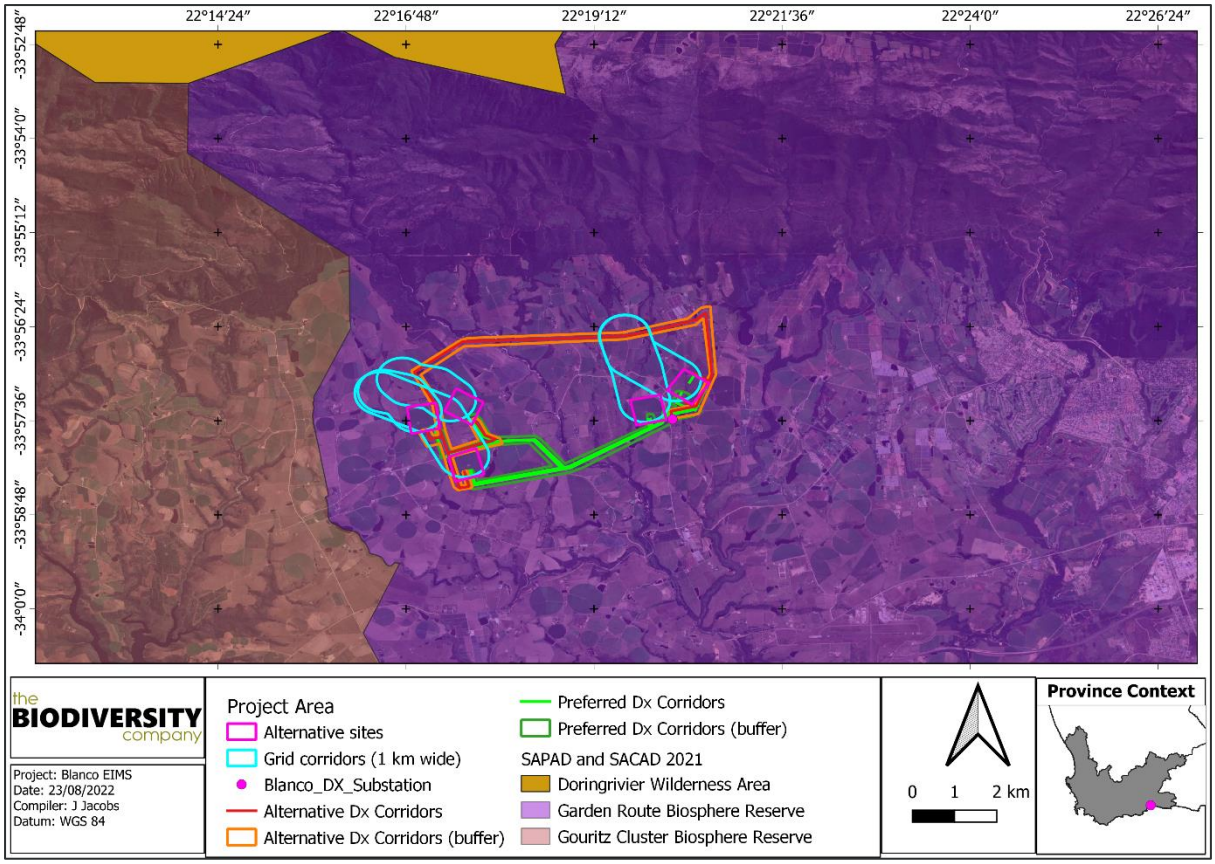

Figure 33: The Blanco project area in relation to the protected areas.

According to the protected area spatial datasets from SAPAD (2021) and SACAD (2021), the Outeniqua project area overlaps with the Gouritz Cluster Biosphere Reserve (Figure 34) which is a conservation area while the Witkliprug Nature Reserve (protected area) is located ~4km north-west of the Outeniqua study area.

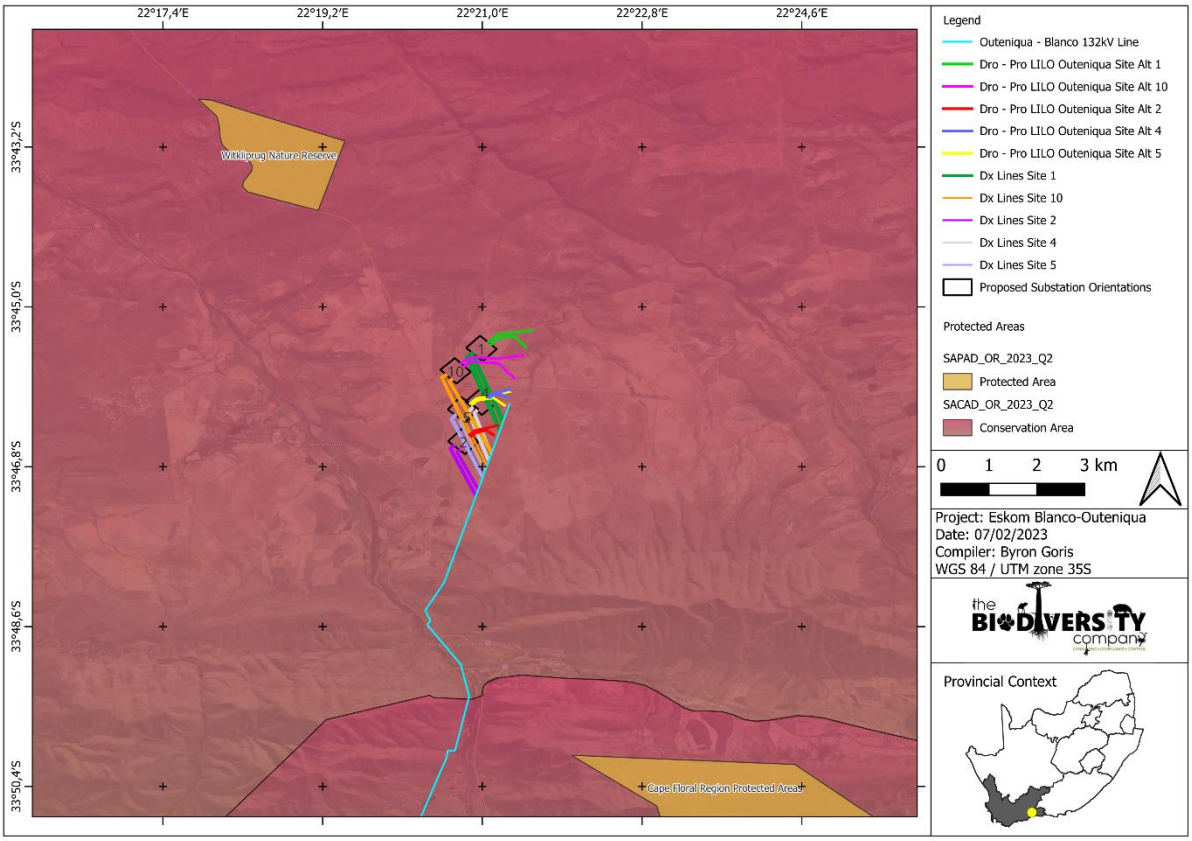

Figure 34: The Outeniqua project area in relation to the protected area known as the Gouritz Cluster Biosphere Reserve.

10.8.3 IMPORTANT BIRD AND BIODIVERSITY AREAS (IBAS)

Important Bird & Biodiversity Areas (IBAs) are sites of international significance for the conservation of the world's birds and other conservation significant species as identified by BirdLife International. These sites are also Key Biodiversity Areas, i.e. sites that contribute significantly to the global persistence of biodiversity (Birdlife South Africa, 2017).

According to Birdlife South Africa (2017), the selection of IBAs is achieved through the application of quantitative ornithological criteria, grounded in up-to-date knowledge of the sizes and trends of bird populations. The criteria ensure that the sites selected as IBAs have true significance for the international conservation of bird populations and provide a common currency that all IBAs adhere to, thus creating consistency among, and enabling comparability between, sites at national, continental and global levels. Figure 35 shows that the Blanco project area is located 1.4 km South from the Outeniqua Mountains IBA. The Outeniqua project area is located approximately 8 km north of the same IBA, as shown in Figure 36.

The Outeniqua Mountains run parallel to the Swartberg range in an East–West direction and are separated from it by the Little Karoo. The variations in altitude and conditions yield a wide diversity of habitats, such as the moist, high-altitude montane fynbos, the karroid and renosterveld shrubland on the low-rainfall northern slopes and the Afro-temperate Forest on the mesic south-facing slopes (Birdlife South Africa, 2018). In total, 277 bird species have been recorded for this area during SABAP2. Globally threatened trigger IBA species include Blue Crane (*Anthropoides paradiseus*), Ludwig's Bustard (*Neotis ludwigii*), Denham's Bustard (*N. denhami*), Secretarybird (*Sagittarius serpentarius*), Martial Eagle (*Polemaetus bellicosus*), Crowned Eagle (*Stephanoaetus coronatus*), Black Harrier (*Circus maurus*), Hottentot Buttonquail (*Turnix hottentottus*), Knysna Woodpecker (*Campethera notata*) and Knysna Warbler (*Bradypterus sylvaticus*). Regionally threatened species are Black Stork (*Ciconia nigra*), Verreaux's Eagle (*Aquila verreauxii*), African Marsh Harrier (*Circus ranivorus*), Lanner Falcon (*Falco biarmicus*), Cape Rockjumper (*Chaetops frenatus*) and Striped Flufftail (*Sarothrura affinis*). Restricted-

range and common biome-restricted species include Cape Bulbul (*Pycnonotus capensis*), Cape Sugarbird (*Promerops cafer*), Orange-breasted Sunbird (*Anthobaphes violacea*), Forest Buzzard (*Buteo trizonatus*), Knysna Turaco (*Tauraco corythaix*), Knysna Woodpecker and Forest Canary (*Crithagra scotops*). Locally common species include Cape Siskin (*Crithagra totta*), Victorin's Warbler (*Cryptillas victorini*), Cape Spurfowl (*Pternistis capensis*), Yellow-throated Woodland Warbler (*Phylloscopus ruficapilla*), Olive Bush-Shrike (*Chlorophoneus olivaceus*), Black-bellied Starling (*Notopholia corrusca*), Swee Waxbill (*Coccopygia melanotis*) and Chorister Robin-Chat (*Cossypha dichroa*). Uncommon species include Protea Seedeater (*Crithagra leucoptera*), Cape Rockjumper, Hottentot Buttonquail, Striped Flufftail, Grey Cuckooshrike (*Coracina caesia*), Knysna Warbler, White-starred Robin (*Pogonocichla stellata*), Karoo Chat (*Emarginata schlegelii*) and Black-headed Canary (*Serinus alario*) (Birdlife South Africa, 2018).

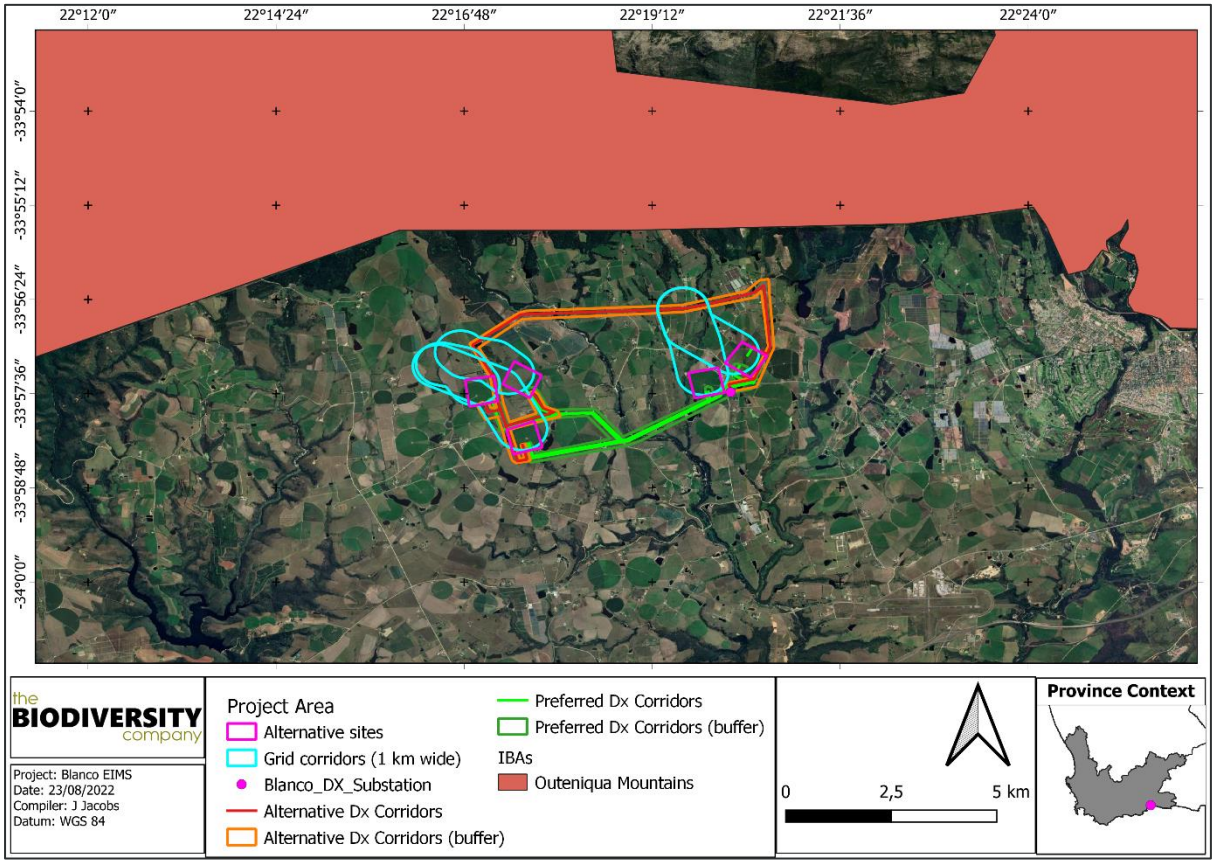

Figure 35: The Blanco project area in relation to the Outeniqua Mountains IBA.

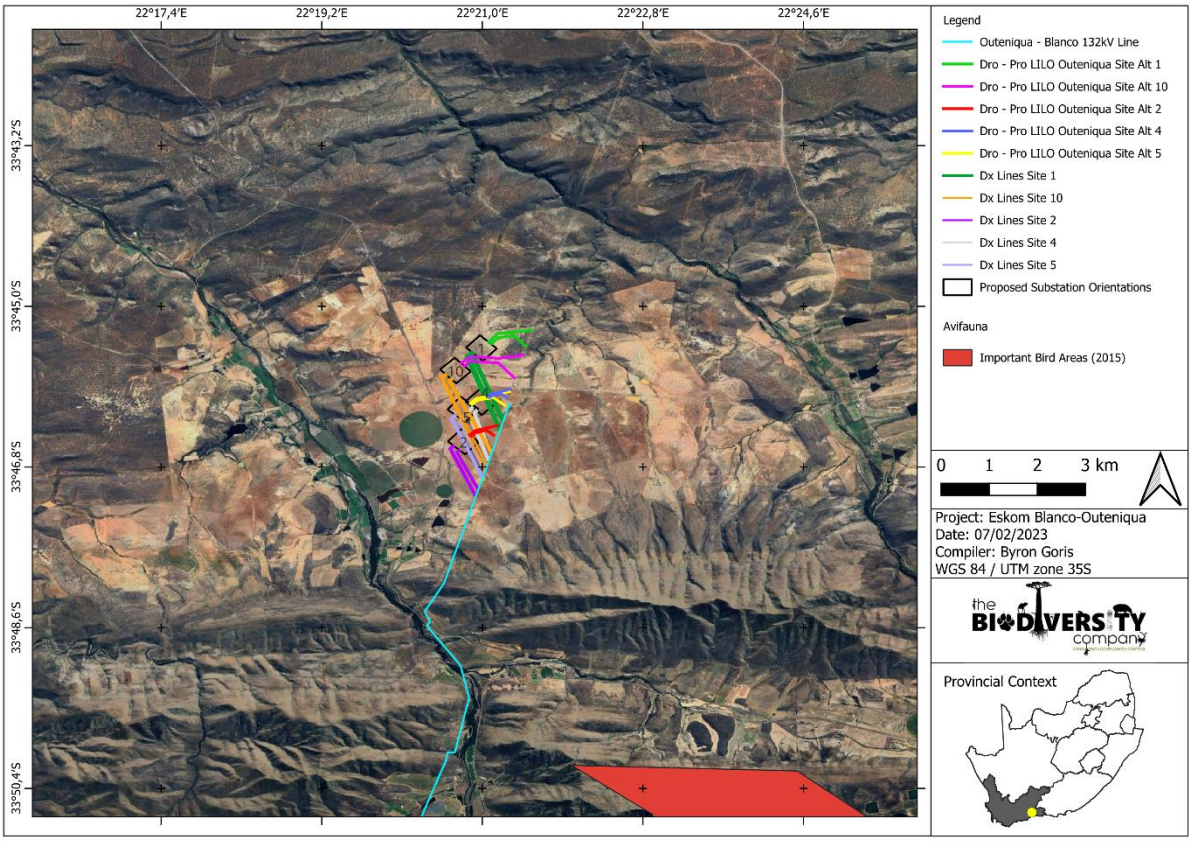

Figure 36: The Outeniqua project area in relation to the Outeniqua Mountains IBA.

10.8.4 VEGETATION TYPES

The Blanco project area is situated in the Fynbos biome. This biome has a mediterranean-style climate with hot and dry summers and a winter rainfall (Mucina & Rutherford, 2006). It occurs on most of the Cape Fold Belt as well as the adjacent lowlands between the mountains and the Atlantic Ocean (west and south) as well as between the mountains and the Indian Ocean (south) (Mucina & Rutherford, 2006).

Fynbos is characterised as a shrubland or heathland that is evergreen and fire-prone with vegetation such as restios, ericoid shrubs, and proteas (Mucina & Rutherford, 2006). Fynbos comes in three major vegetation complexes, namely fynbos, renosterveld and strandveld. On a fine-scale vegetation type, the project area overlaps mainly with the Garden Route Granite Fynbos and partly with the Garden Route Shale Fynbos vegetation types (Figure 37).

The Outeniqua project area is situated in the Succulent Karoo biome, a region covering approximately 111 000 km^2. This biome, baring the strongest floristic resemblance to the Fynbos Biome, is classed as the world's only biodiversity hotspot region that is completely arid. The biome is predominantly found west of the western escarpment, extending across an interrupted belt from coastal regions of southern Namibia, through Namaqualand, across the regions of Hantam, Tanqua, Roggeveld, and the Little Karoo (Mucina & Rutherford, 2006).

According to Mucina & Rutherford (2006), a substantial amount of the terrain in the Succulent Karoo is flat or gently undulating and most of the area has an altitude below 800m. The semidesert region includes the winter-rainfall arid zone of southern Africa and experiences an overall Mean Annual Temperature of 16.8°C. The biome is botanically rich in species, with 6 356 species of vascular plants from 1 002 genre, and a high level of endemism.

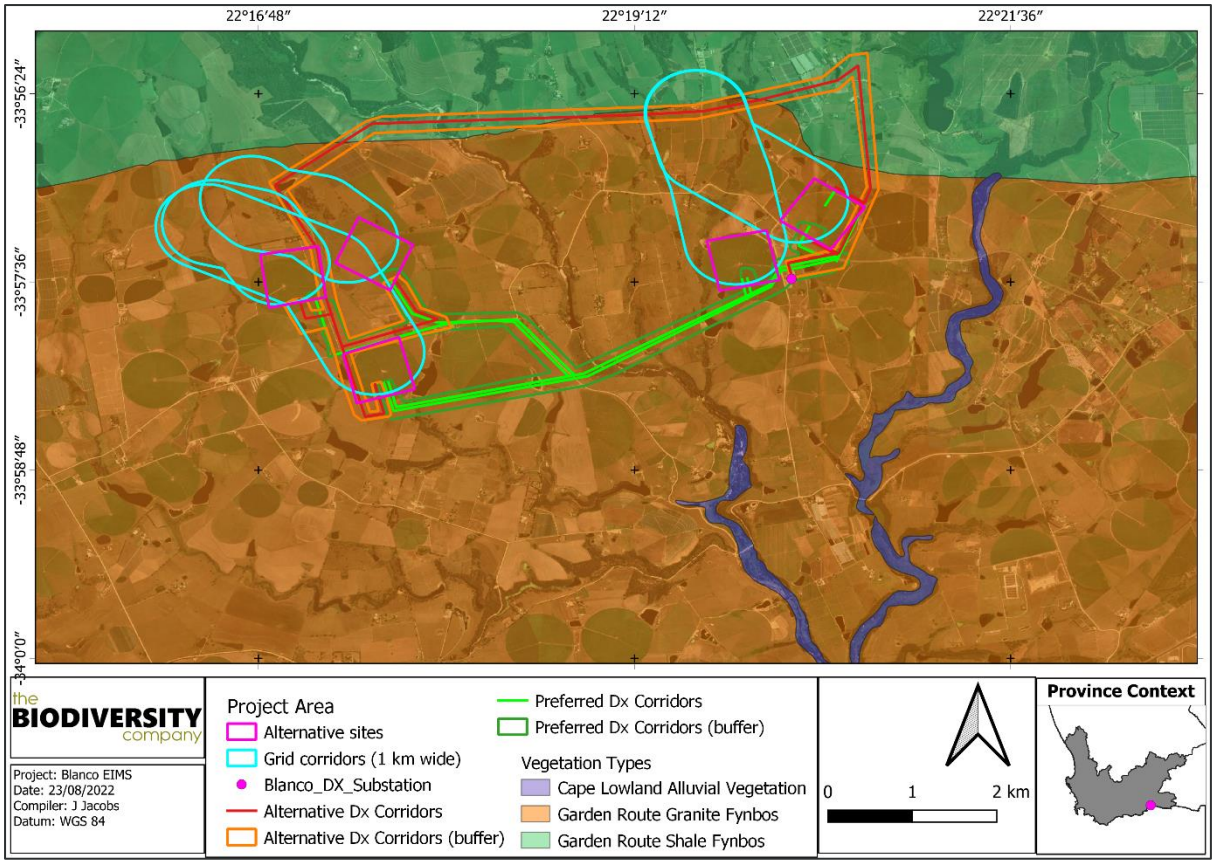

Figure 37: Map illustrating the vegetation type associated with the Blanco project area.

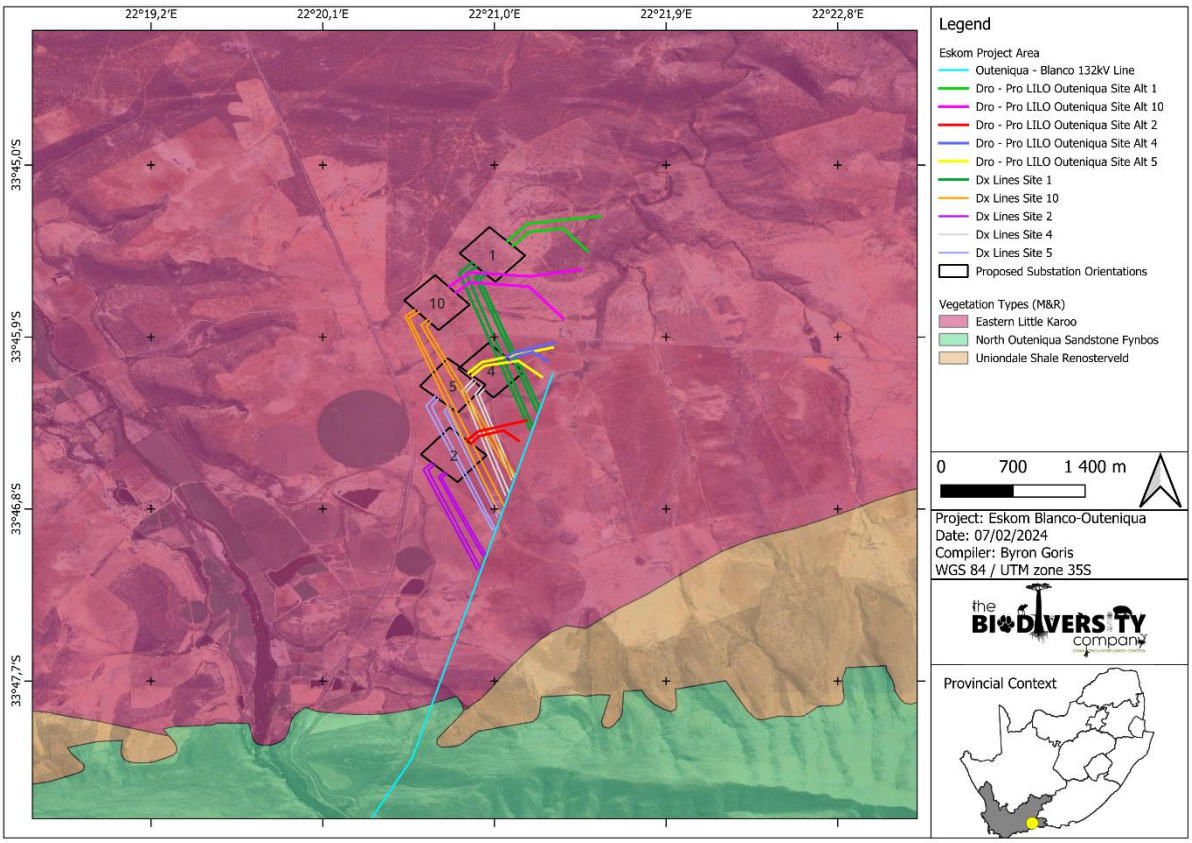

Figure 38: Map illustrating the vegetation type associated with the Outeniqua project area.

10.8.5 EXPECTED FLORA SPECIES

The POSA database was used to generate expected flora for each project area. Furthermore, the screening tool included a number of sensitive species to take note of relevant to the project locations.

Please note that the Screening Tool report includes lists of bird, mammal, reptile, amphibian, butterfly and plant species of conservation concern known or expected to occur on the proposed development footprint. Some of these SCC are sensitive to illegal harvesting. Such species have had their names obscured and are listed as sensitive plant unique number/sensitive animal unique number. As per the best practise guideline that accompanies the protocol and screening tool, **the name of the sensitive species may not appear in this report nor any of the specialist reports released into the public domain**. It should be referred to as sensitive plant or sensitive animal and its threat status may be included, e.g. critically endangered sensitive plant or endangered sensitive animal.

10.8.5.1 BLANCO PROJECT AREA

The POSA database indicates that 1139 species of indigenous plants are expected to occur within the Blanco project area. Twenty-five (25) flora SCC based on their conservation status could be expected to occur within the project area and are provided in Table 25 below.

Table 25: Threatened flora species that may occur within the Blanco project area.

Family	Taxon	Screening Tool Sensitivity Designation	IUCN	Ecology
Ericaceae	*Erica glandulosa* subsp. *fourcadei*	-	VU	Indigenous; Endemic
Rutaceae	*Acmadenia maculata*	-	NT	Indigenous; Endemic
Iridaceae	*Geissorhiza outeniquensis*	-	NT	Indigenous; Endemic
Campanulaceae	*Prismatocarpus rogersii*	-	NT	Indigenous; Endemic
Proteaceae	*Protea lepidocarpodendron*	-	NT	Indigenous; Endemic
Proteaceae	*Leucadendron chamelaea*	-	CR	Indigenous; Endemic
Apiaceae	*Centella caespitosa*	-	VU	Indigenous; Endemic
Proteaceae	*Leucadendron tinctum*	-	NT	Indigenous; Endemic
Proteaceae	*Protea longifolia*	-	VU	Indigenous; Endemic
Asteraceae	*Metalasia galpinii*	-	VU	Indigenous; Endemic
Ericaceae	*Erica aneimena*	-	VU	Indigenous; Endemic
Ericaceae	*Erica elsieana*	-	EN	Indigenous; Endemic
Aizoaceae	*Lampranthus pauciflorus*	Medium	EN	Indigenous; Endemic
Orchidaceae	*Satyrium princeps*	-	VU	Indigenous; Endemic
Asteraceae	*Phymaspermum leptophyllum*	-	NT	Indigenous; Endemic
Proteaceae	*Leucospermum formosum*	-	EN	Indigenous; Endemic
Rhamnaceae	*Phylica gracilis*	-	NT	Indigenous; Endemic
Fabaceae	*Aspalathus glabrescens*	-	EN	Indigenous; Endemic

Iridaceae	*Freesia leichtlinii* subsp. *alba*	-	NT	Indigenous; Endemic
Proteaceae	*Leucospermum glabrum*	Medium	EN	Indigenous; Endemic
Iridaceae	*Gladiolus fourcadei*	-	EN	Indigenous; Endemic
Proteaceae	*Leucadendron conicum*	-	NT	Indigenous; Endemic
Orchidaceae	*Acrolophia lunata*	-	EN	Indigenous; Endemic
Ericaceae	*Erica inconstans*	-	VU	Indigenous; Endemic
Fabaceae	*Aspalathus araneosa*	-	VU	Indigenous; Endemic
Scrophulariaceae	*Selago ferruginea*	-	CR	Indigenous; Endemic
Proteaceae	*Protea susannae*	-	NT	Indigenous; Endemic
Ericaceae	*Erica unicolor* subsp. *mutica*	Medium	EN	Indigenous; Endemic
Iridaceae	*Gladiolus emiliae*	-	NT	Indigenous; Endemic
Proteaceae	*Mimetes pauciflorus*	-	VU	Indigenous; Endemic
Crassulaceae	*Crassula decumbens* var. *brachyphylla*	-	NT	Indigenous; Endemic
Proteaceae	*Protea coronata*	-	NT	Indigenous; Endemic
Ericaceae	*Erica stylaris*	-	VU	Indigenous; Endemic
Scrophulariaceae	*Nemesia elata*	-	VU	Indigenous; Endemic
Fabaceae	*Psoralea diturnerae*	-	EN	Indigenous; Endemic
Oxalidaceae	*Oxalis involuta*	-	CR	Indigenous; Endemic
Orchidaceae	*Disa venusta*	-	VU	Indigenous; Endemic
Proteaceae	*Leucospermum praecox*	-	VU	Indigenous; Endemic
Rutaceae	*Agathosma microcalyx*	-	NT	Indigenous; Endemic
Scrophulariaceae	*Selago burchellii*	Medium	VU	Indigenous; Endemic
Proteaceae	*Spatalla barbigera*	-	NT	Indigenous; Endemic
Aizoaceae	*Cephalophyllum diversiphyllum*	-	NT	Indigenous; Endemic
Restionaceae	*Restio femineus*	-	EN	Indigenous; Endemic
Oxalidaceae	*Oxalis pendulifolia*	-	NT	Indigenous; Endemic
Proteaceae	*Mimetes splendidus*	-	EN	Indigenous; Endemic
Iridaceae	*Freesia fergusoniae*	Medium	VU	Indigenous; Endemic
Rutaceae	*Diosma passerinoides*	Medium	VU	Indigenous; Endemic
Rutaceae	*Agathosma microcarpa*	Medium	VU	Indigenous; Endemic
-	*Sensitive species 980*	Medium	-	-

-	*Sensitive species 516*	Medium	-	-
-	*Sensitive species 800*	Medium	-	-
-	*Sensitive species 500*	Medium	-	-
-	*Sensitive species 763*	Medium	-	-

10.8.5.2 OUTENIQUA PROJECT AREA

The POSA database indicates that at least 69 species of indigenous plants are expected to occur within the immediate area surrounding Outeniqua. At the time of the desktop study undertaken for this project area, the conservation status of the plant species on the POSA database was unavailable. A further six (6) sensitive plant species relevant to the project area were generated in the screening tool report (Table 26).

Table 26: Sensitive flora species relevant to Outeniqua project area according to the screening tool report.

Family	Taxon	Screening Tool Sensitivity Designation	Regional (SANBI, 2016)	Ecology
Aizoaceae	*Glottiphyllum linguiforme*	Medium	VU	Indigenous; Endemic
Fabaceae	*Aspalathus pedunculata*	Medium	Rare	Indigenous; Endemic
Scrophulariaceae	*Manulea derustiana*	Medium	VU	Indigenous; Endemic
Ericaceae	*Erica zebrensis*	Medium	EN	Indigenous; Endemic
-	*Sensitive species 54*	Medium	-	-
-	*Sensitive species 187*	Medium	-	-

10.8.6 EXPECTED FAUNA SPECIES

Avifauna, Mammal and Herpetofauna observations and recordings fall under this section.

10.8.6.1 AVIFAUNA

10.8.6.1.1 BLANCO PROJECT AREA

The SABAP2 Data lists 279 avifauna species that could be expected to occur within the BLANCO project area. Twenty-six (26) of these expected species are regarded as threatened (Table 27). Nineteen (19) of these species have a low likelihood of occurrence due to lack of suitable habitat in the project area.

Table 27: Threatened avifauna species that are expected to occur within the Blanco project area.

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
Alcedo semitorquata	Half-collared Kingfisher	NT	LC	Moderate
Ardenna grisea	Sooty Shearwater	Unlisted	NT	Low
Bradypterus sylvaticus	Knysna Warbler	VU	VU	Moderate
Buteo trizonatus	Forest Buzzard	LC	NT	Low
Campethera notata	Knysna Woodpecker	NT	NT	Low
Chaetops frenatus	Cape Rockjumper	NT	NT	Low
Circus maurus	Black Harrier	EN	EN	Low
Circus ranivorus	African Marsh Harrier	EN	LC	Moderate
Coracias garrulus	European Roller	NT	LC	Low
Crithagra leucoptera	Protea Canary	NT	NT	Low

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
Falco biarmicus	Lanner Falcon	VU	LC	Moderate
Geocolaptes olivaceus	Ground Woodpecker	LC	NT	Low
Grus paradisea	Blue Crane	NT	VU	Low
Leptoptilos crumenifer	Marabou Stork	NT	LC	Moderate
Monticola explorator	Sentinel Rock Thrush	LC	NT	Low
Morus capensis	Cape Gannet	VU	EN	Low
Neotis denhami	Denham's Bustard	VU	NT	Low
Numenius arquata	Eurasian Curlew	NT	NT	Moderate
Oxyura maccoa	Maccoa Duck	NT	VU	Low
Phalacrocorax capensis	Cape Cormorant	EN	EN	Low
Polemaetus bellicosus	Martial Eagle	EN	EN	Low
Procellaria aequinoctialis	White-chinned Petrel	VU	VU	Low
Sagittarius serpentarius	Secretarybird	VU	EN	Low
Sarothrura affinis	Striped Flufftail	VU	LC	Low
Stephanoaetus coronatus	Crowned Eagle	VU	NT	High
Stercorarius antarcticus	Brown Skua	EN	Unlisted	Low

10.8.6.1.2 OUTENIQUA PROJECT AREA

The SABAP2 Data lists 241 avifauna species that could be expected to occur within the Outeniqua project area. Seventeen (17) of these expected species are regarded as threatened (Table 28). Twelve (12) of these species have a low likelihood of occurrence due to lack of suitable habitat in the project area.

Table 28: Threatened avifauna species that are expected to occur within the Outeniqua project area.

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
Afrotis afra	Southern Black Korhaan	VU	VU	Moderate
Alcedo semitorquata	Half-collared Kingfisher	NT	LC	Low
Anthropoides paradiseus	Blue Crane	NT	VU	Low
Aquila verreauxii	Verreaux's Eagle	VU	LC	Moderate
Bradypterus sylvaticus	Knysna Warbler	VU	VU	Moderate
Campethera notata	Knysna Woodpecker	NT	NT	Low
Chaetops frenatus	Cape Rockjumper	NT	NT	Low
Ciconia nigra	Black Stork	VU	LC	Low
Circus maurus	Black Harrier	EN	EN	Low
Crithagra leucoptera	Protea Canary	NT	NT	Low
Falco biarmicus	Lanner Falcon	VU	LC	Moderate
Geocolaptes olivaceus	Ground Woodpecker	LC	NT	Moderate
Neotis denhami	Denham's Bustard	VU	NT	Low
Neotis ludwigii	Ludwig's Bustard	EN	EN	Low

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
Oxyura maccoa	Maccoa Duck	NT	VU	Low
Polemaetus bellicosus	Martial Eagle	EN	EN	Low
Sarothrura affinis	Striped Flufftail	VU	LC	Low

10.8.6.2 MAMMALS

10.8.6.2.1 BLANCO PROJECT AREA

The IUCN Red List Spatial Data lists 67 mammal species that could be expected to occur within both project areas. This list excludes large mammal species that are normally restricted to protected areas. Nine (9) of these expected species are regarded as threatened (Table 29). No sensitive mammal species are relevant to this project area according to the screening tool report.

Table 29: Threatened mammal species that are expected to occur within the Blanco project area.

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
Amblysomus corriae	Fynbos Golden Mole	NT	NT	Low
Aonyx capensis	Cape Clawless Otter	NT	NT	Moderate
Dasymys incomtus	African Marsh Rat	NT	LC	Moderate
Leptailurus serval	Serval	NT	LC	Low
Myosorex longicaudatus	Long-tailed Forest Shrew	Not listed	VU	Low
Panthera pardus	Leopard	VU	VU	Low
Pelea capreolus	Grey Rhebok	NT	LC	Low
Philantomba monticola	Blue Duiker	VU	LC	Low
Poecilogale albinucha	African Striped Weasel	NT	LC	Moderate

10.8.6.2.2 OUTENIQUA PROJECT AREA

The IUCN Red List Spatial Data lists 88 mammal species that could be expected to occur within both project areas (The full list will be provided in the final assessment). This list excludes large mammal species that are normally restricted to protected areas. Six (6) of these expected species are regarded as threatened (Table 30). One sensitive mammal species are relevant to this project area according to the screening tool report (Table 31).

Table 30: Threatened mammal species that are expected to occur within the Outeniqua project area.

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
Aonyx capensis	Cape Clawless Otter	NT	NT	Moderate
Mystromys albicaudatus	White-tailed Rat	VU	VU	Moderate
Myosorex longicaudatus	Long-tailed Forest Shrew	Not listed	VU	Low
Panthera pardus	Leopard	VU	VU	Low
Parahyaena brunnea	Brown Hyena	NT	NT	Low
Pelea capreolus	Grey Rhebok	NT	LC	Low

Table 31: Sensitive mammal species relevant to Outeniqua project area according to the screening tool report.

Species	Common Name	Screening Tool Sensitivity Designation	Conservation Status		Likelihood of occurrence
			Regional (SANBI, 2016)	IUCN (2021)	
Bunolagus monticularis	Riverine Rabbit	Medium	CR	CR	Low

10.8.6.3 HERPETOFAUNA

10.8.6.3.1 AMPHIBIANS

The amphibian list is generated from the IUCN spatial dataset (2017) and FrogMap database (Fitzpatrick Institute of African Ornithology, 2021a), uses the 3322-quarter degree square which encapsulates both the Blanco and Outeniqua project areas.

Based on the IUCN Red List Spatial Data and FrogMap, seventeen (17) amphibian species are expected to occur within the greater zone featuring both project areas. **One of these expected species is regarded as threatened (Table 32).** No sensitive amphibian species were generated by screening tool report for either project area.

Table 32: Threatened amphibian species that may occur within the project area.

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
Afrixalus knysnae	Knysna Leaf-folding Frog	EN	EN	Low

Afrixalus knysnae (Knysna Leaf-folding Frog) is found at low altitudes along the border between the Eastern Cape and Western Cape Provinces in South Africa (IUCN, 2017). It can be found in a coastal mosaic of vegetation types, including mountain fynbos heathland and forest, and breeds in small dams, well-vegetated ornamental garden ponds and shallow semi-permanent water with much emergent vegetation (IUCN, 2017). The lack of suitable forest habitat within the project area contributed to a low likelihood of occurrence for this species.

10.8.6.3.2 REPTILES

The reptile list is generated from the IUCN spatial dataset (2017) and ReptileMap database (Fitzpatrick Institute of African Ornithology, 2021b), using the 3322-quarter degree square which encapsulates both the Blanco and Outeniqua project areas.

Based on the IUCN Red List Spatial Data and the ReptileMAP database, fifty-seven (57) reptile species are expected to occur within the greater zone featuring both project areas. No reptile SCCs are expected to occur within the project area. No sensitive reptile species are relevant to either project area according to the screening tool report.

10.9 AQUATIC AND WETLANDS

The aquatic and wetland environment inputs were provided by a specialist from The Biodiversity Company (TBC). The desktop aquatic and wetland findings are presented in the subsections below.

10.9.1 CATCHMENT AND WATER RESOURCES

The project areas are located in the K30A-9087 (Maalgate River), J34F-08863 (Doring system) and J35B-08861 (Klip system) Sub Quaternary Reaches (SQR). The river systems present in both the Blanco and Outeniqua project areas flow through agricultural and peri-urban type of land-use. Table 33 below presents the summary of the Present Ecological State (PES) of the SQRs associated with the relevant Water Management Areas (WMA's).

Table 33: Summary of the Present Ecological State of the SQRs.

	SQR Importance and Sensitivity	Score
Blanco	K30A-9087 (Maalgate River)	
	Present Ecological Status	Largely Modified (class D)
	Ecological Importance	High
	Ecological Sensitivity	Very High
	Default Ecological Category	A
Outeniqua (majority of proposed infrastructure)	J34F-08863 (Doring River)	
	Present Ecological Status	Largely Modified (class D)
	Ecological Importance	High
	Ecological Sensitivity	High
	Default Ecological Category	B
Outeniqua (SQR crossed by Dx Lines Site 10, 2, and 5 [refer to map legends])	J35B-08861 (Klip River)	
	Present Ecological Status	Largely Modified (class D)
	Ecological Importance	Moderate
	Ecological Sensitivity	Very High
	Default Ecological Category	A

Various datasets were considered for the identification of water resources within the area, with particular reference to wetlands and riverine systems within the 500 m regulated area. Figure 39 presents the extent of water resources identified within the local Blanco area, while Figure 40 presents this information for the Outeniqua project area.

Topographical river line data for the quarter degree squared 3322 was also considered to identify watercourses within the regulated areas, distinguishing between non-perennial and perennial watercourses. Table 34 presents a summary (or overview) of water resource attributes identified for the Blanco study area, and Table 35 includes this information for the Outeniqua study area.

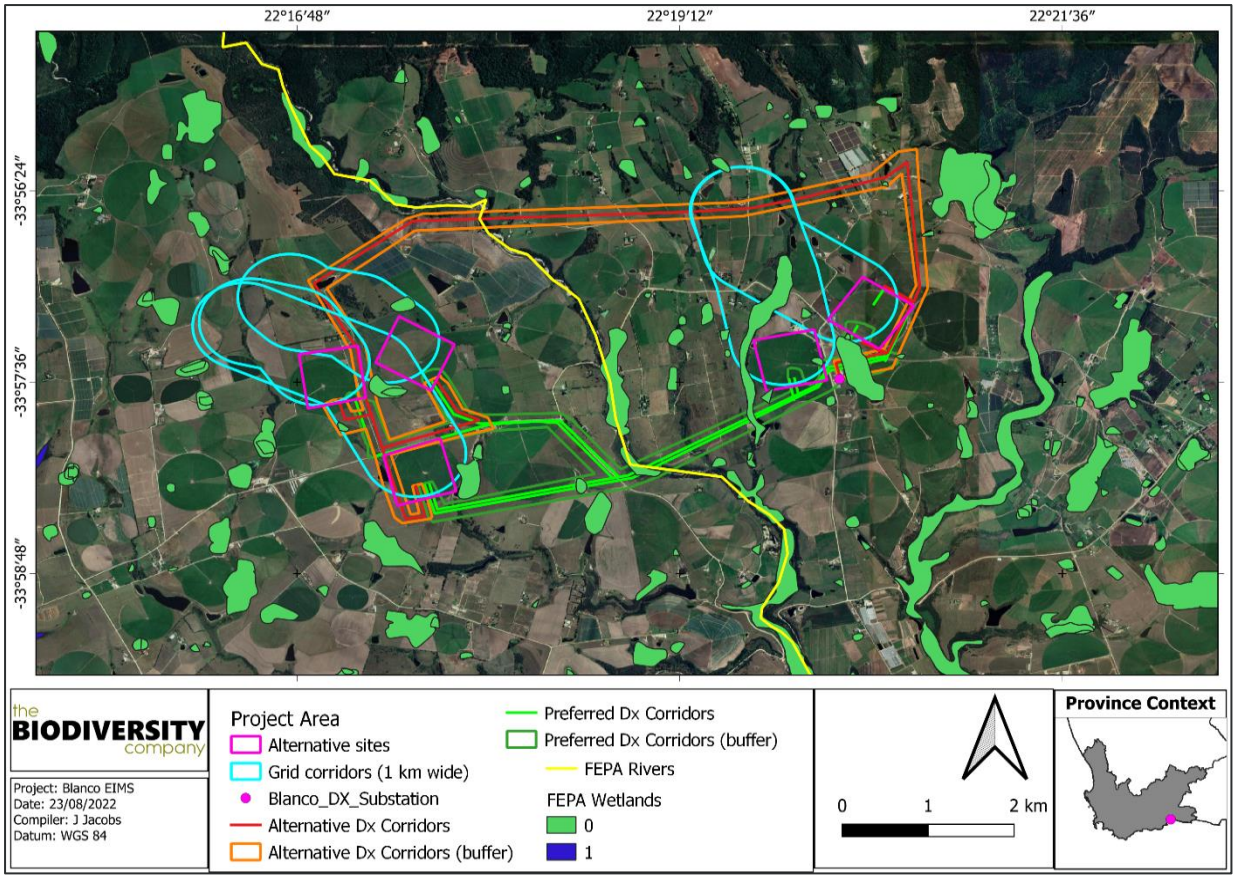

Figure 39: The location of NFEPA wetlands in relation to the Blanco study area.

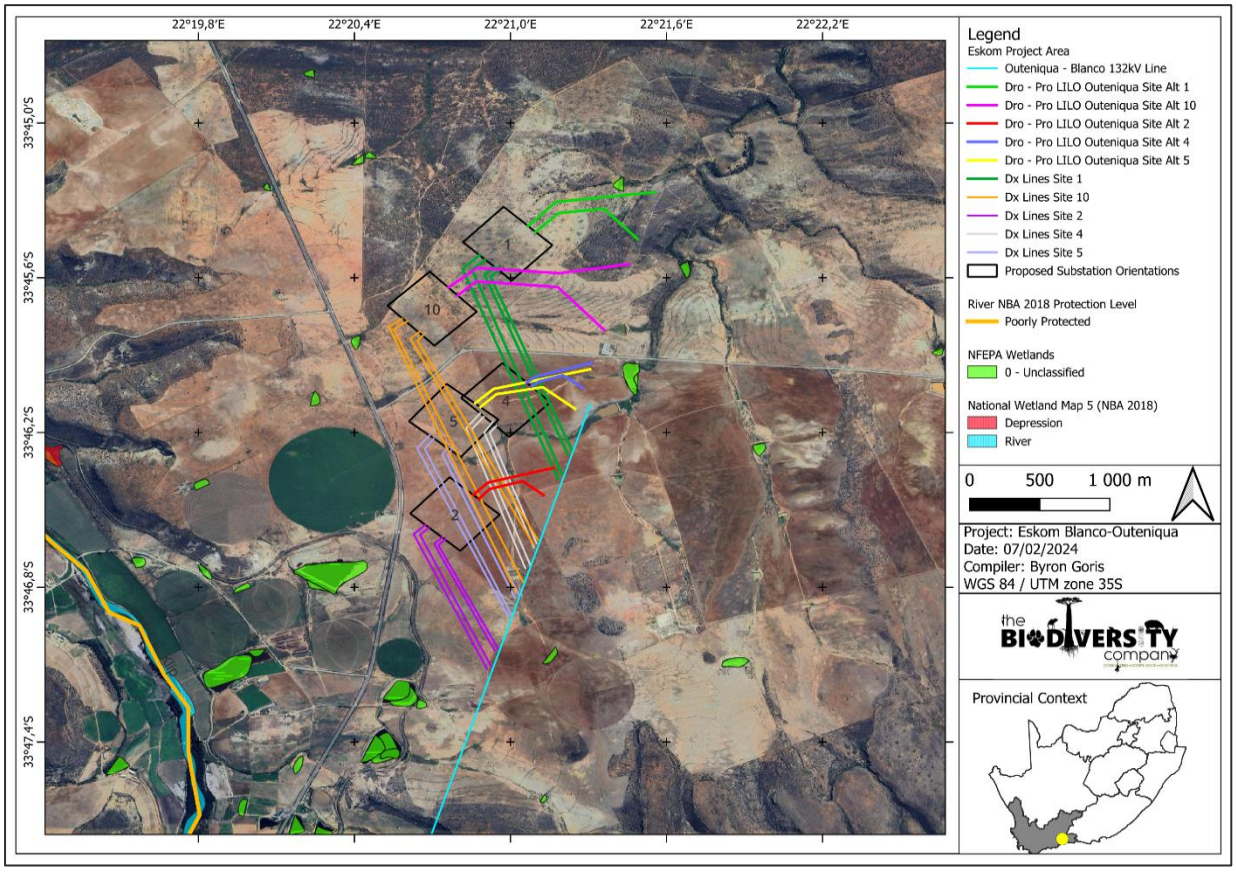

Figure 40: The location of NFEPA wetlands in relation to the Outeniqua project area.

Table 34: Summary of water resource attributes for the Blanco sites

Site alternatives	Description
A1	• A watercourse (channel) does extent into the site. • Several dams are located on the periphery of the site. • A natural valley bottom wetland is located to the south of the site.
A2	• A dam is located within the site, this is considered to be an artificial wetland. The system is located in valley system. • A watercourse (channel) does extent into the site. • Several dams are located on the periphery of the site. • Two natural valley bottom wetlands are located to the west and east of the site. • The Koesterbosrivier system flanks the western boundary of the site.
A7	• No wetlands are located within the site. • A watercourse (channel) does extent into the site. • The eastern boundary is flanked by a valley bottom system.
A8	• This is the only site with no watercourses expected for the area. • Water resources are located on the periphery of the site in several directions.
A9	• The north-eastern 'edge' of the site is encroached upon by a valley bottom wetland. • The western and eastern boundaries are both flanked by watercourses. • Dams are located in close proximity to the site.

Table 35: Summary of water resource attributes for the Outeniqua sites.

Site label from mapping	Description
1	• A channeled valley-bottom NW5 wetland is located within 100 m of the "Dro - Pro LILO Outeniqua Site Alt 1" lines extending from the site. • "Dro-Pro LILO Outeniqua Site Alt 1" and "Dx Lines Site 1" cross drainage lines at various points.
10	• No notable water features across substation location. • "Dro-Pro LILO Outeniqua Site Alt 10" and "Dx Lines Site 10" cross drainage lines at various points.
2	• A channeled valley-bottom NW5 wetland can be found approximately 400 m to the west of the site. • No wetlands or NFEPA rivers within the substation location. A small drainage line does feature. • "Dro-Pro LILO Outeniqua Site Alt 2" and "Dx Lines Site 2" cross drainage lines at various points.

Site label from mapping	Description
4	• A channeled valley-bottom wetland can be found approximately 500 m to the east of the site. • No wetlands or NFEPA rivers within the substation location. A small drainage line does feature. • "Dro-Pro LILO Outeniqua Site Alt 4" and "Dx Lines Site 4" cross drainage lines at various points.
5	• No wetlands or NFEPA rivers within the substation location. A small drainage line does feature. • "Dro-Pro LILO Outeniqua Site Alt 5" and "Dx Lines Site 5" cross drainage lines at various points.

River line data and water areas for the BLANCO project area were sourced for the quaternary degree square 3322, which depicts numerous watercourse and water areas (predominantly dams) in proximity to the project components (Figure 42).

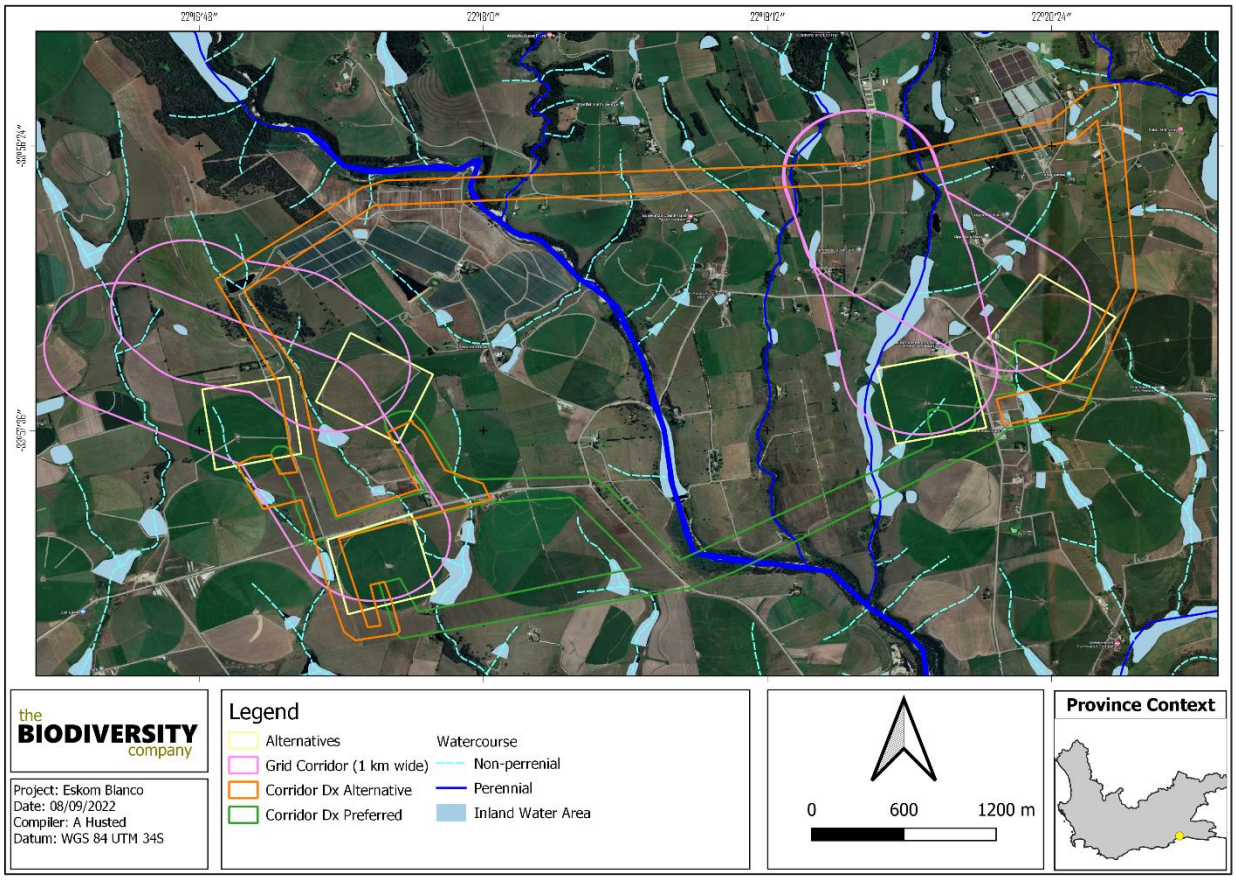

Figure 41: Blanco project area in relation to expected watercourse and water areas.

River line data and water areas for the Outeniqua project area were also sourced from the quaternary degree square 3322. Various watercourses and water areas drain the area covered by the project components (Figure 46). As shown in Figure 42, proposed substation locations 2, 4, and 5 would be placed over drainage lines, while all possible site lines connected to the five sites cross drainage lines in various locations.

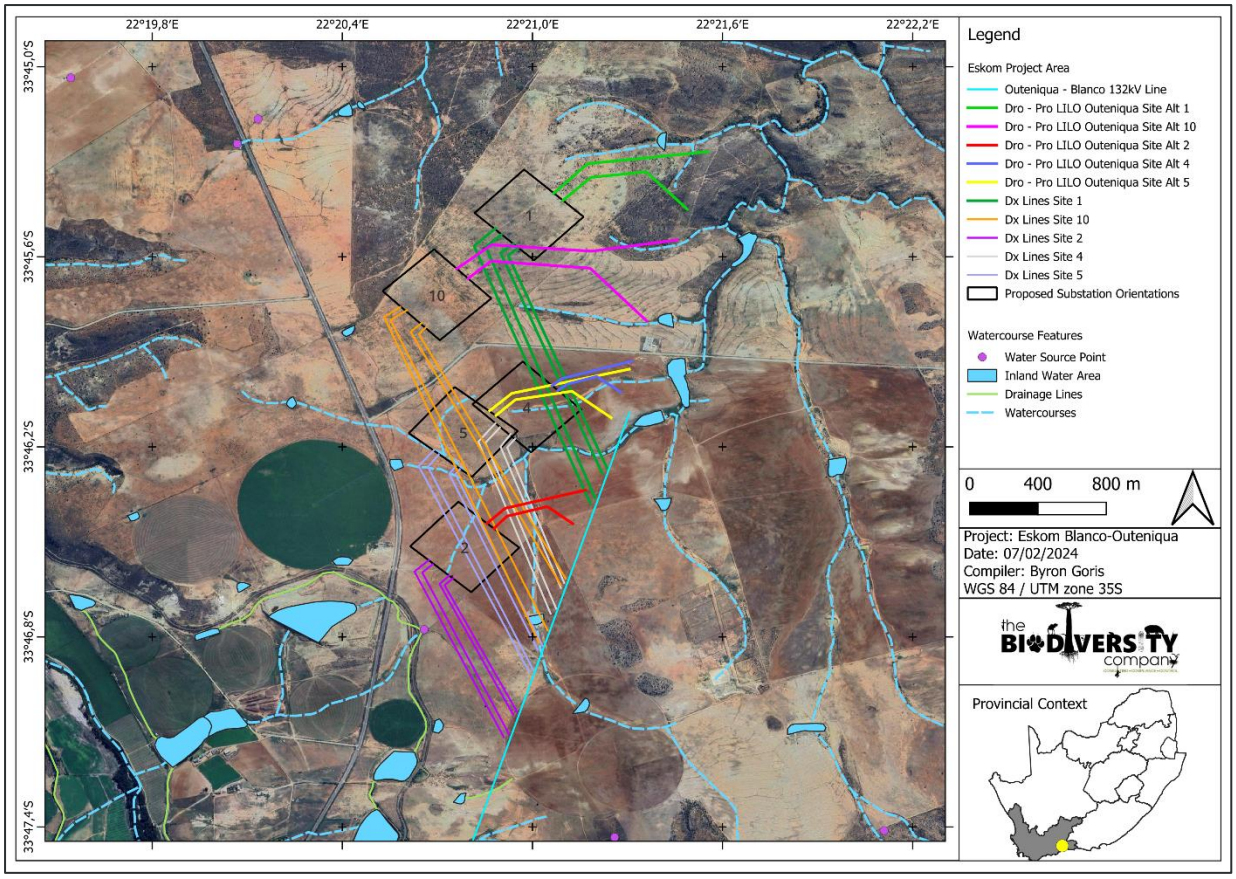

Figure 42: Outeniqua project area in relation to expected watercourse and water areas.

10.9.2 SENSITIVITY

The overall Aquatic Biodiversity Theme sensitivity is very high for both the Blanco and Outeniqua project areas as per the DEA National Web-based Environmental Screening Tool (See Figure 43 and Figure 44). The purpose of the Western Cape BSP is to inform land-use planning and development on a provincial scale and to aid in natural resource management. One of the outputs is a map of Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). These are classified into different categories, namely CBA1 areas, CBA2 areas, ESA areas and Other Natural Areas (ONAs) based on biodiversity characteristics, spatial configuration, and requirements for meeting targets for both biodiversity patterns and ecological processes. The Aquatic Biodiversity Theme sensitivity is considered very high for both project areas for the following reasons:

- The “Very High” sensitivity rating of the Blanco site can be attributed to the project being situated in an area with a strong presence of wetlands and rivers, as well as aquatic CBAs.
- The “Very High" sensitivity rating for the Outeniqua site is attributed to an aquatic ESA 1 being crossed – a watercourse in the north of the project area.

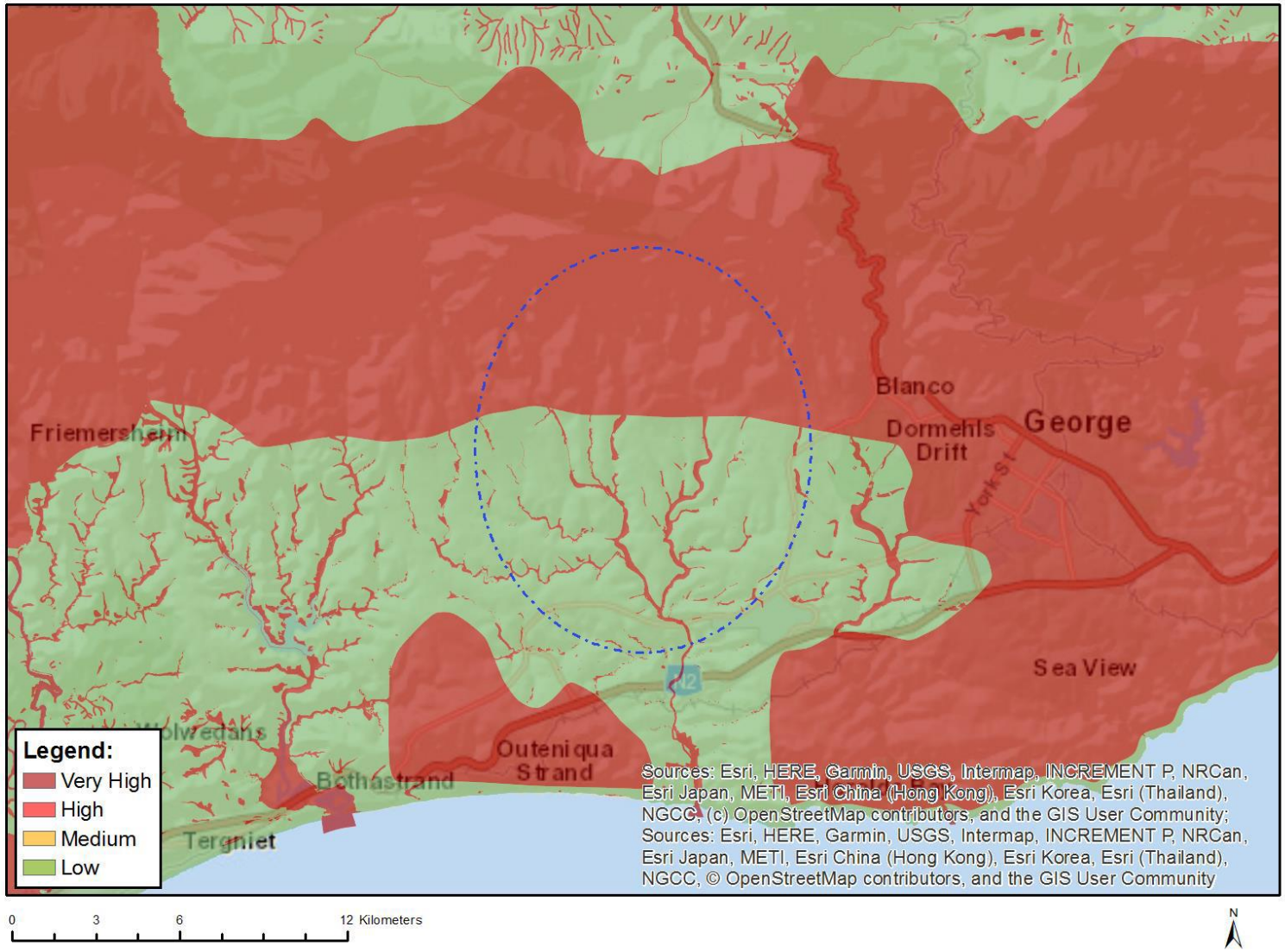

Figure 43: Relative aquatic theme sensitivity for the Blanco project area.

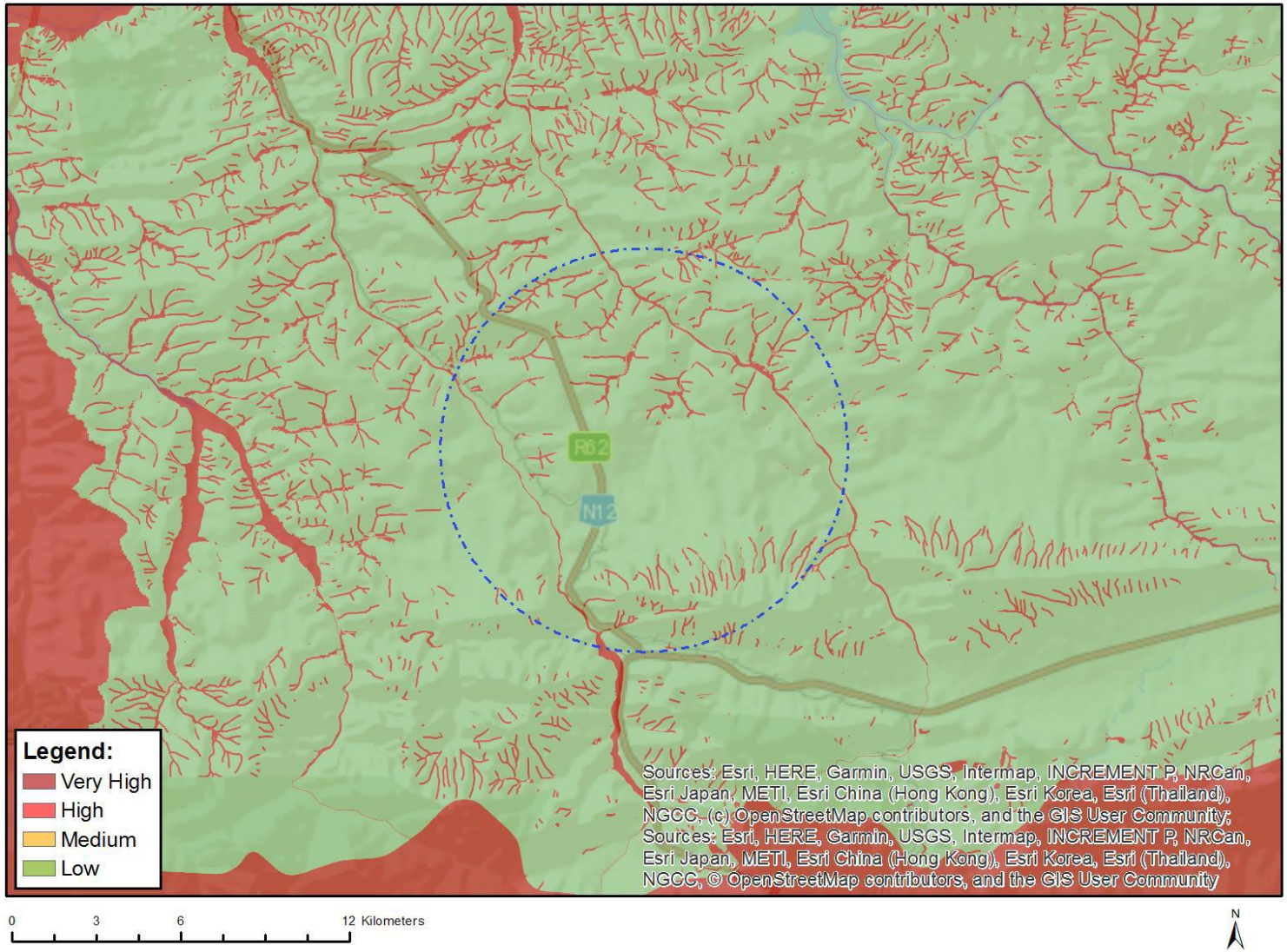

Figure 44: Relative aquatic theme sensitivity for the Outeniqua project area.

10.9.3 BUFFER REQUIREMENTS

The "Preliminary Guideline for the Determination of Buffer Zones for Rivers, Wetlands and Estuaries" (Macfarlane et al. 2014) will be used to determine the appropriate buffer zone for the proposed activities. According to Macfarlane and Bredin (2017) the minimum recommended buffer for 'worst case' service infrastructure is 20 m. The recommended minimum buffer for above-ground communication/power (electricity) infrastructure is 10 m.

10.10 VISUAL RECEPTORS

The baseline landscape and visual impact inputs were provided by Lourens du Plessis (LOGIS). The baseline findings are presented in the subsections below.

10.10.1 LANDSCAPE CHARACTER AREAS AND VISUAL ABSORPTION CAPACITY (VAC)

Landscape Character Areas (LCAs) are defined as "single unique areas which are the discrete geographical areas of a particular landscape type". The overriding character differentiating factors within the subject landscape appear to be landform /drainage and vegetation cover. The landform appears to divide the landscape discrete areas including;

1. Cultivated Rural Landscape Character Area. This area has gently undulating topography and a predominance of cultivated fields that are generally separated by roads and rivers. This is a relatively open landscape with little VAC which is only provided by undulating hills and alien vegetation;
2. The Urban / Residential Landscape Character Area. This area is comprised entirely of the urban areas of Blanco and George. VAC is generally high within these areas due to the extent of structures and urban vegetation.

Visual Receptors are defined as "individuals and / or defined groups of people who have the potential to be affected by the proposal". The significance of a change in a view for a visual receptor is likely to relate to use. Uses such as guest houses, recreation and tourism related areas are likely to rely on the maintenance of an outlook for successfully attracting guests and users. Residential areas could depend on outlook for the enjoyment of the area by residents and for maintaining property values. A route that is particularly important for tourism such as the Garden Route, Outeniqua and Montagu Passes may also be dependent on outlook for the maintenance of a suitable experience for users.

Visual receptors within the affected landscape that could be sensitive to landscape change are indicated below.

- Area Receptors may include;
    - Urban areas within the Zebra and Blanco areas as well as the town of George to a lesser extent which are located within and adjacent to the 6km radius of the study areas, respectively; and
    - The Witkliprug Nature Reserve which, at its closest, is located approximately 4.0km to the north-west of the Outeniqua study area.
- Point Receptors that include;
    - There are a number of Local Farmsteads and Homesteads located within the study areas and surrounding landscape. The farmsteads within the proposed site have a primarily agricultural use.
- Linear Receptors or routes through the area that include;
    - The N2, N9 and N12 national routes that run through and adjacent to the study areas.
    - The R62, R102, R404 and the unsurfaced local roads that that run through the proposed study areas. All of these are used mainly by local and regional people and to a lesser extent by domestic and international tourists for recreational purposes. The landscape character areas and visual receptors within the study area are presented in Figure 45 and Figure 46.

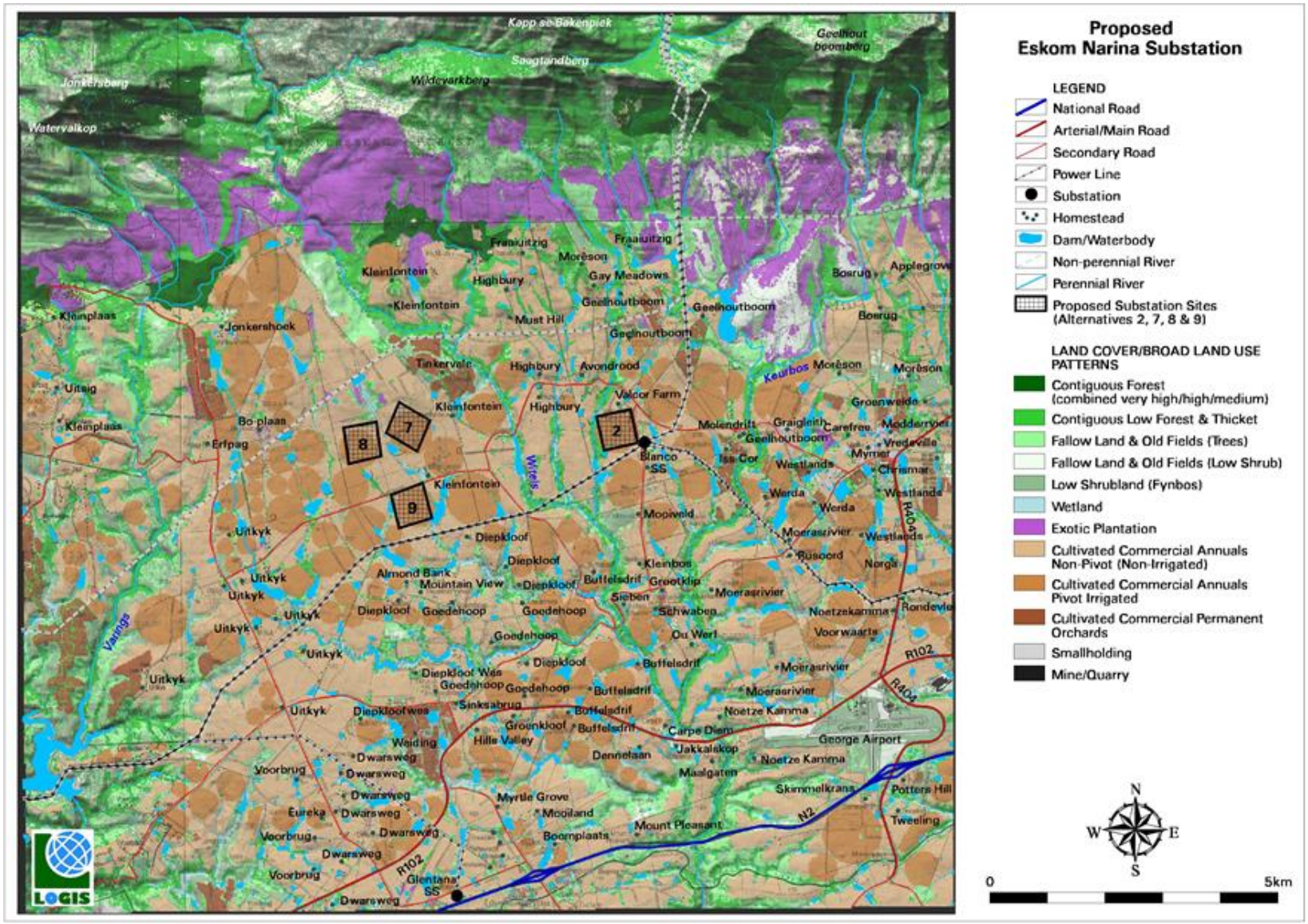

Figure 45: Blanco landscape character areas and visual receptors.

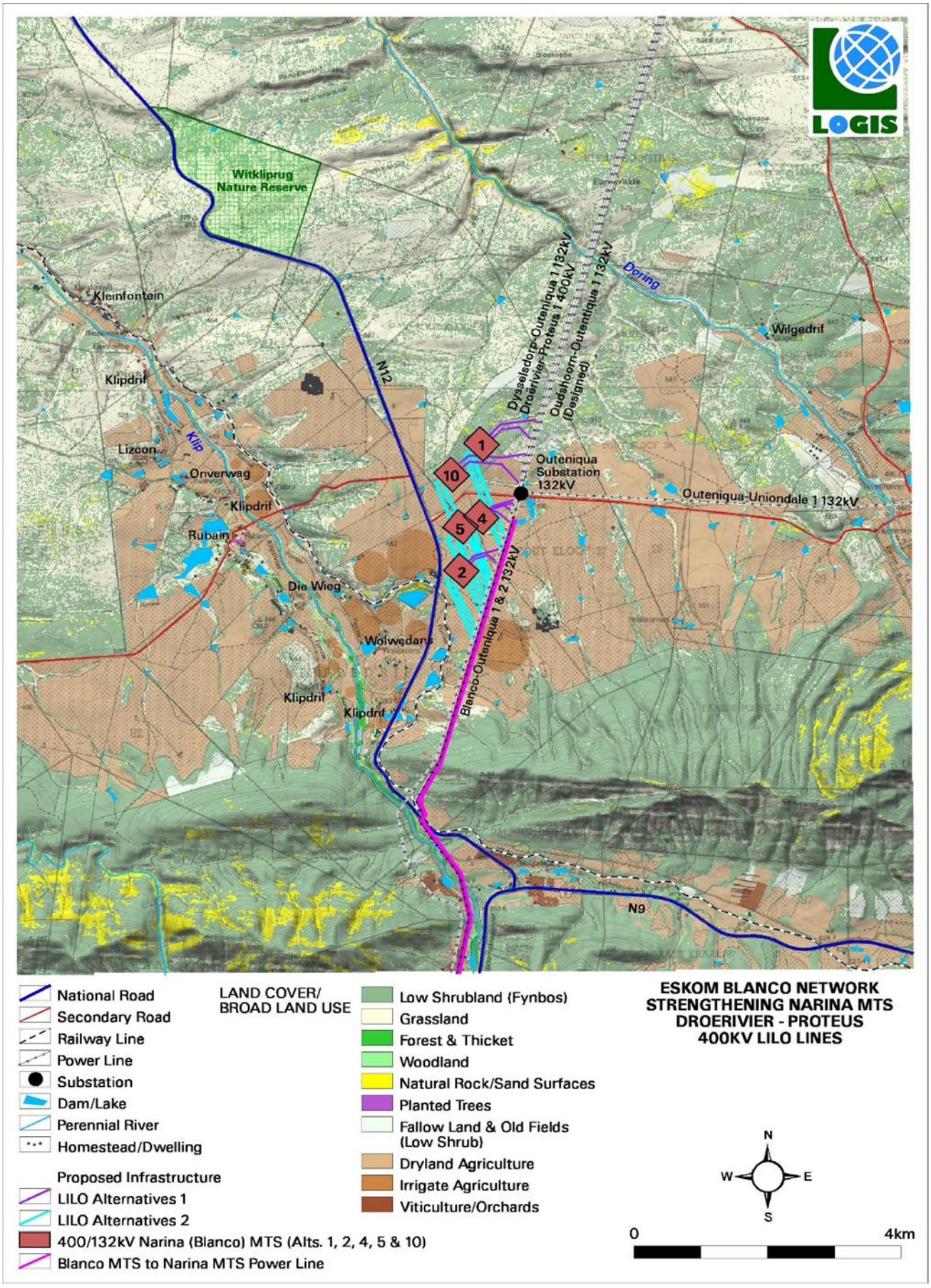

Figure 46: Outeniqua landscape character areas and visual receptors.

11 ENVIRONMENTAL IMPACT ASSESSMENT

This section describes the impact assessment methodology, the impacts identified as well as the preliminary impact assessment during this scoping phase. Further impacts may be identified once public consultation on this report has been concluded and an updated impact assessment will be presented in the EIA phase.

11.1 IMPACT ASSESSMENT METHODOLOGY

The impact significance rating methodology, as provided by EIMS, is guided by the requirements of the NEMA EIA Regulations 2014 (as amended). The broad approach to the significance rating methodology is to determine the environmental risk (ER) by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relate this to the probability/ likelihood (P) of the impact occurring. This determines the environmental risk. In addition, other factors, including cumulative impacts and potential for irreplaceable loss of resources, are used to determine a prioritisation factor (PF) which is applied to the ER to determine the overall significance (S). The impact assessment will be applied to all identified alternatives. Where possible, mitigation measures will be recommended for impacts identified.

11.1.1 DETERMINATION OF ENVIRONMENTAL RISK

The significance (S) of an impact is determined by applying a prioritisation factor (PF) to the environmental risk (ER). The environmental risk is dependent on the consequence (C) of the particular impact and the probability (P) of the impact occurring. Consequence is determined through the consideration of the Nature (N), Extent (E), Duration (D), Magnitude (M), and Reversibility (R) applicable to the specific impact.

For the purpose of this methodology the consequence of the impact is represented by:

$$\boldsymbol{C = \frac{(E + D + M + R) * N}{4}}$$

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in Table 36 below.

Table 36: Criteria for Determining Impact Consequence.

Aspect	Score	Definition
Nature	- 1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e. limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property boundary),
	3	Local (i.e. the area within 5 km of the site),
	4	Regional (i.e. extends between 5 and 50 km from the site
	5	Provincial / National (i.e. extends beyond 50 km from the site)
Duration	1	Immediate (<1 year)
	2	Short term (1-5 years)
	3	Medium term (6-15 years)
	4	Long term (15-65 years, the impact will cease after the operational life span of the project)

Aspect	Score	Definition
	5	Permanent (>65 years, no mitigation measure of natural process will reduce the impact after construction)
Magnitude/ Intensity	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected)
	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected)
	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way, moderate improvement for +ve impacts)
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease, high improvement for +ve impacts)
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease, substantial improvement for +ve impacts)
Reversibility	1	Impact is reversible without any time and cost.
	2	Impact is reversible without incurring significant time and cost.
	3	Impact is reversible only by incurring significant time and cost
	4	Impact is reversible only by incurring prohibitively high time and cost
	5	Irreversible Impact

Once the C has been determined the ER is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/ scored as per Table 37.

Table 37: Probability Scoring.

Probability	1	Improbable (the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <25%),
	2	Low probability (there is a possibility that the impact will occur; >25% and <50%),
	3	Medium probability (the impact may occur; >50% and <75%),
	4	High probability (it is most likely that the impact will occur- > 75% probability), or
	5	Definite (the impact will occur),

The result is a qualitative representation of relative ER associated with the impact. ER is therefore calculated as follows:

ER= C x P

Table 38: Determination of Environmental Risk.

Conseq	5	5	10	15	20	25
	4	4	8	12	16	20

	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
	Probability					

The outcome of the environmental risk assessment will result in a range of scores, ranging from 1 through to 25. These ER scores are then grouped into respective classes as described in Table 39.

Table 39: Significance Classes.

Environmental Risk Score	
Value	Description
< 9	Low (i.e. where this impact is unlikely to be a significant environmental risk/ reward).
≥9 - <17	Medium (i.e. where the impact could have a significant environmental risk/ reward),
≥17	High (i.e. where the impact will have a significant environmental risk/ reward).

The impact ER will be determined for each impact without relevant management and mitigation measures (pre-mitigation), as well as post implementation of relevant management and mitigation measures (post-mitigation). This allows for a prediction in the degree to which the impact can be managed/mitigated.

11.1.2 IMPACT PRIORITISATION

Further to the assessment criteria presented in the section above, it is necessary to assess each potentially significant impact in terms of:

1. Cumulative impacts; and
2. The degree to which the impact may cause irreplaceable loss of resources.

To ensure that these factors are considered, an impact prioritisation factor (PF) will be applied to each impact ER (post-mitigation). This prioritisation factor does not aim to detract from the risk ratings but rather to focus the attention of the decision-making authority on the higher priority/significance issues and impacts. The PF will be applied to the ER score based on the assumption that relevant suggested management/mitigation impacts are implemented.

Table 40: Criteria for Determining Prioritisation.

Cumulative Impact (CI)	Low (1)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.
	Medium (2)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.
	High (3)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/ definite that the impact will result in spatial and temporal cumulative change.
	Low (1)	Where the impact is unlikely to result in irreplaceable loss of resources.

Irreplaceable Loss of Resources (LR)	Medium (2)	Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.
	High (3)	Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criteria represented in Table 40. The impact priority is therefore determined as follows:

Priority = CI + LR

The result is a priority score which ranges from 2 to 6 and a consequent PF ranging from 1 to 1.5 (refer to Table 41).

Table 41: Determination of Prioritisation Factor.

Priority	Prioritisation Factor
2	**1**
3	**1.125**
4	**1.25**
5	**1.375**
6	**1.5**

In order to determine the final impact significance, the PF is multiplied by the ER of the post mitigation scoring. The ultimate aim of the PF is an attempt to increase the post mitigation environmental risk rating by a factor of 0.5, if all the priority attributes are high (i.e. if an impact comes out with a high medium environmental risk after the conventional impact rating, but there is significant cumulative impact potential and significant potential for irreplaceable loss of resources, then the net result would be to upscale the impact to a high significance).

Table 42: Final Environmental Significance Rating.

Environmental Significance Rating	
Value	Description
≤ -17	High negative (i.e. where the impact must have an influence on the decision process to develop in the area).
> -17 ≤ -9	Medium negative (i.e. where the impact could influence the decision to develop in the area).
> -9 < 0	Low negative (i.e. where this impact would not have a direct influence on the decision to develop in the area).
0	No impact
>0 <9	Low positive (i.e. where this impact would not have a direct influence on the decision to develop in the area).

Environmental Significance Rating	
≥ 9 < 17	Medium positive (i.e. where the impact could influence the decision to develop in the area).
≥ 17	High positive (i.e. where the impact must have an influence on the decision process to develop in the area).

The significance ratings and additional considerations applied to each impact will be used to provide a quantitative comparative assessment of the alternatives being considered. In addition, professional expertise and opinion of the specialists and the environmental consultants will be applied to provide a qualitative comparison of the alternatives under consideration. This process will identify the best alternative for the proposed project.

11.2 IDENTIFICATION AND PRELIMINARY ASSESSMENT OF IMPACTS

This Section presents the potential impacts that have been identified during the scoping phase assessment. It should be noted that this report will be made available to I&AP's for review and comment with all comments and our responses included in the final Scoping report submitted to the DFFE for adjudication. The results of the public consultation will be used to update the identified potential impacts which will be further refined during the course of the EIA assessment and consultation process. Potential environmental impacts were identified during the scoping process. These impacts were identified by the EAP, the appointed specialists, and will be updated once public input is received.

Without proper mitigation measures and continual environmental management, most of the identified impacts may potentially become cumulative, affecting areas outside of their originally identified zone of impact. Relevant preliminary cumulative impacts have been identified and will be updated during the detailed EIA level investigation. When considering cumulative impacts, it is important to bear in mind the scale at which different impacts occur. There is potential for a cumulative effect at a broad scale, such as regional deterioration of air quality, as well as finer scale effects occurring in the area surrounding the activity. The main impacts which have a cumulative effect on a regional scale are related to the transportation vectors that they act upon. For example, air movement patterns result in localised air quality impacts having a cumulative effect on air quality in the region. Similarly, water acts as a vector for distribution of impacts such as contamination across a much wider area than the localised extent of the impacts source. At a finer scale, there are also impacts that have the potential to result in a cumulative effect, although due to the smaller scale at which these operate, the significance of the cumulative impact is lower in the broader context.

11.3 DESCRIPTION AND PRELIMINARY ASSESSMENT OF IMPACTS

The following potential impacts were identified during the scoping phase assessment. These preliminary impact calculations will be subject to amendment based on the EIA phase assessment and the results of public consultation undertaken during the EIA phase. The impact assessment matrix is included in Appendix 3 and the below subsections describe each impact in more detail.

11.3.1 TERRESTRIAL BIODIVERSITY IMPACTS

The majority of the biodiversity within both study areas has been fragmented and impacted on by existing land uses including agriculture, farmsteads, roads, powerlines and other infrastructure. Due to the spatial extent of the proposed Narina substation and associated lines infrastructure, a variety of terrestrial biodiversity areas exist. These range from low sensitive (e.g. agricultural areas etc) to highly sensitive areas (e.g. pristine areas, wetlands and watercourses as well as areas where red data species occur). Furthermore, the study areas contain CBA1 (Blanco area) and ESA 1&2 areas (both Blanco and Outeniqua study areas). The ecological integrity, importance, and functioning of these terrestrial biodiversity areas provide a variety of ecological services that are considered beneficial, with one key service being the maintenance of biodiversity. The preservation of these systems is the most important aspect to consider for the proposed project. Thus, if these areas are not

maintained in a natural or near natural state, destroyed or fragmented further, then meeting targets for biodiversity features will not be achieved.

The following preliminary impacts have been identified and assessed in this report:

- Destruction, further loss and fragmentation of the vegetation community.
- Introduction of alien species, especially plants.
- Erosion due to storm water runoff and wind.
- Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration and poaching).
- Environmental pollution due to potential leaks, discharges, pollutant leaching into the surrounding environment.

(i) Mitigation measures

- If sensitive species occur within the preferred footprint, the first option should be to relocate the proposed footprint followed by the alternative of preparing a relocation plan (prepared by a suitably qualified specialist).
- Search and rescue of species of concern. Obtain permits for disturbance/destruction of any listed/protected species found on site. Where possible, undertake activities in previously disturbed areas and/or habitats with lower sensitivity. Where possible, locate activities on the boundaries of existing disturbance. Use existing access roads as much as possible.
- Where possible, locate infrastructure in previously disturbed places and/or habitats with a lower sensitivity score. Rehabilitate disturbed areas as soon as possible. Control alien plants.
- Where possible, undertake activities in previously disturbed areas and/or habitats with lower sensitivity. Where possible, locate activities on the boundaries of existing disturbance. Use existing access roads as much as possible. Rehabilitate disturbed areas as soon as possible.
- If areas are fenced, the fences must be checked for snares on a daily basis for the duration of the construction period. All incidences must be reported to the closest police station. Anti-poaching toolbox talks should form part of the induction process of all the fencing teams. Any contractor or employee caught poaching should be removed from site.
- Restrict the clearing of watercourse vegetation as far as possible. Areas that have been cleared should be re-vegetated with indigenous species or other suitable plant species, such as *Eragrostis tef*, after construction and initial rehabilitation work (reinstatement of the geomorphological template) is completed. Compile and implement an alien plant control program with a particular focus on alien control in watercourses (including wetlands) during the rehabilitation phase of the project. Rehabilitate disturbed areas as soon as possible. Restrict new footprints to disturbed areas as far as possible. Regular monitoring should be undertaken in the watercourses to check any possible invasion by alien vegetation so that they can be weeded out before they grow and spread out.
- All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site.
- All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good “housekeeping”.

(ii) Cumulative Impacts

- Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.

(iii) Irreplaceable loss of Resources

- The impact is likely to result in irreplaceable loss of resources on the approved substation location of the application area.

11.3.2 AQUATIC AND WETLAND IMPACTS

The impacts that have been identified on aquatic and wetland systems during the proposed development include the loss of local water resources, with indirect risks posed by all site alternative on the adjacent (and downslope) systems. The loss of wetland is likely to result in a level of compensation, a wetland offset strategy could determine the feasibility and also identify opportunities for compensation. The development of the site will alter the topography and associated hydrodynamics of the catchment. The loss of infiltration and surface roughness from the developed site will result in an increase in run-off velocity, primarily during the wet season period. The altered hydrology is likely to affect the structure of the receiving water resources, resulting in erosion of the systems. Sedimentation of the resources will also contribute to impaired water and habitat quality. Run-off from the site has the potential to transport contaminated water from the substation area to the receiving watercourse. The impacts to water quality caused by spills/leaks from the site can be mitigated to an acceptable level. These impacts will be assessed and discussed in more detail in the EIA phase.

(i) Mitigation measures

- The construction vehicles and machinery must make use of existing access routes as much as possible, before adjacent areas are considered for access.
- The contractors used for the project should have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly.
- It is preferable that construction takes place during the dry season to reduce the erosion potential of the exposed surfaces.
- All chemicals and toxicants to be used for the construction must be stored within the construction footprint and in a bunded area.
- All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site.
- All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good “housekeeping”.
- Adequate sanitary facilities and ablutions on the construction footprint must be provided for all personnel throughout the application area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation).
- Have action plans on site, and training for contactors and employees in the event of spills, leaks and other impacts to the aquatic systems.
- Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil.
- All waste generated on-site during construction must be adequately managed. Separation and recycling of different waste materials should be supported.

(ii) Cumulative Impacts

- Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.

(iii) Irreplaceable loss of Resources

- The impact may result in irreplaceable loss of resources.

11.3.3 AGRICULTURAL POTENTIAL AND SOILS IMPACTS

Considering the occurrence of various soil forms that are commonly associated with high land capabilities, it is likely that areas with high land capability sensitivity do occur within the project areas. The development of these areas will likely result in loss of high land capability. The major concern regarding the loss of agricultural land and / or the loss of agricultural potential is centred around the compaction and the erosion of the soil resource.

During the construction phase, high intensity construction activities will be carried out. This includes soil stripping, digging foundations, compacting soil, removing vegetation and the use of heavy machinery.

It is evident from the impact calculations in Table 43 that in a pre-mitigation state, moderate impacts are expected. This score can be decreased to "Low" despite the high sensitivity of the soil as well as the high intensity of the proposed construction activities. In most cases, highly functioning soil resources will be transformed from high arable potential to completely disturbed. During the operational phase, those impacts associated with the construction phase are expected to be prolonged, specifically regarding compaction of the soil. The operational phases also pose a risk to soil contamination with spillages/leaks from operating machinery, vehicle and equipment. The potential source of soil contamination could be mitigated to an acceptable residual level. Stormwater run-off must also be managed to prevent the erosion of the adjacent cultivated areas.

(i) Mitigation measures

- Only predefined access roads are to be used to reduce any unnecessary compaction.
- Prevent any spills from occurring. Machines must be parked within hard park areas and must be checked daily for fluid leaks.
- Invasive plant control must be undertaken quarterly.
- All excess soil (soil that are stripped and stockpiled to make way for foundations) must be stored, continuously rehabilitated to be used for rehabilitation of eroded areas.
- If a spill occurs, it is to be cleaned up immediately and reported to the appropriate authorities where required.

(ii) Cumulative Impacts

- Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is likely that the impact will result in spatial and temporal cumulative change.

(iii) Irreplaceable loss of Resources

- The impact will result in irreplaceable loss of resources.

11.3.4 IMPACTS ON HERITAGE OR PALAEONTOLOGICAL FEATURES

Burial grounds and graves have high heritage significance and are given a IIIA significance rating in accordance with the system described in Section 4 of this document. Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. All graves have high levels of emotional, religious and in some cases historical significance. It is also important to understand that graves could have significant heritage value to the relevant families. No graves were identified by the desktop analysis in both the study areas.

There are 2 structures identified in the footprint area of the proposed site 2 substation alternative of the Blanco study area. Several farmsteads and structures are identified in the footprint area of the proposed transmission powerline corridor alternatives. Structures older than 60 years fall under the protection of Section 34(1) of the National Heritage Resources Act 25 of 1999. Additionally, in terms of Section 35(4) of the National Heritage Resources Act (25 of 1999), man-made features and artefacts older than 100 years are defined as being archaeological. In the same section, the Act also states that such archaeological sites and objects may not be disturbed, altered, modified or destroyed without a suitable permit from the South African Heritage Resources Agency (SAHRA).

The Blanco study area pre-mitigation impact significance for known and unknown heritage resources is rated as medium to low negative, but with the implementation of the required mitigation measures the post-mitigation impact will be low negative. The overall Environmental significance will be Low negative. The Outeniqua study area pre-mitigation impact significance for unknown heritage resources is rated as low negative, with the implementation of the required mitigation measures the post-mitigation impact will be low negative. The overall Environmental significance will be Low negative. Chance finds of unknown heritage resources is predicted that the unmitigated impact to be low negative, with a post-mitigation impact of low negative.

According to the Palaeosensitivity Map available on the South African Heritage Resources Information System database (SAHRIS), the Palaeontological Sensitivity of the proposed substation alternatives are mostly rated as Insignificant and low for the Blanco study area and high for the Outeniqua sites. Therefore, while no further palaeontological studies are proposed in terms of the Blanco study area, the Outeniqua study area alternatives will require a field based palaeontological assessment.

The following preliminary construction phase impacts have been identified and assessed in this report:

- Destruction of known and unknown heritage finds.
- Impact on Palaeontology

(i) Mitigation measures

- Archaeological sites and objects may not be disturbed, altered, modified or destroyed without a suitable permit from the South African Heritage Resources Agency (SAHRA).
- Implement a chance find procedures in case where possible heritage finds are uncovered.
- Palaeontology:
    - If Palaeontological Heritage is uncovered during surface clearing and excavations a Chance find Protocol should be implemented immediately. Fossil discoveries ought to be protected and the ECO/site manager must report to South African Heritage Resources Agency (SAHRA) so that mitigation (recording and collection) can be carried out.
    - Before any fossil material can be collected from the development site the specialist involved would need to apply for a collection permit from SAHRA. Fossil material must be housed in an official collection (museum or university), while all reports and fieldwork should meet the minimum standards for palaeontological impact studies proposed by SAHRA (2012).

(ii) Cumulative Impacts

- Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is likely that the impact may result in spatial and temporal cumulative change.

(iii) Irreplaceable loss of Resources

- The impact is unlikely to result in irreplaceable loss of resources.

11.3.5 SOCIO-ECONOMIC IMPACTS

The proposed Narina Substation project will impact on high quality agricultural soil which is used to grow crops that contribute to food security in South Africa. One of the most significant potential social impacts associated with the proposed project is the potential impacts on livelihoods of the farming community. Farmers may fear that their land rights and property values will be affected. The project will require access to farms, and because of the current socio-political issues in South Africa, this is a sensitive matter. Farmers may also be concerned about the impact of the Narina Substation project on their existing way of life, and on the infrastructure on their farms. Further assessments of the social impacts will be undertaken and presented in the EIA phase.

Many of the economic impacts of this project have been rated as positive at this preliminary impact assessment stage with the impacts extending from a local level, through to the region and also to a national level. During the construction phase, the positive impacts on the local economy will be the greatest (through employment

opportunities as well as material and contractor requirement) while during the operational phase the economic impacts move towards a more regional and national level when electricity distribution and stability is in full swing. A preliminary impact assessment of each of the below impacts has been undertaken and will be refined in the EIA phase. The following preliminary socio-economic impacts have been identified at this stage:

- Economic costs
- Employment
- Population influx
- Nuisance factors
- Employment
- Impact on agriculture
- Sense of place and property values
- Stable electricity supply
- Disruptions in power supply

(i) Mitigation measures

- Eskom must appoint an agricultural economist to determine what the actual losses will be to the farmers due to the Substation and Powerlines development on their properties. Farmers must be compensated for the actual losses for their land. The principles explained in the IFC Handbook for Preparing a Resettlement Action Plan must be followed where necessary. This includes a land use/land capability inventory; an asset register and physical asset survey; an income stream analysis and entitlement matrix. Compensation must be determined with input from the landowners.
- If any existing activities will be affected negatively, Eskom must enter negotiations with the affected parties as soon as reasonably achievable to ensure the affected parties are compensated fairly or can make additional arrangements. Interference with existing livelihoods should be avoided if possible. If any new activities are planned for a property, Eskom must consult with the landowner and obtain his consent to execute the activity on his/her land.
- If any interference takes place and there are actual losses, the landowner should be compensated for their losses. Eskom must have a claims procedure that is communicated to all affected landowners. In order to receive compensation, the claim forms must be submitted to the Eskom. Compensation should follow the IFC principles, which states that market related prices should be paid, and if anything is restored, it must be to the same or better standards than before.
- If areas are fenced, the fences must be checked for snares daily for the duration of the construction period. All incidences must be reported to the closest police station. Anti-poaching toolbox talks should form part of the induction process of all the fencing teams. Any contractor or employee caught poaching should be removed from site.
- It may be unavoidable to change travel patterns. It is important to inform the affected stakeholders about the possibility of this impact as soon as possible. It will allow them time to get used to the idea and plan their activities accordingly. Before construction Eskom must meet individually with each landowner to discuss their movement patterns and needs. Eskom must provide all the affected landowners with a construction schedule to ensure that they know when construction will take place on their properties. It is recommended that construction be done outside the peak planting and harvesting seasons. Any changes to the construction schedule must be communicated to the farmers at least a week in advance. As far as possible obstruction of access routes and sensitive areas must be avoided. If it cannot be avoided both parties must agree on alternative routes, and Eskom should carry the cost of implementing the alternatives. Industrial vehicles should not travel during peak traffic times.

- If private roads are affected by project activities, it is the responsibility of Eskom to maintain these roads as long as they use them. Eskom should engage with the relevant farmers about road maintenance, as some of them have preferential ways in which the roads must be maintained, for example if roads are only graded and not built up it turns into rivers when there is heavy rain. The road maintenance agreements must be formalised before construction commences to ensure all parties involved are protected and know their rights and responsibilities. It is recommended that construction be planned for the dry season as far as possible. Eskom must provide all the affected landowners with a construction schedule to ensure that they know when construction will take place on their properties. Any changes to the construction schedule must be communicated to the farmers at least a week in advance.
- Before the project commences Eskom should compile an asset and infrastructure baseline of any landowner infrastructure such as fences, pipes, electricity lines, roads and troughs that may be affected by the project. Photographs and GPS co-ordinates of the infrastructure must be included in the baseline. A copy of the baseline affecting their property should be given to each landowner, who should sign off the document to ensure that it is accurate. Eskom should keep the master document. If any damage occurs it should be reinstated to its pre-project status. If the infrastructure must move, it must be done at Eskom's cost. Eskom must ensure that the construction team has a copy of the asset and infrastructure baseline to guarantee that no infrastructure will be damaged due to ignorance during the construction phase of the project.
- All contractors should sign a code of conduct as part of their induction process. Induction must explicitly include aspects such as closing gates and littering. Toolbox talks must be designed to include social and environmental aspects. A fining system must be put in place for any transgressions affecting the landowners. It is important to instil respect for the landowners and their livelihoods from the beginning of the project.
- All contractors and employees need to wear photo identification cards. Vehicles should be marked as construction vehicles and should have Eskom's or the contractor's logo clearly exhibited. Entry and exit points of the site should be controlled during the construction and operational phase. The schedules of the security company (if any) should be communicated to the farmers. It must be considered that guards changing shifts contribute to the impact of strangers accessing properties, and therefore a system that consider the safety of both the Eskom infrastructure and the safety of the landowners must be implemented. The necessary sanitation facilities must be made available, and some form of shelter from the elements. The security guards must not be allowed to make fires for cooking or heating purposes.
- A system to arrange access to properties must be devised and formalised. The landowners must agree to the system. Access must be arranged at least 24 hours prior, except in emergencies, when the landowners should also be informed immediately. Landowners have the right to refuse people access to their properties if it was not arranged in advance. If routine access is required, the landowners must be provided with a roster indicating dates and approximate times that access will be required. Eskom must compensate the landowners for any damage to property or goods if it was due to behaviour of their contractors. Sub-contractors must be made aware of this and a clause spelling out their liability should be included in their contracts.
- It is difficult to mitigate the impact on sense of place as it is experienced on a personal level. In general, the mitigation measures suggested in the visual, noise, ecological impact assessments and other relevant specialist studies should be adhered to. The relevant specialists will provide scientific mitigation measures for the aspects relevant to their studies. The direction and brightness of lights close to residences must be considered. The public perception would be negative or positive depending on the successful implementation of the rehabilitation.
- Toolbox talks should include talks about the impact of promiscuous behaviour. Eskom should develop an in-house infectious diseases strategy to address health issues within the workforce. A workforce

code of conduct should be developed to maximise positive employee behaviour in the local community and optimise integration.

- Services and goods must be procured locally as far as reasonably possible. Aspects of this positive impact will occur by default when the construction force lives locally, and they utilise local services and support local shops.
- Close cooperation with the local, district and provincial economic development government spheres is strongly advised. The economic impact is likely to result in considerable infrastructure development needs. Thus, impacts on roads, servitudes and traffic patterns need to be addressed.
- An in-migration of jobseekers will be expected and Eskom needs to work closely with Government to ensure no further informal settlements proliferate.
- Provide local employment as far as possible.
- Eskom needs to negotiate with each individual farmer where there is clear evidence of land value losses (which losses could be a result of either productivity losses or general land value losses).

(ii) Cumulative Impacts

- Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.

(iii) Irreplaceable loss of Resources

- The impact may result in the irreplaceable loss of resources however the value of these resources would be limited.

11.3.6 TRAFFIC IMPACTS

Heavy vehicle traffic during both the construction and decommissioning phase of the development are expected to cause additional wear and tear on the surrounding road network. The gravel access roads to the sites are also expected to sustain damage during the construction and decommissioning phases of the project. Vehicles are expected to cause dust along unpaved access roads to the site.

The project will inevitably result in disruption of traffic on local, regional and National Roads, but to varying degrees. The severity of the impacts will depend on the order of the road (how many lanes, width, length, turns, etc.), the receiving environment and vicinity of land uses and towns. Additional traffic on the road network could result in changes to the operations of that road network. In order to quantify and determine the extent of the impact of traffic to be generated by the proposed development, a full traffic impact study has to be conducted according to the Technical Methods for Highways (TMH) 16: Volume 1 and Volume 2 - South African Traffic Impact and Site Traffic Assessment Standards and Requirements Manual.

The preliminary impacts on traffic associated with the project activities include the following:

- Deterioration of road network condition.
- Impact of abnormal loads.
- Impact of dust along gravel site access roads.
- Impact of additional traffic volumes on intersection capacity.

(i) Mitigation measures

- Only predefined access roads are to be used to reduce any unnecessary deterioration of the existing road networks.
- Regular wet grading and wetting for dust suppression should be undertaken.
- Limit the number and frequency of heavy and overloaded vehicles where possible.

- Scheduling of development traffic movement to not coincide with existing peaks where possible, and strong use of buses or high occupancy vehicles especially for transportation of the construction labour force.
- Consideration should be given to the time of day when the abnormal loads would be moved to mitigate the negative effects of abnormal load movement on the general road traffic.
- Close cooperation with the local, district and provincial economic development government spheres is strongly advised. The economic impact is likely to result in considerable infrastructure development needs. Thus, impacts on roads, servitudes and traffic patterns need to be addressed.
- If private roads are affected by project activities, it is the responsibility of Eskom to maintain these roads as long as they use them. Eskom should engage with the relevant farmers about road maintenance, as some of them have preferential ways in which the roads must be maintained, for example if roads are only graded and not built up it turns into rivers when there is heavy rain. The road maintenance agreements must be formalised before construction commences to ensure all parties involved are protected and know their rights and responsibilities. It is recommended that construction be planned for the dry season as far as possible. Eskom must provide all the affected landowners with a construction schedule to ensure that they know when construction will take place on their properties. Any changes to the construction schedule must be communicated to the farmers at least a week in advance.

(i) Cumulative Impacts

- Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact may result in spatial and temporal cumulative change.

(ii) Irreplaceable loss of Resources

- The impact is unlikely to result in irreplaceable loss of resources.

11.3.7 VISUAL IMPACTS

The construction and operation of the proposed Eskom Narina MTS and associated powerlines may have a visual impact on potentially sensitive visual receptors particularly within (but not restricted to) a 6 km radius of the proposed project development sites. Such visual receptors include people travelling along the national and secondary roads, as well as those residing within the farming homesteads and residential areas in the study areas. This study area is a known as a tourist destination owing to its proximity to the Garden route, picturesque farmland and fields set against the backdrop of the dramatic Outeniqua Mountains as well as the well-known towns of Oudtshoorn and George.

In terms of determining prioritisation, public response, cumulative effects and the possible irreplaceable loss of resources have to be considered. As consultation has not been undertaken it is impossible to confirm public response in this regard, however, the study areas are considered to have a very high visual and scenic quality by virtue of the landscape and environment.

(i) Mitigation measures

- Rehabilitate disturbed area and reinstate agricultural usage.
- Remove all above ground construction phase infrastructure.
- Return land to pre-construction use.
- Minimise disturbance of the natural landscape.
- Undertake rehabilitation and screen planting where possible.
- Locate infrastructure as far away from the edge of local roads where possible.

(ii) Cumulative Impacts

- Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, the impact will result in spatial and temporal cumulative change.

(iii) Irreplaceable loss of Resources

- The impact may result in irreplaceable loss of resources.

11.3.8 GROUNDWATER IMPACTS

The potential impacts on groundwater resources associated with the construction phase activities include the following:

- Erosion of site and siltation of surface water features due to vegetation clearance and stockpiling of unconsolidated and loose material.
- Surface and groundwater deterioration and siltation due to contaminated stormwater run-off from the construction area.
- Poor quality leachate may emanate from the construction camp which may have a negative impact on groundwater and surface water quality.
- Mobilisation and maintenance of vehicle and machinery on-site may cause hydrocarbon contamination of surface water and groundwater resources.
- Poor storage and management of hazardous chemical substances on-site may cause surface water and groundwater pollution.

Minimal impacts on the groundwater system are expected. The environmental significance rating of groundwater quantity impacts on down-gradient receptors are rated as moderately negative without implementation of remedial measures and low negative with implementation of proposed mitigation measures. Groundwater quality impacts from the substation footprint and related waste facilities are rated as moderately negative without implementation of remedial measures and low negative with implementation of mitigation measures.

(iii) Mitigation measures

- All on site vehicle and equipment maintenance must be undertaken within an area of secondary containment, such as a bund or over a drip tray, to prevent accidental soil contamination. Oil and diesel stored on site must be placed within a suitably sized bund. The dispensing of hydrocarbons must be undertaken with due care to prevent or contain spills.
- All waste generated must be contained and stored in suitably sealed, bunded and protected areas to avoid spills and leaks. Waste must be collected and disposed of offsite in a responsible manner so as to prevent groundwater contamination off site.

(iv) Cumulative Impacts

- Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact may result in spatial and temporal cumulative change.

(v) Irreplaceable loss of Resources

- The impact may result in irreplaceable loss of resources if not adequately mitigated but the value of the resources will be limited.

11.3.9 NOISE IMPACTS

For noise impacts during the construction phase, the assumption is that construction activities would be during day-time hours only. Given the nature of construction activities for the powerlines (linear development) the noise levels at the nearest residential receptors to the construction areas may exceed IFC guidelines for residential areas (55 dBA). If there are exceedances of this guideline, it would be of short duration. The negative

noise impacts are therefore considered to be of medium significance without mitigation and low significance with mitigation at the nearest receptors due to these activities.

The noise levels at the nearest residential receptors due to the construction activities of the Substation is not likely to exceed daytime IFC guidelines for residential areas (55 dBA). The negative noise impacts are therefore considered to be of low significance without and with mitigation at the nearest receptors due to these activities.

(i) Mitigation measures

- As construction will only take place during day-time hours and will be of limited duration, Noise Sensitive Receptors within proximity of the powerline construction site should be notified of the activities and potential disturbance durations prior to construction taking place.

(ii) Cumulative Impacts

- Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.

(iii) Irreplaceable loss of Resources

The impact is unlikely to result in irreplaceable loss of resources.

11.3.10 NO-GO ALTERNATIVE

The no-go alternative option means 'do nothing' or the option of not undertaking the proposed Narina Substation project or any of its activities, consequently leading to the continuation of the current land-use. As such, the 'do nothing' alternative or keeping the current status quo of the various current land uses also provides the baseline against which the impacts of all other alternatives were compared.

Should the Narina Substation project not go ahead, there would be certain impacts identified above which would change from negative to positive (mostly biophysical and cultural impacts) and conversely certain impacts would change from positive to negative (mostly social and economic impacts).

11.4 SUMMARY OF PRELIMINARY IMPACT ASSESSMENT

A summary of all the identified preliminary impacts, their associated phases, as well as their impact calculations and significance are presented in Table 43 below. This preliminary impact assessment is subject to change once additional information from specialists, or I&APs becomes available. The updated or final impact assessment will be presented in the EIA phase.

Table 43: Preliminary Scoping Phase Impact Assessment.

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
1	Biodiversity	Destruction, further loss and fragmentation of the vegetation community		Construction	-1	3	5	5	5	4	-18	-1	2	5	3	3	4	-13	Medium	2	2	-16,3
2	Biodiversity	Introduction of alien species, especially plants		Construction	-1	2	3	3	3	4	-11	-1	2	3	3	3	3	-8,3	Medium	2	1	-9,3
3	Biodiversity	Erosion due to storm water runoff and wind		Construction	-1	2	3	3	3	4	-11	-1	2	2	2	3	3	-6,8	Medium	2	3	-9,3
4	Biodiversity	Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration and poaching).		Construction	-1	2	3	3	4	3	-9	-1	1	3	3	3	3	-7,5	Medium	2	1	-8,4
5	Biodiversity	Environmental pollution due to potential leaks, discharges, pollutant leaching into the surrounding environment		Construction	-1	3	4	3	4	4	-14	-1	2	3	3	3	3	-8,3	Medium	1	2	-9,3
6	Biodiversity	Continued fragmentation, further loss and fragmentation of the vegetation community		Operation	-1	2	3	3	3	3	-8,3	-1	2	3	2	3	3	-7,5	Medium	1	3	-9,4

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
7	Biodiversity	Vegetation loss due to erosion and encroachment by alien invasive plant species		Operation	-1	3	4	3	3	3	-9,8	-1	3	3	2	2	3	-7,5	Medium	2	2	-9,4
8	Biodiversity	Potential leaks, discharges, pollutant from activities leaching into the surrounding environment		Operation	-1	2	3	3	3	3	-8,3	-1	2	3	2	3	3	-7,5	Medium	1	2	-8,4
9	Biodiversity	Continued displacement and fragmentation of the faunal community (including threatened or protected species) due to ongoing anthropogenic disturbances (noise, dust and vibrations) and habitat degradation/loss (litter, road mortalities and/or poaching).		Operation	-1	3	4	3	3	3	-9,8	-1	3	3	2	3	3	-8,3	Medium	2	1	-9,3
10	Biodiversity	Loss of water resources		Construction	-1	3	3	3	3	4	-12	-1	2	3	2	3	3	-7,5	Medium	2	2	-9,4
11	Biodiversity	Degradation of resources, impaired functionality		Construction	-1	3	4	3	4	3	-10,5	-1	3	3	2	3	3	-8,3	Medium	2	2	-10,3

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
12	Biodiversity	Deterioration of resource integrity		Construction	-1	3	4	3	4	3	-10,5	-1	3	3	2	3	3	-8,3	Medium	2	2	-10,3
13	Biodiversity	Degradation of resources, impaired functionality		Operation	-1	2	3	3	3	3	-8,3	-1	2	2	2	3	3	-6,8	Medium	1	1	-6,8
14	Biodiversity	Deterioration of resource integrity		Operation	-1	2	2	3	2	3	-6,8	-1	2	2	2	2	3	-6	Medium	1	1	-6
15	Biodiversity	Loss of land capability		Construction	-1	2	4	4	3	4	-13	-1	2	4	3	3	3	-9	Medium	2	2	-11,3
16	Biodiversity	Deterioration of land capability		Construction	-1	2	4	3	3	3	-9	-1	2	4	3	3	3	-9	Medium	2	2	-11,3
17	Biodiversity	Loss of land capability		Operation	-1	3	4	4	4	4	-15	-1	2	3	3	3	3	-8,3	Medium	1	1	-8,3
18	Biodiversity	Deterioration of land capability		Operation	-1	3	3	3	3	3	-9	-1	2	3	2	3	3	-7,5	Medium	2	1	-8,4
20	Biodiversity	Destruction, further loss and fragmentation of the vegetation community		Construction	-1	3	5	3	4	4	-15	-1	2	5	3	3	4	-13	Medium	1	2	-14,6
21	Biodiversity	Introduction of alien species, especially plants		Construction	-1	2	3	3	3	4	-11	-1	2	3	3	3	3	-8,3	Medium	2	1	-9,3
22	Biodiversity	Erosion due to storm water runoff and wind		Construction	-1	2	3	3	3	4	-11	-1	2	2	2	3	3	-6,8	Medium	1	2	-7,6
23	Biodiversity	Displacement of faunal community due to habitat loss, direct		Construction	-1	2	3	3	4	3	-9	-1	1	3	3	3	3	-7,5	Medium	2	1	-8,4

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
		mortalities and disturbance (road collisions, noise, light, dust, vibration and poaching).																				
24	Biodiversity	Environmental pollution due to potential leaks, discharges, pollutant leaching into the surrounding environment		Construction	-1	3	4	3	4	4	-14	-1	2	3	3	3	3	-8,3	Medium	1	2	-9,3
25	Biodiversity	Continued fragmentation, further loss and fragmentation of the vegetation community		Operation	-1	2	3	3	3	3	-8,3	-1	2	3	2	3	3	-7,5	Medium	1	3	-9,4
26	Biodiversity	Vegetation loss due to erosion and encroachment by alien invasive plant species		Operation	-1	3	4	2	2	3	-8,3	-1	3	3	2	2	2	-5	Medium	2	2	-6,3
27	Biodiversity	Potential leaks, discharges, pollutant from activities leaching into the surrounding environment		Operation	-1	2	3	3	3	3	-8,3	-1	2	3	2	3	3	-7,5	Medium	1	2	-8,4
28	Biodiversity	Continued displacement and fragmentation of the faunal community (including threatened		Operation	-1	3	4	3	3	3	-9,8	-1	3	3	2	3	3	-8,3	Medium	2	1	-9,3

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
		or protected species) due to ongoing anthropogenic disturbances (noise, dust and vibrations) and habitat degradation/loss (litter, road mortalities and/or poaching).																				
29	Biodiversity	Loss of water resources		Construction	-1	3	3	3	3	3	-9	-1	2	2	2	2	3	-6	Medium	1	1	-6
30	Biodiversity	Degradation of resources, impaired functionality		Construction	-1	3	3	3	3	3	-9	-1	2	3	2	3	3	-7,5	Medium	2	1	-8,4
31	Biodiversity	Deterioration of resource integrity		Construction	-1	3	3	3	3	3	-9	-1	2	3	2	3	3	-7,5	Medium	2	1	-8,4
32	Biodiversity	Degradation of resources, impaired functionality		Operation	-1	2	2	2	3	3	-6,8	-1	1	2	2	2	3	-5,3	Medium	1	1	-5,3
33	Biodiversity	Deterioration of resource integrity		Operation	-1	2	2	2	2	3	-6	-1	1	2	2	2	3	-5,3	Medium	1	1	-5,3
34	Biodiversity	Loss of land capability		Construction	-1	2	3	3	3	4	-11	-1	2	3	3	3	3	-8,3	Medium	1	1	-8,3
35	Biodiversity	Deterioration of land capability		Construction	-1	2	3	3	3	3	-8,3	-1	2	3	3	3	3	-8,3	Medium	1	1	-8,3
36	Biodiversity	Loss of land capability		Operation	-1	3	3	4	4	4	-14	-1	2	2	2	3	3	-6,8	Medium	2	1	-7,6

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
37	Biodiversity	Deterioration of land capability		Operation	-1	3	3	3	3	3	-9	-1	2	2	2	3	3	-6,8	Medium	2	1	-7,6
39	Heritage & Palaeo	Destruction of unidentified heritage finds	Alternative 1	Construction	-1	1	5	1	5	2	-6	-1	1	4	1	4	1	-2,5	High	1	3	-3,1
40	Heritage & Palaeo	Impact on Palaeontology	Alternative 1	Construction	-1	1	5	1	1	1	-2	-1	1	1	1	1	1	-1	High	2	2	-1,3
41	Heritage & Palaeo	Destruction of unidentified heritage finds	Alternative 2	Construction	-1	1	5	1	5	2	-6	-1	1	4	1	4	1	-2,5	High	1	3	-3,1
42	Heritage & Palaeo	Impact on possible heritage finds	Alternative 2	Construction	-1	1	5	4	5	3	-11,3	-1	1	5	2	5	2	-6,5	High	2	2	-8,1
43	Heritage & Palaeo	Impact on Palaeontology	Alternative 2	Construction	-1	1	5	1	1	1	-2	-1	1	1	1	1	1	-1	High	2	2	-1,3
44	Heritage & Palaeo	Destruction of unidentified heritage finds	Alternative 7	Construction	-1	1	5	1	5	2	-6	-1	1	4	1	4	1	-2,5	High	1	3	-3,1
45	Heritage & Palaeo	Impact on Palaeontology	Alternative 7	Construction	-1	1	5	1	1	1	-2	-1	1	1	1	1	1	-1	High	2	2	-1,3
46	Heritage & Palaeo	Destruction of unidentified heritage finds	Alternative 8	Construction	-1	1	5	1	5	2	-6	-1	1	4	1	4	1	-2,5	High	1	3	-3,1
47	Heritage & Palaeo	Impact on Palaeontology	Alternative 8	Construction	-1	1	5	1	1	1	-2	-1	1	1	1	1	1	-1	High	2	2	-1,3
48	Heritage & Palaeo	Destruction of unidentified heritage finds	Alternative 9	Construction	-1	1	5	1	5	2	-6	-1	1	4	1	4	1	-2,5	High	1	3	-3,1

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
49	Heritage & Palaeo	Impact on Palaeontology	Alternative 9	Construction	-1	1	5	1	1	1	-2	-1	1	1	1	1	1	-1	High	2	2	-1,3
50	Heritage & Palaeo	Destruction of unidentified heritage finds	Transmission Powerline Corridors	Construction	-1	1	5	1	5	2	-6	-1	1	4	1	4	1	-2,5	High	1	3	-3,1
51	Heritage & Palaeo	Impact on possible heritage finds	Transmission Powerline Corridors	Construction	-1	1	5	4	5	3	-11,3	-1	1	5	2	5	2	-6,5	High	2	2	-8,1
52	Heritage & Palaeo	Impact on Palaeontology	Transmission Powerline Corridors	Construction	-1	1	5	1	1	1	-2	-1	1	1	1	1	1	-1	High	2	2	-1,3
54	Heritage & Palaeo	Destruction of unidentified heritage finds	Alternative 1	Construction	-1	1	5	1	5	2	-6	-1	1	5	1	5	1	-3	High	1	2	-3,4
55	Heritage & Palaeo	Impact on possible heritage finds	Alternative 1	Construction	-1	1	5	1	5	2	-6	-1	1	5	1	5	1	-3	High	1	2	-3,4
56	Heritage & Palaeo	Impact on Palaeontology	Alternative 1	Construction	-1	1	5	3	5	3	-10,5	-1	1	5	1	5	1	-3	High	1	2	-3,4
57	Heritage & Palaeo	Impact on Cultural Landscape	Alternative 1	Construction	-1	2	3	1	3	3	-6,8	-1	2	3	1	3	2	-4,5	High	2	2	-5,6
58	Heritage & Palaeo	Destruction of unidentified heritage finds	Alternative 2	Construction	-1	1	5	1	5	2	-6	-1	1	5	1	5	1	-3	High	1	2	-3,4
59	Heritage & Palaeo	Impact on possible heritage finds	Alternative 2	Construction	-1	1	5	1	5	2	-6	-1	1	5	1	5	1	-3	High	1	2	-3,4
60	Heritage & Palaeo	Impact on Palaeontology	Alternative 2	Construction	-1	1	5	3	5	3	-10,5	-1	1	5	1	5	1	-3	High	1	2	-3,4

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
61	Heritage & Palaeo	Impact on Cultural Landscape	Alternative 2	Construction	-1	2	3	4	3	4	-12	-1	2	3	3	3	4	-11	High	2	2	-13,8
62	Heritage & Palaeo	Destruction of unidentified heritage finds	Alternative 4	Construction	-1	1	5	1	5	2	-6	-1	1	5	1	5	1	-3	High	1	2	-3,4
63	Heritage & Palaeo	Impact on possible heritage finds	Alternative 4	Construction	-1	1	5	1	5	2	-6	-1	1	5	1	5	1	-3	High	1	2	-3,4
64	Heritage & Palaeo	Impact on Palaeontology	Alternative 4	Construction	-1	1	5	3	5	3	-10,5	-1	1	5	1	5	1	-3	High	1	2	-3,4
65	Heritage & Palaeo	Impact on Cultural Landscape	Alternative 4	Construction	-1	2	3	1	3	3	-6,8	-1	2	3	1	3	4	-9	High	2	2	-11,3
66	Heritage & Palaeo	Destruction of unidentified heritage finds	Alternative 5	Construction	-1	1	5	1	5	2	-6	-1	1	5	1	5	1	-3	High	1	2	-3,4
67	Heritage & Palaeo	Impact on possible heritage finds	Alternative 5	Construction	-1	1	5	1	5	2	-6	-1	1	5	1	5	1	-3	High	1	2	-3,4
68	Heritage & Palaeo	Impact on Palaeontology	Alternative 5	Construction	-1	1	5	3	5	3	-10,5	-1	1	5	1	5	1	-3	High	1	2	-3,4
69	Heritage & Palaeo	Impact on Cultural Landscape	Alternative 5	Construction	-1	2	3	4	3	4	-12	-1	2	3	3	3	4	-11	High	2	2	-13,8
70	Heritage & Palaeo	Destruction of unidentified heritage finds	Alternative 10	Construction	-1	1	5	1	5	2	-6	-1	1	5	1	5	1	-3	High	1	2	-3,4
71	Heritage & Palaeo	Impact on possible heritage finds	Alternative 10	Construction	-1	1	5	1	5	2	-6	-1	1	5	1	5	1	-3	High	1	2	-3,4

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
72	Heritage & Palaeo	Impact on Palaeontology	Alternative 10	Construction	-1	1	5	3	5	3	-10,5	-1	1	5	1	5	1	-3	High	1	2	-3,4
73	Heritage & Palaeo	Impact on Cultural Landscape	Alternative 10	Construction	-1	2	3	4	3	4	-12	-1	2	3	3	3	4	-11	High	2	2	-13,8
75	Socio-Economic	Economic distortions	Alternative 1	Planning	-1	2	1	1	3	2	-3,5	-1	2	1	1	3	2	-3,5	Medium	1	1	-3,5
76	Socio-Economic	Delayed Investment spending	Alternative 1	Planning	-1	2	1	3	2	3	-6	-1	2	1	2	2	3	-5,3	Medium	1	1	-5,3
77	Socio-Economic	Resettlement	Alternative 1	Construction	-1	2	5	1	5	1	-3,3	-1	2	5	1	5	1	-3,3	Medium	1	1	-3,3
78	Socio-Economic	Employment	Alternative 1	Construction	1	3	1	2	2	3	6	1	3	1	2	2	4	8	Medium	1	1	8
79	Socio-Economic	Population influx	Alternative 1	Construction	-1	3	2	3	3	3	-8,3	-1	3	2	3	3	3	-8,3	Medium	1	1	-8,3
80	Socio-Economic	Community health	Alternative 1	Construction	-1	3	1	3	3	3	-7,5	-1	3	1	2	3	3	-6,8	Medium	1	1	-6,8
81	Socio-Economic	Nuisance factors	Alternative 1	Construction	-1	2	1	3	3	3	-6,8	-1	2	1	2	3	3	-6	Medium	1	1	-6
82	Socio-Economic	Employment	Alternative 1	Operation	1	3	4	1	2	3	7,5	1	3	4	1	2	4	10	Medium	1	1	10
83	Socio-Economic	Impact on agriculture	Alternative 1	Operation	-1	2	4	2	3	3	-8,3	-1	2	4	2	3	3	-8,3	Medium	1	1	-8,3

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
84	Socio-Economic	Impact on tourism	Alternative 1	Operation	-1	3	4	4	3	3	-10,5	-1	3	4	4	3	3	-10,5	Medium	1	1	-10,5
85	Socio-Economic	Health and safety impacts	Alternative 1	Operation	-1	3	4	2	2	2	-5,5	-1	3	4	1	2	2	-5	Medium	1	1	-5
86	Socio-Economic	Sense of place and property values	Alternative 1	Operation	-1	2	3	3	3	3	-8,3	-1	2	3	3	3	3	-8,3	Medium	1	1	-8,3
87	Socio-Economic	Stable electricity	Alternative 1	Operation	1	4	4	3	3	4	14	1	4	4	3	3	4	14	Medium	1	1	14
88	Socio-Economic	Spatial policy alignment	Alternative 1	Operation	1	3	4	3	2	3	9	1	3	4	3	2	3	9	Medium	1	1	9
89	Socio-Economic	Disruption of power supply	Alternative 1	Decommissioning	-1	4	5	3	3	4	-15	-1	4	5	3	3	4	-15	Medium	1	1	-15
90	Socio-Economic	Nuisance factors	Alternative 1	Decommissioning	-1	2	1	3	3	3	-6,8	-1	2	1	2	3	3	-6	Medium	1	1	-6
91	Socio-Economic	Economic distortions	Alternative 2	Planning	-1	2	1	1	3	2	-3,5	-1	2	1	1	3	2	-3,5	Medium	1	1	-3,5
92	Socio-Economic	Delayed Investment spending	Alternative 2	Planning	-1	2	1	3	2	3	-6	-1	2	1	2	2	3	-5,3	Medium	1	1	-5,3
93	Socio-Economic	Resettlement	Alternative 2	Construction	-1	2	5	2	5	4	-14	-1	2	5	1	5	4	-13	Medium	1	1	-13
94	Socio-Economic	Employment	Alternative 2	Construction	1	3	1	2	2	3	6	1	3	1	2	2	4	8	Medium	1	1	8

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
95	Socio-Economic	Population influx	Alternative 2	Construction	-1	3	2	3	3	3	-8,3	-1	3	2	3	3	3	-8,3	Medium	1	1	-8,3
96	Socio-Economic	Community health	Alternative 2	Construction	-1	3	1	3	3	3	-7,5	-1	3	1	2	3	3	-6,8	Medium	1	1	-6,8
97	Socio-Economic	Nuisance factors	Alternative 2	Construction	-1	2	1	2	3	3	-6	-1	2	1	2	3	3	-6	Medium	1	1	-6
98	Socio-Economic	Employment	Alternative 2	Operation	1	3	4	1	2	3	7,5	1	3	4	1	2	4	10	Medium	1	1	10
99	Socio-Economic	Impact on agriculture	Alternative 2	Operation	-1	2	4	2	3	3	-8,3	-1	2	4	2	3	3	-8,3	Medium	1	1	-8,3
100	Socio-Economic	Impact on tourism	Alternative 2	Operation	-1	3	4	3	3	3	-9,8	-1	3	4	3	3	3	-9,8	Medium	1	1	-9,8
101	Socio-Economic	Health and safety impacts	Alternative 2	Operation	-1	3	4	2	2	2	-5,5	-1	3	4	1	2	2	-5	Medium	1	1	-5
102	Socio-Economic	Sense of place and property values	Alternative 2	Operation	-1	2	3	2	3	3	-7,5	-1	2	3	2	3	3	-7,5	Medium	1	1	-7,5
103	Socio-Economic	Stable electricity	Alternative 2	Operation	1	4	4	3	3	4	14	1	4	4	3	3	4	14	Medium	1	1	14
104	Socio-Economic	Spatial policy alignment	Alternative 2	Operation	1	3	4	3	2	3	9	1	3	4	3	2	3	9	Medium	1	1	9
105	Socio-Economic	Disruption of power supply	Alternative 2	Decommissioning	-1	4	5	3	3	4	-15	-1	4	5	3	3	4	-15	Medium	1	1	-15

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
106	Socio-Economic	Nuisance factors	Alternative 2	Decommissioning	-1	2	1	2	3	3	-6	-1	2	1	1	3	3	-5,3	Medium	1	1	-5,3
107	Socio-Economic	Economic distortions	Alternative 7	Planning	-1	2	1	1	3	2	-3,5	-1	2	1	1	3	2	-3,5	Medium	1	1	-3,5
108	Socio-Economic	Delayed Investment spending	Alternative 7	Planning	-1	2	1	3	2	3	-6	-1	2	1	2	2	3	-5,3	Medium	1	1	-5,3
109	Socio-Economic	Resettlement	Alternative 7	Construction	-1	2	5	1	5	1	-3,3	-1	2	5	1	5	1	-3,3	Medium	1	1	-3,3
110	Socio-Economic	Employment	Alternative 7	Construction	1	3	1	2	2	3	6	1	3	1	2	2	4	8	Medium	1	1	8
111	Socio-Economic	Population influx	Alternative 7	Construction	-1	3	2	3	3	3	-8,3	-1	3	2	3	3	3	-8,3	Medium	1	1	-8,3
112	Socio-Economic	Community health	Alternative 7	Construction	-1	3	1	2	3	3	-6,8	-1	3	1	2	3	3	-6,8	Medium	1	1	-6,8
113	Socio-Economic	Nuisance factors	Alternative 7	Construction	-1	2	1	3	3	3	-6,8	-1	2	1	3	3	3	-6,8	Medium	1	1	-6,8
114	Socio-Economic	Employment	Alternative 7	Operation	1	3	4	1	2	3	7,5	1	3	4	1	2	4	10	Medium	1	1	10
115	Socio-Economic	Impact on agriculture	Alternative 7	Operation	-1	2	4	2	3	3	-8,3	-1	2	4	2	3	3	-8,3	Medium	1	1	-8,3
116	Socio-Economic	Impact on tourism	Alternative 7	Operation	-1	3	4	2	3	3	-9	-1	3	4	2	3	3	-9	Medium	1	1	-9

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
117	Socio-Economic	Health and safety impacts	Alternative 7	Operation	-1	3	4	2	2	2	-5,5	-1	3	4	1	2	2	-5	Medium	1	1	-5
118	Socio-Economic	Sense of place and property values	Alternative 7	Operation	-1	2	3	4	3	3	-9	-1	2	3	4	3	3	-9	Medium	1	1	-9
119	Socio-Economic	Stable electricity	Alternative 7	Operation	1	4	4	3	3	4	14	1	4	4	3	3	4	14	Medium	1	1	14
120	Socio-Economic	Spatial policy alignment	Alternative 7	Operation	1	3	4	2	2	3	8,3	1	3	4	2	2	3	8,3	Medium	1	1	8,3
121	Socio-Economic	Disruption of power supply	Alternative 7	Decommissioning	-1	4	5	3	3	4	-15	-1	4	5	3	3	4	-15	Medium	1	1	-15
122	Socio-Economic	Nuisance factors	Alternative 7	Decommissioning	-1	2	1	3	3	3	-6,8	-1	2	1	2	3	3	-6	Medium	1	1	-6
123	Socio-Economic	Economic distortions	Alternative 8	Planning	-1	2	1	1	3	2	-3,5	-1	2	1	1	3	2	-3,5	Medium	1	1	-3,5
124	Socio-Economic	Delayed Investment spending	Alternative 8	Planning	-1	2	1	3	2	3	-6	-1	2	1	2	2	3	-5,3	Medium	1	1	-5,3
125	Socio-Economic	Resettlement	Alternative 8	Construction	-1	2	5	1	5	1	-3,3	-1	2	5	1	5	1	-3,3	Medium	1	1	-3,3
126	Socio-Economic	Employment	Alternative 8	Construction	1	3	1	2	2	3	6	1	3	1	2	2	4	8	Medium	1	1	8
127	Socio-Economic	Population influx	Alternative 8	Construction	-1	3	2	3	3	3	-8,3	-1	3	2	3	3	3	-8,3	Medium	1	1	-8,3

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
128	Socio-Economic	Community health	Alternative 8	Construction	-1	3	1	2	3	3	-6,8	-1	3	1	2	3	3	-6,8	Medium	1	1	-6,8
129	Socio-Economic	Nuisance factors	Alternative 8	Construction	-1	2	1	3	3	3	-6,8	-1	2	1	3	3	3	-6,8	Medium	1	1	-6,8
130	Socio-Economic	Employment	Alternative 8	Operation	1	3	4	1	2	3	7,5	1	3	4	1	2	4	10	Medium	1	1	10
131	Socio-Economic	Impact on agriculture	Alternative 8	Operation	-1	2	4	2	3	3	-8,3	-1	2	4	2	3	3	-8,3	Medium	1	1	-8,3
132	Socio-Economic	Impact on tourism	Alternative 8	Operation	-1	3	4	2	3	3	-9	-1	3	4	2	3	3	-9	Medium	1	1	-9
133	Socio-Economic	Health and safety impacts	Alternative 8	Operation	-1	3	4	2	2	2	-5,5	-1	3	4	1	2	2	-5	Medium	1	1	-5
134	Socio-Economic	Sense of place and property values	Alternative 8	Operation	-1	2	3	4	3	3	-9	-1	2	3	4	3	3	-9	Medium	1	1	-9
135	Socio-Economic	Stable electricity	Alternative 8	Operation	1	4	4	3	3	4	14	1	4	4	3	3	4	14	Medium	1	1	14
136	Socio-Economic	Spatial policy alignment	Alternative 8	Operation	1	3	4	2	2	3	8,3	1	3	4	2	2	3	8,3	Medium	1	1	8,3
137	Socio-Economic	Disruption of power supply	Alternative 8	Decommissioning	-1	4	5	3	3	4	-15	-1	4	5	3	3	4	-15	Medium	1	1	-15
138	Socio-Economic	Nuisance factors	Alternative 8	Decommissioning	-1	2	1	2	3	3	-6	-1	2	1	2	3	3	-6	Medium	1	1	-6

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
139	Socio-Economic	Economic distortions	Alternative 9	Planning	-1	2	1	3	3	3	-6,8	-1	2	1	2	3	3	-6	Medium	1	1	-6
140	Socio-Economic	Delayed Investment spending	Alternative 9	Planning	-1	2	1	3	2	3	-6	-1	2	1	2	2	3	-5,3	Medium	1	1	-5,3
141	Socio-Economic	Resettlement	Alternative 9	Construction	-1	2	5	1	5	1	-3,3	-1	2	5	1	5	1	-3,3	Medium	1	1	-3,3
142	Socio-Economic	Employment	Alternative 9	Construction	1	3	1	2	2	3	6	1	3	1	2	2	4	8	Medium	1	1	8
143	Socio-Economic	Population influx	Alternative 9	Construction	-1	3	2	3	3	3	-8,3	-1	3	2	3	3	3	-8,3	Medium	1	1	-8,3
144	Socio-Economic	Community health	Alternative 9	Construction	-1	3	1	2	3	3	-6,8	-1	3	1	2	3	3	-6,8	Medium	1	1	-6,8
145	Socio-Economic	Nuisance factors	Alternative 9	Construction	-1	2	1	4	3	3	-7,5	-1	2	1	4	3	3	-7,5	Medium	1	1	-7,5
146	Socio-Economic	Employment	Alternative 9	Operation	1	3	4	1	2	3	7,5	1	3	4	1	2	4	10	Medium	1	1	10
147	Socio-Economic	Impact on agriculture	Alternative 9	Operation	-1	2	4	2	3	3	-8,3	-1	2	4	2	3	3	-8,25	Medium	1	1	-8,25
148	Socio-Economic	Impact on tourism	Alternative 9	Operation	-1	3	4	3	3	3	-9,8	-1	3	4	3	3	3	-9,8	Medium	1	1	-9,8
149	Socio-Economic	Health and safety impacts	Alternative 9	Operation	-1	3	4	2	2	2	-5,5	-1	3	4	1	2	2	-5	Medium	1	1	-5

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
150	Socio-Economic	Sense of place and property values	Alternative 9	Operation	-1	2	3	4	3	3	-9	-1	2	3	4	3	3	-9	Medium	1	1	-9
151	Socio-Economic	Stable electricity	Alternative 9	Operation	1	4	4	3	3	4	14	1	4	4	3	3	4	14	Medium	1	1	14
152	Socio-Economic	Spatial policy alignment	Alternative 9	Operation	1	3	4	2	2	3	8,3	1	3	4	2	2	3	8,3	Medium	1	1	8,3
153	Socio-Economic	Disruption of power supply	Alternative 9	Decommissioning	-1	4	5	3	3	4	-15	-1	4	5	3	3	4	-15	Medium	1	1	-15
154	Socio-Economic	Nuisance factors	Alternative 9	Decommissioning	-1	2	1	4	3	3	-7,5	-1	2	1	3	3	3	-6,8	Medium	1	1	-6,8
156	Socio-Economic	Economic costs	Alternative 1	Planning	-1	4	4	1	2	3	-8,3	-1	4	4	1	2	3	-8,3	Medium	1	1	-8,3
157	Socio-Economic	Employment	Alternative 1	Construction	1	3	1	2	1	4	7	1	3	1	2	1	4	7	Medium	1	1	7
158	Socio-Economic	Population influx	Alternative 1	Construction	-1	3	3	1	3	3	-7,5	-1	3	3	1	3	3	-7,5	Medium	1	1	-7,5
159	Socio-Economic	Nuisance factors	Alternative 1	Construction	-1	3	1	1	2	3	-5,3	-1	3	1	1	2	3	-5,3	Medium	1	1	-5,3
160	Socio-Economic	Employment	Alternative 1	Operation	1	3	4	2	1	4	10	1	3	4	2	1	4	10	Medium	1	1	10
161	Socio-Economic	Impact on agriculture	Alternative 1	Operation	-1	2	4	2	3	3	-8,3	-1	2	4	2	3	3	-8,3	Medium	1	1	-8,3

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
162	Socio-Economic	Sense of place and property values	Alternative 1	Operation	-1	3	3	2	3	3	-8,3	-1	3	3	2	3	3	-8,3	Medium	1	1	-8,3
163	Socio-Economic	Stable electricity supply	Alternative 1	Operation	1	4	4	3	1	4	12	1	4	4	3	1	4	12	Medium	1	1	12
164	Socio-Economic	Disruptions in power supply	Alternative 1	Decommissioning	-1	4	5	3	3	4	-15	-1	4	5	3	3	4	-15	Medium	1	1	-15
165	Socio-Economic	Nuisance factors	Alternative 1	Decommissioning	-1	3	1	1	2	3	-5,3	-1	3	1	1	2	3	-5,3	Medium	1	1	-5,3
166	Socio-Economic	Economic costs	Alternative 2	Planning	-1	4	4	1	2	3	-8,3	-1	4	4	1	2	3	-8,3	Medium	1	1	-8,3
167	Socio-Economic	Employment	Alternative 2	Construction	1	3	1	2	1	4	7	1	3	1	2	1	4	7	Medium	1	1	7
168	Socio-Economic	Population influx	Alternative 2	Construction	-1	3	3	2	3	3	-8,3	-1	3	3	2	3	3	-8,3	Medium	1	1	-8,3
169	Socio-Economic	Nuisance factors	Alternative 2	Construction	-1	3	1	2	2	3	-6	-1	3	1	2	2	3	-6	Medium	1	1	-6
170	Socio-Economic	Employment	Alternative 2	Operation	1	3	4	2	1	4	10	1	3	4	2	1	4	10	Medium	1	1	10
171	Socio-Economic	Impact on agriculture	Alternative 2	Operation	-1	2	4	3	3	3	-9	-1	2	4	3	3	3	-9	Medium	1	1	-9
172	Socio-Economic	Sense of place and property values	Alternative 2	Operation	-1	3	3	3	3	3	-9	-1	3	3	3	3	3	-9	Medium	1	1	-9

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
173	Socio-Economic	Stable electricity supply	Alternative 2	Operation	1	4	4	3	1	4	12	1	4	4	3	1	4	12	Medium	1	1	12
174	Socio-Economic	Disruptions in power supply	Alternative 2	Decommissioning	-1	4	5	3	3	4	-15	-1	4	5	3	3	4	-15	Medium	1	1	-15
175	Socio-Economic	Nuisance factors	Alternative 2	Decommissioning	-1	3	1	2	2	3	-6	-1	3	1	2	2	3	-6	Medium	1	1	-6
176	Socio-Economic	Economic costs	Alternative 4	Planning	-1	4	4	1	2	3	-8,3	-1	4	4	1	2	3	-8,3	Medium	1	1	-8,3
177	Socio-Economic	Employment	Alternative 4	Construction	1	3	1	2	1	4	7	1	3	1	2	1	4	7	Medium	1	1	7
178	Socio-Economic	Population influx	Alternative 4	Construction	-1	3	3	1	3	3	-7,5	-1	3	3	1	3	3	-7,5	Medium	1	1	-7,5
179	Socio-Economic	Nuisance factors	Alternative 4	Construction	-1	3	1	2	2	3	-6	-1	3	1	2	2	3	-6	Medium	1	1	-6
180	Socio-Economic	Employment	Alternative 4	Operation	1	3	4	2	1	4	10	1	3	4	2	1	4	10	Medium	1	1	10
181	Socio-Economic	Impact on agriculture	Alternative 4	Operation	-1	2	4	3	3	3	-9	-1	2	4	3	3	3	-9	Medium	1	1	-9
182	Socio-Economic	Sense of place and property values	Alternative 4	Operation	-1	3	3	2	3	3	-8,3	-1	3	3	2	3	3	-8,3	Medium	1	1	-8,3
183	Socio-Economic	Stable electricity supply	Alternative 4	Operation	1	4	4	3	1	4	12	1	4	4	3	1	4	12	Medium	1	1	12

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
184	Socio-Economic	Disruptions in power supply	Alternative 4	Decommissioning	-1	4	5	3	3	4	-15	-1	4	5	3	3	4	-15	Medium	1	1	-15
185	Socio-Economic	Nuisance factors	Alternative 4	Decommissioning	-1	3	1	2	2	3	-6	-1	3	1	2	2	3	-6	Medium	1	1	-6
186	Socio-Economic	Economic costs	Alternative 5	Planning	-1	4	4	1	2	3	-8,3	-1	4	4	1	2	3	-8,3	Medium	1	1	-8,3
187	Socio-Economic	Employment	Alternative 5	Construction	1	3	1	2	1	4	7	1	3	1	2	1	4	7	Medium	1	1	7
188	Socio-Economic	Population influx	Alternative 5	Construction	-1	3	3	3	3	3	-9	-1	3	3	3	3	3	-9	Medium	1	1	-9
189	Socio-Economic	Nuisance factors	Alternative 5	Construction	-1	3	1	2	2	3	-6	-1	3	1	2	2	3	-6	Medium	1	1	-6
190	Socio-Economic	Employment	Alternative 5	Operation	1	3	4	2	1	4	10	1	3	4	2	1	4	10	Medium	1	1	10
191	Socio-Economic	Impact on agriculture	Alternative 5	Operation	-1	2	4	3	3	3	-9	-1	2	4	3	3	3	-9	Medium	1	1	-9
192	Socio-Economic	Sense of place and property values	Alternative 5	Operation	-1	3	3	2	3	3	-8,3	-1	3	3	2	3	3	-8,3	Medium	1	1	-8,3
193	Socio-Economic	Stable electricity supply	Alternative 5	Operation	1	4	4	3	1	4	12	1	4	4	3	1	4	12	Medium	1	1	12
194	Socio-Economic	Disruptions in power supply	Alternative 5	Decommissioning	-1	4	5	3	3	4	-15	-1	4	5	3	3	4	-15	Medium	1	1	-15

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
195	Socio-Economic	Nuisance factors	Alternative 5	Decommissioning	-1	3	1	2	2	3	-6	-1	3	1	2	2	3	-6	Medium	1	1	-6
196	Socio-Economic	Economic costs	Alternative 10	Planning	-1	4	4	1	2	3	-8,3	-1	4	4	1	2	3	-8,3	Medium	1	1	-8,3
197	Socio-Economic	Employment	Alternative 10	Construction	1	3	1	2	1	4	7	1	3	1	2	1	4	7	Medium	1	1	7
198	Socio-Economic	Population influx	Alternative 10	Construction	-1	3	3	2	3	3	-8,3	-1	3	3	2	3	3	-8,3	Medium	1	1	-8,3
199	Socio-Economic	Nuisance factors	Alternative 10	Construction	-1	3	1	1	2	3	-5,3	-1	3	1	1	2	3	-5,3	Medium	1	1	-5,3
200	Socio-Economic	Employment	Alternative 10	Operation	1	3	4	2	1	4	10	1	3	4	2	1	4	10	Medium	1	1	10
201	Socio-Economic	Impact on agriculture	Alternative 10	Operation	-1	2	4	2	3	3	-8,3	-1	2	4	2	3	3	-8,3	Medium	1	1	-8,3
202	Socio-Economic	Sense of place and property values	Alternative 10	Operation	-1	3	3	2	3	3	-8,3	-1	3	3	2	3	3	-8,3	Medium	1	1	-8,3
203	Socio-Economic	Stable electricity supply	Alternative 10	Operation	1	4	4	3	1	4	12	1	4	4	3	1	4	12	Medium	1	1	12
204	Socio-Economic	Disruptions in power supply	Alternative 10	Decommissioning	-1	4	5	3	3	4	-15	-1	4	5	3	3	4	-15	Medium	1	1	-15
205	Socio-Economic	Nuisance factors	Alternative 10	Decommissioning	-1	3	1	1	2	3	-5,3	-1	3	1	1	2	3	-5,3	Medium	1	1	-5,3

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
207	Traffic	Deterioration of road network condition	Alternative 1	Construction	-1	4	2	3	2	4	-11	-1	3	2	2	2	3	-6,8	High	1	1	-6,8
208	Traffic	Increase in dust along unsurfaced gravel access roads	Alternative 1	Construction	-1	3	2	2	2	3	-6,8	-1	3	2	1	2	2	-4	High	1	1	-4
209	Traffic	Increase in peak hour traffic volumes	Alternative 1	Construction	-1	3	2	3	1	4	-9	-1	3	2	2	1	3	-6	High	1	1	-6
210	Traffic	Impact of abnormal loads	Alternative 1	Construction	-1	4	2	4	2	4	-12	-1	3	2	3	2	3	-7,5	High	1	1	-7,5
211	Traffic	Deterioration of road network condition	Alternative 1	Operation	-1	3	4	2	2	2	-5,5	-1	2	4	1	1	2	-4	High	1	1	-4
212	Traffic	Increase in dust along unsurfaced gravel access roads	Alternative 1	Operation	-1	3	4	1	1	2	-4,5	-1	2	4	1	1	2	-4	High	1	1	-4
213	Traffic	Increase in peak hour traffic volumes	Alternative 1	Operation	-1	3	4	1	1	2	-4,5	-1	2	4	1	1	2	-4	High	1	1	-4
214	Traffic	Impact of abnormal loads	Alternative 1	Operation	-1	3	4	2	2	2	-5,5	-1	2	4	1	1	2	-4	High	1	1	-4
215	Traffic	Deterioration of road network condition	Alternative 2	Construction	-1	4	2	3	2	4	-11	-1	3	2	2	2	3	-6,8	High	1	1	-6,8
216	Traffic	Increase in dust along unsurfaced gravel access roads	Alternative 2	Construction	-1	2	2	2	2	3	-6	-1	2	2	1	2	2	-3,5	High	1	1	-3,5
217	Traffic	Increase in peak hour traffic volumes	Alternative 2	Construction	-1	3	2	3	1	4	-9	-1	3	2	2	1	3	-6	High	1	1	-6

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
218	Traffic	Impact of abnormal loads	Alternative 2	Construction	-1	4	2	4	2	4	-12	-1	3	2	3	2	3	-7,5	High	1	1	-7,5
219	Traffic	Deterioration of road network condition	Alternative 2	Operation	-1	3	4	2	2	2	-5,5	-1	2	4	1	1	2	-4	High	1	1	-4
220	Traffic	Increase in dust along unsurfaced gravel access roads	Alternative 2	Operation	-1	2	4	1	1	2	-4	-1	1	4	1	1	2	-3,5	High	1	1	-3,5
221	Traffic	Increase in peak hour traffic volumes	Alternative 2	Operation	-1	3	4	1	1	2	-4,5	-1	2	4	1	1	2	-4	High	1	1	-4
222	Traffic	Impact of abnormal loads	Alternative 2	Operation	-1	3	4	2	2	2	-5,5	-1	2	4	1	1	2	-4	High	1	1	-4
223	Traffic	Deterioration of road network condition	Alternative 4	Construction	-1	4	2	3	2	4	-11	-1	3	2	2	2	3	-6,8	High	1	1	-6,8
224	Traffic	Increase in dust along unsurfaced gravel access roads	Alternative 4	Construction	-1	2	2	2	2	3	-6	-1	2	2	1	2	2	-3,5	High	1	1	-3,5
225	Traffic	Increase in peak hour traffic volumes	Alternative 4	Construction	-1	3	2	3	1	4	-9	-1	3	2	2	1	3	-6	High	1	1	-6
226	Traffic	Impact of abnormal loads	Alternative 4	Construction	-1	4	2	4	2	4	-12	-1	3	2	3	2	3	-7,5	High	1	1	-7,5
227	Traffic	Deterioration of road network condition	Alternative 4	Operation	-1	3	4	2	2	2	-5,5	-1	2	4	1	1	2	-4	High	1	1	-4
228	Traffic	Increase in dust along unsurfaced gravel access roads	Alternative 4	Operation	-1	2	4	1	1	2	-4	-1	1	4	1	1	2	-3,5	High	1	1	-3,5

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
229	Traffic	Increase in peak hour traffic volumes	Alternative 4	Operation	-1	3	4	1	1	2	-4,5	-1	2	4	1	1	2	-4	High	1	1	-4
230	Traffic	Impact of abnormal loads	Alternative 4	Operation	-1	3	4	2	2	2	-5,5	-1	2	4	1	1	2	-4	High	1	1	-4
231	Traffic	Deterioration of road network condition	Alternative 5	Construction	-1	4	2	3	2	4	-11	-1	3	2	1	2	3	-6	High	1	1	-6
232	Traffic	Increase in dust along unsurfaced gravel access roads	Alternative 5	Construction	-1	3	2	1	2	3	-6	-1	3	2	2	2	3	-6,8	High	1	1	-6,8
233	Traffic	Increase in peak hour traffic volumes	Alternative 5	Construction	-1	3	2	3	1	4	-9	-1	3	2	1	1	2	-3,5	High	1	1	-3,5
234	Traffic	Impact of abnormal loads	Alternative 5	Construction	-1	4	2	4	3	4	-13	-1	2	2	3	1	2	-4	High	1	1	-4
235	Traffic	Deterioration of road network condition	Alternative 5	Operation	-1	2	4	1	2	2	-4,5	-1	2	4	2	2	3	-7,5	High	1	1	-7,5
236	Traffic	Increase in dust along unsurfaced gravel access roads	Alternative 5	Operation	-1	2	4	1	1	2	-4	-1	2	4	1	2	2	-4,5	High	1	1	-4,5
237	Traffic	Increase in peak hour traffic volumes	Alternative 5	Operation	-1	3	4	1	1	2	-4,5	-1	2	4	2	1	2	-4,5	High	1	1	-4,5
238	Traffic	Impact of abnormal loads	Alternative 5	Operation	-1	3	4	1	1	2	-4,5	-1	2	4	1	1	3	-6	High	1	1	-6
239	Traffic	Deterioration of road network condition	Alternative10	Construction	-1	4	2	3	2	4	-11	-1	3	2	2	2	3	-6,8	High	1	1	-6,8

IMPACT DESCRIPTION					Pre-Mitigation							Post Mitigation								Priority Factor Criteria		
Identifier	Discipline	Impact	Alternative	Phase	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Final score
240	Traffic	Increase in dust along unsurfaced gravel access roads	Alternative10	Construction	-1	3	2	2	2	3	-6,75	-1	3	2	1	2	2	-4	High	1	1	-4
241	Traffic	Increase in peak hour traffic volumes	Alternative10	Construction	-1	3	2	3	1	4	-9	-1	3	2	2	1	3	-6	High	1	1	-6
242	Traffic	Impact of abnormal loads	Alternative10	Construction	-1	4	2	4	2	4	-12	-1	3	2	3	2	3	-7,5	High	1	1	-7,5
243	Traffic	Deterioration of road network condition	Alternative10	Operation	-1	3	4	2	2	2	-5,5	-1	2	4	1	1	2	-4	High	1	1	-4
244	Traffic	Increase in dust along unsurfaced gravel access roads	Alternative10	Operation	-1	3	4	1	1	2	-4,5	-1	2	4	1	1	2	-4	High	1	1	-4
245	Traffic	Increase in peak hour traffic volumes	Alternative10	Operation	-1	3	4	1	1	2	-4,5	-1	2	4	1	1	2	-4	High	1	1	-4
246	Traffic	Impact of abnormal loads	Alternative10	Operation	-1	3	4	2	2	2	-5,5	-1	2	4	1	1	2	-4	High	1	1	-4
248	Visual	Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed Infrastructure.		Construction	-1	4	5	4	4	5	-21,3	-1	3	4	3	3	3	-9,8	Medium	1	2	-11,0

12 SENSITIVITY MAPPING

Environmental sensitivity mapping provides a strategic overview of the environmental, cultural and social assets in a region. The sensitivity mapping technique integrates numerous datasets (base maps and shapefiles) into a single consolidated layer making use of Geographic Information System (GIS) software and analysis tools. Environmental sensitivity mapping is a rapid and objective method applied to identify areas which may be particularly sensitive to development based on environmental, cultural and social sensitivity weightings – which is refined by specialists' input within each respective field based on aerial or ground-surveys. Therefore, the sensitivity mapping exercise assists in the identification of sensitive areas within and surrounding the proposed application area.

This sensitivity mapping approach allows for the identification of lower risk areas for positioning the project infrastructure whilst protecting identified sensitive environmental areas/ features. Furthermore, environmental sensitivity is used to aid in decision-making during consultation processes, forming a strategic part of environmental assessment processes. Refer to Figure 47 and Figure 48 for the preliminary scoping combined sensitivity/ composite maps. The compilation of this map has taken into consideration the various baseline specialist studies undertaken for the application area. Most of the application area consists of low to medium sensitive areas. This sensitivity map will be updated during the course of the EIA phase once the specialist studies have been completed. Any relevant feedback from the public participation process will also be considered in the EIA phase update.

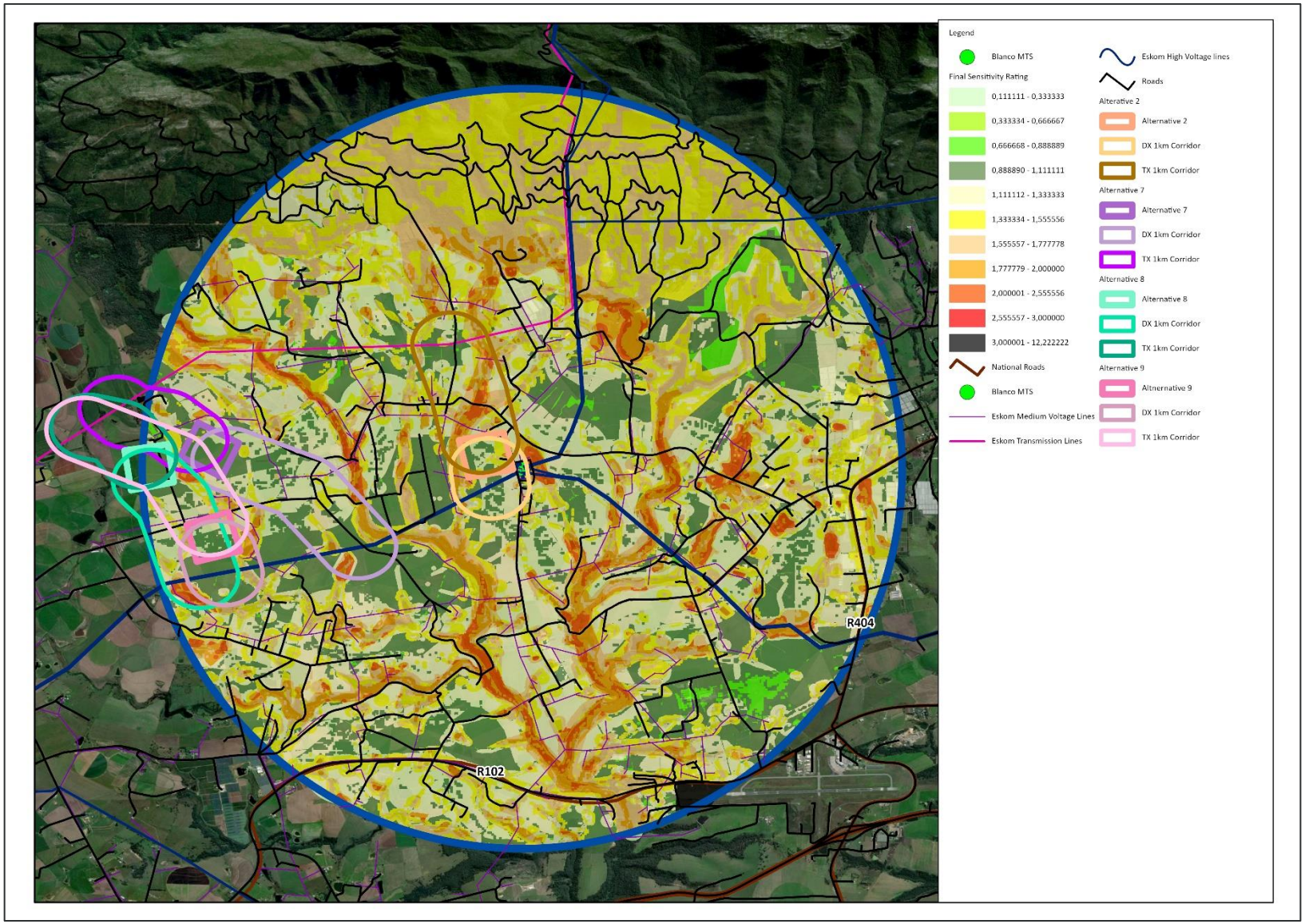

Figure 47: Blanco Scoping level sensitivity map.

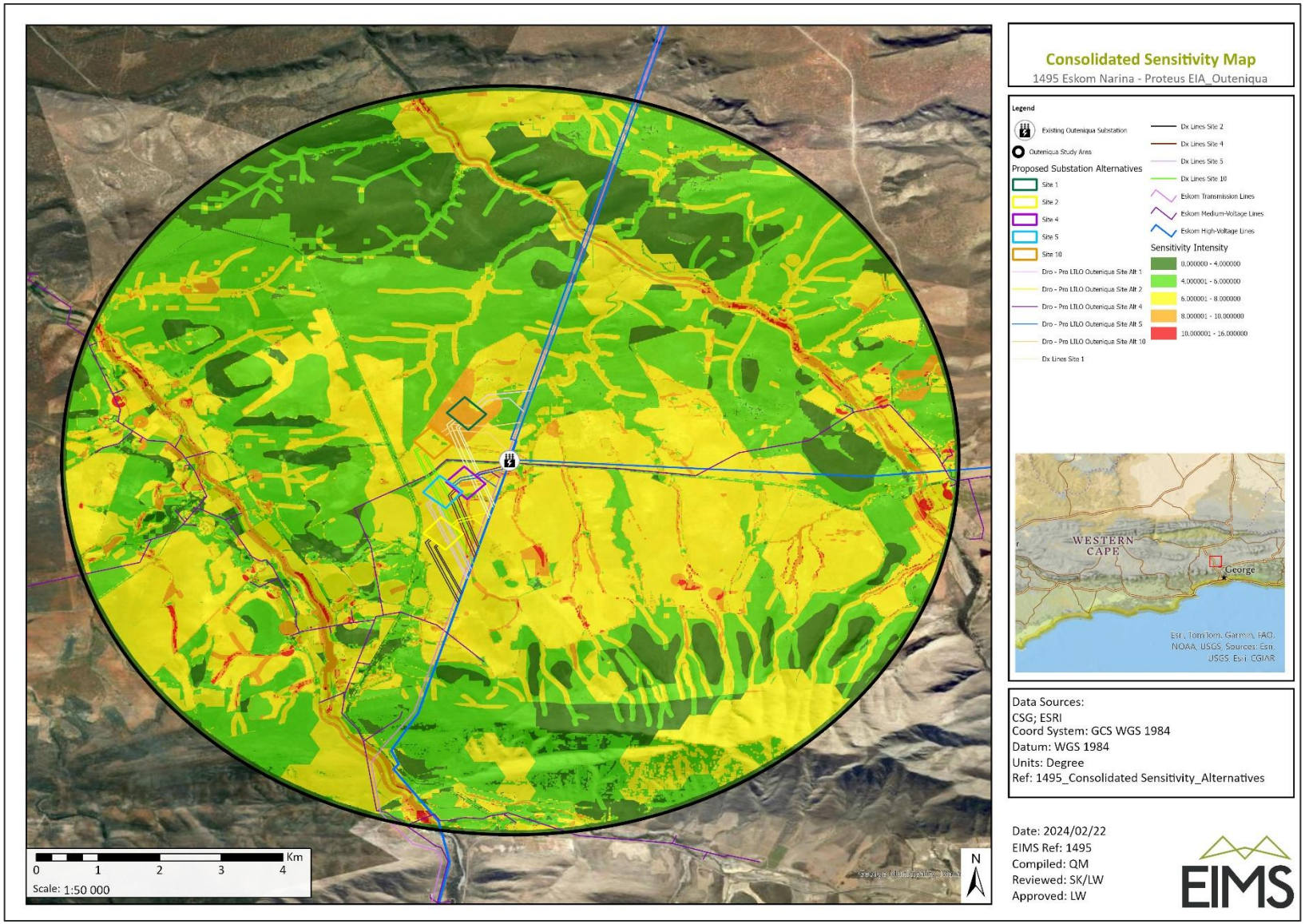

Figure 48: Outeniqua Scoping level sensitivity map.

13 PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASSESSMENT

The section below outlines the proposed plan of study which will be conducted for the various environmental aspects during the EIA Phase. It is also important to note that the plan of study will also be guided by comment obtained from I&AP's and other stakeholders during the PPP.

13.1 DESCRIPTION OF ALTERNATIVES TO BE CONSIDERED IN EIA PHASE

The alternatives that have been considered are discussed in Section 8 of this Scoping Report with a summary of the alternative assessment presented in Section 8.7. The feasible development alternatives to be further assessed in the EIA phase are presented below.

13.1.1 LOCATION ALTERNATIVES

Constructing a substation in the Blanco area is not attainable due to the resistance of affected landowners to sell their land and their objections to the EA application on their properties. As such, a feasible option would be placing the station in the Outeniqua area. Five location alternatives have been identified in the Outeniqua study area for the proposed Narina Substation as follows:

1. **OSS1** (on farm Zout Kloof 27 Portion 2)
2. **OSS2** (on farm Klippedrif 81 Portion 2)
3. **OSS4** (on farm Zout Kloof 27 Portion 2)
4. **OSS5** (on farms Klippedrif 81 Portion 8 & Zout Kloof 27 Portion 2)
5. **OSS10** (on farm Zout Kloof 27 Portions 6 & 20)

All five of the above SS locations will be assessed as separate alternatives in the EIA phase.

13.1.2 PROCESS ALTERNATIVES

The following process alternatives have been identified and will be assessed further in the EIA phase.

- Use of environmentally friendlier alternatives to typical mineral oils in the substation transformers, if possible;
- Utilisation of waste sorting and recycling programmes during the construction and operation phases for both the substation and the powerlines; and
- Use of alternative pylon tower designs for the powerlines.

The potential alternatives to conventional mineral oils will be discussed and assessed further in the EIA phase.

13.2 DESCRIPTION OF THE ASPECTS TO BE ASSESSED AS PART OF THE EIA PROCESS

The following aspects will be assessed further during the EIA phase investigation to be undertaken:

- Cultural and Heritage Resources,
- Palaeontological Resources,
- Socio-Economic Impacts,
- Avifaunal Impacts,
- Terrestrial Ecology,
- Agricultural Potential,
- Soils and Land Capability,

- Aquatic and Wetlands Ecology,
- Visual Impacts; and
- Traffic Impacts.

13.3 ASPECTS TO BE ASSESSED BY SPECIALISTS

Table 44 below details the various aspects of the project to be addressed in the EIA phase through detailed specialist studies.

Table 44: Details of specialists input during the EIA phase.

Aspect	Company Responsible	Scope of Work / Terms of Reference
Terrestrial Biodiversity including Avifauna	The Biodiversity Company	**Fauna (mammals, herpetofauna and avifauna)** The surveys will include the following: • A survey of the application areas (if permitted); • Compilation of an expected species list; • Compilation of an identified species list; • Identify any Red Data or listed species present or potentially occurring in the area; • A proximity assessment to any protected or ecologically important areas; and • A habitat assessment and delineation. The field survey for fauna will be undertaken concurrently with vegetation surveys. All animals observed in the area will be noted. Ecological indicators, such as calls, tracks and dung will be noted and regarded as indicative of the presence of that particular animal. A detailed fauna lists will be compiled and discussed in relation to the floristic survey findings. The probability of occurrence for species not observed during field surveys will be considered if applicable regarding available habitats. Protected and endemic species will be the focus of discussion. Faunal composition of disturbed sites will be compared to the composition of undisturbed areas. The current status of the faunal environment will be determined and an evaluation of the extent of site-related effects in terms of certain ecological indicators, as well as identification of specific important ecological attributes such as rare and endangered species, protected species, sensitive species and endemic species will be made. The faunal environment and habitat will be characterised in relation to biota and the extent of site related effects. Presence of red data and protected species will be indicated on a map. Sampling techniques will be passive (sightings, calls and tracking) as well as active (trapping, cameras and searching). Fauna will be assessed during the day and at night, the fauna which will be assessed for this study include the following: • Mammals;

Aspect	Company Responsible	Scope of Work / Terms of Reference
		• Avifauna; and • Reptiles & amphibians. **Flora (Plants & vegetation)** The surveys will include the following: • A survey for Red and Orange Data plant species; • Vegetation units will be identified, classified and delineated; • Habitat types will be classified and delineated; • The survey will be conducted in consultation with local authorities who have information to be considered; and • The survey area will include the application area. The floristic survey should be conducted during the growing season (the rainy season when most plants are in flower or seeding), over the application areas. This period is between October and April. These will give an indication of the actual species present on site and will be discussed in context of plant communities (should the area support distinct communities) within the ecosystem of the area. Protected, endemic, exotic, alien invasive and culturally significant species will also be discussed as separate issues and related back to relevant legal requirements. Furthermore, the identification of red data and protected species as listed according to the IUCN List, NEMBA and other Provincial and National legislation will be completed. Depending on the vegetation and terrain, the timed meander sampling could be used during vegetation assessments, however, should dominant vegetation types require other methods be used, then these shall be motivated. **Habitat features** The surveys will include the following: • The identification of these features and delineation thereof; and • The location of any unique or protected habitat features. All sensitive areas, as described by the provincial and national legislation, will be identified. The locality and extent, as well as species composition of sensitive areas such as the wetlands or pans, streams, rivers and rocky outcrops will be conducted to identify and map all such sensitive areas present. Sensitive areas will be identified and delineated.
Aquatic and Wetlands	The Biodiversity Company	**Wetlands** • A desktop assessment of all available datasets.

<table>
<tr><th>Aspect</th><th>Company Responsible</th><th>Scope of Work / Terms of Reference</th></tr>
<tr><td></td><td></td><td>

The wetland areas will be delineated in accordance with the DWAF (2005) guidelines, whereby the outer edges of the wetland areas will be identified.
The Present Ecological State (PES) or health for the wetland as a whole will be calculated, whereby the hydrology, geomorphology and vegetation scores are aggregated to obtain an overall PES health score (Macfarlane et al., 2020).
The assessment of the ecosystem services supplied by the identified wetlands will be conducted per the guidelines as described in WET-EcoServices (Kotze et al., 2020).
The Ecological Importance and Sensitivity (EIS) tool will be derived to assess the system’s ability to resist disturbance and its capability to recover from disturbance once it has occurred (Rountree et al., 2013).

Aquatic Ecology

The overall Present Ecological Status of the associated aquatic ecosystems will be determined using the River Eco-status Monitoring Programme (REMP) Ecological Classification manual (Kleynhans and Louw, 2007). The PES will be calculated based on the results of the various abovementioned biological indexes. The methods that will be utilised are summarised in the table below.
<table>
<tr><th>Aspect</th><th>Analyses</th></tr>
<tr><td>Water Quality</td><td>In situ (DWAF, 1996)</td></tr>
<tr><td>Habitat</td><td>Intermediate Habitat Integrity Assessment (Kleynhans, 1998)
Integrated Habitat Assessment System (McMillan, 1998)
Biotope assessment (Tate and Husted, 2015)</td></tr>
<tr><td>Biotic indices</td><td>SASS5 (Dickens and Graham, 2002);
The Average Score Per Taxon (ASPT);
Macroinvertebrate Response Assessment Index (MIRAI); (Thirion,2007)
Fish Response Assessment Index (Kleynhans, 2007)</td></tr>
</table>
Buffer Zones

The “Preliminary Guideline for the Determination of Buffer Zones for Rivers, Wetlands and Estuaries” (Macfarlane, et al., 2014) will be used to determine the appropriate buffer zone for the proposed activity.
</td></tr>
<tr><td>Soils and Agricultural Potential</td><td>The Biodiversity Company</td><td>Agricultural Potential Assessment

Owing to the large surface area to be assessed, an approach combining predictive soil mapping, supported by ground truthing has been proposed. Predictive soil mapping (PSM) can be defined as the development of a numerical or statistical model of the</td></tr>
</table>

Aspect	Company Responsible	Scope of Work / Terms of Reference
		relationship among environmental variables and soil properties, which is then applied to a geographic data base to create a predictive map. The use of the Land Type Survey (Land Type Survey Staff 1972-2006), Geographic Information Systems (GIS) and Digital Elevation Models (DEM) in collaboration with ground truthed baseline information have helped refine the ability of predictive mapping, which has paved the way for Digital Soil Mapping (DSM) (van Zijl & Botha, 2016). Tough terrain and large application areas often render soil sampling impractical, which emphasises the need for DSM. Van Zijl (2018) mentions that sparse observation densities are often used in such cases, ranging from 74-216 ha.obs-1. The main advantage of DSM lies within the importance of the soil-environmental correlation, which can be used to map out the distribution of soils with relatively few sampling sites. According to van Zijl (2018), two main methodologies may be used for DSM, including the expert knowledge approach as well as the land type disaggregation approach. The latter will form part of the methodology used for the basic assessment required for this particular study. The land type disaggregation approach includes the use of land type information to digitally map out the soil units as per the dominant soil forms associated with the terrain units. As with all DSM projects, an element of accuracy will be assessed as part of the assessment. Scattered soil surveying will determine the accuracy of the digital soil mapping exercise. The land type disaggregation approach is commonly used for Environmental Impact Assessments (EIAs) and has been well-documented in the past to be practical and time efficient. In addition to soil information derived from the Land Type Database (Land Type Survey Staff 1972-2006), the soil-environmental relationships observed during the site assessment will be used to improve the accuracy of the study, ultimately upholding the principle of (Botha, 2016), that in-field observation is an important addition to land type information. To summarise, as part of this assessment, the expected distribution of soils will be integrated with soil-environmental associations as well as topography to digitally map out the soil distribution. The site assessment will then focus on ground-truthing these soil distributions and acquiring additional information to improve the specialist's knowledge of the soil-environmental correlation. The accuracy of the DSM exercise will then be calculated to determine the accuracy of soil maps. Expert knowledge from in-field soil-environmental correlations will then be used to improve the accuracy as much as possible. In the event that a low accuracy is calculated for a specific uniform area, additional sampling sits will be investigated to ensure an accurate soil map. Land capability and agricultural potential is determined by a combination of soil, terrain and climate features. Land capability is defined by the most intensive long term sustainable use of land under rain-fed conditions. At the same time an indication is given

Aspect	Company Responsible	Scope of Work / Terms of Reference
		about the permanent limitations associated with the different land use classes. Land capability is divided into eight classes, and these may be divided into three capability groups. The land classes and groups are arranged in order of decreasing capability and ranges of use. The risk of use increases from class I to class VIII (Smith, 2006). The land potential classes are determined by combining the land capability results and the climate capability of a region. Land use will be identified using aerial imagery and then ground-truthed while out in the field. The land use categories are split into: • Cultivated; • Grazing; • Natural; • Mines; • Urban Built-Up; and • Waterbodies.
Visual	Logis	The visual impact assessment will be undertaken in accordance with: • The Government of the Western Cape Guideline for Involving Visual and Aesthetic Specialists in EIA Processes, which is the only relevant local guideline, setting various levels of assessment subject to the nature of the proposed development and surrounding landscape; and • The Landscape Institute and Institute of Environmental Management and Assessment (UK) Guidelines for Landscape and Visual Impact Assessment (LVIA) which provides detail of international best practice (technical methodology). In terms of availability of information, current project planning provides a high-level approximation of the location of the various project components but none of these can be confirmed at this stage. The final position of the substation and the powerlines will be dependent on the approval of the ongoing EIA study. In order to address the lack of final information, the suggested approach is to undertake: • A comprehensive investigation into the study area to define the baseline receiving environmental conditions. This will be based primarily on high resolution aerial imagery and supplemented with spot field verification; and • The baseline characterisation will be categorised into areas or zones per specialist discipline and then the impact of the proposed activities assessed for each zone. Specific mitigation applicable to the activity and zone can then be defined.

Aspect	Company Responsible	Scope of Work / Terms of Reference

Heritage and Palaeontology	PGS Heritage	The proposed development triggers the need for a Heritage Impact Assessment as required under S.38 of the NHRA. SAHRA will be the commenting authority under S38.8 of the NHRA. A Notice of Intent to Develop (NID) will be submitted to SAHRA to inform them of the proposed developments and the proposed way forward. As soon as this process has been agreed upon with SAHRA the following steps will be taken.
		• High-level (primarily desktop combined with some focused site verification) sensitivity mapping of study area.
		  o The assessment will be done through recent and historic aerial and topographical map assessments to identify possible places where heritage resources might be located.
		• Site-specific Phase 1 Heritage Assessment
		  o A desktop study, which is aimed at compiling as much information as possible, regarding the known heritage resources within and surrounding the proposed development areas. The desktop study will cover the following:
		  a. Archival Research: Archival documents and maps housed at the National Archives will be accessed and studied to provide historical background to the study area as well as the identification of heritage resources located there.
		  b. Outcome: Identification of Heritage sensitive areas on outcome of Heritage work.
		  c. Fieldwork: The fieldwork component consists of a selective site visit to some of the identified sensitive areas and is aimed at identifying heritage resources and compiling a general heritage character for the area. The locations of all heritage resources that are recorded during the survey will be documented using a hand-held GPS.
		• Reporting for HIAs/PIAs
		• Adherence to the content requirements for specialist reports in accordance with Appendix 6 of the EIA Regulations 2017, as amended;
		• Adherence to all best practice guidelines, relevant legislation and authority requirements;
		• Identification sensitive areas to be avoided;
		• Assessment of the impact and significance of the proposed development during the Pre-construction,

Aspect	Company Responsible	Scope of Work / Terms of Reference
		Construction, Operation, Decommissioning Phases (according to the impact rating methodology).
Traffic	SMEC South Africa	Assessment of the potential Impacts on the N12 and adjacent roads due to the proposed project.
Socio-Economic	Southern Economic Development	The baseline will include a description of the socio-economic characteristics of the local area before construction. These could include but is not restricted to the following: • Land-use and settlement patterns; • Identification and recording of landowners within a 100m radius around the sub-station and 55m on both side from the transmission lines; • Identification of socio-economic sensitive areas 2km from sub-station; • Demographic profile (households and population size, age, gender, growth); • Heath institutions and profile; • Education institutions and profile; • Transport and roads; • Municipal services (energy, waste, water and sanitation) • Telecommunications; • Safety and Security (crime and illegal mining activities); • Sector composition of the economy in terms of employment and output; • Labour force composition (unemployed, informal, employed); • Cost of living (property and retail prices); • Incidence of unemployment on youth, PDI's and women • Skills levels of the labour force; and • Income poverty levels. **Methodology and Data Sources** The report will be based on primary, secondary resources as well as economic modelling: **Primary Data** The baseline data from secondary sources will be supplemented by an orientation site visit during the impact assessment phase of the study. Other primary sources include: • Mapping of socio-economic activities close to the sub-station and transmission lines; • Available statistics data per municipality based on Stats SA stats (community survey 2011 and 2016) per municipality and town; Municipal institutional assessments of SALGA

Aspect	Company Responsible	Scope of Work / Terms of Reference
		and other available statistics (e.g. public investment, crime statistics); • Interviews with affected and interested parties to determine: o Land-use. o Type of structures in influence zone of sub-station and transmission lines. o Levels of in-migration and settlement patterns. o Occupancy rates in accommodation establishments. o Tourists visiting the area (past and current). o Property prices and vacancy rates. o Labour and employment. o Indicators of community safety (crime). o Service delivery levels (health, education, water, sanitation, energy, refuse, town planning. transport and roads). o Expectations of impact of sub-station in local area. • Financial information of construction period and costs supplied by Eskom (if available). **Secondary Data** Secondary data that will be collected as part of the desktop study include to the following: • Integrated Development Plan of George Municipality; • Spatial Development Frameworks (SDFs); • Interviews with specialists responsible for different EIA work streams including ecological studies and visual assessments; • Statistics South Africa Data (Census 2001 – 2011 and Community Survey 2016); • Any other relevant documentation such as project information, EIA reports of similar developments, etc. **Economic Modelling** Input-output (I/O) modelling is used to assess the project's potential impact on employment and economic output. The I/O analyses is based on i) direct impacts (income and employment created due to employment by the project itself) ii) indirect impacts (backward linkages to local suppliers) and iii) induced impacts due to the overall increase in income levels and increased spending on goods and services which could lead to a further increase in production and employment in the local area.

13.4 PROPOSED METHOD OF ASSESSING ENVIRONMENTAL ASPECTS

The same method of assessing impact significance as was used during the Scoping phase will be applied during the EIA phase. This methodology is described in detail in Section 11.1 of this report.

13.5 PROPOSED METHOD FOR ASSESSING DURATION AND SIGNIFICANCE

The significance of environmental impacts will be rated before and after the implementation of mitigation measures. These mitigation measures may be existing measures or additional measures that may arise from the impact assessment and specialist input. The impact rating system considers the confidence level that can be placed on the successful implementation of the mitigation. The proposed method for the assessment of environmental issues is set out in the Section 11.1. This assessment methodology enables the assessment of environmental issues including: the severity of impacts (including the nature of impacts and the degree to which impacts may cause irreplaceable loss of resources), the extent of the impacts, the duration and reversibility of impacts, the probability of the impact occurring, and the degree to which the impacts can be mitigated.

The specialist studies will recommend practicable mitigation measures or management actions that effectively minimise or eliminate negative impacts, enhance beneficial impacts, and assist project design. If appropriate, the studies will differentiate between essential mitigation measures, which must be implemented and optional mitigation measures, which are recommended.

13.6 STAGES AT WHICH COMPETENT AUTHORITIES WILL BE CONSULTED

Competent authorities have been and will be consulted during the initial notification period, the scoping phase as well as during the EIA phase.

13.7 PROPOSED METHOD OF EIA PHASE PUBLIC PARTICIPATION

The proposed public participation process to be followed for the EIA phase is provided below.

- The commenting periods that will be provided to the I&AP's (and the competent authorities) will be 30 days as per the relevant legislative requirements.
- The dates of the review and commenting period for the draft EIA/EMPr will be determined at a later date and communicated to all registered I&APs through faxes, emails, SMS's and/or registered letters.
- The location at which the hard copy of the EIA report will be made available is at the same public venues in the application area that the Scoping Report was made available (refer to Section 9.3.5), will be sent electronically to stakeholders who request a copy, and placed on the EIMS website (www.eims.co.za).
- The public participation will be undertaken in compliance with Chapter 6 of NEMA GNR 982.
- Public meetings and focus group meetings will be held during the review period for the EIA report.
- All comments and issues raised during the various comment periods will be incorporated into the EIA Report that will be submitted to the Competent Authority for review and decision making.

13.8 DESCRIPTION OF TASKS THAT WILL BE UNDERTAKEN DURING THE EIA PROCESS

The plan of study detailed in the above sections and is summarised below. The following tasks will be undertaken as part of the EIA phase of the project:

- EIA-phase specialist studies.
- Public consultation:
    - Notification of the availability of the EIAR for review and comment to all registered I&AP's;
    - Public and focus group meetings.

- Authority consultation:
    - Consultation with Competent Authorities as well as commenting authorities; and
    - Correspondence or meetings with certain authorities to provide authorities with project related information and obtain their feedback.
- Document compilation:
    - The EIA and EMPr will be compiled in line with the requirements of Appendix 3 and 4 of the NEMA EIA Regulations.
    - The EIA and EMPr will be made available for public comment for a minimum period of 30 days.
    - The EIA and EMPr will be finalised and submitted to the DFFE for adjudication and decision making.

13.9 MEASURES TO AVOID, REVERSE, MITIGATE, OR MANAGE IMPACTS

All comments received from I&APs during the Scoping Report review will be taken into consideration and where applicable inform the high-level mitigation measures. Detailed mitigation measures will be further developed as part of the EIA phase. The potential impacts will further be assessed in terms of the mitigation potential, taking into consideration the following:

- Reversibility of impact:
    - Reversible;
    - Partially reversible.; and
    - Irreversible.
- Irreplaceable loss of resources:
    - Replaceable;
    - Partially replaceable; and
    - Irreplaceable.
- Potential of impacts to be mitigated:
    - High;
    - Medium; and
    - Low.

The assessment findings for each identified impact taking the above into consideration will be provided in the EIA Report and associated EMPr.

14 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations relating to this scoping phase assessment should be noted:

14.1 GENERAL

- This study is based on conceptual designs and information provided by the applicant, and it is assumed that no significant changes or deviations to the final designs will occur.
- In determining the significance of impacts, with mitigation, it is assumed that mitigation measures proposed in the report are correctly and effectively implemented and managed throughout the life of the project.

14.2 SOILS AND LAND CAPABILITY (AGRICULTURE)

- The assessment has only been completed at a desktop level. It is assumed all datasets and information considered for the assessment is representative of the area and is well suited for the intended purposes of this scoping report;
- The impact description is preliminary and is solely based on the screening survey and desktop information; and
- This assessment has only considered land capability and soil.

14.3 SOCIO-ECONOMIC

- Where up to date site specific / ward level socio-economic data is missing, municipal and provincial trends were used as proxy for trends in the local area.
- It is assumed that the local community development priorities are expressed through public processes and public documents such as municipal integrated development plans.
- Socio-economic baseline information was mainly based on official statistics from Stats SA, as well as municipal documentation. Sub-municipal data was only available for 2011. Recent trends, as well as information on a sub-municipal level, were also based on quantitative and qualitative information received from local representatives with local knowledge. The lack of more recent official socio-economic data is therefore seen as a limiting factor, although it is not anticipated to influence the outcome of the report.

14.4 TRAFFIC

- The Scoping exercise is a preliminary assessment of the project's receiving environment, which will be part of the EIA phase. The environment was assessed through site visits, appraisals, desktop screening, and input from authorities and IAPs. If necessary, refinement of maps will be undertaken in the EIA phase. The project's design is still in feasibility stage, and due to the dynamic planning environment, the dimensions and layout of the infrastructure may change.

14.5 HERITAGE AND PALAEONTOLOGY

- This report excludes fieldwork, a Heritage and Palaeontological specialist walkthrough and detailed report will be undertaken during the EIA phase.

14.6 TERRESTRIAL BIODIVERSITY AND AVIFAUNA

- The assessment has only been completed at a desktop level. It is assumed all datasets and information considered for the assessment is representative of the area and is well suited for the intended purposes of this scoping report;
- The impact description is preliminary and is solely based on the screening survey and desktop information; and
- This assessment has only considered terrestrial ecosystem characteristics.

14.7 AQUATIC AND WETLANDS

- The assessment has only been completed at a desktop level. It is assumed all datasets and information considered for the assessment is representative of the area and is well suited for the intended purposes of this scoping report;
- The impact description is preliminary and is solely based on the screening survey and desktop information; and
- This assessment has only considered freshwater systems and soil.

14.8 VISUAL

- Geographical Information Systems (GIS) software was used as a tool to generate viewshed analyses and to apply relevant spatial criteria to the proposed infrastructure.
- A detailed Digital Terrain Model (DTM) for the study area was created from topographical data provided by the Japan Aerospace Exploration Agency (JAXA), Earth Observation Research Centre, in the form of the ALOS Global Digital Surface Model "ALOS World 3D - 30m" (AW3D30) elevation model.
- Proximity offsets (the radial distance between the proposed development and the identified visual receptors) were determined based on the anticipated visual experience of the observer over varying distances.
- Calculation of visibility is based purely on the Digital Elevation Model and does not take into account the screening potential of vegetation or other development.

15 UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I **Sikhumbuzo Mahlangu** herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected Parties has been correctly recorded in the report.

Signature of the EAP

_____

Date:

16 UNDERTAKING REGARDING LEVEL OF AGREEMENT

I **Sikhumbuzo Mahlangu** herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with Interested and Affected Parties and stakeholders has been correctly recorded and reported herein.

Signature of the EAP

_____

Date:

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Appendix 1: EAP Curriculum Vitae

Appendix 2: Public Participation

Appendix 3: Impact Assessment Matrix

Appendix 4: DEA Screening Tool Report and SSVR

Figure 49: Conceptual design of the Narina Substation.