DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT FOR THE PROPOSED DEVELOPMENT OF KHANYAZWE FLEXPOWER AND ASSOCIATED INFRASTRUCTURE IN MALELANE WITHIN THE JURISDICTION OF NKOMAZI LOCAL MUNICIPALITY, MPUMALANGA PROVINCE

DFFE REF:

14/12/16/3/3/2/2493

DATE:

08 JULY 2024

PREPARED FOR:

KHANYAZWE FLEXPOWER ("KFP")

PREPARED BY

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EXECUTIVE SUMMARY

Nsovo Environmental Consulting (hereafter referred to as Nsovo) has been appointed by Khanyazwe Flexpower (Pty) Ltd (KFP) to undertake the Environmental Impact Assessment (EIA) process for the proposed Flexpower power Plant and associated infrastructures. The proposed project will be located inside an urban area, on Portions 1, 4, and 116 of Farm Malelane 389 FP, in Malelane within the Nkomazi Local Municipality, Mpumalanga Province.

The project involves developing, constructing, and operating a 1000MW natural gas-fired power plant using Gas Engines (or Internal Combustion Engines (ICE)). After careful engineering consideration and research during the public consultation period, the applicant reviewed the capacity of the proposed power plant. Based on further research and engineering outcomes, it was confirmed that this plant can generate up to a maximum of 1000MW. The proposed project is adopting a phased development approach, which entails the following:

- Phase 1: 440MW to be built by 2028
- Phase 2: 560MW to be built by 2030

KFP will source gas through the Republic of Mozambique Pipeline Investments Company (ROMPCO), which has an existing gas pipeline that connects Mozambique's Pande Temane gas fields to Sasol's operations in South Africa, as well as several industrial and retail customers. Suppose gas from the existing Pande Temane fields is insufficient. In that case, alternative gas sources may include imported LNG projects developed in Matola, which will provide additional gas into the ROMPCO pipeline. KFP is also proposing the development of approximately two 500 m 275kV and/or 132 kV overhead powerlines from the proposed power plant to the existing Eskom Khanyazwe substation. The power plant will provide a mid-merit power profile to the national grid.

The proposed development will include the construction and assembly of the following associated infrastructures:

- Gas engines for the generation of electricity through the use of natural gas
- Heat Recovery Steam Generators (HRSG) capture heat from high-temperature exhaust gases to produce high-temperature and high-pressure dry steam for use in steam turbines.
- Steam turbines for the generation of additional electricity through the use of dry steam generated by the HRSG
- Bypass stacks associated with each gas turbine
- Dirty water retention dams and clean water dams
- Firewater tanks
- Storm water channels
- Waste storage facilities (general and hazardous)
- Exhaust stacks for the discharge of combustion gases into the atmosphere
- A water treatment plant for the treatment of raw water into potable water and the production of demineralised water (for steam generation)

- Water pipelines from the power block to the station's boundary fence and water tanks to transport and store water of both industrial quality and potable quality
- Dry-cooled system consisting of air-cooled condenser fans situated in fan banks.
- LV and MV switch gear rooms
- Control room
- Closed fin-fan coolers to cool lubrication oil for the gas and steam turbines
- A gas pipeline from the power block to the station's boundary fence and a gas pipeline supply conditioning process facility for the conditioning and measuring of natural gas before being supplied to the gas turbines.
- Ancillary infrastructure, including access roads, warehousing, buildings, access control facilities and workshop area, storage facilities, emergency backup generators, firefighting systems, laydown areas, and 275/132kV switchyard
- A 275kV and/or 132kV power line to connect the project to the national grid to evacuate the generated electricity.

Gas power is widely regarded as a transition fuel for fulfilling the global climate change commitments made at COP21, and COP28 further emphasized the transitional function of gas. Its considerably lower CO_2 emissions than coal and its complementary role as a counterbalance to renewable energy are the main reasons for this. Additionally, it may lead to conversions to alternatives with fewer CO_2 emissions, like replacing natural gas with "Green Gasses." (such as green Hydrogen). KFP is being created within the framework of this energy transition because, in addition to initially replacing coal power, the project's energy will gradually function as a renewable energy balancer and, in the long run, potentially be converted to green fuel alternatives as and when these alternatives become available.

Natural gas is expected to play a central role in supporting Africa's drive to achieve electricity connection for nearly 600 million people without grid access, reduce widespread reliance on coal for power generation, and fast-track the continent's slowed industrial expansion. In support of the vision for the South African Gas-to-Power Programme, the Department of Mineral Resources and Energy (DMRE) has developed a Gas Independent Power Producer Procurement Programme (GASIPPPP), which will serve as an anchor for the gas infrastructure required for the establishment of a gas market in the country.

The EIA process is being undertaken according to Appendix 2 of the NEMA EIA Regulations of 2014., as amended.

The objective of the Scoping process, as indicated in the Regulations process, was to, through a consultative process—

i. Identify the relevant policies and legislation applicable to the activity;
ii. motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
iii. identify and confirm the preferred activity and technology alternative through an identification of impacts and risks and ranking process of such effects and risks;

iv. identify and confirm the preferred site through a detailed site selection process, which includes an identification of impacts and risks inclusive of identification of cumulative impacts and a ranking method of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;

v. identify the key issues to be addressed in the assessment phase;

vi. agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be conducted to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration, and probability of the impacts to inform the location of the development footprint within the preferred site; and

vii. Identify suitable measures to avoid, manage, or mitigate identified impacts and determine the extent of the residual risks that need to be managed and monitored.

The Scoping phase has been completed and entailed a detailed description of the baseline environment, which formed the backdrop of the impact assessment phase. Furthermore, it allowed for identifying critical issues and concerns based on input from the relevant stakeholders, I&APs, and the EAP's professional judgment based on experience and expertise.

Any EIA process considered alternatives, such as technological, structural, and locality considerations. The Scoping Report identified and discussed the identified options and the no-go alternative. The preferred option will be selected based on specialist studies, public input, and technical and environmental factors.

The following alternatives have been identified and considered for the proposed project:

- Site Alternatives;
- Layout Alternatives within the preferred site;
- Technical alternative - the technology to be used in the activity;
- Water supply;
- Site Access alternatives; and
- The no-go alternative.

The proposed development entails the following:

Power Plant: The power plant technology will be Internal Combustion Engines (ICE)). The generation activities will entail the development of the following primary activities:

- Development of the gas-to-power facility
- Operation at a maximum capacity of 1000 MW.

Connection to the ROMPCO: An approximately 500 m gas pipeline extension will be required to connect the power plant to the ROMPCO pipeline.

Connection to the Eskom Grid. This scope of work entails the construction of infrastructure to connect to the Eskom grid in line with Eskom's minimum requirements. KFP will be responsible for the construction, and Eskom will be responsible for the operation and maintenance of the proposed infrastructure. From the power plant, electricity will be evacuated through a double 275kV transmission line and/or a double 132kV transmission line, connecting to an expanded Eskom Khanyazwe Substation located within 500 m of the power plant. Subsequently, the project will include the following:

- Extension of a Busbar at the Eskom Khanyazwe substation; or
- A loop-in loop-out tie in into the 275kV transmission lines entering into Khanyazwe substation; and
- Approximately 0.5km 2x 275kV powerline and/or 2x 132kV powerline will connect to the existing Eskom Khanyazwe 275/132kV substation to be expanded to accommodate the 500MVA transformer bay.

Road Access: An access road (temporary and permanent) will be constructed to link the proposed power station to the nearby existing road network. The current primary road to the proposed development site is a gravel road that connects to the N4. A new access point from the N4 has been proposed. This proposed access will tie in with the gravel road to access the power plant near the Eskom Khanyazwe substation.

- Developing an approximately 10m wide access road.

Associated Infrastructure: This will include

- Water and lube oil tanks for water and oil required for the engines' generation process and cooling;
- Water treatment plant to produce the required quality of water for the generation process;
- Sewerage treatment plant;
- Hazardous waste area, including used oil tanks and sanitary waste disposal;
- Building infrastructure, which will include, but not be limited to, plant operational and maintenance building; ablution facilities, offices; and
- Fencing to maximize the security of the plant.

Water allocation: Three water supply alternatives have been identified for the proposed project's construction and operational phases. The preferred technology alternative will inform the water requirements, and this will, in turn, inform which water supply source will likely be adequate. The options considered during the Scoping include municipal water supply, adjacent irrigation canal, and groundwater supply through a borehole. In order to have a minimal impact on the water supply in the area, the ICE technology has been identified as the preferred technology option primarily due to its very low water requirements. For this technology, a detailed water balance has been completed to ascertain the water requirements for the operational phase of the power station. It has also been confirmed that the source of water will primarily be a borehole. A geohydrological assessment has been commissioned to confirm the yields, with completion expected during July 2024.

Water treatment facility: Water for the power plant will be sourced from boreholes on the site. This water will require treatment to be suitable for use in the engine's cooling system and, depending on the quality of the water, for human consumption. A water treatment plant will form part of the plant equipment to produce this water. Water quality test results from several boreholes in the area that are considered 'bad quality' were obtained. These results were used

to develop a concept water treatment plant that accounted for the worst possible scenario to understand what the most onerous water treatment plant design would entail.

- Should the borehole water quality be of poor quality, a reverse osmosis plant would be required to produce the treated water for the plant. This plant would produce brine and a softening filter cake that is 91% calcium carbonate as byproducts. Brine may be a hazardous waste depending on the borehole water quality and the final water treatment.
- Should the borehole water quality be average or good instead, a reverse osmosis plant would not be required; only a softening plant would. In this case, no brine would be produced.
- The final design for the water treatment plant will be completed once the boreholes on the site have been drilled and the water quality has been tested.

Wastewater Management: the management of wastewater on-site will entail:

- **Water treatment plant**: Byproducts from the water treatment plant will be stored on-site and disposed of by a specialist contractor. Depending on borehole water quality and the water treatment plant process, up to 3200 m^3 of brine could be produced per year.
- **Oily water:** Any area where water used for floor washing could become oil-contaminated will be bunded. This water will be channelled to sumps, where it will be pumped to an oily-water storage tank. An oil filtration system will then separate the oil from the water. The removed oil will be stored and removed from the site by a specialist contractor. The clean water will be discharged into the stormwater system.
- **Sewage:** An on-site sewage plant will be used on the plant due to the lack of a municipal system in the area. A package solution is intended that would be required to be de-sludge sand disposed accordingly. This sludge would be classified as a hazardous material and removed by a specialist contractor. Volumes of around 15m3 per year are anticipated.
- **Stormwater**: The site will include a stormwater system that channels rainwater to a dam. The stormwater system and dam size will be determined during the detailed design of the plant.

Waste Storage Facility: The plant will generate hazardous and general waste, which will be stored at the waste storage facility. The facility will be designed and operated in accordance with the norms and standards for waste storage (GN R926 OF 2013).

No-go alternative: Under GN R.982, consideration must be given to the option not to act, in which an alternative is usually considered when the proposed development is envisaged to have significant adverse environmental impacts that mitigation measures cannot ameliorate effectively. The no-go alternative would be not undertaking the proposed project's development. A further assessment of the no-go alternative was undertaken.

The Scoping phase preliminary specialist reports for some of the Themes, as dictated by the Screening Tool, further identified additional specialist studies as part of the plan of study for EIA. As such, detailed specialist studies were undertaken to assess the potential impacts on the environment associated with the construction, operation, and decommissioning phases of the proposed Flexpower power plant and associated infrastructure. The identification and assessment of impacts are based on the baseline environment and the identified impacts that the proposed project

will pose on the receiving environment. At the same time, the specialists have proposed mitigation measures to reduce the identified impacts to manageable or negligible. The details of the Specialist are included in Table 1 below, and the reports are attached as **Appendix C.**

Table 1: Details of the Specialists.

Specialist Study		Company	Specialist
Theme	Report	Company	Specialist
Geotechnical Assessment	Full Report	SRK Consulting	
Wetland Impact Assessment	Site Sensitivity Verification	WaterMakers	Willem Lubbe
Heritage Impact Assessment	Compliance Statement	Archaeological And Heritage Services Africa	Edward Matenga
Major Hazard Installation	Exemption Letter	ISHECON	Derick Botha
Terrestrial and Aquatic Biodiversity SSV and Compliance Statement	Compliance Statement	Amanzi Environmental Services	Rudi Greffrath
Paleontological Assessment SSV	Compliance Statement	Bamford (Pty) Ltd	Dr. Marion Bamford
Civil Aviation SSV	Full Report	GWI Group	Jon Heeger
Agricultural Impact Assessment	Full Report	Nsovo Environmental Consulting	Tshiamo Setsipane
Visual Impact Assessment	Full Report	Outline Landscape Architects	Katherine Hammel-Louw
Eco-Tourism Assessment	Full Report		
Social Impact Assessment	Full Report		Vhahangwele Manavhela
Noise and Vibration Specialist	Full Report	DB Acoustics	Barend du Plessis
Air Quality	Full Report	EHRCON	Uno Neveling
Climate Change Impact	Full Report		Jeandré Neveling
Traffic Impact Assessment	Full Report	Traffic Surveys	Pieter Joost
Avifauna	Full Report	Mboneni Ecological Services	Avhafarei Phamphe

This Scoping report was made available to the Interested and Affected Parties (I&APs) as well as Organs of State for thirty (30) days (31 January 2024 – 29 February 2024) to allow them to review and comment. Comments received during the Scoping phase were addressed in the Report and included in the Comments and Responses Report (CRR). Furthermore, the Plan of Study for the EIA was incorporated in this report and submitted to the Competent Authority (CA), the DFFE, as per section 24C of the NEMA. The DFFE assessed the Final Scoping report and the plan of study for EIA and accepted it on the 25th of April 2024.

The EIA was conducted as dictated by the NEMA and the EIA Regulations of December 2014, as amended, and associated regulations. This report has comprehensively addressed the potential positive and negative impacts associated with the proposed Khanyazwe Flexpower Plant. A team of environmental specialists informed this environmental impact assessment report; their studies are attached. Furthermore, the EIA identified critical issues and concerns based on inputs from the relevant stakeholders, I&APs, and the EAP's professional judgment based on experience and expertise in the field.

Various alternatives have been proposed and assessed. The primary objective was to determine the suitability of each option for the intended use and the suitability of each option based on its identified impacts. The EIA further duly considered the suitability of the overall project within its developmental – and environmental context.

Sixteen specialist studies were undertaken, and input from these studies was key in preparing this EIA report. The specialist's recommendation guided the consideration of the most suitable and preferred alternative. None of the alternatives were considered fatal flaws, and the specialists made several recommendations to be included in the EMPr to reduce the severity of the identified impacts on the environment. The recommendations are highlighted in Section 8.

A comparative analysis of the alternative was thoroughly conducted, and reasons were provided. The final recommended alternatives are provided in the Table below.

Recommended Alternatives for approval

Alternatives	Recommended Option
Site	Site Alternative 1
Technology	ICE
Water source	Borehole
Grid Connection	Either 275kV or 132

No fatal flaws or highly significant impacts were identified during the EIA phase that would necessitate substantial redesign or termination of the project. Potential negative impacts have been identified, and where the impacts were detrimental to the environment, alternatives were proposed, and mitigation measures were recommended.

The report is subject to a 30-day comment and review period to allow input from stakeholders and I&APs. The comments received via email, calls, and meetings will be considered and incorporated in the report and comprehensively addressed in the CRR. Furthermore, the EIA provides a detailed assessment of the identified issues and their significance ratings and proposes mitigation measures as applicable. Any further recommendations the DFFE makes will be duly addressed and incorporated before submitting the final report for decision-making.

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LIST OF ACRONYMS AND ABBREVIATIONS

AEL	Atmospheric Emission License
CARA	Conservation of Agricultural Resources Act, 1983 (43 of 1983)
CBA	Critical Biodiversity Area
CBD	Central Business District
CCGT	Combined Cycle Gas Turbines
DBSA	Development Bank of Southern Africa
DEDEAT	Department of Economic Development, Environmental Affairs and Tourism
DFFE	Department of Forestry, Fisheries and the Environment
DWS	Department of Water, and Sanitation
DMPR	Department of Mineral and Petroleum Resources
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPr	Environmental Management Programme
ERA	Electricity Regulation Act, 2006 (4 of 2006)
GA	Gas Act, 2001 (48 of 2001)
GASIPPPP	Gas Independent Power Producer Procurement Programme
GHG	Greenhouse Gas Emissions
GNR	Government Notice Regulations
GSA	Gas Supply Agreement
HSA	Hazardous Substances Act, 1973 (56 of 1973)
I&APs	Interested and Affected Parties
ICE	Internal Combustion Engine
IDP	Integrated Development Plan
IEA	International Energy Agency
IEP	Integrated Energy Plan
IPPPP	Independent Power Producers Procurement Programme
IRP	Integrated Resource Plan
KFP	Khanyazwe Flexpower

LNG	Liquefied Natural Gas
MBSP	Mpumalanga Biodiversity Sector Plan
MPRDA	Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MDARDLA	Mpumalanga Department of Agriculture, Rural Development and Land Administration
MW	Megawatt
NCRECA	Noise Control Regulations under the Environmental Conservation Act, 1989 (73 of 1989)
NDP	National Development Plan
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998)
NEMAQA	National Environmental Management: Air Quality Act, 2004 (No. 39 of 2004)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (No. 10 of 2004)
NEMPAA	National Environmental Management: Protected Areas Act, 2003 (57 of 2003)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NHRA	National Heritage Resources Act, 1999 (No. 25 of 1999)
NLM	Nkomazi Local Municipality
NO_2	Nitrogen dioxide
NPA	National Ports Act, 2005 (12 of 2005)
NPAES	National Protected Areas Expansion Strategy (2009)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
OCGT	Open Cycle Gas-Turbine
OHSA	Occupational Health and Safety Act, 1993 (Act 85 of 1993)
PPP	Public Participation Process
SACAD	South Africa Conservation Areas Database
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SAPAD	South Africa Protected Areas Database
ToR	Terms of Reference
WULA	Water Use Licence Application

1 INTRODUCTION AND BACKGROUND

Gas power is widely regarded as a transition fuel for fulfilling the global climate change commitments made at COP21, and COP28 further emphasized the transitional function of gas. Its considerably lower CO_2 emissions than coal and its complementary role as a counterbalance to renewable energy are the main reasons for this. Additionally, it may lead to conversions to alternatives with fewer CO_2 emissions, like replacing natural gas with "Green Gas." (such as green Hydrogen). Khanyazwe Flexpower is being created within the framework of this energy transition because, in addition to initially replacing coal power, the project's energy will gradually function as a renewable energy balancer and, in the long run, potentially be converted to green fuel alternatives as and when these alternatives become available.

Natural gas is expected to play a central role in supporting Africa's drive to achieve electricity connection for nearly 600 million people without grid access, reduce widespread reliance on coal for power generation, and fast-track the continent's slowed industrial expansion. In support of the vision for the South African Gas-to-Power Programme, the Department of Mineral Resources and Energy (DMRE) has developed a Gas Independent Power Producer Procurement Programme (GASIPPPP), which will serve as a catalyst for the gas infrastructure required for the establishment of a gas market in the country whilst also providing the much-needed dispatch flexibility to support the power system.

On the 4th of January 2023, the DMRE released the draft Integrated Resource Plan (IRP2023), which presents the roadmap for new power plants to be built up to 2030 (Horizon 1) and up to 2050 (Horizon 2) for public comment. While it is still a draft, the results do indicate that gas power plays a critical role in

- reducing the amount of unserved energy in the system;
- reducing the amount of diesel currently consumed in the OCGTs;
- Balancing the erratic behaviour of the existing coal-fired power plants; and
- Balancing the growing intermittency from wind and solar power plants.

As per the 'emerging plan' suggested in the draft IRP2023, over 7000 MW of gas power plants is proposed to be built before 2030, and fast-tracking of gas-to-power procurement has been identified as a critical intervention. This is more than double the current IRP2019 requirement for gas, which is only 3000 MW.

Following the Ministerial Determination (gazetted on the 7th of July 2020 in Gazette Number 43509), which calls for the procurement of 3000MW through a competitive Independent Power Producer (IPP) programme, the Department of Minerals, Resources, and Energy (DMRE) has launched a Gas IPP Programme (GASIPPPP) on the 14th of December 2023 through the IPP Office under the DMRE. The GASIPPPP calls for 2000MW of natural gas power projects of 300MW to 1000MW across the country to be developed to ensure energy security. This capacity represents the capacity allocated under the heading "Gas and Diesel" for 2024 to 2027 in Table 5 of the IRP 2019.

The scope of the project for the earmarked area will include:

- Delivery of natural gas from the ROMPCO gas pipeline to the power plant using a gas pipeline extension;
- Building a 1000MW gas-fired power plant, including the high voltage connection to the electrical grid.

Khanyazwe Flexpower (Pty) Ltd (hereafter referred to as KFP) is potentially a participant in this program, but there is also an opportunity for KFP to supply power to other off-takers. Consequently, KFP is proposing to develop an Internal Combustion Engine (ICE) power facility and associated infrastructure with a maximum capacity of 1000 MW on a sugar cane plantation approximately 2 km from Malelane town, which falls within the jurisdiction of Nkomazi Local Municipality in the Mpumalanga Province.

The proposed development triggers listed activities in terms GNR 983, GNR 984, and GNR 985 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), EIA Regulations of 2014 as amended, which requires an Environmental Impact Assessment (EIA) process to be undertaken by a registered Environmental Assessment Practitioner (EAP); a Water Use Licence Application (WULA) triggering section 21(c) and (i), in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA) from the Department of Water and Sanitation (DWS) and an Atmospheric Emissions Licence (AEL) triggering subcategory 1.4: gas combustion installation and 1.5: reciprocating engines, in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) from the Ehlanzeni District Municipality.

Subsequently, Nsovo Environmental Consulting (Nsovo) is the independent consultant appointed by KFP and is responsible for the necessary authorisation and licensing processes to comply with the legislative requirements. The project proponent is Khanyazwe Flexpower (Pty) Ltd., whereas the Competent Authority is the Department of Forestry, Fisheries and the Environment (DFFE). The project will be undertaken in line with the requirements of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) and associated EIA Regulations of 2014 as amended.

2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

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

- Is independent and objective;
- Has expertise in conducting EIAs;
- Considers all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

Table 2 presents the details of the EAP involved, including relevant experience. A detailed Curriculum Vitae and Qualifications are attached in **Appendix B.**

Table 2: Details of the Environmental Assessment Practitioner (EAP)

Name of Company	Nsovo Environmental Consulting
Person Responsible	Munyadziwa Rikhotso
Professional Registration	Environmental Assessment Practitioners Association of South Africa EAP EAPASA (Reg 2019/1156)
Postal Address	40 Lyncon Rd Carlswald 1684
Telephone Number	087 803 9294
Email	munyadzi@nsovo.co.za
Qualifications & Experience	BSc Honours Environmental Sciences **20 years of experience**
Project Related Expertise	In terms of project-related expertise, the Environmental Assessment Practitioner has completed the following projects: • EIA for the proposed Tubatse strengthening phase 1 – Senakangwedi B integration within the jurisdiction of Greater Tubatse Local Municipality in Limpopo Province. • EIA for the proposed 400KV Maphutha-Witkop Eskom Powerline in Limpopo Province. • EMPr, WULA, and EA amendment for the proposed Juno Gromis 400kV power line • Environmental Impact Assessment process for the proposed development of the Eskom Agulhas 400kV MTS within the jurisdiction of Swellendam Local Municipality, Western Cape. • Environmental Management Plan and Eskom characterization for the upgrading of Eskom distribution lines in Gauteng • Basic Assessment for the proposed Transnet Orex Feeder substations (Aries, Garona, Helios, and Juno substations) within the Northern and Western Cape provinces. • Basic assessment of the proposed development of the Transnet Capital Projects substations (Bosmanskop, Leeufontein, and Rietkuil substations).

	• Construction Environmental Management Programmes for the proposed Transnet Orex Feeder substations (Aries, Garona, Helios, Juno) within the Northern and Western Cape provinces.

2.1 DETAILS OF THE APPLICANT

Table 3 presents details of Khanyazwe Flexpower (Pty) Ltd.

Table 3: Details of the Applicant

Name of Company	Khanyazwe Flexpower (Pty) Ltd
DFFE Project Reference	14/12/16/3/3/2/2493
Project	Khanyazwe Flexpower

2.2 DETAILS OF THE SPECIALIST

To adequately identify and assess potential environmental impacts associated with the proposed project, Nsovo has appointed the specialist sub-consultants listed in Table 4. The Environmental Impact Assessment Report (dEIAR) will include the draft specialist reports.

Table 4: Details of Specialist Studies

Specialist Study	Company	Specialist	Reference
Geotechnical Assessment	SRK Consulting		Appendix C1
Wetland Impact Assessment	WaterMakers	Willem Lubbe	Appendix C2
Heritage Impact Assessment	Archaeological And Heritage Services Africa	Edward Matenga	Appendix C3
Major Hazard Installation	ISHECON	Derek Botha	Appendix C4
Terrestrial and Aquatic Biodiversity SSV and Compliance Statement	Amanzi Environmental Services	Rudi Greffrath	Appendix C5
Paleontological Assessment SSV	Bamford (Pty) Ltd	Dr. Marion Bamford	Appendix C6
Civil Aviation SSV	GWI Group	Jon Heeger	Appendix C7
Agricultural Impact Assessment	Nsovo Environmental Consulting	Tshiamo Setsipane	Appendix C8

Specialist Study	Company	Specialist	Reference
Visual Impact Assessment	Outline Landscape Architects	Katherine Hammel-Louw	Appendix C9
Eco-Tourism Assessment			Appendix C10
Social Impact Assessment and Tourism		Vhahangwele Manavhela	Appendix C11
Avifauna	Mboneni Ecological Services	Avhafarei Phamphe	Appendix C12
Noise and Vibration Specialist	dBAcoustics	Barend du Plessis	Appendix C13
Air Quality	EHRCON	Uno Neveling	Appendix C14
Climate Change Impact		Jeandre Neveling	Appendix C15
Traffic Impact Assessment	Traffic Surveys	Pieter Joost	Appendix C16

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

Section 8 of the IFC (International Finance Corporation) performance standard states that where the project involves physical elements, aspects, and facilities that are likely to generate environmental and social impacts, the risks and impacts will be identified in the context of the Project's Area of Influence (PAOI). This area of influence encompasses, as appropriate, the area likely to be affected by:

(i) the project and the client's activities and facilities that are directly owned, operated, or managed (including by contractors) and that are a component of the project;

(ii) impacts from unplanned but predictable developments caused by the project that may occur later or at a different location; or

(iii) indirect project impacts on biodiversity or ecosystem services upon which Affected

This section provides detailed information on the PAOI. The main aim is to describe the environmental aspects of the proposed development area and provide a baseline description of the surroundings.

3.1 LOCALITY OF THE PROPOSED PROJECT

The proposed project is within an urban area, on Portions 1, 4, 39, 96, 99, and the Remaining Extent of Portion 116 of the Farm Malelane 389 FP, which is approximately 3 km from the Kruger National Park and 18 km west of the Matsulu township. The proposed site is under the administration of the Nkomazi Local Municipality within the Ehlanzeni District Municipality in Mpumalanga province.

Figure 1 below is the locality map that shows the location of the proposed Khanyazwe Flexpower. Refer to Appendix A for the A3 locality and sensitivity maps.

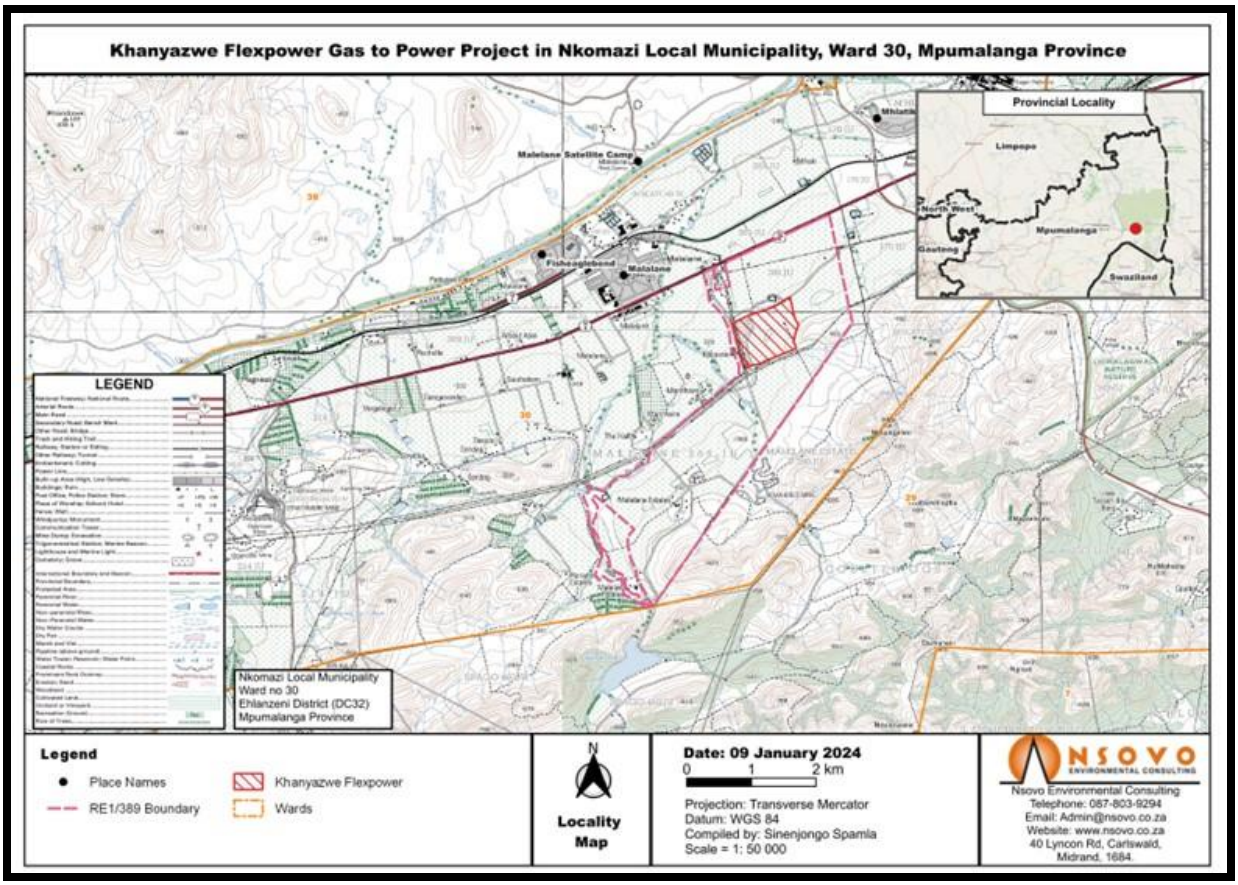


Figure 1: Locality Map

3.1.1 Province and Provincial Boundaries

The proposed development will be undertaken within the Mpumalanga Province, bordered by Limpopo to the North, Gauteng to the West, Free State, and KwaZulu-Natal in the South. The province also borders Swaziland (North of Swaziland) and Mozambique (east of Mozambique).

3.1.2 Municipality and Wards

The proposed development site is located in Ward 30 of the Nkomazi Local Municipality, which is under the jurisdiction of the Ehlanzeni District Municipality in the Mpumalanga Province.

3.2 DESCRIPTION OF THE AFFECTED PROPERTIES

The proposed development of the Khanyazwe Flexpower Plant and associated infrastructures is proposed on the Farms listed in Table 5 below.

Table 5: Property Details

Farm Name	Portion Number	Surveyor General 21 Digit Code
Proposed Site		
Malelane 389 FP	1	T0JU000000000038900001
Access Roads		
Malelane 389 FP	4	T0JU000000000038900004
Malelane 389 FP	39	T0JU000000000038900039
Malelane 389 FP	99	T0JU000000000038900099
Malelane 389 FP	96	T0JU000000000038900096
Malelane 389 FP	RE116	T0JU000000000038900116

3.3 SURROUNDING LAND USES

This section describes the land uses within and around the proposed study area, which includes farming, residential areas, and a retail centre are discussed below.

3.3.1 RESIDENTIAL

The proposed development site's immediate surroundings are mainly agricultural lands. The residential communities adjacent to it include informal, semi-suburban (township), and suburban households. Table 6 provides names and descriptions of communities affected by the proposed development.

Table 6: Names and descriptions of communities that may be affected by the proposed project

Community	Description
Adjacent Farms	A farmstead bordering the proposed site will be directly affected by the proposed project.
Malelane town	A farming town along the N4, bordering the Kruger National Park. The town is characterised by medium-income residential households. The town is situated at the Crocodile and Komati Rivers' confluence in the Mpumalanga Province. The town is 8 km

Community	Description
	from the Crocodile Bridge Gate into the Kruger National Park, 50 km from the Mozambique border, and 65 km from the Eswatini border.
Matsulu	Matsulu is a low-medium income residential household approximately 20 km from the site.
Hectorspruit	Situated on a southern branch of the Crocodile River, Hectorspruit is a small farming village. It is 18km from the proposed site, 19 km from Malelane Gate into Kruger Park, 32 km from the Mozambique border, and 56 km from the Eswatini border.

3.3.2 PROTECTED AREAS

The site is located approximately 2.98 km from the border of the Kruger National Park and 7.82 km from the Malelane Gate, the flagship of the South African National Parks. It is one of Africa's largest game reserves, covering approximately 19,485 km². Its high density of wild animals includes the Big 5 (lions, leopards, rhinos, elephants, and buffalos). The proposed site and the Kruger National Park border are separated by Malelane Town, the N4, and other agricultural and industrial areas, as depicted in Figure 2 below. During the Scoping phase, SANParks emphasised the need to confirm the exact distance from the Kruger National Park, hence the clarity in the map below.

Figure 2: Confirmation of distance from the Kruger National Park for the preferred site Option 1 (Options 3 and 4 were eliminated in the Final Scoping) (Google Maps, 2024)

3.3.3 COMMERCIAL AND INDUSTRIAL

The main economic activities and employment sources within the Nkomazi Local Municipality are farming, manufacturing, and tourism. According to the Development Bank of Southern Africa (DBSA, 2000), the GDP of Ehlanzeni District Municipality (which includes Nkomazi) is valued at R11.2 billion, comprising about 18 % of Mpumalanga Province Gross Domestic Product (DBSA, 2000). The manufacturing sector contributes about 27%, trade 17%, and agriculture 14% to the economic activity. A significant challenge to growing the economy is the lack of skills within the district. The following areas have been identified to become the regional drivers for economic growth and job creation: agriculture, mining, retailing, tourism, manufacturing, and business opportunities that might exist due to the development of the N4 Maputo Corridor, which is also the Mpumalanga provincial Flagship Project.

3.3.4 AGRICULTURE AND FARMING

The town is along the N4 Corridor of South Africa, and its economy relies predominantly on farming. The RCL sugarcane fields on the southern side of the Crocodile River stretching for 20 km is one of the character-defining elements of the landscape.

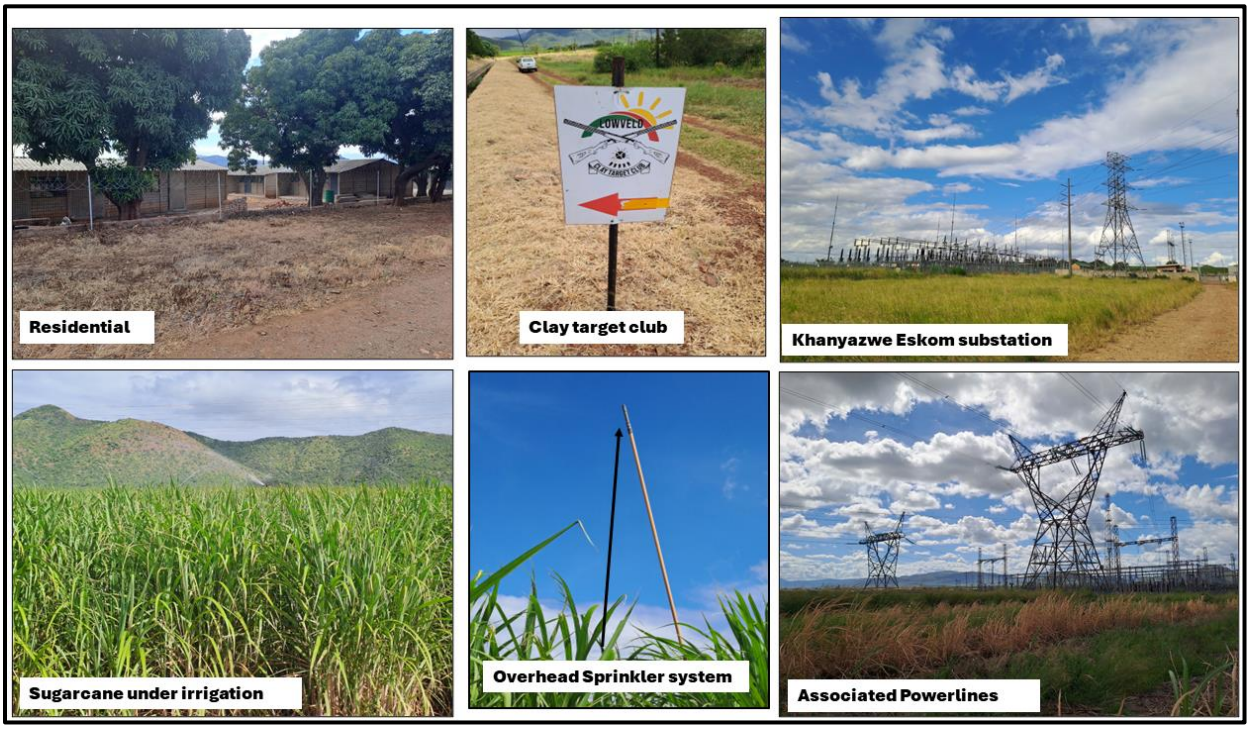


Figure 3: Other Land uses associated with the study area.

3.3.5 SURFACE INFRASTRUCTURE

This describes the surface infrastructures within the study area, including the road network's description, existing substations, and powerlines.

3.3.5.1 Road Network

The site is along the N4, a national route from South Africa to Mozambique. The proposed development site is situated on Portions 1, 4, 99, and 116 of Farm Malelane 389 FB and is accessed through a gravel road that connects the farm from N4.

Access to the study site is provided via an unnamed gravel road, which will remain unchanged. The position of the access will be confirmed as in line with the TRH 26, South African Road Classification and Access Management Manual(2) and is, therefore, supported from a traffic engineering and transport planning viewpoint.

3.3.5.2 Existing Powerlines and Substations

Two existing Eskom substations and powerlines are within the proposed study area: one on the side of the N4 highway 800 m northwest of the preferred site (Malelane Distribution Substation) and another substation only 250 m west of the preferred site (Khanyazwe Transmission Substation). Other infrastructures include transmission and distribution powerlines within the proposed study area. The project design requires the grid connection, either at 275kV or 132kV, into the Khanyazwe substation.

Figure 4: The power lines and substation within the proposed study area.

3.3.6 Aerodromes and Obstacle Limitation Surfaces

Malelane (FAMN) is licensed as a SACAA Category 2 airfield. R326, another unlicensed but CAA-registered aerodrome, is nearby, but it is 3,71km away from the proposed site.

Limited aerodrome services exist at FAMN, which has a Precision Approach Path Indicator (PAPI) visual landing guidance system. This system operates using lights that allow pilots to determine their position relative to the approach guide slope. There is no runway centreline or airfield lighting as it operates under Visual Flight Rules (VFR). Malelane RWY 09/27 is 1 248x18m tar-surfaced with 2,5m gravel shoulders, classified as ICAO Code 2B since the RFL (reference field length) is slightly under 1 200m under optimal conditions.

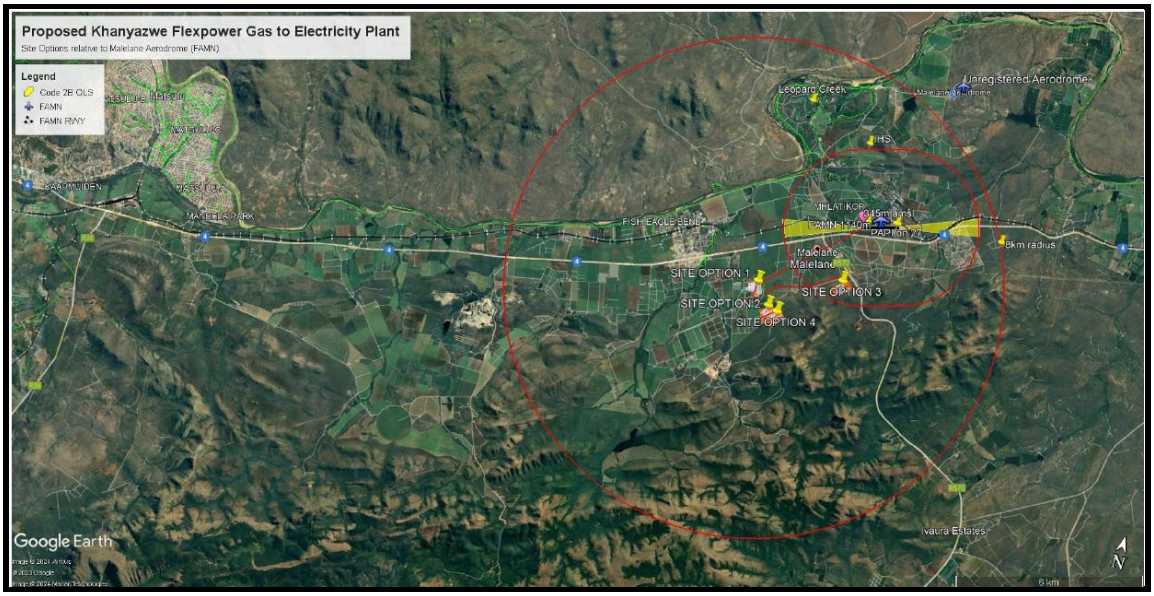


Figure 5: The Civil Aerodromes within site proximity.

3.3.7 FACILITIES

The proposed site is located ±2 km from the Malelane Central Business District (CBD), the main economic hub of the Nkomazi Local Municipality. The CBD hosts activities and infrastructure suitable for daily economic activities, such as shopping centres, police stations, schools, post offices, etc. In addition, a residential area is 2 km north of the proposed site.

3.3.7.1 Hospitality Facilities

The public participation process confirmed the existence of hospitality facilities near the study area, with the closest being 2 km away, i.e. (Elegant Guesthouse). Most of the Guesthouses are close to the Kruger border on the banks of the Crocodile River. It must be noted that the guest houses included on the map are not a comprehensive list but are indicative of land use.

Figure 6: Location of hospitality facilities in relation to the proposed site options (Options 3 and 4 were eliminated in the Final Scoping)

3.4 A PLAN THAT LOCATES THE PROPOSED ACTIVITY OR ACTIVITIES APPLIED FOR, AS WELL AS ASSOCIATED STRUCTURES AND INFRASTRUCTURE AT AN APPROXIMATE SCALE DESCRIPTION OF THE PROPOSED ACTIVITIES

A plan that locates the proposed activities is presented on a map at a scale of 1:50 000, attached as Appendix A of this report. Coordinates of the proposed site and associated linear infrastructure are presented in the Table 7.

Table 7: Preferred Site and associated infrastructure coordinates

Description	Coordinates
Preferred Site Corner coordinates	
Corner A	25°30'02.17"S 31°31'45.18"E
Corner B	25°29'52.07"S 31°32'05.92"E
Corner C	25°30'13.34"S 31°31'48.43"E
Corner D	25°30'03.51"S 31°32'08.46"E
Transmission/Distribution Powerline	
Transmission Line Start	25°30'7.37"S 31°31'59.68"E

Transmission Middle	25°30'16.92"S 31°31'54.29"E
Transmission Line End	25°30'07.18"S 31°31'44.02"E
Access Road	
Access Road Start	25°29'41.31"S 31°31'10.88"E
Access Road Middle	25°29'59.85"S 31°31'30.10"E
Access Road End	25°30'01.79"S 31°31'45.39"E

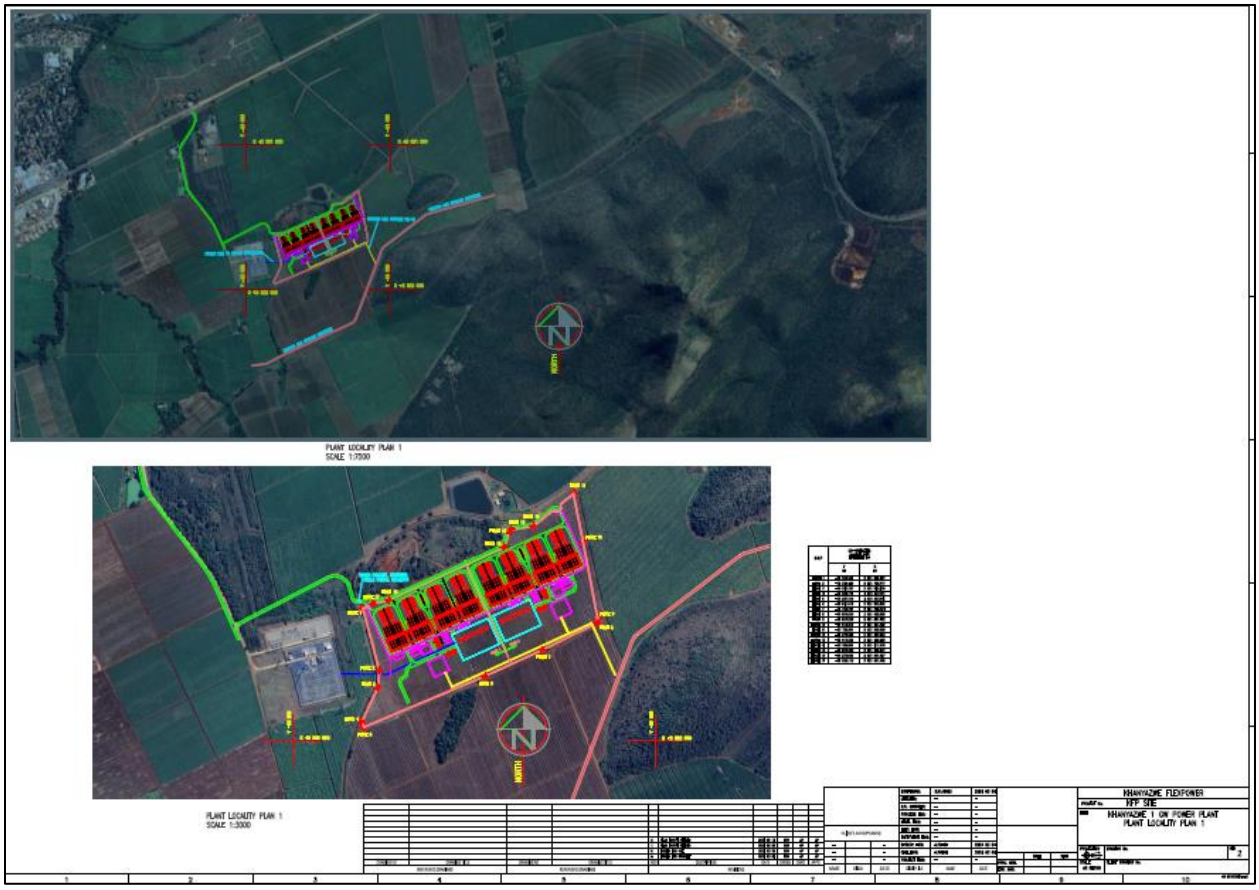


Figure 7: Site layout, which located the proposed activities and associated infrastructure

4 A DESCRIPTION OF THE SCOPE OF THE PROPOSED ACTIVITY, INCLUDING ALL LISTED AND SPECIFIED ACTIVITIES TRIGGERED AND A DESCRIPTION OF THE ACTIVITIES TO BE UNDERTAKEN, INCLUDING ASSOCIATED STRUCTURES AND INFRASTRUCTURE

This section describes the proposed activities, including the proposed project's scope. It mainly focuses on the listed activities that trigger the EIA process. It also describes the associated structures and infrastructure related to the proposed development.

4.1 THE PROPOSED ACTIVITIES

The project involves developing, constructing, and operating a 1000MW natural gas-fired power plant using Gas Engines (or Internal Combustion Engines (ICE)). After careful engineering consideration and research during the public consultation period, the applicant reviewed the capacity of the proposed power plant. Based on the outcomes of further research and engineering it was confirmed that this plant has the capabilities to generate up to 1000 MW (maximum of 1000MW). KFP will source gas from the Republic of Mozambique Pipeline Investments Company (ROMPCO), which has an existing gas pipeline that connects Mozambique's Pande Temane gas fields to Sasol's operations in South Africa, as well as several industrial and retail customers. Alternative sources of gas, if gas from the existing Pande Temane fields is not sufficient, may include imported LNG projects being developed in Matola, which will be able to provide additional gas into the ROMPCO pipeline.

The proposed development entails the following:

Power Plant: The power plant technology will be Internal Combustion Engines (ICE)). The generation activities will entail the development of the following primary activities:

- Development of the gas-to-power facility
- Operation at a maximum capacity of 1000 MW.

Connection to the ROMPCO: An approximately 500 m gas pipeline extension will be required to connect the power plant to the ROMPCO pipeline.

Gas Pressure Reduction Station: Used to reduce the gas from ROMPCO to suitable operating pressures for the power plant. It will include a metering station, pressure reduction, heating, filters, and safety valves.

Connection to the Eskom Grid. This scope of work entails the construction of infrastructure to connect to the Eskom grid in line with Eskom's minimum requirements. KFP will be responsible for the construction, and Eskom will be responsible for the operation and maintenance of the proposed infrastructure. From the power plant, electricity will be evacuated through a double 275kV transmission line and/or a double 132kV transmission line, connecting to an expanded Eskom Khanyazwe Substation located within 500 m of the power plant. Subsequently, the project will include the following:

- Extension of a Busbar at the Eskom Khanyazwe substation; and
- Approximately 0.5km 2x 275kV powerline and/or 2x 132kV powerline will connect to the existing Eskom Khanyazwe 275/132kV substation to be expanded to accommodate the 500MVA transformer bay.

Road Access: An access road (temporary and permanent) will be constructed to link the proposed power station to the nearby existing road network. The current primary road to the proposed development site is a gravel road that connects to the N4. A new access point from the N4 has been proposed. This proposed access will tie in with the gravel road to access the power plant near the Eskom Khanyazwe substation.

- Developing an approximately 10m wide access road.

Associated Infrastructure: This will include

- Water and lube oil tanks for water and oil required for the engine's generation process and cooling.

- Water treatment plant to produce the required quality of water for the generation process.
- Building infrastructure, which will include, but not be limited to, plant operational and maintenance building, ablution facilities, offices, and
- Fencing to maximize the security of the plant.

Water allocation: Three water supply alternatives have been identified for the proposed project's construction and operational phases. The preferred technology alternative will inform the water requirements, and this will, in turn, inform which water supply source will likely be adequate. The options considered during the Scoping include municipal water supply, adjacent irrigation canal, and groundwater supply through a borehole. In order to have a minimal impact on the water supply in the area, the ICE technology has been identified as the preferred technology option primarily due to its very low water requirements. For this technology, a detailed water balance has been completed to ascertain the water requirements for the operational phase of the power station. It has also been confirmed that the source of water will primarily be a borehole. A geohydrological assessment has been commissioned to confirm the yields, with completion expected in August 2024.

Water treatment facility: Water for the power plant will be sourced from boreholes on the site. This water will require treatment to be suitable for use in the engine's cooling system and, depending on the quality of the water, for human consumption. A water treatment plant will form part of the plant equipment to produce this water. Water quality test results from several boreholes in the area considered 'bad quality' were obtained. These results were used to develop a concept water treatment plant that accounted for the worst possible scenario to understand what the most onerous water treatment plant design would entail.

- Should the borehole water quality be of poor quality, a reverse osmosis plant would be required to produce the treated water for the plant. This plant would produce brine and a softening filter cake that is 91% calcium carbonate as byproducts. Brine may be a hazardous waste depending on the quality of the borehole water and the final water treatment.
- Should the borehole water quality be average or good, a reverse osmosis plant would not be required; only a softening plant would. In this case, no brine would be produced.
- The final design for the water treatment plant will be completed once the boreholes on the site have been drilled and the water quality has been tested.

Wastewater Management: the management of wastewater on-site will entail:

- Water treatment plant: Byproducts from the water treatment plant will be stored on-site and disposed of by a specialist contractor. Depending on borehole water quality and the water treatment plant process, up to 3200 m^3 of brine could be produced per year.
- Oily water: Any area where water used for floor washing could become oil-contaminated will be bunded. This water will be channelled to sumps, where it will be pumped to an oily-water storage tank. An oil filtration system will then separate the oil from the water. The removed oil will be stored and removed from the site by a specialist contractor. The clean water will be discharged into the stormwater system.
- Sewage: An on-site sewage plant will be used on the plant due to the lack of a municipal system in the area. A package solution is intended that would be required to be de-sludged and disposed of accordingly. This

sludge would be classified as a hazardous material and removed by a specialist contractor. Volumes of around 15m^3 per year are anticipated. Clean water from the sewage system would be discharged into the stormwater system or a soak-away.

- Stormwater: The site will include a stormwater system that channels rainwater to a dam. The stormwater system and dam size will be determined during the detailed design of the plant.

Waste Storage Facility: The plant will generate hazardous and general waste, which will be stored at the waste storage facility. The facility will be designed and operated in accordance with the norms and standards for waste storage (GN R926 OF 2013).

The following is the list of the proposed activities, including the dimensions of their footprint, capacity, and exact coordinates presented in Table 8 and shown in Figure 7:

Table 8: Primary infrastructure

Project component	Area/Length/Size	Servitude	Purpose
Power Plant	21 hectares	n/a	Generation of electricity using Internal Gas Combustion Engines (ICE)
Embedded gas pipeline	500 m	36 m	Transportation of gas from the ROMPCO pipeline to the power plant.
2x 275Kv and/or 132kV Overhead transmission line	500 m	2x 47 m	Transmission of electricity to the existing Eskom Khanyazwe substation.
Access/Service Road	1.2 km	10 m	Access to site.
Construction access road	3 km	10m	Access to the site for construction
Extension of the existing Eskom Khanyazwe substation	1000m^2	n/a	Extension of the substation to accommodate the incoming 2x275kV and/or 2x132kV and 500MVA transformer.
Water treatment Plant	400m^2	n/a	Treatment of borehole water for use in the cooling system
Sewage Treatment Plant	100m^2	n/a	Treatment of sewage.
Waste Storage Facility	3000m^2	n/a	Storage of hazardous and general waste.

The power plant will provide a mid-merit power profile to the national grid. It will be designed to operate for 25 years, after which, subject to prevailing circumstances, it will either be decommissioned or refurbished and extended. If decommissioned, the land where the power plant is located will undergo an extensive rehabilitation project, which will see the removal of all power plant equipment and reinstatement of the land back to its original purpose, sugar cane farming.

4.2 ACTIVITIES ASSOCIATED WITH THE PROJECT CONSTRUCTION PHASE

The Phase 1 and Phase 2 construction phases of the proposed project would take approximately 33 to 36 months each, and the activities to be undertaken are discussed hereunder. The proposed development will ultimately include constructing and assembling the infrastructures mentioned in Table 9

Table 9: Construction phase activities

Activity	Gas Pipeline	Power Plant Facility	Transmission Line	Access road
Site Walk down	Site walk down along the pipeline to determine sensitivities and mark areas of sensitivity as a no-go.	Site walk down to determine sensitivities and mark areas of sensitivity as a no-go.	Site walk down along the pipeline to determine sensitivities and mark areas of sensitivity as a no-go.	Site walk down along the route alignment to determine sensitivities and them as a go.
Vegetation clearance	Vegetation clearance of the 36m wide servitude.	Vegetation clearance of the 15-20 hectares footprint.	Vegetation clearance of the foundation footings along 2 x 47 m wide servitude.	Vegetation clearance of the 10m wide corridor.
Excavation of foundations	Excavation of trenches via directional drilling or alternative technology and concrete works.	Excavation of foundation and concrete works for the plant.	Excavation of foundations for the towers and minor amendment at the substation.	Levelling and surface preparation.

Activity	Gas Pipeline	Power Plant Facility	Transmission Line	Access road
Civil works	Installation and laying of the pipeline.	Construction of the power plant.	Construction of the steel structures.	The civil works will entail the preparation of proper drainage channels on access roads.
Technical /Mechanical	Mechanical activities to prepare for operation.	Mechanical activities to prepare for operation.	Stringing and energizing the powerline.	
Rehabilitation	Rehabilitation of servitude and encouraging plant growth.	Rehabilitation laydown areas and encouraging plant growth.	Rehabilitation of servitude and encouraging plant growth.	Rehabilitation, excess material removal, and continuous service road maintenance.

4.2.1 REHABILITATION

Upon completion of construction work, the site will be rehabilitated as per the specifications of the EMPr and approved Method Statements (MS) and will meet the requirements of the rehabilitation plan. The rehabilitation activities will include:

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

4.3 OPERATIONAL PHASE

The KFP and associated infrastructure will be commissioned immediately after construction. Subsequent maintenance and refurbishment normally occur during the power station's operational lifetime. Most routine maintenance can be done by ordinary operating personnel while the plant is in operation. Extended maintenance measures may require shutting off the gas and venting the system. The oil change interval depends on the lube oil quality, operating conditions, and engine condition.

During the project's operational phase, the powerline servitude will need to be kept clear of any vegetation, structures, or activities that may interfere with the powerlines. Eskom will also require access to the servitude to undertake maintenance and perform any necessary repair work.

4.3.1 SAFETY ASPECT

The safety risks in a typical power plant are posed by heavy machines with rotating parts, high temperatures and pressures, high voltages, and potentially explosive fuel gas mixtures. A gas explosion may occur if an ignition source (spark or hot surface) arises in a space with a gas-air mixture of an ignitable ratio. In a power plant, the most serious danger situations are caused by gas leaking into the engine hall or unburned unburnt gas escaping into the exhaust gas system.

In a power plant, all reasonable safety measures should be employed, for instance:

- The plant should be equipped with gas detection and alarm systems.
- The exhaust gas system should be designed to avoid ventilating gas pockets after each engine stop. Rupture disks should be installed to minimize pressure build-up in case of a deflagration.
- During engine start-up, several automatic safety checks and actions occur. The gas supply is shut off during the first engine revolutions to purge any gas in the engine cylinders and exhaust gas pipes.
- Running time in unloaded conditions, where combustion efficiency is low, is limited.
- In an emergency situation, the gas supply is shut off, and the combustion is disabled immediately.

4.4 LISTED ACTIVITIES APPLICABLE TO THE PROJECT

The proposed development triggers listed activities in terms of 2014 EIA Regulations as amended, the National Water Act, 1998 (Act 36 of 1998), and the National Environmental Management: 1998 (Act 39 of 1998). The listed activities applicable are listed and briefly described in Table 10 below:

Table 10: Listed activities applicable to the project

Listed Activity		Describe the portion of the proposed project to which the applicable listed activity relates.
Applicable activities listed under the EIA Regulations of 2014 as amended – Listing Notice 1		
GNR 983 Activity 11 (ii)	*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* *(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.*	The project entails developing a 275kV transmission powerline inside an urban area from the power station to the Khanyazwe substation.
GNR 983 Activity 14	*The development and related operation of facilities or infrastructure for the storage or for the storage and handling of dangerous goods, where such storage occurs in containers with a combined capacity of 80 cubic meters or more but not exceeding 500 cubic meters.*	The plant will have dangerous good storage tanks with a combined capacity of approximately 480m^3. Dangerous goods will include lube oil, diesel and other hydrocarbons.
GNR 983 Activity 24	*"The development of a road:* *(ii) A road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 meters."*	The proposed project will require the development of a 1,2 km, 10 m wide access road to the development site and associated

Listed Activity		Describe the portion of the proposed project to which the applicable listed activity relates.
		infrastructure. Post-construction, the road will serve as a maintenance road
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* *excluding where such land has already been developed for residential, mixed, retail, commercial, industrial, or institutional purposes.*	The proposed facility will be developed in an urban area that is currently zoned for agriculture. The footprint of the development and associated infrastructure will be approximately 20 hectares
GN R 983 Activity 47	*The expansion of facilities or infrastructure for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.*	The Eskom Khanyazwe substation is extended to accommodate the incoming 2x275kV and/or 2x132kV and 500MVA transformer.
Applicable activities listed under the EIA Regulations of 2014 as amended – Listing Notice 2		
GNR 984, Activity 2	*"The development of facilities or infrastructure for the generation of electricity from a non-renewable resource where the electricity output is 20 megawatts or more"*	The proposed project involves developing a gas power plant and associated infrastructure with a maximum output of 1000 MW.
GNR 984, Activity 6	*"The development of facilities or infrastructure for any process or activity which requires a permit or license or an amended permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent."*	The proposed gas-to-power plant development requires an Atmospheric Emission License (AEL) under the National Environmental Management: National Environmental Air Quality Act (Act 39 of 2004) (NEMA: QA) for the burning of natural gas.

Listed Activity		Describe the portion of the proposed project to which the applicable listed activity relates.
		The proposed project triggers water-use activities in terms of the NWA and requires a WUL before commencement.
GNR 984, Activity 7	*"The development and related operation of facilities or infrastructure for the bulk transportation of dangerous goods-* *i. in gas form, outside an industrial complex, using pipelines, exceeding 1 000 meters in length, with a throughput capacity of more than 700 tons per day".*	The proposed project entails the development of a gas pipeline from the existing ROMPCO gas pipeline to the power plant.

It must be noted that the proposed project triggers listed NEM: AQA Section 21 listed activities detailed in Table 11. The Licencing Authority for the proposed project, as per Section 36(5)(d) of the National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004), highlights that the Minister is the licensing Authority and must perform the functions of the Licencing Authority (Table 11). Subsequently, in terms of the application for an Atmospheric Emission Licence (AEL), the two processes (EIA-AEL) are running concurrently, with only one public participation process, as elucidated in the National Air Quality Management Framework of South Africa.

Table 11: Listed Activities under Section 21 of NEM: AQA (GN No.893 of 22 November 2013) as amended

Listed Activity	Description
Category 1.4: Gas Combustion Installations, namely gas combustion used primarily for steam raising or electricity generation with a design capacity equal to or greater than 50MW heat input per unit, based on the lower calorific value of the fuel used.	The proposed gas plant will operate at 1000MW at its maximum capacity.
Category 1.5: Reciprocating Engines	The proposed project proposes using Internal Gas Combustion Engine technology.

The proposed project triggers listed activities under Section 21 of the NWA, as detailed in Table 12 below. The application has been lodged with the responsible authority, the DWS.

Table 12: Listed Activities under Section 21 of NWA, 1998

The National Water Act, 1998 (Act 36 of 1998) Activities	
Section 21 (a) *21(a) Taking water from a water resource*	Water will be abstracted from boreholes for domestic uses and processing plant.
Sectio 21 (b) *21(b) Storage of water*	Water tanks will be required for the storage of clean water. The water will be used in the plant and for offices
Section 21 (c) *21(c) Impeding or diverting the flow of water in a watercourse; and*	The proposed development is close to a watercourse (river).
Section 21 (i) *21(i) Altering the Bed, Banks, Course, or Characteristics of a Water Course*	The proposed development is close to a watercourse (river).

The National Water Act, 1998 (Act 36 of 1998) Activities	
Section 21 (g) *21(g) Disposing of water in a manner that may detrimentally impact a water course.*	The proposed project requires a sewage treatment plant to treat sewage generating sludge estimated at approximately 15m^3 per annum. A soakaway system will be used to divert treated water from the sewage treatment plant to a stormwater dam, which, in the case of high rainfall, may result in overflow into the surrounding area.

Considering the information currently available, no waste-related activities as per NEM: WA Section 21 are triggered. As such, there is no requirement for a Waste Management Licence. The handling and management of waste on-site will be dictated by the EMPr and associated norms and standards as well as Municipal by-laws.

4.5 APPLICABLE LEGISLATION AND GUIDELINES

IEM prescribes a code of practice for ensuring that environmental management principles are fully integrated into all stages of the development process. It advocates the use of several environmental and management tools appropriate for the various levels of decision-making. The most comprehensive set of legislative tools to date that provides a legislative framework that allows IEM to be rolled out is the Specific Environmental Management Acts (SEMA), which are sector-specific and linked to NEMA. These include NEM: WA (waste), NEM: AQA (air quality), NEM: BA (biodiversity), NWA (water resources), NEM: PAA (protected areas), and in some instances, NEM: ICMA (coastal management). In addition to the SEMAs, every developmental project must comply with international, national, provincial, and local legislation, regulations, strategies, and policies to manage environmental impacts.

The EIA Regulations of 2014, as amended, under Appendix 2 Section 1(e), requires a description of applicable legislation in the Scoping Report. This section lists and describes the acts and legislations relevant to the proposed development and associated infrastructure. A list of the current South African environmental legislation pertinent to the proposed development is described in Table 13.

Municipal policies, plans, by-laws, KFP policies, and world best practices were considered during the EIA process. The table below describes the legislation that applies to the project; it is not an exhaustive analysis but provides a guideline for the relevant aspects of each legislation.

Table 13: Legislation Pertaining to the Proposed Project

Legislation	Administering Authority:	Summary	Applicability
The Constitution of the Republic of South Africa (Act 108 of 1996)	All Spheres of Government	The Constitution is the supreme law of the Republic of South Africa, so statutes must be in line with it. Section 24 indicates that everyone has the right to an environment that is not harmful to one's health or well-being. That Right includes an obligation imposed on the State to protect the environment for the benefit of present and future generations.	The proposed development has considered the best environmental management practices during the project's life cycle.
National Environmental Management Act (Act 107 of 1998)	National and Provincial	The Act requires that an environmental authorisation must be issued before a listed activity may commence. Section 24(4) of NEMA prescribes that the procedures for the investigation, assessment, and communication of the potential consequences or impacts of activities on the environment must, among other things, with respect to every application for environmental authorisation, ensure that the general objectives of Integrated Environmental Management (IEM) are considered. Section 24(2) indicates that the Minister can publish a list of activities that may not commence without environmental authorization. Three listing notices, Listing Notice 1, 2, and 3, were published in 2014 and amended on the 7th of April 2017 to determine whether a Basic Assessment or Scoping and Environmental Impact Assessment should be undertaken. NEMA also provides for the duty of care and remediation of environmental damage. This duty is set out in section 28 and is imposed on every person "who causes, has caused or may cause significant pollution or degradation of the environment. Section 30 further	The proposed development triggers "listed activities," as defined by NEMA, therefore requiring an EA from the relevant Competent Authority (CA), in this case, the DFFE according to Section 24C. Further, the DFFE screening tool has been consulted from the project's onset, and a copy of the report has been uploaded together with the application form. The DFFE screening tool was also used to guide the required specialist studies; thus, the list corresponds with the specialist studies identified in the screening tool report submitted to the DFFE.

Legislation	Administering Authority:	Summary	Applicability
		indicates the procedures for reporting incidents and the need to implement remedial measures that deal with incidents.	
National Environmental Biodiversity Act (Act 10 of 2004)	National and Provincial	The National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. The following regulations, strategies, and frameworks emanate from this Act: • Alien and Invasive Species Regulations, 2014 • South Africa's • National Biodiversity Strategy and Action Plan (NBSAP) • National Spatial Biodiversity Assessment (NSBA) • National Biodiversity Framework (NBF, 2009)	Aquatic And Terrestrial biodiversity themes are high. Subsequently, the sensitivity has been mapped, and sensitive areas flagged to allow for the creation of buffers and protection of them. The requisite application will be submitted to the provincial department, where protected species have been identified and mapped within the construction footprint.
National Environmental Management: Protected Areas Act	National and Provincial	The purpose of the Act includes providing for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity. Section 17 provides the purpose of declaring areas as protected areas. Any development envisaged in a protected area would require approval from the responsible management authority.	The site's sensitivity has been mapped, and sensitive areas have been flagged to allow for the creation of buffers and protection of protected areas. The site is 4km from the Kruger National Park; however, it is not within a protected area.
National Environmental Management: Air	Municipalities	The Act's purpose includes reforming the law relating to air quality and providing national norms and standards regulating air quality monitoring, management, and control in the country. It also gives effect to S24 of the Constitution. Apart from imposing an obligation on	The proposed project proposes using Internal Gas Combustion Engines technology. The proposed project activities

Legislation	Administering Authority:	Summary	Applicability
Quality Act (Act No. 39 of 2004)		metropolitan and district municipalities to implement the licensing system, a list of activities has been published, which indicates activities that require an Air Emission Licence (AEL).	trigger Section 21 of this Act, and the requisite applications will be applied.
National Environmental Management: Waste Act (Act No. 59 of 2008)	National and Provincial	The purpose of the Act includes reforming the law regulating waste management to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation, securing ecologically sustainable development, and remediating contaminated land. A list of activities has been published indicating activities requiring a Waste Management Licence (WML).	None of the activities trigger the requirement of a Waste Management Licence. However, the handling and storage of general and hazardous waste has been provided for in the EMPr prepared. The plant will store more than 80m^3 of waste on-site, so the provisions of GNR 926 of 2013 must be complied with.
National Water Act (Act No. 36 of 1998)	National and Provincial	The Act seeks to ensure that the country's water resources are protected, used, developed, conserved, managed, and controlled in a manner that considers relevant factors such as meeting the basic human needs of present and future generations. It lists the 11 water uses specified in Section 21 that require a licence/ General Authorisation.	The proposed development is close to a watercourse (river). The scope of work triggers Section 21 listed activities (a), (c) and (i), and a WUL application has been lodged with the DWS under reference number WU34725.
National Heritage Resources Act (Act No. 25 of 1999)	National and Provincial	NHRA aims to introduce an integrated and interactive system for managing national heritage resources. Any development that falls within the ambit of the developments described in the Act and/or involves an impact on heritage resources must comply with the requirements of the NHRA. Permits for this specific project would be	No heritage or palaeontological significance sites have been identified within the proposed site. However, chance finds remain a possibility and this has been considered in the EMPr.

Legislation	Administering Authority:	Summary	Applicability
		administered by the Provincial Heritage Agency or South African Heritage Resources Agency (SAHRA).	
Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)	National, Provincial, and Local	The Act aims to control the use of natural agricultural resources to promote the conservation of soil, water resources, and vegetation and combat weeds and invader plants. Section 6 of the Act makes provision for control measures to be applied to achieve the objectives of the Act. In addition, there is also draft legislation, namely, Sustainable Utilisation of Agricultural Resources.	The proposed project is on agricultural land. Measures relating to soil, water, and vegetation conservation and the management of alien invasive species has been considered and forms part of the EMPr.
Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)	Municipality	The assessment of impacts relating to noise pollution management and control, where appropriate, must form part of the EMPr.	Noise generated during the project's construction and operational phases must comply with the provincial Noise Control Regulations. A noise impact assessment has been commissioned to assess the noise levels and propose mitigation measures in consultation with other specialists.
Electricity Regulation, 2006 (Act 4 of 2006)	National	This act provides the national regulatory framework for the electricity supply industry to make the National Energy Regulator the custodian and enforcer of the national electricity regulatory framework; to provide for licenses and registration as how generation, transmission, distribution, reticulation, trading, and the import and export of electricity are regulated; to regulate the reticulation of electricity by municipalities, and to provide for matters connected to it.	The proposed project is an electricity generation project. An application for a generation certificate must be lodged with the National Energy Regulator of South Africa (NERSA) in terms of Section 11.

Legislation	Administering Authority:	Summary	Applicability
National Road Traffic Act (Act No. 93 of 1996)	National, Provincial, and Local	An abnormal load vehicle permit will be required to transport the various solar power plant and transmission line components to the site for construction. These include: • Route clearance and permits for vehicles carrying abnormally heavy or abnormally dimensional loads will be required. • Transport vehicles exceeding the dimensional limitation (length) of 22m.	The constriction phase will entail the delivery of components that may, in some instances, be abnormal loads. At all times, the project will need to comply with the requirements of the Act and apply for permits as required
Occupational Health and Safety Act (OHS Act	National	The Major Hazard Installation (MHI) regulations (July 2001) published under Section 43 of the Occupational Health and Safety Act (OHS Act) requires employers, self-employed persons, and users who have on their premises, either permanently or temporarily, a major hazard installation or a quantity of a substance which may pose a risk (our emphasis) that could affect the health and safety of workers and the public to conduct a risk assessment in accordance with the legislation. Following legislation, the risk assessment must be done by an approved inspection authority (AIA) registered with the Department of Labour and accredited by the South African Accreditation Systems (SANAS) before construction of the facility.	The project must comply with the requirements of the Act throughout the project phases. Installation of approximately 500m gas pipeline will require clearance from a reputable specialist.
Hazardous Substance Act, 1973 (56 of 1973)		The Hazardous Substances Act controls hazardous substances' production, import, use, handling, and disposal. Under the Act, hazardous substances are defined as substances that are toxic, corrosive, irritant, strongly sensitizing, flammable, and pressure-	The power-generating process produces negligible amounts of waste, predominantly solid, brine, and general domestic waste, predominantly from the water treatment process. The project will also generate

Legislation	Administering Authority:	Summary	Applicability
		generating under certain circumstances and may injure, cause ill health, or even death in humans.	hazardous waste in the form of used oils generated from maintenance and cleaning activities. The waste generated will need to be classified and managed in accordance with the provisions of the Waste Act and associated norms and standards for storage (GN R923 OF 2013)
Gas Act, 2001 (48 of 2001)		The Gas Act 48 of 2001 intends: • to promote the orderly development of the piped gas industry. • to establish a national regulatory framework. • to establish a National Gas Regulator as the custodian and enforcer of the national regulatory framework; and • to provide for matters connected therewith. The objects of this Act are to: (a) promote the efficient, effective, sustainable, and orderly development and operation of gas transmission, storage, distribution, liquefaction, and regasification facilities and the provision of efficient, effective, and sustainable gas transmission, storage, distribution, liquefaction, re-gasification, and trading services. (b) facilitate investment in the gas industry.	The proposed project entails the development of a gas-to-power facility with a maximum output of 1000 MW and associated infrastructure. The associated infrastructure will include a gas pipeline that connects to the ROMPCO.

Legislation	Administering Authority:	Summary	Applicability
		(c) ensure safety and efficiency—economical and environmentally responsible transmission, distribution, storage, liquefaction, and re-gasification of gas. (d) promote companies in the gas industry owned or controlled by historically disadvantaged South Africans using license conditions to enable them to become competitive. (e) ensure that gas transmission, storage, distribution, trading, liquefaction, and re-gasification services are provided equitably and that all parties concerned consider the interests and needs of all parties concerned. (f) promote skills among employees in the gas industry. (g) promote employment equity in the gas industry. (h) promote the development of competitive markets for gas and gas services. (i) facilitate gas trade between the Republic and others. (j) promote access to gas affordably and safely.	
Mpumalanga Nature Conservation Act, 1998 (Act No. 10 of 1998)	Provincial	This Act makes provisions regarding nature conservation in the Mpumalanga province. It provides for, among other things, wildlife protection, hunting, fisheries, endangered fauna and flora as listed in the Convention on International Trade in Endangered Species of Wild Fauna and Flora, the control of harmful animals, freshwater pollution, and enforcement.	The project is within 10 km of Kruger National Park Malelane Gate

Legislation	Administering Authority:	Summary	Applicability
Climate Change Bill (2018)		The objects of the Act are to: a) provide for the coordinated and integrated response to climate change and its impacts by all spheres of government by the principles of cooperative governance. b) Effectively manage inevitable climate change impacts by enhancing adaptive capacity, strengthening resilience, and reducing vulnerability to climate change, building social, economic, and environmental resilience and an adequate national adaptation response in the global climate change response. c) make a fair contribution to the global effort to stabilise greenhouse gas concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe and in a manner that enables economic, employment, social and environmental development to proceed sustainably. The National Greenhouse Gas Emission Reporting Regulations have been promulgated in terms of NEM: AQA to introduce a single national reporting system for the transparent reporting of greenhouse gas emissions. The regulations apply to the categories of emission sources listed in Annexure 1 to the regulations and include electricity production exceeding 10 MW. Tier 1 reporting is required as a minimum, with a five-year grace period applicable before reporting of the lower tiers.	Climate change considerations must be incorporated into the design, and the objects of the Act must be adhered to. An air quality and climate change specialist study has been commissioned to assess the impacts of gas power stations on climate change.

Legislation	Administering Authority:	Summary	Applicability
Subdivision of Agricultural Land Act (Act 70 of 1970)	National	A change of land use (re-zoning) for the development of agricultural land needs to be approved in terms of the Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA). This is required for long-term leases, even if no subdivision is required.	The site is currently zoned as agriculture and will need to be rezoned to industrial. A rezoning application has been initiated.
Civil Aviation Act 13 of 2009	Civil Aviation Authority	As outlined in Part 139.01.30 of the Civil Aviation Regulations (GN R425, GG 35398 of 1 June 2012), Buildings or other objects which will constitute an obstruction or potential hazard to aircraft moving in the navigable air space in the vicinity of an aerodrome, or navigation aid, or which will adversely affect the performance of the radio navigation or instrument landing systems, must not be erected or allowed to come into existence without the prior approval of the Director.	Civil aviation was rated high on the screening report. However, a detailed assessment of mapping confirmed that the proposed power plant location is within the low sensitivity of civil aviation aerodromes.
Defence Act 42 of 2002	Department of Defence	The Defence Act 42 of 2002 is a comprehensive piece of legislation in South Africa that governs various aspects related to national defence, military organization, and security matters.	The screening tool assessed the proposed site as having low sensitivity to Defence concerns. Therefore, according to protocols for Specialist (GN.320) of March 2020, there are no anticipated negative impacts on defence. Moreover, GIS mapping confirmed that the proposed project is located within a low-sensitivity area.
OTHER National Protected Areas Expansion Strategy (NPAES) Environmental Conservation Act (Act No. 73 of 1983) Natural Scientific Professions Act (Act No. 27 of 2003)			

Legislation	Administering Authority:	Summary	Applicability
National Veld and Forest Fire Act (101 of 1998) National Protected Areas Expansion Strategy (NPAES) Civil Aviation Act (Act 13 of 2009) and Civil Aviation Regulations (CAR) of 1997; Draft White Paper on Civil Aviation Policy, 2017 ICAO Annex 14, Volume 1: Aerodrome Design and Operations (see Appendix 6.4 & 6.5) SA Civil Aviation Regulations (CARS): Part 139 – Aerodromes and Heliports SA Civil Aviation Technical Standards (CATS): SACATS 139.01.30 (26th Amendment) – Obstacle Limitations and Markings Outside Aerodromes or Heliports (Appendix 6.2) Associated provisions of SACATS 139.02.2 – Aerodrome Design Requirements ATNS Database of civil aviation airspace in South Africa, February 2024. White Paper on Renewable Energy (2003); Integrated Resource Plan for South Africa (2010); Fencing Act (Act 31 of 1963); **PROVINCIAL** Mpumalanga Nature Conservation Act 10 of 1998 **MUNICIPAL** Municipal Systems Act (Act No. 32 of 2000) Municipal By-laws as applicable to the project area Laws identified in the respective specialist reports **INTERNATIONAL** International Finance Corporation Performance Standards Equator Principles International Convention on Biological Diversity (CBD, 1993) The Convention on Wetlands (RAMSAR Convention, 1971)			

Legislation	Administering Authority:	Summary	Applicability
The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 1973) The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention, 1979) The United Nations Framework Convention on Climate Change (UNFCC,1994)			

4.6 OTHER POLICIES AND GUIDELINES

The following guideline documents have been considered in the preparation of this report:

- Department of Environmental Affairs (DEA) Integrated Environmental Management Guideline Series 7, Public Participation in the EIA Process as published in Government Gazette No. 33308, 18 June 2010;
- Implementation Guidelines (published for comment) in Government Notice 603 of 2010; and
- Integrated Environmental Management Information Series (Booklets 0 to 23) (DEAT, 2002 – 2005).

4.7 IFC PERFORMANCE REQUIREMENTS

The IFC Sustainability Framework articulates the IFC's strategic commitment to sustainable development and is an integral part of the IFC's approach to risk management. The Framework incorporates the IFC's Policy, Performance Standards, and Access to Information Policy. Alongside the Performance Standards is a companion set of Guidance Notes, guiding clients in meeting them. The Framework was adopted in 2006 and updated in 2012 following an 18-month consultation with stakeholders worldwide.

The Performance Standards are directed towards clients, guiding the identification of risks and impacts. They are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business sustainably. These include stakeholder engagement and disclosure obligations of the client concerning project-level activities." IFC Performance Standards 2012."

4.8 EQUATOR PRINCIPLES

The Equator Principles are a set of environmental and social risk management guidelines adopted by financial institutions to assess and manage the environmental and social risks associated with project financing. While traditionally applied to various sectors, aligning the Equator Principles with renewable energy projects is crucial for ensuring sustainable and responsible practices in developing and financing clean energy initiatives.

Renewable energy projects should conduct thorough Environmental and Social Impact Assessments (ESIA) to evaluate impacts on biodiversity, ecosystems, and communities, ensuring alignment with the Equator Principles. Engaging stakeholders, including local communities and indigenous groups, is crucial to address concerns and share benefits equitably. Projects must prioritise biodiversity conservation and highlight contributions to climate change mitigation. Ensuring community health and safety, managing supply chain risks responsibly, and respecting human rights are fundamental. Financial institutions should integrate the Equator Principles into their funding decisions to uphold environmental and social responsibilities.

5 MOTIVATION FOR THE FOR THE NEED AND DESIRABILITY FOR THE PROPOSED DEVELOPMENT, INCLUDING THE NEED AND DESIRABILITY OF THE ACTIVITY IN THE CONTEXT OF THE PREFERRED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE AS CONTEMPLATED IN THE ACCEPTED SCOPING REPORT

5.1 MOTIVATION FOR THE FOR THE NEED AND DESIRABILITY FOR THE PROPOSED DEVELOPMENT

In terms of 3(1)(f) of Appendix 1 of NEMA 2014 EIA Regulations, as amended, an EIA must include a discussion of the need and desirability of a proposed project. Needs and desirability support the Environmental rights as set out in Section 24 of the Constitution, as well as the relevant municipal plans such as Municipal Integrated Development Plans (IDP), Spatial Development Frameworks (SDF), and Environmental Management Frameworks (EMF). Needs and desirability support Sustainable development by ensuring the proposed activity is ecologically, economically, and socially sustainable.

Historically, South Africa has relied on their abundance of coal for their energy needs through the establishment of many large coal-fired power stations; however, today, most of these stations have reached the end of their life, and coal is no longer seen as a viable technology primarily due to the environmental concerns associated with it. Due to the lack of new generation capacity to replace the aging coal fleet, South Africa has been increasingly exposed to rotating power cuts ("load shedding") since 2008. Load shedding has had a crippling effect on the South African economy, with significant job losses being experienced and investment rates declining. While the market and regulatory environment has changed to allow for more renewable energy (primarily in wind and solar power), these measures are limited in alleviating the current power crisis South Africa faces due to their intermittent nature. Gas power is a complementary technology that can mitigate the effects of the declining performance of the coal fleet and provide the necessary flexible capacity to support intermittent renewable energy, thus enabling energy security for the grid.

Globally, gas power is seen as a transition fuel in reaching the global climate change commitments made at the COP21, and the transitionary role of gas was further highlighted at the COP28. This is primarily because it has significantly lower CO_2 emissions than coal and is a complementary technology to balance renewable energy. It also has the potential for conversions towards lower CO_2 emission alternatives such as the use of 'Green Hydrogen' to replace natural gas. KFP is being developed within the context of this energy transition as not only will the energy produced from the project replace coal power for the initial years, but it will also increasingly serve a role as a renewable energy balancer and eventually, potentially be converted to green fuel alternatives as and when these alternatives become available.

Gas-based power generation is relatively new in South Africa but significantly contributes to the world's energy needs (over 22%). However, South Africa has included gas power in its future energy mix by including 3000MW of gas in the Integrated Resource Plan 2019 (IRP 2019) and over 7000MW in the draft IRP2023 to be built before 2030. Following the Ministerial Determination (gazetted on the 7th of July 2020 in Gazette Number 43509), which calls for the procurement of 3000MW through a competitive Independent Power Producer (IPP) programme, the Department of Minerals, Resources, and Energy (DMRE) has launched a 2000MW Gas IPP Programme (GASIPPPP) on the 14th of

December 2023 through the IPP Office under the DMRE. The GASIPPPP calls for natural gas power projects of between 300MW to 1000MW across the country to be developed. KFP is potentially a participant in this program. Still, there is also an opportunity for KFP to supply power to other off-takers directly, owing to legislation around wheeling power through the Eskom grid and removing generation license restrictions from NERSA. In the future, there will also be more opportunities for selling gas power to the newly established Independent System Market Operator (ISMO), which is currently going through the relevant policy approval processes.

South Africa is facing significant electricity shortages and water scarcity at a national level. The proposed project aims to supply additional electricity to the national grid without intensive water use while also approximately 40% less CO_2 intensive than conventional coal-fired electricity generation. Significantly, with the proposed maximum capacity of 1000 MW, the project will reduce the risk of rolling electricity blackouts. The proposed facility's benefit, location, and contribution will allow for the increased focus on developing desired industrial capabilities, “host regions” for development, and comprehensive planning and design to accommodate the diverse regional development needs and contexts.

5.2 KFP BUSINESS CASE

The Khanyazwe Flexpower Project offers a compelling business case driven by the urgent need to enhance South Africa’s energy security and reliability amidst frequent power outages and load shedding. Located in Malelane within the Nkomazi Local Municipality of Mpumalanga Province, this project aims to provide a stable and reliable power supply by establishing an up to 1000MW natural gas-fired power plant. This initiative addresses the immediate need for a more resilient national grid and supports economic development through substantial job creation during the construction and operational phases. By stimulating local businesses and fostering economic growth in the region, the project aligns with broader national goals of reducing unemployment and promoting inclusive economic development.

Environmental sustainability is a key driver, as the project leverages natural gas, a cleaner alternative to coal, significantly reducing greenhouse gas emissions and supporting South Africa’s climate commitments. The strategic use of existing infrastructure, such as the ROMPCO gas pipeline and the Eskom Khanyazwe substation, enhances cost efficiency and facilitates rapid project deployment, minimizing environmental impact and operational costs. The project also plays a crucial role in the country’s energy transition by complementing renewable energy sources and ensuring a continuous and balanced energy supply, which is vital for integrating renewables into the national grid.

Furthermore, the Khanyazwe Flexpower Project is strategically positioned to drive regional development, improve local infrastructure, and boost the regional economy. Compliance with international standards, including the IFC Performance Standards, ensures the project’s credibility and attractiveness to investors, while effective risk management practices mitigate potential environmental and social impacts. Overall, the project meets the growing

demand for reliable power and contributes to sustainable development, making it a valuable and forward-thinking investment for stakeholders.

5.2.1 BENEFITS OF THE PROJECT

Natural gas is expected to play a central role in supporting Africa's drive to achieve electricity connection for nearly 3 million people without access to the grid, reduce widespread reliance on coal for power generation, and fast-track the continent's slowed industrial expansion.

Consequently, this project aims to respond to the government initiative driven by the need to diversify the country's energy sources and create a balanced and more sustainable energy mix. The proposed project will ensure the following:

- Create opportunities within the gas space;
- Reduce greenhouse gas emissions;
- Ensure a balanced and cleaner energy supply;
- Improvement of South Africa's socio-economic status; and
- Improve the reliability of South Africa's electricity supply.

The Khanyazwe Flexpower intends to fulfill several critical requirements South Africa needs today while also serving as a long-term sustainable energy source for its future. The immediate benefit of this project is that by introducing 1000MW of gas capacity onto the South African grid, almost one stage of load shedding can be avoided. In reducing load shedding, South Africa will avoid further economic and job loss challenges, which currently result from the crippling levels of load shedding experienced today.

This power will also have a positive economic and environmental impact on the grid by displacing coal and diesel-fired capacity, which today are the primary providers of flexible balancing power. Coal has almost double the CO_2 emissions to gas and consumes significantly more water than a gas power plant. The diesel-fired Open Cycle Gas Turbine (OCGT) power plants currently relied upon by Eskom to balance the system are operating at far higher rates than initially planned and are costing Eskom (and, by extension, South Africans) approximately R3B every month on diesel purchases. Gas is a significantly more cost-effective fuel source. When used in a high-efficiency technology, the energy cost will be far less than diesel OCGTs used today, thus saving on the eventual price of electricity that consumers pay. KFP will be designed using technology options that can operate flexibly, supporting the growing need for renewable energy balancing capabilities on the grid. Thanks to the fast start times of a gas power plant, the System Operator will be better equipped to balance the system in the event of any sudden loss of power on the grid, such as through the loss of a coal unit or when renewable power projects experience unexpected drops in output. This project will play a vital role in maintaining energy security on the national grid by being a reliable source of dispatchable energy as and when the System Operator requires it.

The development of gas power projects, particularly in the Mpumalanga Province, is also an opportunity to offset the job losses caused by the decommissioning of Eskom's coal fleet. This project's implementation will positively impact the local economy through job creation opportunities directly or indirectly related to the power plant construction and operations. From this project, there will be opportunities for local people to be trained to operate and maintain the power plant, along with many supporting service opportunities being created.

In essence, KFP is a project that will play an important role in helping South Africa with its 'Just Energy Transition' (JET) objectives by allowing for a reliable transition away from coal towards a more sustainable energy future while accommodating and supporting the country's socio-economic development needs.

The socio-economic benefits expected from the development include the following:

- In the short term, there will be temporary job opportunities during the construction of the proposed infrastructure. These include skilled, semi-skilled, and under-skilled labourers, consisting of locals (in and around the industrial area), including regional and national communities.
- Enabling a continued supply of natural gas into the region will continue to provide direct heat and chemical feedstock for industrial processes, commercial and residential cooking and heating applications, and an alternative fuel source for transport. South Africa has already seen a partial reduction in electricity demand because of trends such as the increasing use of LPG for cooking and space heating.

There are several advantages of Gas-to-Power for the Mpumalanga and South African energy supply:

- A gas power plant is far less complex than a coal-fired power plant and hence has shorter construction times, which is crucial in addressing South Africa's current short-term electricity demands.
- In terms of environmental impacts, a gas-powered plant has approximately 40% less CO_2 emissions per unit of power than coal, largely due to greater efficiency but also to the hydrogen content. Rapid start-up, ramp-up, and ramp-down times enable gas power systems to follow variable and rapidly changing generation patterns of renewable energy sources more effectively than coal power.
- New gas field discoveries on the east and west coasts of Southern Africa have opened the possibility of increased gas imports, either via pipeline or liquefied natural gas (LNG). New onshore gas discoveries could also serve as a future fuel source for gas power plants.
- Due to the existence of the coal fleet, there is already a large amount of transmission capacity across the Mpumalanga province that can support the introduction of a new gas-to-power project.

5.2.2 SUPPORTING STRATEGIES

At the regional level, the project would improve the socioeconomic status of the adjacent communities and the region at large. At the national level, the project would contribute to implementing South Africa's new energy policy as embodied in the White Paper on Energy (Department of Minerals and Energy, 1998), which highlights that, amongst

others, coal plays a central role in the socioeconomic development of our country, while simultaneously providing the necessary infrastructural economic base for the country to become an attractive host for foreign investments in the energy sector. The priorities to which this project would contribute are laying the groundwork for enhancing a cleaner energy supply. Several national policy documents, including the White Paper on the Energy Policy of South Africa, approved in 1998; the National Development Plan ("NDP"); the draft Integrated Energy Plan 2023; the Integrated Resources Plan 2023; and the draft Gas Master Plan 2024 present the case for natural gas as a significant contributor to South Africa's energy mix.

5.3 A MOTIVATION FOR THE PREFERRED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE AS CONTEMPLATED IN THE ACCEPTED SCOPING REPORT

In terms of location, Mpumalanga lends itself very well to the development of gas power projects as this is where the main gas supply from Mozambique passes through and due to the grid availability, which is severely limited in other parts of the country. Furthermore, as this is where most of the aging coal fleet is located, there is a natural progression of skills and experience that can transition into the developing gas power sector. Subsequently, Khanyazwe Flexpower secured a suitable site in the Mpumalanga region. The site proposed for the proposed development is preferred for the following reasons:

- Land Ownership—This is an important aspect of the proposed project regarding its viability, limiting potential appeals. To manage this risk, the proponent has already engaged and obtained the rights to develop this project, with the appropriate consent to undertake this EIA from the landowners.
- Proximity to the Eskom Grid—The proposed gas power facility requires a connection to the grid to transmit the electricity generated. As such, the facility's location must be closer to the substation. The site earmarked for the proposed development is within 500 m of the Eskom Khanyazwe substation, which reduces the length of the powerline that will be constructed for connection.
- Access to the Gas pipeline – The natural resource required for the proposed gas-to-power facility is the availability of natural gas. The preferred location for the facility is in proximity to the ROMPCO gas pipeline (500m), which runs from Mozambique to South Africa. This location has been strategically preferred to ease gas tapping from the ROMPCO gas pipeline.
- Low altitude—Gas power plants perform better at lower altitudes than power plants that may be built at higher altitudes, such as the highveld.

The above reasons make the proposed site suitable for the proposed power plant. The Final Scoping Report indicated that consideration of an alternative location could pose challenges, which may include the following:

  - The proponent may not find suitable land to purchase,
  - The alternative site may be farther from the grid connection point (substation), which means longer powerlines will need to be constructed, and

- The gas pipeline tapping point may be farther, requiring a longer pipeline to be constructed to tap into the proposed gas pipeline.

Despite the identified pre-empted challenges, the public participation process successfully proposed and recommended that alternative sites be considered. Three additional sites were considered, with only one considered suitable and feasible for the proposed project. Thus, it was assessed and compared to the preferred site.

This section identifies the preferred development footprint within the approved site of alternatives, which was selected following thorough consideration of alternatives and sensitivities highlighted in the specialist reports. Buffers have been considered to ensure avoidance of areas considered highly sensitive. The sections below provide a summary of the work done by specialists in recommending the development footprint with the proposed site by eliminating highly sensitive areas. The map presented below highlights the sensitive areas that were avoided where possible, while the final map presents the proposed development footprint

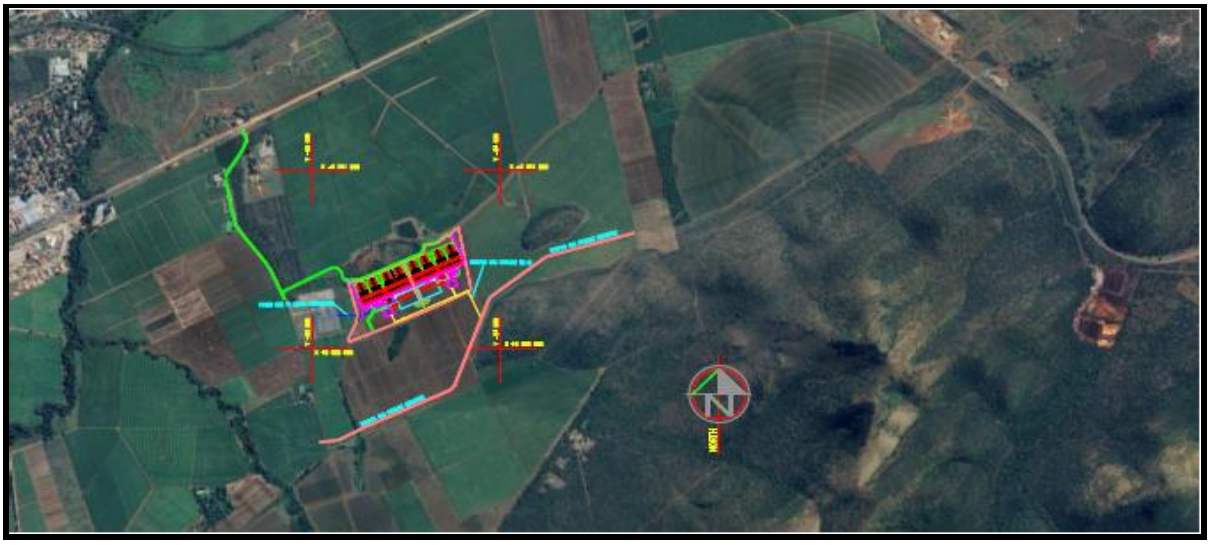


Figure 8: Final Layout

6 A FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE AS CONTEMPLATED IN THE ACCEPTED SCOPING REPORT

According to the EIA Regulations published in Government Notice (GN) R982 of 2014, as amended, feasible and reasonable alternatives must be identified and considered within the Scoping and assessed further in the Environmental Impact Assessment Phase. This section focuses on the alternatives identified during the Scoping and recommends further investigation in the EIA with recommendations made for the preferred.

According to GN R 982 of the EIA Regulations (2014), an alternative is defined as *"…in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to the:*

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

The various alternatives have been assessed in terms of both environmental acceptability as well as economic feasibility. The selection of the preferred alternative is based on several factors:

- Public input, ascertained through the PPP;
- Specialists' recommendations;
- Environmental constraints;
- Technical feasibility;
- Economic cost-benefit analysis;
- Best practicable environmental option, i.e., the option that provides the most benefit or causes the least damage to the environment as a whole at a cost acceptable to society in both the long and short term; and
- Optimisation of existing infrastructure, such as access roads.

The purpose of alternatives, as defined in the Department of Environmental Affairs and Tourism's (now DFFE) 2004 Integrated Environmental Information Series on the Criteria for determining alternatives in EIA, is to find the most effective way of meeting the need and purpose of the proposal, either through enhancing the environmental benefits of the proposed activity or through reducing or avoiding potentially significant negative impacts.

In terms of Section 24 of NEMA, the proponent must demonstrate that alternatives have been described and investigated in sufficient detail during the EIA process. It is important to highlight that alternatives must be practical, feasible, reasonable, and viable to cater for an unbiased approach to the project and, in turn, to ensure environmental protection. The role of alternatives is to find the most effective way of meeting the need and purpose of the proposal, either through enhancing the environmental benefits of the proposed activity or through reducing or avoiding potentially significant negative impacts.

In order to ensure full disclosure of alternative activities, it is important that various role players contribute to their identification and evaluation. Stakeholders have an important contribution to make during the EIA Process, and each role is detailed as follows:

The role of the environmental practitioner is to:

- encourage the proponent to consider all feasible alternatives;
- provide opportunities for stakeholder input to the identification and evaluation of alternatives;
- document the process of identification and selection of alternatives;
- provide a comprehensive consideration of the impacts of each of the alternatives and
- document the process of evaluation of alternatives.

The role of the proponent (KFP) is to:

- disclose all information relevant to the identification and evaluation of alternatives;
- assist in the identification of alternatives, particularly where these may be of a technical nature;
- be open to the consideration of all reasonable alternatives; and
- be prepared for possible modifications to the project proposal before settling on a preferred option.

The role of the public is to:

- assist in the identification of alternatives, particularly where local knowledge is required;
- be open to the consideration of all reasonable alternatives; and
- recognize that there is rarely one favoured alternative that suits all stakeholders and that alternatives will be evaluated across a broad range of criteria, including environmental, social, and economic aspects.

The applicability of each alternative type to the proposed project is outlined in Table 14. It must be highlighted that the alternatives presented in the table are derived from both the EIA Regulations (2014) as amended and the Department of Environmental Affairs (now Department of Forestry, Fisheries, and the Environment) 2004 Integrated Environmental Information Series on the Criteria for determining alternatives in EIA. This report will further discuss where the alternative is applicable to the project.

Table 14: Applicability of each alternative

Alternative	Applicability
No-go Option	The 'no-go' alternative is sometimes referred to as the 'no-action' alternative (Glasson *et al.,* 1999) and, at other times, the 'zero-alternative.' It assumes that the activity does not go ahead, implying a continuation of the current situation or the status quo. This alternative must be discussed on all projects as it allows for an assessment of impacts should the activity not be undertaken. **This alternative is discussed in this report and not recommended.**
Activity alternatives	These are sometimes referred to as project alternatives, although the term activity can be used in a broad sense to embrace policies, plans, and programs as well as projects. Consideration of such alternatives requires a change in the nature of the proposed

Alternative	Applicability
	activity. This would entail a process where a different project is proposed. **Only one activity alternative is discussed in this report.**
Location/ property alternatives	Location alternatives could be considered for the entire proposal or for a component of a proposal. The latter is sometimes considered under site layout alternatives. A distinction should also be drawn between alternative locations that are geographically quite separate and alternative locations that are in close proximity. In the latter case, alternative locations in the same geographic area are often referred to as alternative sites. Alternative sites were considered during the scoping phase, **and only two of the four are considered in this report.**
Process alternatives	Various terms are used for this category, including technological alternatives and equipment alternatives. The purpose of considering such alternatives is to achieve the same goal using a different method or process. An industrial process could be changed, or an alternative technology could be used. These are also known as technological and equipment alternatives and will be discussed as they apply to the type of technology. **Two technology options are considered and detailed in this report.**
Demand alternatives	Demand alternatives arise when a demand for a certain product or service can be met by some alternative means. This is applicable to the demand for a product or service. An example of this would be where there is a need to provide more electricity. Specific to the proposed project, alternatives regarding the demand for electricity will be discussed in detail as the issues around electricity and reliable supply are known. **The proposed project is an energy generation project and forms part of the renewable IPP projects that are commissioned to respond to the energy demand. However, demand alternatives are not discussed in this report.**
Scheduling alternatives	These are sometimes known as sequencing or phasing alternatives. In this case, an activity may comprise several components, which can be scheduled in a different order or at different times and, as such, produce different impacts. **The proposed project is a phased project, as detailed above. The impacts of the different phases are similar and will not be discussed.**
Input alternatives	By their nature, input alternatives are most applicable to industrial applications that may use different raw materials or energy sources in their processes. **The proposed project is a gas power plant implying that the energy source is gas. No alternative sources are discussed as part of the project.**
Routing alternatives	Alternative routes, such as power lines, transport, and pipeline routes, are generally considered for linear developments. The proposed project seeks to identify and assess

Alternative	Applicability
	the most suitable corridor for constructing a power line with the least environmental impact. **Therefore, powerline and access and construction route alternatives were considered early in the project and will not be assessed in detail further in this report.**
Site layout alternatives	Site layout alternatives permit consideration of different spatial configurations of an activity on a particular site. This may include particular components of a proposed development or the entire activity. **Site layouts are applicable to existing power stations, and the preferred layout is presented in this report.**
Scale alternatives	In some cases, activities that can be broken down into smaller units can be undertaken on different scales. For example, a housing development within an overall mixed-use development could have the option of 1,000, 2,000, or 4,000 housing units. Each of these scale alternatives may have different impacts. The proposed project has been broken down into two phases detailed above. **However, scale alternatives are not discussed further in this report.**
Design alternatives.	This entails the consideration of different designs for aesthetic purposes or different construction materials to optimize local benefits and sustainability would constitute design alternatives. The selection of tower designs will depend on factors such as topographical conditions as well as visual sensitivity. **Therefore, design alternatives are applicable to this development and are discussed in detail in this report.**

The identification of alternatives is a crucial component of the EIA process. During this process, the identified alternatives are assessed in terms of environmental acceptability and technical and economic feasibility, and the preferred alternative is highlighted and presented to the Authorities.

6.1 ALTERNATIVES CONSIDERED

Analysing alternative solutions is fundamental to planning and design planning. The alternatives must satisfy the goal or purpose of the project, be reasonable based on various perspectives, and preferably entail positive and limited negative consequences. Alternatives that may be considered include location, type of activity, design or layout, technology used, and operational aspects of the proposed activities. Over and above the consideration of alternatives at a high level, NEMA legislation has defined a framework that guides the selection of alternatives. The Act states that consideration of alternatives is one of the most critical elements of the environmental assessment process. Its role is to provide a framework for sound decision-making based on the principles of sustainable development.

Various alternatives and the no-go alternative were identified, which are comprehensively discussed. The preferred alternative will be selected based on a synthesis of the technical and environmental factors, specialist studies, and public input.

This section describes the alternatives considered and includes the following:

- Site Alternatives
- Layout Alternatives within the preferred site;
- Technical alternative - the technology to be used in the activity;
- Water supply;
- Site Access alternatives; and
- The no-go alternative.

6.1.1 Site Alternative

As indicated briefly above, following the initial public consultation, the applicant considered concerns about the current site location and identified three additional sites as recommended during the consultation and draft review period. The primary criterion for the selection of the preferred sites was based on the following:

- Environmental sensitivity
- Current land use
- Proximity to Khanyazwe substation
- Proximity to the ROMPCO gas pipeline
- Water Accessibility
- Gradient
- Site Access
- CAA Clearance
- Geotechnical Suitability which considers the various geotechnical aspects likely to have a bearing on the geotechnical suitability of the site for the proposed. The assessment considered the aspects such as:
    - Slope angle, presence of deep soils, drainage, erosion, water table, presence of bedrock, excavatability, suitability of soils as construction material, potentially expansive soils, bearing capacity of soils, foundations, and road construction.

The proposed sites are depicted on the map below and described in the next sections.

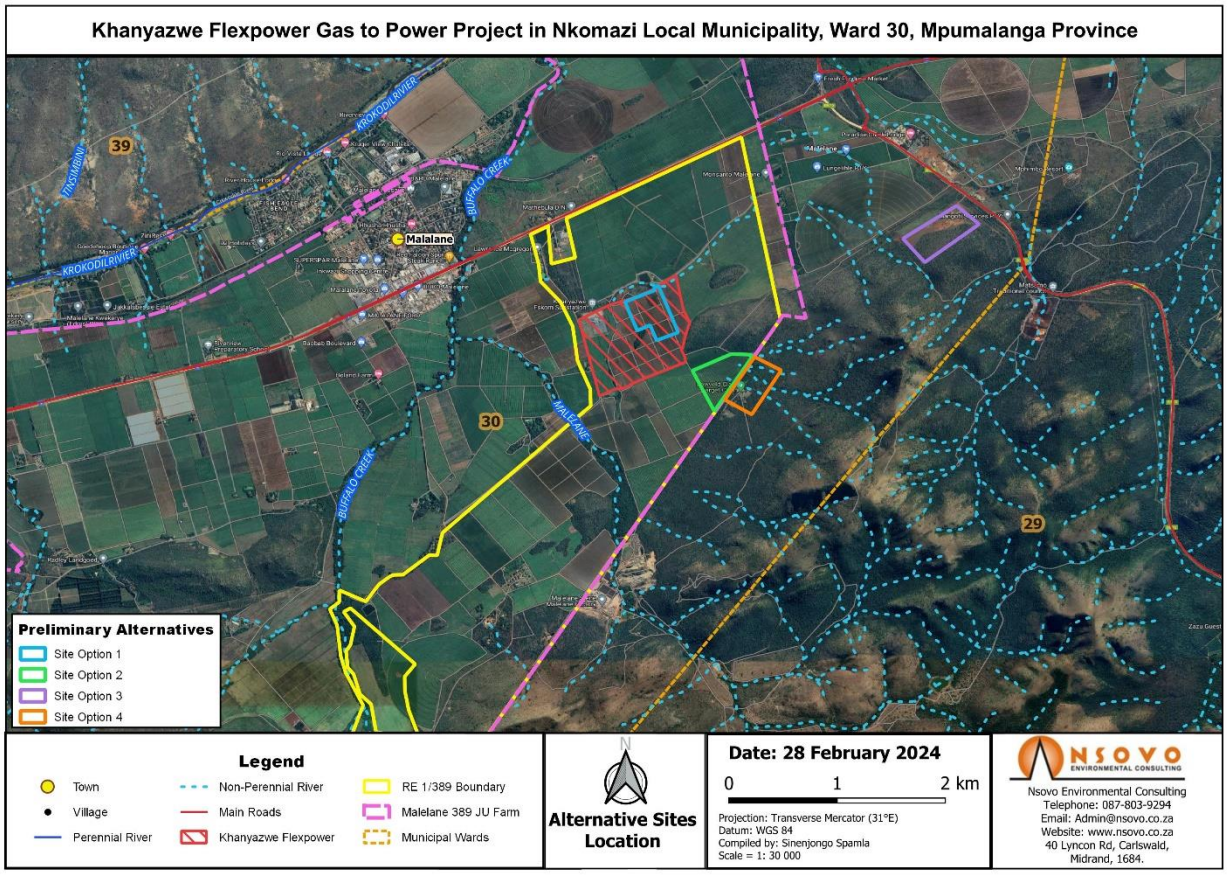


Figure 9: Site Alternatives assessed during the Scoping Phase

6.1.1.1 Site Option 1

Site option 1 is nearest the Khanyazwe substation and connects to current access routes that tie into the N4. The location is approximately 1.2 km from the N4 and 500m from the ROMPCO pipeline. The site is located on active sugarcane agricultural fields with a farmstead directly adjacent to the site, which will be directly affected by the proposed project. Although the site is predominantly agriculture, the western flank is a buffer area between fields with indigenous vegetation, classified as ESA. The northeastern side is characterised by a non-perennial stream. The geotechnical assessment considered the site highly suitable for the proposed development. Regarding CAA, Only Option 1 and the associated ground-based infrastructure fully comply with relevant ICAO Annex 14 and SACAA (CARS and CATS) standards for obstacle limitation surfaces.

Photograph 1: The western boundary of Proposed Site Option 1. The western flank is a buffer area between fields with indigenous vegetation

Photograph 2: Northern boundary of Option 1 (right) set along an access road

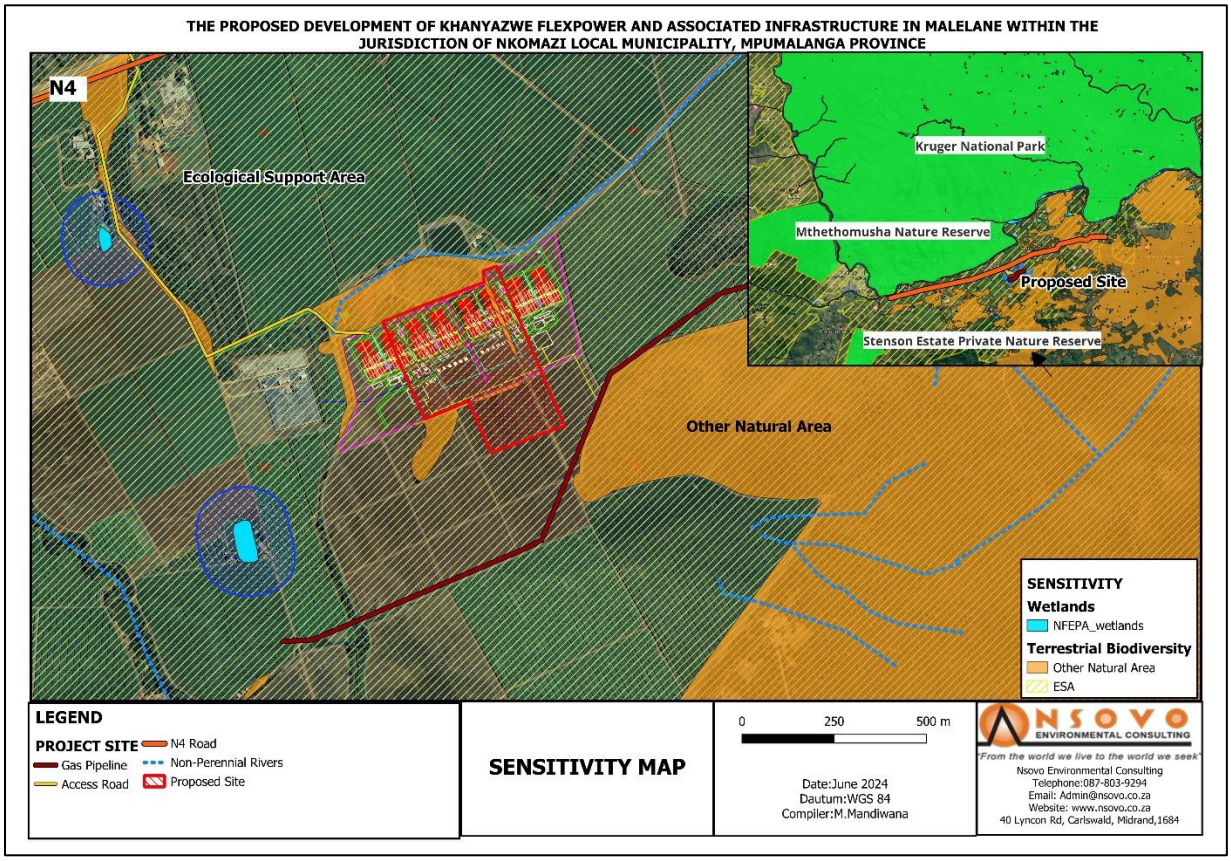


Figure 10: Sensitivity map of the Preferred Site

6.1.1.2 Site Option 2

This site alternative is the closest to Site Option 1; it is also close to the ROMPCO gas pipeline but would require longer powerlines to connect to the Khanyazwe substation. The site is also located on existing sugar cane fields and encroaches on other natural areas to the northeast. Same as Option 1, the geotechnical assessment considered the site highly suitable for the proposed development. The site is 3.78km from the runway, however, the CAA indicated that it has pre-existing topographical obstacles between the proposed site and the FAMN airport. These obstacles are higher than the height of the proposed structures and, therefore, provide a 'screening' effect, which makes the site acceptable. The wetland delineation indicated that the site encroaches on a wetland.

Photograph 3: The approximate southern boundary of Option 2 (right) is set along an access road.

6.1.1.3 Preferred Site Option

Site options 3 and 4 were dismissed during the Scoping phase. A comparative analysis of the remaining two sites was conducted, and of the remaining two, Site Option 1 is preferred. The preference is based on its suitability for the proposed land use.

Site option 1 was also identified as the most preferred site in the Site Sensitivity Verification Report for the Visual Impact compared to the alternatives. It does not directly impact any watercourses. Furthermore, it ticks the parameters highlighted in section 12.1 above.

The proposed site's challenges relate to its proximity to some existing farm dwellings and the potential noise and fumes that may be generated, particularly during the operational phase. All of these have been identified as critical impacts, and specialist studies have been commissioned to ensure that mitigation measures are proposed. Furthermore, this report has addressed the impact of noise and air quality and other associated social impacts.

Given the proposed mitigation measure, Site Option 1 is preferred and should be approved.

6.1.2 TECHNICAL ALTERNATIVES (POWER GENERATION TECHNOLOGY)

KFP has considered various technology options, including Combined Cycle Gas Turbines (“CCGT”) and Internal Gas Combustion Engines (“ICE”). ICE technology is renowned for its operations, installation, and dispatch flexibility. CCGTs

are the most efficient gas technology available but are less flexible. The sections below describe the technologies considered and a comparative analysis. Both alternatives are feasible and have been assessed as part of the EIA phase.

6.1.2.1 Combined Cycle Gas Turbines (CCGT)

Combined Cycle Gas Turbines (CCGT) are a highly efficient energy generation technology combining gas-fired and steam turbines. The technology converts natural gas into electricity using a gas turbine generator, and waste heat from this initial process is used to make steam to generate additional electricity via a steam turbine. Figure 11 shows the working principle of a combined cycle power plant.

The process entails burning gas in a gas turbine, producing electrical power via a coupled generator and hot exhaust gases. The hot exhaust gas passes through a heat recovery boiler to produce steam (alternatively, a Heat Recovery Steam Generator or HRSG), which can be converted into electric power with a coupled steam turbine and generator.

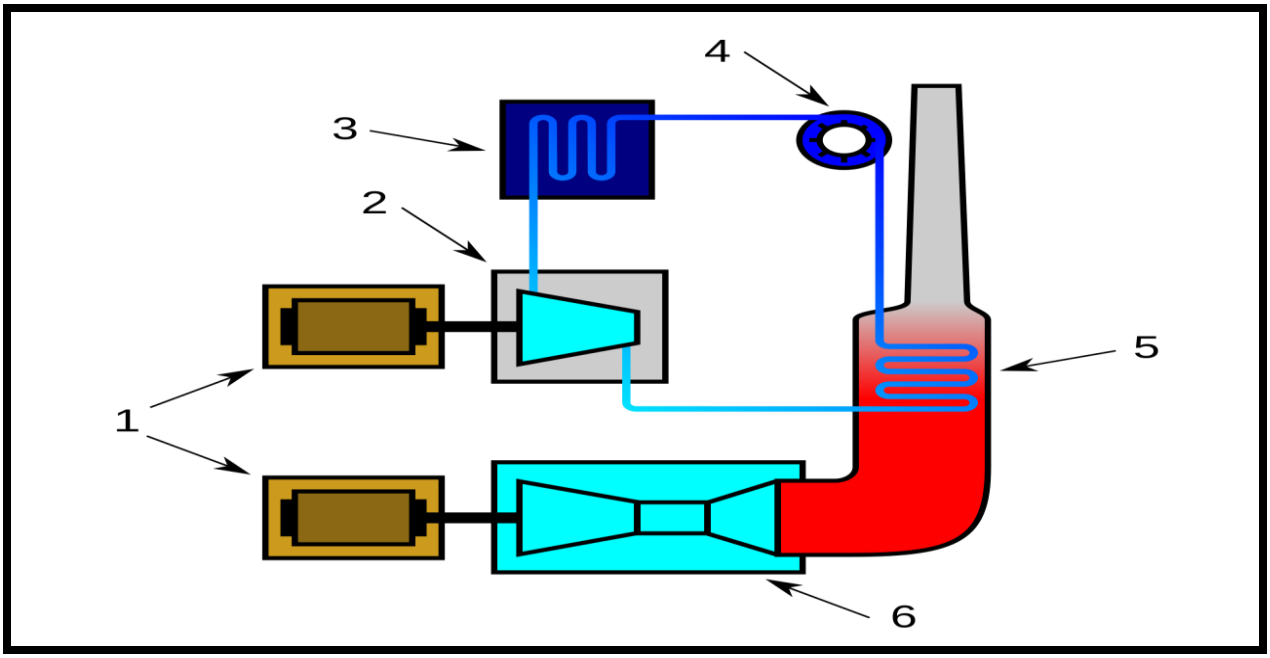


Figure 11: Working principle of a combined cycle power plant (Legend: 1-Electric generators, 2-Steam turbine, 3-Condenser, 4-Pump, 5-Heat recovery boiler, 6-Gas turbine) (Wikipedia)

A CCGT with a 2-2-1 and a 5-5-1 configuration was considered, meaning there are two or five gas turbines, each with a heat recovery boiler, which will supply steam to a single steam turbine.

The steam cycle would require a source of demineralized water, which would require an on-site water treatment plant. To minimize the water consumption requirements, air-cooled condenser technology was considered for the steam cooling cycle.

Depending on the final turbine model selected, hydrogen could be blended into the fuel mix from 40-85% vol%.

Figure 12 below is an illustration of a typical CCGT.

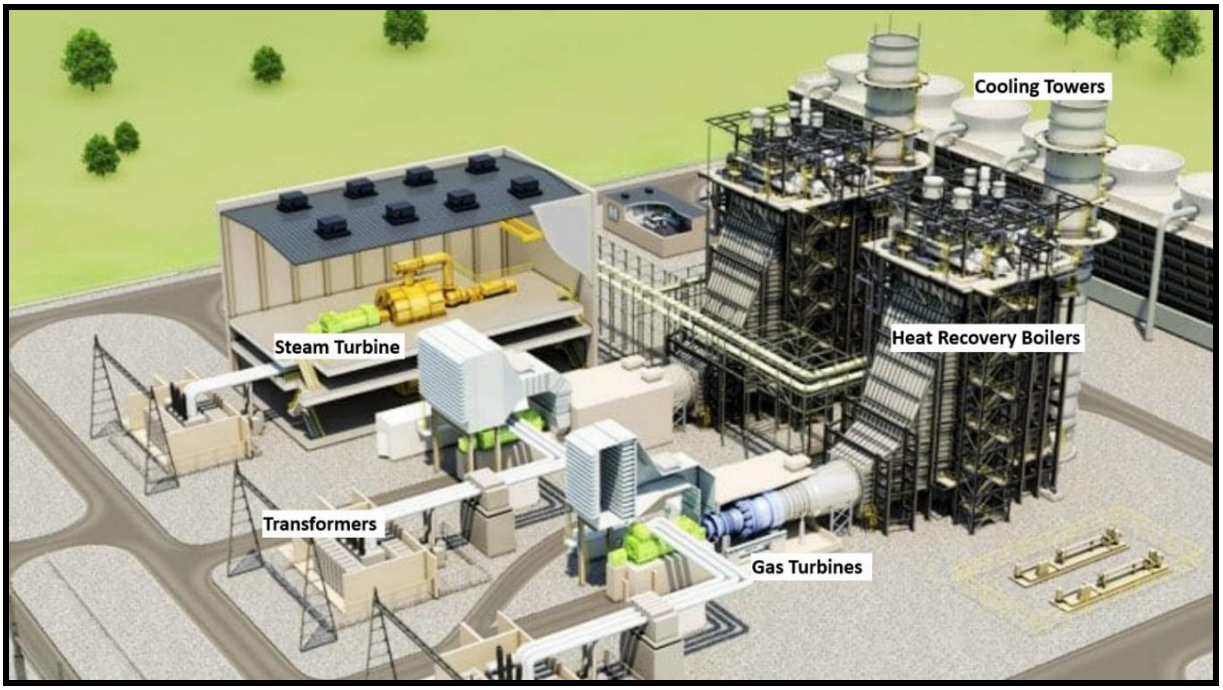


Figure 12: Main components of a typical CCGT power plant

The main infrastructure associated with a CCGT power plant includes the following:

- Gas turbines for the generation of electricity through the use of natural gas
- Heat recovery steam generators (HRSG) to capture heat from high-temperature exhaust gases to produce high-temperature and high-pressure dry steam to be used in the steam turbines
- Steam turbines for the generation of additional electricity through the use of dry steam generated by the HRSG
- Stormwater dams
- Firewater tanks
- Storm water channels
- Waste storage facilities (general and hazardous)
- Exhaust stacks for the discharge of combustion gases into the atmosphere
- A water treatment plant for the treatment of raw water into potable water and the production of demineralised water (for steam generation)

- Water pipelines from the power block to the station's boundary fence and water tanks to transport and store water of both industrial quality and potable quality
- Dry-cooled system consisting of air-cooled condenser fans situated in fan banks
- LV and MV switch gear rooms
- Control room
- Closed fin-fan coolers to cool lubrication oil for the gas and steam turbines
- A gas pipeline from the power block to the station's boundary fence and a gas pipeline supply conditioning process facility for the conditioning and measuring of natural gas before being supplied to the gas turbines.
- Ancillary infrastructure includes access roads, warehousing, buildings, access control and workshop areas, storage facilities, emergency backup generators, firefighting systems, laydown areas, and a 275/132kV switchyard.
- A power line will connect the project to the national grid to evacuate the generated electricity.

The main disadvantage of CCGTs is that they consume a considerable amount of water, which is known to be severely constrained in this area.

6.1.2.2 INTERNAL COMBUSTION ENGINE (ICE)

ICE technology, specifically Medium-Speed ICE technology, is finding greater appeal within utility-scale applications due to its superior flexibility within energy systems with a greater demand for such flexibility. The principles of operation are the same as those of a normal petrol-fuelled car engine, except that gas is the primary fuel source. The principle behind the four-stroke is the intake-compression-ignition-exhaust sequence, which produces the mechanical energy on the shaft that can drive an electrical alternator, as shown in the figure below.

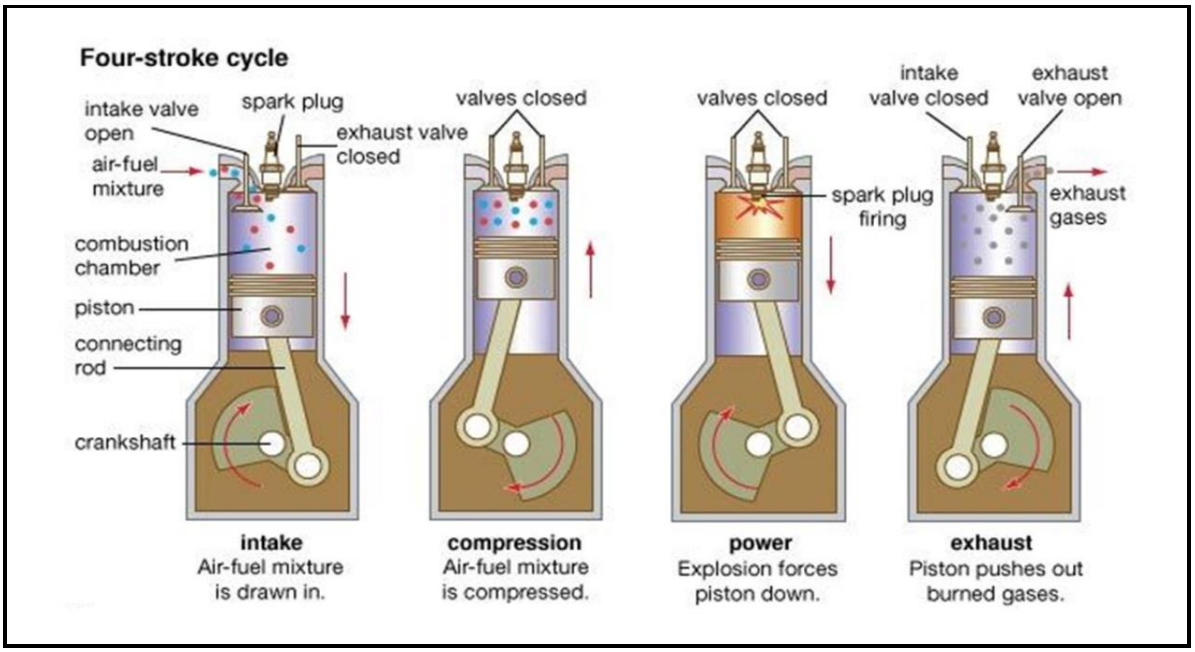


Figure 13: Four Stroke Cycle (Encyclopedia Britannica, Inc. 2007)

Due to their relatively smaller size, ICE power plants typically comprise multiple 'batches.'

- Each ICE can produce approximately 18-26 MW, so to generate 1000 MW, one would require approximately 40-50 engines. Engines are typically grouped into clusters of 4-6 and housed in engine halls holding one or two clusters each.
- Each ICE is capable of completely independent operations, with start-up taking as short as 2 minutes from initiation to full load.

Cooling for ICE power plants utilises air-cooled radiators. The radiators can be placed on the ground or on the roofs of the engine halls. The cooling circuit uses treated water and requires small top-ups over time. The treated water is produced on-site in a water treatment plant.

Figure 14 below shows a typical layout of an ICE power plant.

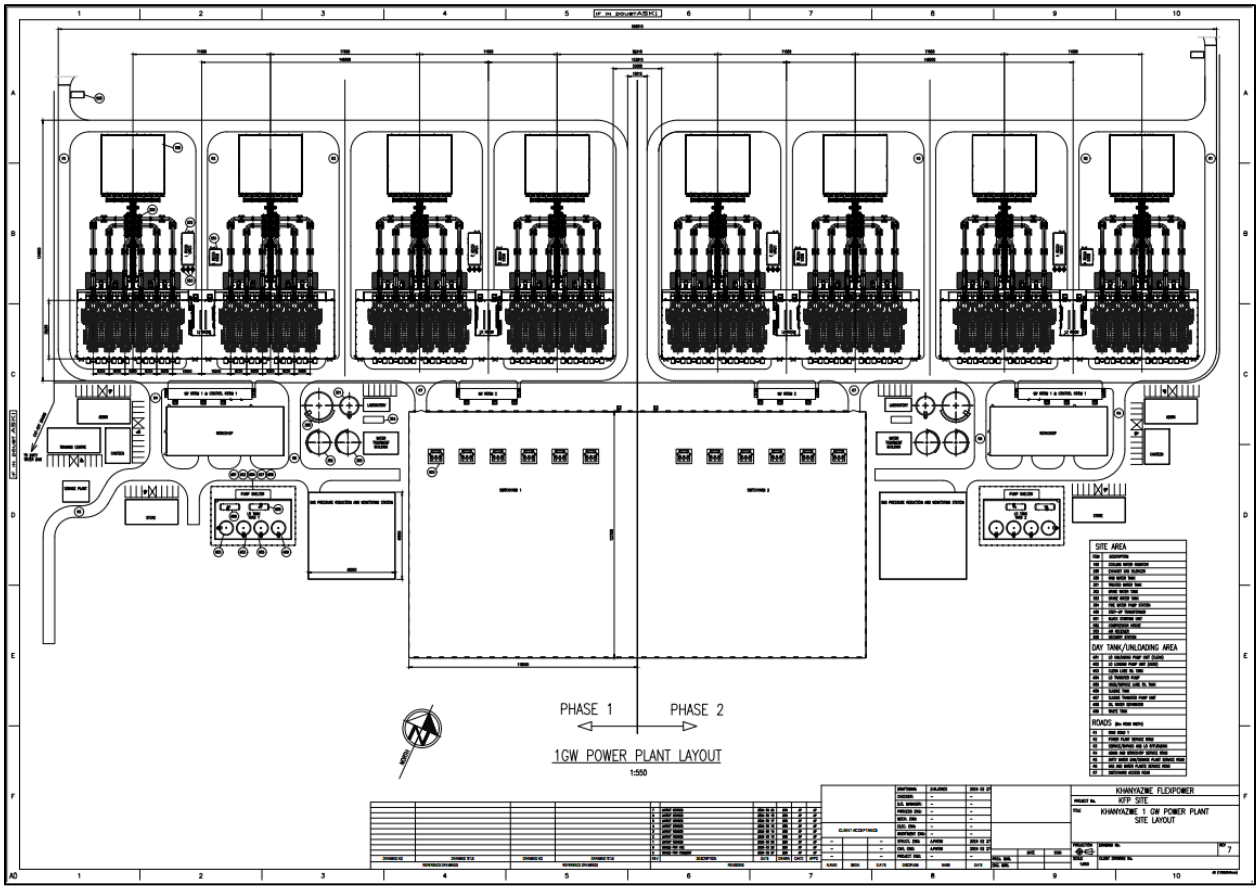


Figure 14: Proposed KFP Power Plant Layout

The main infrastructure associated with an ICE power plant consists of the following:

- Medium Speed Gas Engines for the generation of electricity using natural gas
- Storm water channels
- Waste storage facilities (general and oily water)
- Clustered exhaust stacks for the discharge of combustion gases into the atmosphere
- A water treatment plant for the treatment of raw water into potable water quality
- Water pipelines from the power block to the station's boundary fence and water tanks to transport and store water of both industrial quality and potable quality
- Dry-cooled system consisting of air-cooled radiators
- LV and MV switch gear rooms
- Control room
- Lube oil tanks (used and new)
- Firewater tanks
- A gas pipeline from the power block to the station's boundary fence and a gas pipeline supply conditioning process facility for the conditioning and measuring of natural gas before being supplied to the gas engines.

- Ancillary infrastructure includes access roads, warehousing, buildings, access control and workshop areas, storage facilities, emergency backup generators, firefighting systems, laydown areas, and a 275/132kV switchyard.
- A power line will connect the project to the national grid to evacuate the generated electricity.

6.1.2.3 COMPARATIVE ANALYSIS OF THE TECHNOLOGY ALTERNATIVES

Each technology has advantages and disadvantages, and this report presents the preferred technology following a detailed comparative analysis. Table 15 is a preliminary comparison of some of the key parameters that will be considered in the final selection:

Table 15: Comparative Analysis

	ICE	CCGT
Operational Flexibility	It is the most flexible technology suitable for peak and mid-merit applications.	It is the least flexible technology suitable for high mid-merit and baseload applications.
Energy Efficiency	Moderately good efficiency of 45-50%.	Best efficiency of 55-60%.
Construction Time	Short construction time of <3 years months.	Long construction time of up to 4 years.
Footprint	A larger footprint is required due to the need for multiple smaller units.	Smaller footprint due to the use of fewer large units.
Water requirements	Negligible water consumption with air-cooled radiator technology.	Higher water consumption for top-up of water in the steam cycle
CO_2 Emissions	They have slightly higher emissions due to their lower efficiency.	Low emissions due to high efficiency.
Job creation potential	More operators are required; maintenance can be done by combining locally trained staff and specialized skills.	Fewer operators are required, and maintenance is undertaken by specialized skills.
Visual	30 m stack height, 20m engine hall height	54 m HRSG height
Water Requirements	12,100m^3/year (1000MW)	175,000m^3/year (1000MW)

6.1.2.4 Preferred Technology

The Sections above provide thorough detail on the technologies considered for the proposed project. ICE Technology was the most feasible, following several engineering considerations, environmental factors, and water requirements.

This preference was primarily based on water requirements, considering South Africa is a water-scarce country. Water was raised as a key factor during public engagements, so it was only prudent to select an alternative that requires less water.

Furthermore, the site identified already poses a visual impact challenge to various receptors, as detailed in the VIA Report; as such, the technology with a lower stack was deemed more practical to reduce the visual impact.

On the socioeconomic end, the ICE technology will allow more employment opportunities, and as indicated above, maintenance can be done by combining locally trained staff and specialized skills.

ICE is also best positioned to provide the flexibility requirements of the power system.

The downside of this technology is slightly higher emissions and a larger footprint, which will be managed to reduce the identified impacts.

With all applicable factors considered, ICE technology is preferred and recommended for approval.

6.1.3 POWER LINE ROUTING ALTERNATIVES

As the detailed design for the grid interconnection with Eskom still needs to be finalised, a number of grid interconnection options have been considered for the project. Namely:

- A connection at 132kV level by extending the 132kV busbars at Khanyazwe substation;
- A connection at 275kV level by extending the 275kV busbars at Khanyazwe substation and; and
- A loop in-loop out connection onto the 275kV lines that enter into the Khanyazwe substation.

The possible 132kV and/or 275kV line routings have been indicated in the image below.

Figure 15: Proposed grid connection routing for phases 1 and 2 and the substation expansion yard

6.1.4 WATER SUPPLY ALTERNATIVES

The table below summarizes the estimated potable and raw water requirements for upper and lower dispatch levels. Using the air-cooled technology described in the technology descriptions section, the power plant's water consumption will be significantly lower than the current amount of water used for sugar cane farming, which is the current use of the land identified for the power plant. Therefore, this power plant is expected to have a net positive effect on water consumption within the region.

Following an inquiry on the amount of water required during the public meeting, it was confirmed that the power plant would require less than what the sugar cane farm requires, estimated to be 260,000m^3 over the 20ha power plant footprint. As recommended by the Provincial Authority (MPDARDLEA) a water balance diagram is attached as **Appendix C16.**

Table 16: Preliminary water requirements for the technology alternatives

Technology	Capacity Factor	Potable Water	Raw water
1000MW ICE	40%	8150 m^3 per annum	11 000 m^3 per annum
1000MW ICE	65%	8800 m^3 per annum	12 100 m^3 per annum
1000MW CCGT	40%	75000 m^3 per annum	102000 m^3 per annum

Technology	Capacity Factor	Potable Water	Raw water
1000MW CCGT	65%	87 500 m^3 per annum	118 000 m^3 per annum

The proposed project has identified three water supply alternatives: municipal water supply, adjacent irrigation canal, and groundwater supply through a borehole. Following engagements with the Municipality, it became apparent that the Municipal supply was not feasible and sustainable; it was thus eliminated. The remaining two alternatives are briefly described below.

Table 17: Description of Water Supply Alternatives

	Alternative 1	Alternative 2
	Borehole supply	Irrigation Canal supply
Description	• This will be from an existing borehole within the farm. Additional boreholes may be drilled if deemed necessary.	• Water is to be sourced from an existing irrigation canal that passes the power plant.
Considerations	• Water will need to be purified before it's being used in the power plant	• Water will need to be purified before being used in the power plant Subject to seasonal fluctuations in availability

A geohydrological study is being undertaken; however, based on data from boreholes drilled close to the proposed site, sufficient water should be available to meet the power plant requirements.

6.1.4.1 Preferred Water Supply

Following detailed geohydrological assessments, the groundwater alternative was highly supported. Furthermore, drilling of an additional borehole was recommended. This option requires approval in terms of the NWA as such pre-application engagements have been held with the DWS as part of the Water Use Licence Application Section 21 (a) for this particular use.

The borehole water is considered raw water and will need to be treated to be suitable for both process use and human consumption. A water treatment plant to produce potable water will form part of the plant.

This option requires yield testing to determine the source's sustainability, which is in progress. However, considering the preliminary studies and yield rates of other boreholes in the area, the yield rates are sufficient for the power plant

requirements. Therefore, the borehole option is preferred and thus recommended. A detailed geohydrological study will be undertaken to confirm this position.

6.1.5 Access Road

The current primary road to the proposed development site is a gravel road that connects to the N4. A new access point from the N4 has been proposed, and a temporary construction access from the Jeppe's Reef Road has been proposed. This proposed access will tie in with the gravel to link the proposed power station, shown in Figure 16 below.

Figure 16: Operation Access Road depicted in Green (KFP, 2024)

Construction access will be through a gravel road that will traverse several farm portions northeast of the proposed site. It is a temporary road that will be rehabilitated post-construction. Figure 17 below depicts the construction access road.

Figure 17: The green line is the temporary construction access (KFP, 2024)

6.1.6 No-Go Alternative

Under GN R.982, consideration must be given to the option not to act. An alternative is usually considered when the proposed development is envisaged to have significant adverse environmental impacts that mitigation measures cannot ameliorate effectively. There would be no economic benefits, i.e., extended employment for local communities. The no-go alternative would be not undertaking the proposed project's development. It would imply that the current electricity supply network is not strengthened, industrial development in the area will be hindered, and the possibility for continued load shedding will remain high. Should the no-go alternative be adopted, the country will be deprived of a much-needed essential service, particularly given the existing energy supply challenge. Furthermore, the identified benefits will not materialize.

6.2 PUBLIC PARTICIPATION PROCESS

Social risks are a product of social development, and modern civilization can further be defined as the potential for any loss, conflict, or instability due to specific issues in projects (e.g., investments, policies, or decisions) and the reaction of related stakeholders that are confronted with negative influences due to proposed projects. Social Risks cannot be eliminated; they can be effectively managed to mitigate the negative impacts. The Public Participation Process (PPP) is any process that involves the public in problem-solving and decision-making; it forms an integral part of the Scoping and EIA process. The PPP provides I&APs with an opportunity to provide comments and raise issues of concern or make suggestions that may enhance the project's benefits. The main principle of Public Participation holds

that those affected by a decision have the right to be involved in the decision-making process (i.e., the public's contribution will influence the decision).

The principles of public participation are to ensure that the PPP:

- Communicates the interests of and meets the process needs of all participants;
- Seek to facilitate the involvement of those potentially affected;
- Involves participants in defining how they participate; and
- Is as inclusive and transparent as possible; it must be conducted in line with the requirements of Regulations as amended.

Against this backdrop, the Regulation governing public participation and engagement was developed. The Public Participation approach adopted for the project is in line with the process contemplated in Chapter 6, Regulation 39 through 44 of the 2014 EIA Regulations as amended in terms of the National Environmental Management Act, 1998 (Act 107 of 1998), The Notice requires that the EAP must ensure that:

- All reasonable measures are taken to identify potentially Interested and Affected Parties (I&APs); and
- Participation by registered I&APs is facilitated so they are provided with a reasonable opportunity to comment on the application.

Chapter 6, Regulation 39 through 44 of the EIA Regulations stipulates that the person conducting a public participation process must consider any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential I&APs and stakeholders of the application or proposed application that is subject to public involvement. Furthermore, other regulations were considered, including the Protection of Personal Information Act, 2013 (Act 04 of 2013), which regulates information sharing and record keeping.

The PPP approach adopted is detailed hereunder.

6.2.1 PUBLIC PARTICIPATION PROCESS APPROACH

The public participation approach adopted aligns with the process contemplated in Regulations 39 through 44 of the EIA Regulations as amended in terms of NEMA, along with the 2017 Public Participation Guidelines.

6.2.1.1 Identification of Interested and Affected Parties

Pre-identified stakeholders include (government departments), landowners, and the public. Notification and request for comments were submitted to the following key stakeholders during the Draft Scoping Phase, and further comments will be sought during the current EIA Phase. Comments were received and duly addressed while meetings

were held with the MTPA and the DWS. More focus group meetings with the stakeholders are planned during the EIA Phase.

Table 18: List of Stakeholders

- Mpumalanga Department of Agriculture and Rural Development and Land and Environmental Affairs
- Mpumalanga Department of Water and Sanitation;
- Mpumalanga Department of Transport and Public Works;
- Mpumalanga Tourism Park Agency (MTPA);
- Southern African Agricultural Initiative
- National Road Agency;
- N4 Trans African Concessions (TRAC)
- South African Heritage Resource Agency;
- Mpumalanga Heritage Resources Agency;
- South African National Parks (SANParks);
- Wildlife and Environmental Society of South Africa;
- AGRI SA;
- Eskom SOC Limited – Transmission
- Ehlanzeni District Municipality
- Nkomazi Local Municipality
- Malelane Irrigation Board
- Sugarcane Growers Association
- ROMPCO
- Civil Aviation Authority
- National Defence Force
- RCL
- BirdLife SA
- National Department of Water and Sanitation
- National Department of Forestry, Fisheries and Environment

6.2.1.2 Public Participation Database

In accordance with the requirements of the EIA Regulations under Section 24 (5) of NEMA, Regulation 42 of GN R. 982, the public participation practitioner must keep a register of I&APs. To fulfil this requirement, such a register is maintained, and details of I&APs, including their comments, are updated throughout the project cycle. The database will be updated and attached in the Final EIR.

6.2.1.3 Site Notices

A2 size notices indicating the availability of the draft EIR and contact details for the request of the hard copy or soft copy of the report will be fixed at different conspicuous locations within and around the proposed project area. Site notices will be printed in English, Afrikaans, and isiSwati and fixed at the following locations:

- Riverview Preparatory School Along N4
- Malelane Super Spar
- Malelane Public Library
- Cell phone Repair Shop -Malelane Town
- Eskom Khanyazwe Substation
- On Site-Behind Eskom Khanyazwe Substation
- Near Buco-Malelane Town
- Impala Restaurant/Tavern-Malelane Town
- Corner of Opdraend Street near Kruger View Chalets
- Pick'n Pay Malelane-Town
- Riviera Cash and Carry Malelane-Town

The photographic evidence of site notices will be attached with the final EIR.

6.2.1.4 Placement of Advertisement in the Local Newspaper

Newspaper advertisements will be published in local newspapers (Lowvelder and Corridor) to inform I&APs that the draft EIR is available for review and comment and to provide details of the public meetings. The advertisements' tear sheets will be attached to the final EIR.

6.2.1.5 Review and comment on the draft EIA report

The draft Report will be made available in hard and soft copies (link in email) to stakeholders mentioned in Section 13.1.1 above and registered I&AP. Hard copies will be made available at the Malelane Public Library. The report's electronic version will also be available via a link or accessed on the Nsovo website (a www.nsovo.co.za).

6.3 A SUMMARY OF COMMENTS RAISED BY INTERESTED AND AFFECTED PARTIES

The issues, comments, and concerns raised during the public participation will be incorporated into the Comments and Response Report (CRR), which will be updated and appended to the Final EIR.

6.3.1 PUBLIC MEETINGS

As part of the PPP, a public open day will be hosted to allow Interested and Affected Parties to raise concerns or share their view of the proposed project. The details are provided in Table 19 below

Table 19: Details of Public Meeting

Date	Meeting Type	Time	Venue
25 July 2024	Public Open Day	10:00 - 18:00	**Rio Vista Lodge,** Monte Vista Estate, Opdraend Street, Malelane

7 DESCRIPTION OF THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE ALTERNATIVES FOCUSING ON THE GEOGRAPHICAL, PHYSICAL, BIOLOGICAL, SOCIAL, HERITAGE AND CULTURAL ASPECTS

Baseline information from various sources and the relevance of the different aspects of the project are summarised in the Table 20. While the specialist report referenced provides more baseline information.

Table 20: Summary of Baseline Assessment and Relevance to the Feasibility Study and Project

Aspect	Relevance
Climate	• It informs the design considering flood lines, i.e., 1: 10, 50, or 100 years. This will be important for the proposed designs. • It allows the team to propose mitigation measures specific to the site conditions.
Topography	• The slope provides the necessary information to determine the depth of foundations required to construct masts, culverts, bridges, and other infrastructure. • From an environmental angle, it informs the mitigation measures to be considered.
Terrestrial Biodiversity Impact Assessment	• It allows for avoidance or the creation of buffers around areas identified as highly sensitive. • Inform the requirements for permits if sites of critical biodiversity cannot be avoided. • It allows for the proposal of relevant mitigation measures.
Aquatic Assessment	• It allows determining the regulated area of a watercourse in terms of water uses as listed in Section 21 (c) and (i). • Informs and confirms the requirements for WULA.

Aspect	Relevance
	• It allows for avoidance or creation of buffers around identified watercourses during the design phase were feasible. • It allows for a proposer risk assessment and consideration of the flood lines.
Palaeontology	• To comply with the regulations of the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA).
Heritage	Each site is assessed for the possible occurrence of six categories of heritage resources • Built Environment / Cultural Landscape • Surface archaeological finds • Subsurface archaeological finds • Industrial archaeology • Graves & Burial Grounds • Intangible heritage To comply with the regulations of the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). • It allows for avoidance or creation of buffers around identified sites of heritage significance. • Phase 1 informs the requirements for permits in the event that sites of heritage cannot be avoided.

This section outlines parts of the socio-economic and biophysical environment likely to be affected during the proposed development's construction, operational, or decommissioning phases. The potential interactions between the project and the environment are presented based on the project description and knowledge of the existing environment. Moreover, the project's potential impacts on the human environment, socio-economic conditions, and physical and cultural resources are also presented.

Similarly, the National Web-based Environmental Screening Tool is a geographically based web-enabled application that allows a proponent intending to apply for environmental authorisation under the Environmental Impact Assessment (EIA) Regulations 2014, as amended, to screen their proposed site for any environmental sensitivity. Thus, it provides site-specific baseline information and risk assessment that guides the EIA process and review information.

7.1 SOCIO-ECONOMIC DESCRIPTION

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

7.1.1 PROVINCIAL DESCRIPTION OF THE PROPOSED PROJECT

Mpumalanga Province is in the northeastern part of South Africa. It borders two of South Africa's neighbouring countries, Mozambique and Swaziland, and other South African provinces, namely Gauteng, Limpopo, KwaZulu-Natal, and Free State Provinces. Mpumalanga is characterized by the high plateau grasslands of the Middleveld, which roll eastwards for hundreds of kilometres. The northeast rises towards mountain peaks and terminates in an immense escarpment (www.municipalities.co.za).

The Mpumalanga Province covers 76 495km² and has a population of approximately 4 335 965 (IDP, 2017). The capital city of Mpumalanga is Mbombela (previously known as Nelspruit), and other major cities and towns include EMalahleni (previously known as Witbank), Standerton, eMkhondo (previously known as Piet Retief), Malelane, Ermelo, Barberton and Sabie. The province is divided into three district municipalities: Gert Sibande, Ehlanzeni, and Nkangala Districts. The three districts are further subdivided into 17 Local Municipalities, of which the proposed development falls within the Nkomazi Local Municipality of the Ehlanzeni District Municipality.

7.1.2 DISTRICT MUNICIPALITY WITHIN WHICH THE STUDY AREA IS LOCATED

The proposed development will be undertaken within the Ehlanzeni District Municipality, which is a Category C municipality in the Mpumalanga Province which comprises five local municipalities, i.e., Bushbuckridge, Mbombela, Thaba Chweu, Umjindi, and Nkomazi (www.municipalities.co.za), the District's headquarters are in Mbombela. The economic growth within the district is through the Maputo Corridor and tourism development. The proximity to the Gauteng province opens opportunities to a larger market, which benefits the district's agricultural and manufacturing sectors. The main economic sectors within the District include mining, manufacturing, energy, and agriculture.

The district municipality is also rich in its biodiversity and mineral resources. Gold mines operate at Barberton and Pilgrims Rest, and chrome mines are at Lydenburg. The future development of the Eastern Limb of the Bushveld Complex directly west of Lydenburg will also influence the future land use patterns within the Thaba Chweu Local Municipality.

The biodiversity within Ehlanzeni also plays a significant role in boosting the tourism industry, with the Kruger National Park being one of the major destinations for international and domestic tourism. Tourism, like agriculture, is among other land-use patterns that use land extensively because of the availability of natural resources.

7.1.3 LOCAL MUNICIPALITY WITHIN WHICH THE PROPOSED STUDY AREA IS LOCATED

The proposed development is within the Nkomazi Local Municipality, a Category B municipality with a total area of 4 787km² within the Ehlanzeni District Municipality. The municipality is strategically placed between Swaziland (north of Swaziland) and Mozambique (east of Mozambique). Kruger National Park also bounds it to the north and the City of Mbombela Local Municipality to the west. It is the smallest of four municipalities in the district, making up 17% of its geographical area. It is linked with Swaziland by two provincial roads and Mozambique by a railway line and the main national road (N4), which forms part of the Maputo Corridor.

7.2 CLIMATIC CONDITION OF THE PROPOSED AREA

7.2.1 TEMPERATURE

Mpumalanga has a sub-tropical climate characterized by hot summers and mild to cool winters, shifting to cold and frosty conditions in the Highveld regions. World Climate Data presented in the province's Vulnerability Assessment Report shows that the current mean annual temperatures are highest in the northwest and northeast areas of the province. In contrast, mean annual precipitation tends to increase in the eastern regions. The province is characterized by summer rainfall and thunderstorms, except in the escarpment area, which receives fair precipitation levels throughout the year (MCCVA, 2015). Mpumalanga has an average temperature of 20˚C. Middelburg is in the heart of the Highveld, experiences summer rain, and has a summer (October to February) to winter (April to August) range of around 19˚C with average temperatures in the contrasting seasons of 26˚C and 8˚C. Figure 18 below shows that the average temperature for the Nkomazi Local Municipality is between 22.1˚C and 23.7˚C.

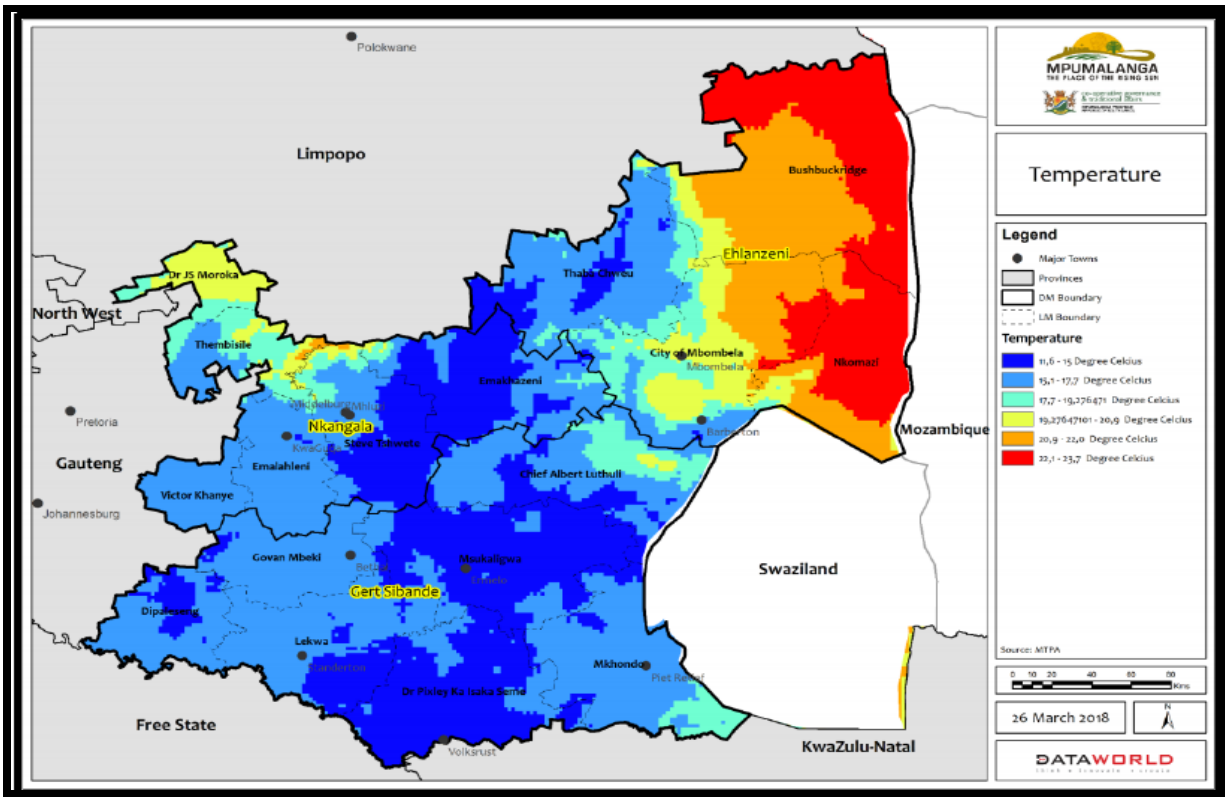


Figure 18: Temperature in Mpumalanga (Mpumalanga Development Spatial Framework, 2018).

7.2.2 RAINFALL

The region experiences a summer-rainfall area separated by the escarpment into two, namely, (a) the Highveld, characterized by cold frosty winters and moderate summers, and (b) the Lowveld, characterized by mild winters and subtropical climate. During winter, the Highveld and Escarpment sometimes experience snow. The annual rainfall occurs mainly during summer in the form of heavy thunderstorms. Given its location between the Drakensberg Escarpment and Vaal River traversing through Mpumalanga, the diverse climate in the region makes the production of a wide variety of crops possible. The Lowveld is subtropical, and due to its latitude and proximity to the warm Indian Ocean, it is also renowned for citrus and subtropical fruits. The Highveld is comparatively cooler due to its altitude and produces much of the summer grains, such as maize and grain sorghum. Exotic trees and plantations such as gum and wattles cover most of the hills on the Escarpment as it receives the most precipitation, with all other areas being moderately hydrated by thunderstorms.

The western portion of the study area linked to site Options 1 and 2 is characterized by a mean annual precipitation between 401 – 600 mm, and this precipitation range is deemed moderately adequate to support rainfed agriculture; thus, supplementary irrigation may be required to cultivate successfully on these soils. These conditions have a moderate to high yield potential for a wide range of adapted crops supporting rain-fed agriculture, resulting in a wide range of suitable crops for cultivation. The mean annual rainfall in Malelane is between 593.1mm and 748mm.

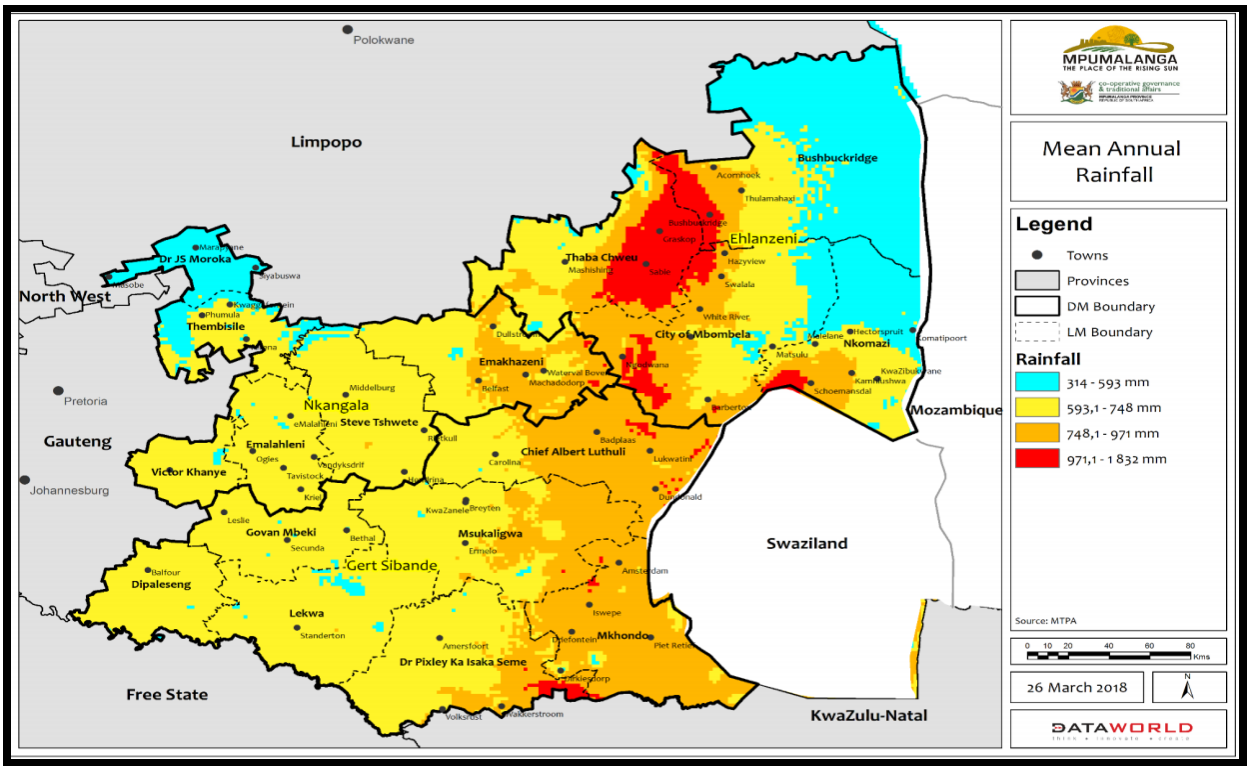


Figure 19: Mpumalanga Mean Annual Rainfall in Mpumalanga (Mpumalanga Development Spatial Framework, 2018).

Figure 20: Site-specific Mean annual rainfall

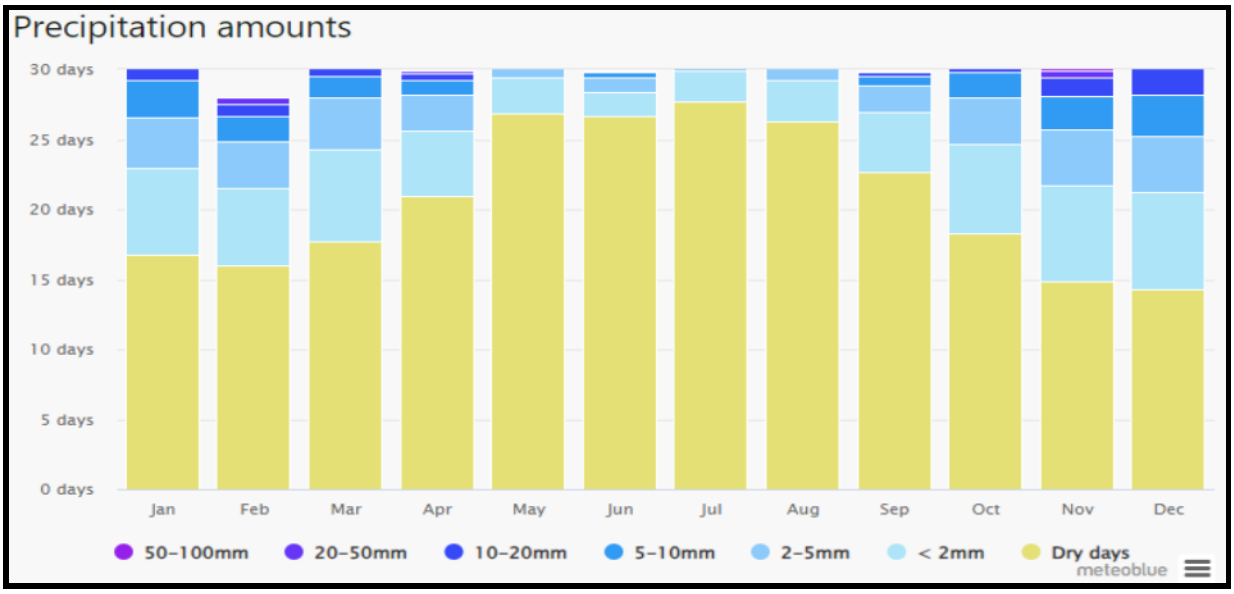


Figure 21: Malelane Average Rainfall for Period 1993 -2023

7.2.3 WIND DIRECTION

According to EHRCON (2024), The predominant wind direction for Malelane is from the southeastern sector. Wind speeds of between 5 and 18 km/h are generally observed. The strongest winds of around 30 km/h usually blow in October. From August to October, this wind sometimes swings to blow from the north, usually a hot, dry wind. Occasionally cyclones do occur. Wind roses comprise 16 spokes, which represent the direction from which the winds blew during the period under review. The colours reflect the different categories of wind speeds. The circles provide information regarding the frequency of occurrence of wind speed and direction categories. The value given in the center of the circle describes the frequency with which calms occurred, i.e., periods during which the wind speed was below 1 m/s.

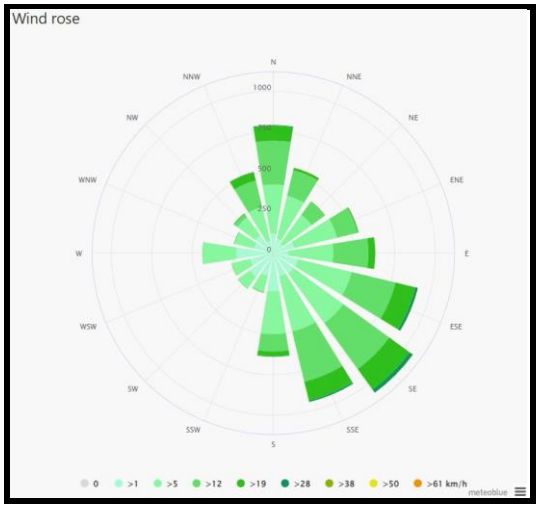


Figure 22: Malelane Wind rose for the period 1993 - 2023

7.2.4 CLIMATE CHANG

EHRCON conducted a climate change impact assessment to provide input into the proposed project. The specialist report highlighted that Power plants are likely to be affected by climate change impacts since they are often located in areas with heightened sensitivity to climate change (such as coastal zones and estuaries), operated over a long period (20 years or more), reliant on fuel supplies that could be disrupted, and reliant on water as an integral part of generation.

The DFFE' South Africa's Third National Communication Under the United Nations Framework Convention on Climate Change (2019), identified the following narratives for Mpumalanga:

Narrative 1: A Hot and Dry Future: Mpumalanga may plausibly experience a climate future that is significantly hotter and drier than the present-day climate. Under low mitigation, temperature increases as large as 2 °C by 2035 may occur, with associated drastic decreases in rainfall. Such a climate regime will also be associated with an increase in the frequency of heat waves and high fire-danger days.

Narrative 2: A Warmer Future with Increased Rainfall: The main alternative narrative for Mpumalanga still implies significant increases in temperature, consistent with narrative 1. The main difference in this scenario is that rainfall totals increase rather than decrease under climate change. Such an increase may imply frequent land-falling tropical lows over the Lowveld regions, potentially significantly impacting tourism and infrastructure. Under such a scenario, drought will not be such a major problem, but the increased occurrence of pests and pathogens may pose an alternative challenge.

The Ehlanzeni District Municipality drafted a Climate Change Vulnerability Assessment and Response Plan (CCVRS) in 2016. The CCVRS noted the key potential climatic changes within the District. It was found that the foreseen impacts of climate change on the Ehlanzeni District Municipality are generally negative and are likely to impact, amongst others, agriculture, biodiversity, human health, human settlements, water resources, and quality within the District.

The Climate Change risks associated with the proposed project highlighted by EHRCON are summarised below.

Table 21: Potential Climate Risks

Variable	Potential Climate Risk
1.Increased temperature	1.1 Increased temperature and heatwaves can pose a health risk to employees. 1.2 Increased temperature and heatwaves can influence productivity. 1.3 Increased temperature and heatwaves can reduce plant efficiencies and available generation capacity. 1.4 Increased temperature and heatwaves can cause transmission line losses and extension of transmission line cables. 1.5 Wildfires may cause physical risks to employees. 1.6 Wildfires may damage infrastructure and facilities. 1.7 Increased temperature, heatwaves, and wildfires may increase financial liability.
2. Reduced rainfall	2.1 Water scarcity and drought can constrain operations. 2.2 Water scarcity and drought can lead to water conflicts with communities. 2.3 Water scarcity and drought may further exacerbate water quality. 2.4 Water scarcity and drought may increase financial liability.
3. Extreme events	3.1 Floods, cyclones, and storms may cause physical risks to employees. 3.2 Floods, cyclones, and storms may affect water quality and increase the spread of disease. 3.3 Floods, cyclones and storms may cause discharge of contaminated water into surrounding areas. 3.4 Floods, cyclones, and storms may cause damage to infrastructure and facilities. 3.5 Floods, cyclones, and storms may cause reduced accessibility due to flooding of roads. 3.6 Lightning may cause a short circuit in transmission lines. 3.7 Floods, cyclones, and storms may increase financial liability.
4. Wind impacts	4.1 High wind speeds and gusts may damage infrastructure. 4.2 High wind speeds and gusts may increase financial liability.

7.3 GEOLOGY WITHIN THE STUDY AREA

Mpumalanga contains, within its boundaries, evidence of the earliest phases of the history of the world. The province is characterized by the presence of most of the geological formations in the country, such as the Witwatersrand Supergroup (gold ore resources), Bushveld Complex (platinum group of minerals), and the Basement Complex geological formations. The Basement Complex is found in the Lowveld as scattered patches in the Southern Highveld (McCarthy and Rubidge, 2005). The stratum consists of various rocks such as dolerite, granite gabbro, gneiss, norite, tuff, and shale. The Barberton Supergroup represents the greenstone belts in Mpumalanga. Greenstone is

economically important and consists of valuable deposits such as gold, antimony, copper-zinc, iron, asbestos, talc, mercury, magnesite, and gemstone. The Lowveld region of the province is underlaid by African Cratonic Basement rocks that date more than 2 billion years. The Highveld region comprises Karoo Sequence sedimentary rocks of a younger age, Carboniferous to Permian.

A large proportion of Nkomazi Local Municipality is underlain with quartz monzonite (30.7%) to the south and central regions. Basalt is the second most dominant (16.5%) geology type, located to the east. The northwestern part is predominantly underlain with arenite and lava. The least occurring geology types are ultramafic rocks, granophyre, gabbro, and dolorite. According to Figure 23, the study area is characterized by the following land types:

- Ea75 – predominantly mafic and ultramafic lavas and schists with banded ironstone and chert of the Tjakastad formation (Onverwacht Group); some mafic to felsic sediments and schists of the Moodies Group (Barberton Sequence).
- Fb162 – Greywacke, shale, and chert of the Sheba Formation (Fig Tree Group); mafic and ultramafic schists and lavas, as well as banded ironstone and chert of the Tjakastad formation (Onverwacht Group); shale, quartzite, conglomerate, and basalt of the Moodies Group.

SRK (2024) assessed the geological formation of the study area and confirmed that Malelane falls within an Archean Greenstone Belt, these are some of the oldest rocks in South Africa, that is, in the order of 3500 million years old. The Greenstone Belt consists of a complex sequence of volcanic, igneous, and sedimentary lithologies. The green colour is variably derived from fuchsite, green chlorite, serpentine, epidote, and amphibole minerals. Three main stratigraphic groups comprise the Barberton/Swaziland Supergroup: the Fig Tree Group, Moodies Group, and the Onverwacht Group. The general description of the rock types is as follows (described from youngest to oldest):

- Fig Tree Group Sandstone, grit, conglomerate, shale, greywacke, phyllite, basaltic lava
- Moodies Group Volcanics, tuff, agglomerate, lava, tuffaceous greywacke, conglomerate.
- Onverwacht Group Various mafic and ultramafic schists, interlayered with banded iron stone, chert, volcanic rocks, and komatitic basalts.

The preferred Site Alternative 1 appears to be located within the Onverwacht Group. The western portion of the study area is underlain by predominantly mafic and ultramafic lavas and schists with banded ironstone and chert of the Tjakastad Formation (Onverwacht Group); some mafic to felsic sediments and schists of the Moodies Group (Barberton Sequence). Site option 4 is underlain by the Greywacke, shale, and chert of the Sheba Formation. Figure 23, below, depicts the geology associated with the study area.

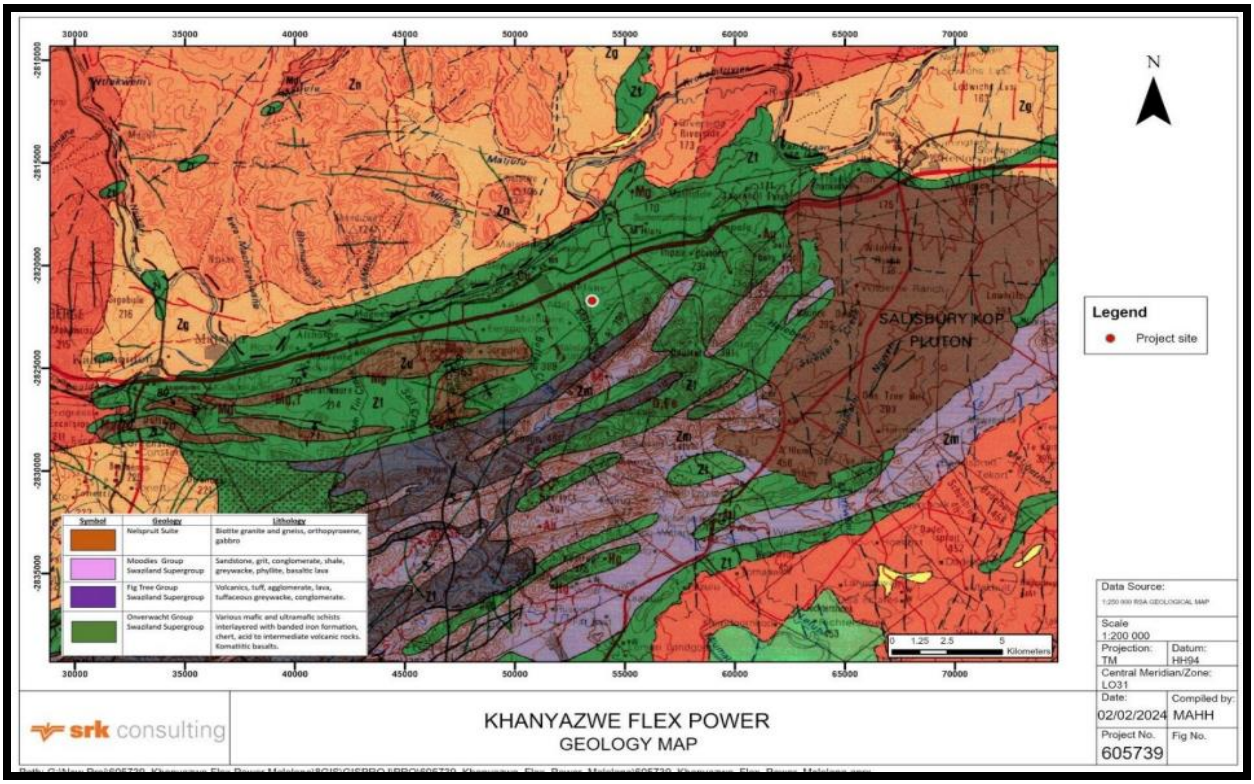


Figure 23: Geological map of the study area (2530 Barberton sheet, 1:250 000) (SRK,2024)

The SRK (2024) study confirmed the following geotechnical aspects of the study area:

- Dolomitic Ground subsidence – Dolomites are not present, sinkholes related to a karst topography are not anticipated, and subsidence is not considered a risk.
- Problem Soils—The presence of highly expansive soils in the area is considered a risk factor, and the extent of the risk is highly dependent on the results of laboratory testing, which will be carried out as part of the detailed geotechnical investigation of the preferred site.
- Seismic Activity –The seismic hazard map of South Africa indicates that the horizontal ground acceleration of the Malelane area is between 50 and 100 cm/sec 2, which is extremely low.

1.1.1 GEOTECHNICAL SITE SUITABILITY VERIFICATION

Following a thorough assessment of the geotechnical criteria, which considers the various geotechnical aspects likely to have a bearing on the geotechnical suitability of the site for the proposed development and construction aspects of the power plant, the most suitable site was recommended. The assessment considered the following aspects:

Slope angle, presence of deep soils, drainage, erosion, water table, presence of bedrock, excitability, suitability of soils as construction material, potentially expansive soils, bearing capacity of soils, foundations, and road construction. Based on the assessment of the above parameters, the geotechnical conditions were assessed, and SRK (2024) recommended Options 1 and 2.

In conclusion, it was confirmed that the site does not appear to have any geotechnical constraints. A detailed topographic survey to evaluate slope angles should be followed by a detailed geotechnical survey of the preferred site. The preliminary Geotechnical Report is attached as Appendix C-17.

7.4 PALAEONTOLOGY

According to the geology map above, the proposed project lies in an eastern greenstone belt, the Barberton Greenstone Belt, the largest and best-studied of several greenstone belts on the Kaapvaal Craton. Accordingly, they represent the oldest crustal rocks on the earth and contain economic reserves of heavy minerals such as gold and nickel; as such, they are of great interest. The BGB succession is composed of the ca. 3.55-3.22 Ga Swaziland (or Barberton) Supergroup, which is preserved as a folded southwest to northeast-trending belt (Agangi et al., 2018). The Paleontology assessment confirmed that the site had been subdivided into three groups, from the base upwards, namely:

- Onverwacht;
- Fig Tree; and
- Moodies Groups as described in 14.3 above.

The basal ca. 3550-3300 Ma Onverwacht Group is dominated by a pillow and massive basalt and komatiite, mafic-ultramafic intrusions, felsic volcanic rocks, and chert. In contrast, the Fig Tree and Moodies Groups consist of sandstone, shale, chert, banded iron formation, and felsic volcanic rocks ranging in age from ca. 3260-3216 Ma.

The southwest-to-northeast-trending Inyoka-Saddleback Fault System separates a northern and a southern terrane of different age and geochemical characteristics (Brandl et al., 2006; Agangi et al., 2018). The Supergroup has undergone multiple deformation events (D1-D4) and has been metamorphosed under conditions of greenschist to amphibolite facies. The final phase of deformation formed the gold deposits.

Felsic volcanic rocks in the Onverwacht Group are mostly preserved in the Theespruit, Sandspruit, and Hooggenoeg Formations. The lowermost portion is the Theespruit and Sandspruit Formations, dated ca. 3552-3521 Ma. They are composed of strongly foliated mafic-ultramafic to felsic volcanic rocks and shallow intrusions metamorphosed at amphibolite facies conditions. These two formations are separated from the overlying mafic-ultramafic volcanic rocks of the Komati Formation by the Komati fault (de Ronde and de Wit, 1994; Lana et al., 2010a). The Hooggenoeg Formation includes felsic volcanic and intrusive rocks, volcaniclastic conglomerates, sandstone, and tuffs.

The Fig Tree Group is also known to contain dacitic volcanic and volcaniclastic rocks (tuffs and agglomerates), dated between 3259 Ma and 3225 Ma, although little information on the chemical composition of these rocks is available

in the literature (Agangi et al., 2018). These ages partly overlap with intrusions to the Barberton Greenstone Belt northwest, such as the 3229-3223 Ma Kaap Valley tonalite.

According to the review by Agangi et al. (2018), the base of the Moodies Group in the vicinity of the Eureka Syncline contains prominent pebble-to-cobble conglomerate beds intercalated with sandstone. The clasts consist of black chert and felsic igneous clasts. Igneous clasts have variable textures, from porphyritic to granophyric, indicative of a volcanic or shallow intrusive origin. Some clasts contain predominant quartz, K-feldspar, and biotite, and accessory zircon, apatite, and monazite, and their dating clusters into three groups that indicate the presence of shallowly emplaced K-rich intrusive rocks with ages pre-dating the emplacement of mafic intrusions (mostly <3.2 Ga).

Of the four main areas of Archaean Granitoid intrusions through the Kaapvaal Craton in South Africa, the proposed project lies in the Eastern and Southeastern Kaapvaal Craton. To the north of the project area is the Nelspruit Batholith or Suite, a Mesoarchaean intrusion dated to around 3200-2800 Ma (Robb et al., 2006). These are ancient volcanic rocks and do not preserve any fossils.

7.4.1 SCREENING TOOL

Based on the DFFE Screening Tool Palaeosensitivity maps, the sites are of medium sensitivity, implying that the greater areas are within medium paleo sensitivity, as depicted in Figure 24.

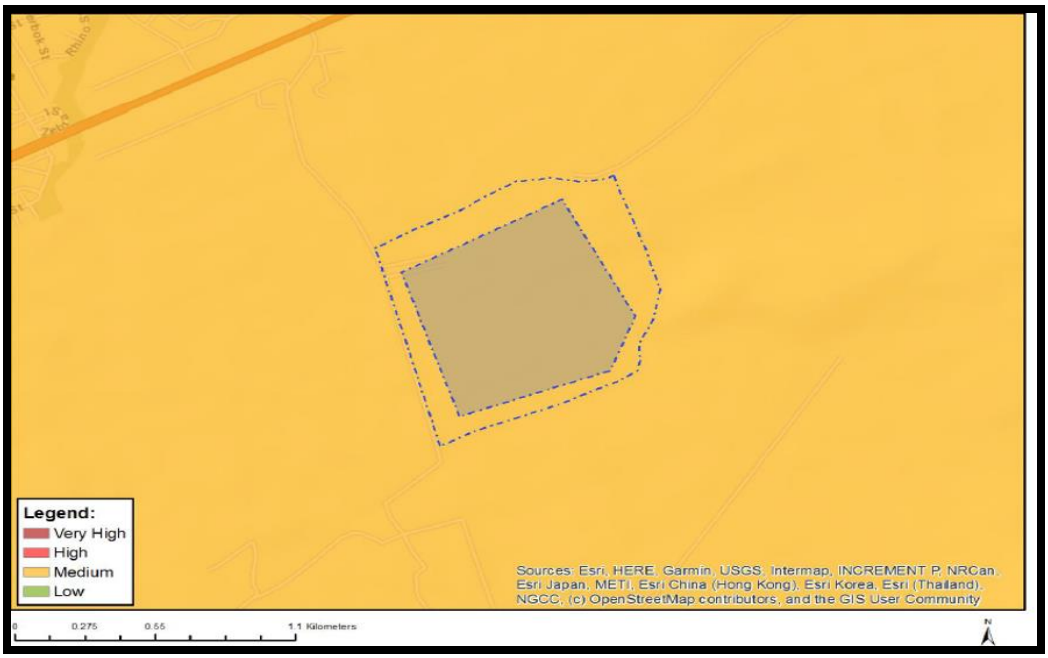


Figure 24: DFFE Screening Palaeo-sensitivity Map (DFFE, 2024)

7.4.2 PALAEONTOLOGY SITE SENSITIVITY VERIFICATION

The Palaeontology Site Sensitivity verification conducted by Marion Bamford (2024) confirmed that the project is on the ancient metamorphosed volcanic rocks of the Tjakastad Subgroup (Onverwacht Group). They predate the sedimentary rocks Figtree and Moodies Groups from where there are rare trace fossils of microbes. Based on the older age and the type of rock that does not preserve fossils (volcanic), it is extremely unlikely that fossils occur in the Tjakastad Subgroup. Based on the geology of the area and the palaeontological record, it can be assumed that the formation and layout of the basalts, lavas, sandstones, shales, and sands are typical for the country and do not contain any trace fossils, fossil plants, insects, invertebrate and vertebrate material. The sands of the Quaternary period would not preserve fossils (Bramford, 2024).

In light of the above DFFE Palaeosensitivity maps (indicated as moderately sensitive (yellow), contrary to the SAHRIS Palaeosensitivity map below, which indicates that the area is indicated as having a low sensitivity (blue). The specialist confirmed that the SAHRIS map is the more accurate as it is based on the geology as well as the palaeotechnical reports compiled for SAHRA by palaeontologists.

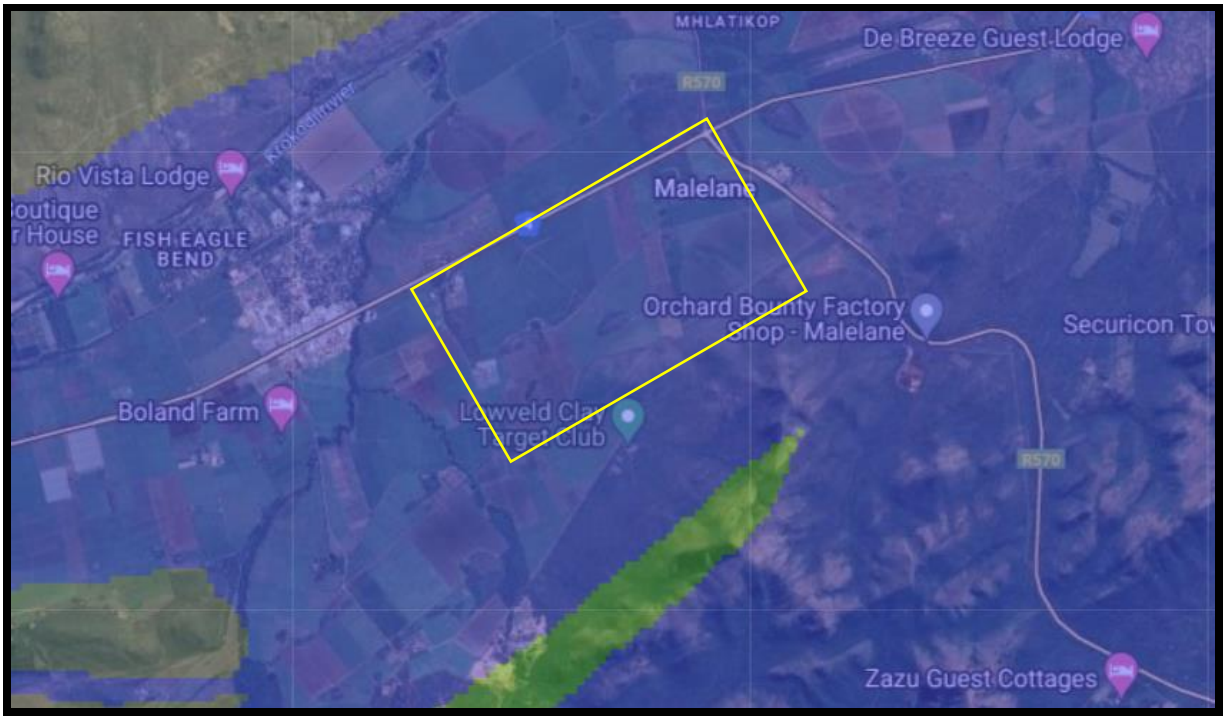


Figure 25: The yellow rectangle shows a SAHRIS Palaeosensitivity map for the proposed Khanyazwe Flexpower project site. Background colours indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero (Bramford, 2024)

Table 22: Paleontology Site Sensitivity Verification

Site Activities	Screening Tool Sensitivity	Verified Sensitivity
Preferred Site	Medium	Very low
Powerline	Medium	Very low
Road	Medium	Very low

In conclusion, the specialist confirmed that based on the lack of previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the overlying soils of the Quaternary. There is almost no chance that any fossils may occur in the volcanic rocks of the Tjakastad Subgroup. As such, the impact on the palaeontological heritage would be very low, as far as palaeontology is concerned, so the project should be authorized, and a Fossil Chance Find Protocol should be added to the EMPr.

The Palaeontology SSV is attached in **Appendix C-6**.

7.5 TOPOGRAPHY OF THE STUDY AREA

The topography of the Mpumalanga region is varied, comprising the Highveld (high-lying) and the Lowveld (low-lying) regions. Mpumalanga is mainly situated on the high plateau grassland known as Highveld. The Highveld stretches hundreds of kilometres eastwards until it rises towards mountain peaks and deep valleys of the Escarpment in the northeast. From the escarpment, it plunges hundreds of meters down to the low-lying area known as the Lowveld. The Province's landscape is characterized by the Northern Drakensberg escarpment, grasslands, numerous valleys, mountain passes, rivers, waterfalls, wetlands, and forests. The Bushveld includes the southern part of the famous Kruger National Park area. The central part of the Province, being a part of the escarpment, is mountainous and consists of alpine grasslands and the Afromontane forest. The Lowveld region is primarily flat with some rocky outcrops, where the study area is located. The proposed power station site is approximately 300m above sea level on a flat landscape surrounded by higher mountains, as indicated by the contours on the hydrological map below. Alternatives sites 3 and 4 appear to be characterised by undulating steep gradients in natural virgin vegetation and the presence of shallow or sub-outcrop inferred (SRK, 2024).

Steep slopes and mountainous areas are found in the western part and along the eastern boundary of the Nkomazi Local Municipality. The Kaalrug Mountain range is situated to the west, forming part of the Barberton Mountains, and the Lebombo Mountain range is located along the eastern boundary. The Lebombo Plains, located between the Komati River and the Lebombo Mountains to the east, are characterized by flat to undulating landscapes. The central part between the Komati River and the mountainous western areas is flat. However, steeper slopes occur to the south towards the Swaziland border.

The topography of the KFP power facility site is relatively flat. The site's average area elevation varies between 342 metre and 356 metre AMSL, as depicted in Figure 26. The project design phase will need to consider the gradients, ensuring that the selected site poses the least impact on the receiving environment.

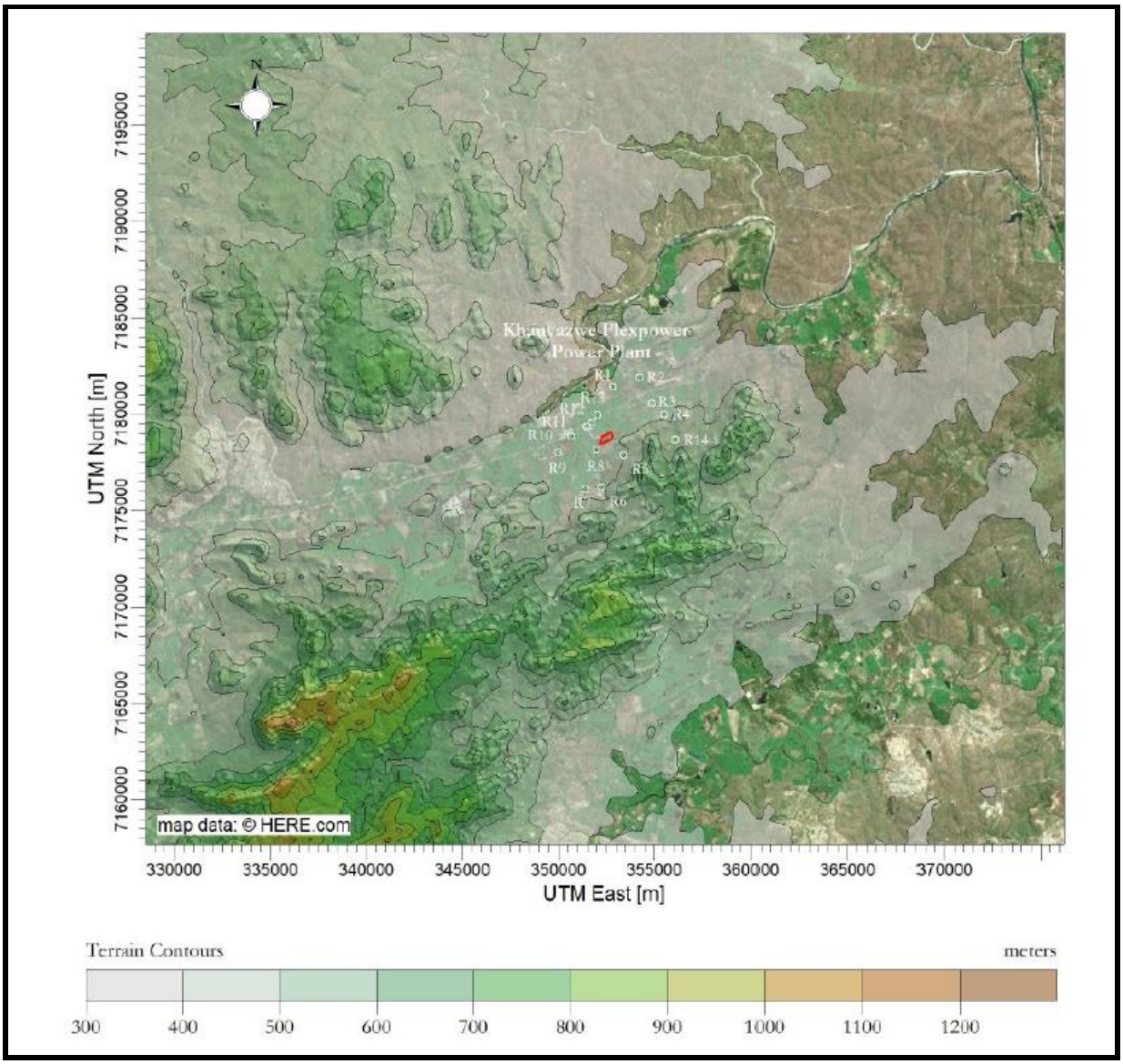


Figure 26: Khanyazwe Terrain Elevation (EHRCON, 2024)

7.6 HYDROLOGY

The proposed study area falls under the Komati Catchment Area and quaternary catchment X24D. The quaternary Catchment receives 816.11 mm/annum. No NFEPA wetlands have been noted around the site; however, two artificial wetlands are present to the east of the gas pipeline and south of the site. The Buffalo Creek River is pointed out on

the western boundary of the site. There are no NFEPA Rivers that were noted in proximity to the site. Refer to Figure 27 below for the hydrological map.

During the comment and review period, SANParks raised a concern regarding the potential impact that the powerplant would have on the Crocodile River system which runs 600m north-west of the project and all the way bordering the Kruger National Park. The concern was regarding the flow of contaminated water because of waste generated at the power station during the construction and operational phases. Noteworthy is that considering the proximity of the proposed power plant to water resources, the project would need to apply for the requisite water use licenses from the Department of Water Affairs and Sanitation, which are the custodians of South Africa's water resources. At the minimum, the environmental management plan will need to address and propose mitigation measures for all identified potential impacts, including water contamination, throughout all project phases. To an extent, depending on the Section 21 water uses triggered, an integrated water and waste management plan will need to be compiled in line with the requirements of the regulations.

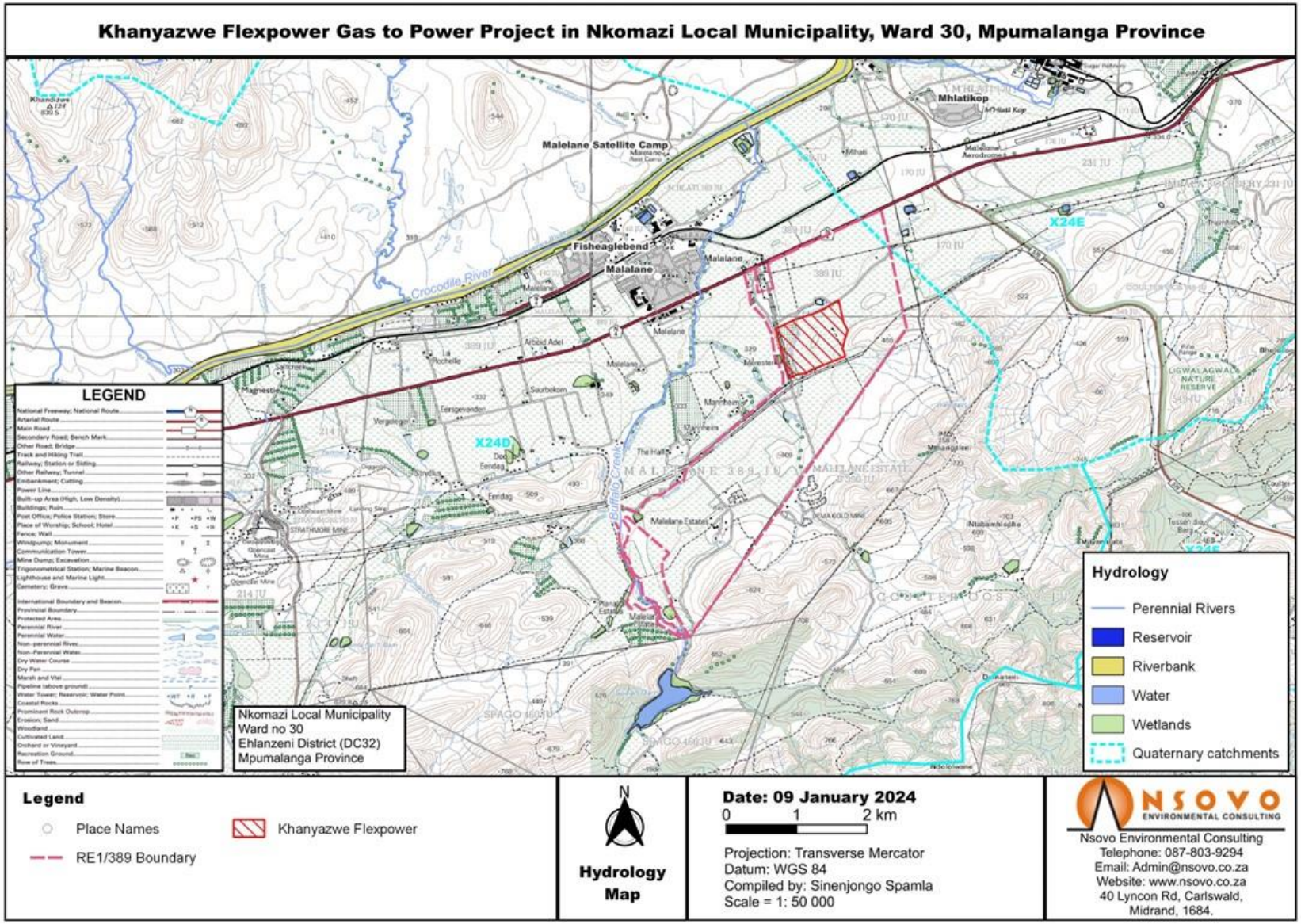


Figure 27: Hydrological map of the proposed location.

7.7 WETLAND DELINEATION

A wetland delineation was conducted in March 2024, and the sites were delineated to assess the sensitivities from a wetland point of view. WaterMakers (2024) presented the outcomes of the Site verification and preference as follows:

- No wetlands (hydro-geomorphic units) were observed in any of the four study sites or any wetland habitat within 500m of any Site Alternatives.
- According to Nel et al. (2011), proposed alternatives, including the preferred, fall within the Lowveld Group 3 wetland vegetation group. According to Macfarlane et al. (2014), the Lowveld Group 3 wetland vegetation group is
- No FEPA wetlands were identified in the study area.
- regarded as being Critically Endangered (Macfarlane et al., 2014). One riparian channel that branched at a higher elevation was observed and delineated within two of the study areas, namely Site 2 and Site 4, as shown in Figure 28.

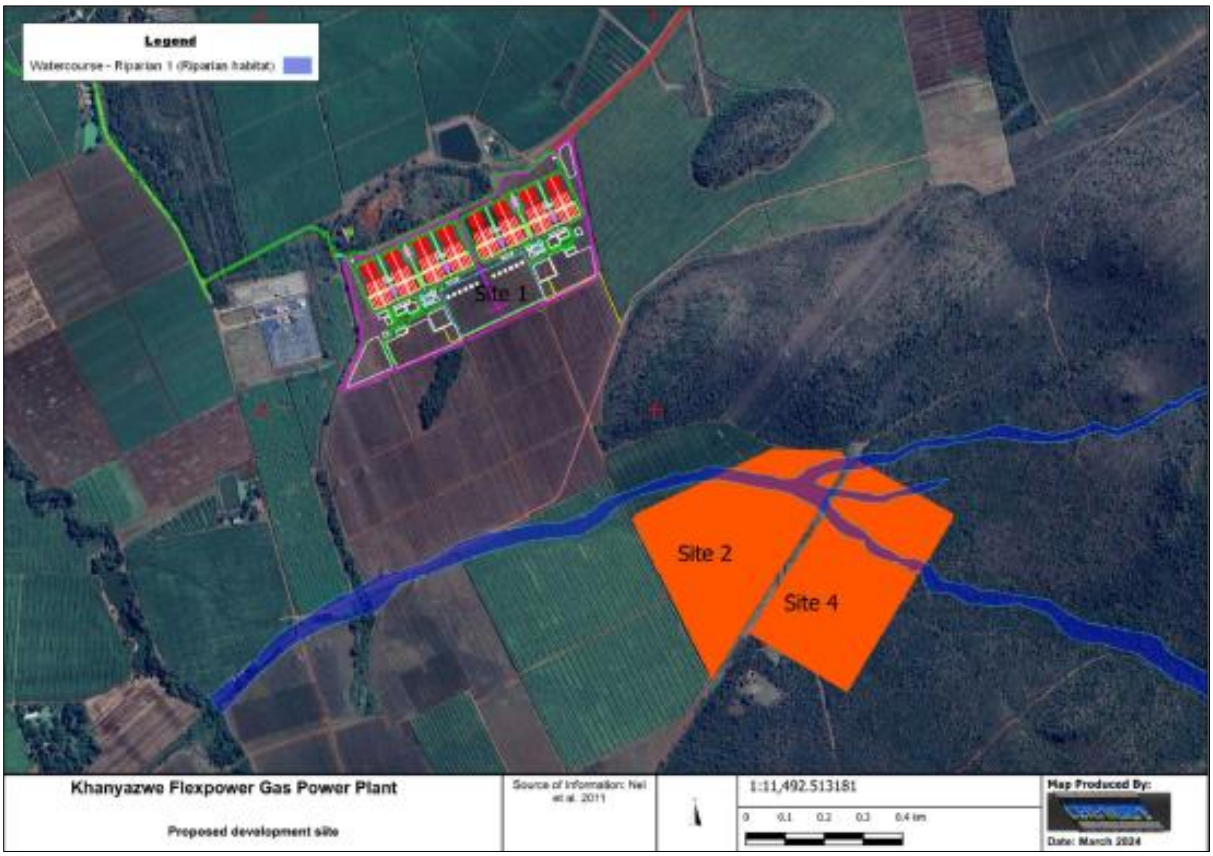


Figure 28: Delineated wetlands within the study area

The wetland specialist recommended site alternative 1, emphasising that the watercourse is, on average, more than 500m away from Site 1. The development of electricity infrastructure on Site 1 is highly unlikely to cause any negative

impacts on watercourses because of the low sensitivity associated with the site, the distance to the nearest watercourse, and the type of development proposed.

Therefore, no further watercourse or wetland studies are deemed necessary for this project as all wetland /riparian (watercourse) sensitivities have been duly scrutinized and field verified by a wetland specialist.

7.8 SITES OF ARCHAEOLOGICAL AND CULTURAL SIGNIFICANCE

In general, historic sites are associated with colonial-era white settlers, colonial wars, industrialization, recent and contemporary African population settlements, and contemporary ritual sites dating to the last hundred years. However, recent historic sites and features associated with the African, settler, and commercial farming communities are on record in the project area environment. The affected general landscape is associated with historical events such as white settler migration, confirmed by the predominant commercial farming by white farmers. No specific historical sites are listed on the proposed development sites.

The site earmarked for the proposed development is degraded from current land uses such as access roads, Eskom distribution power lines, and sugarcane cultivation. No evidence suggests any potential for recovering archaeological remains during earth-moving activities. There is an established associated infrastructure development, roads, and other associated infrastructures across the entire project receiving area. The field survey identified no cultural heritage or archaeological resources within an area earmarked for the proposed development. Whether burial sites are known or not on record, from a heritage perspective, burial grounds and gravesites are accorded the highest social significance threshold. They have both historical and social significance and are considered sacred. Wherever they exist, they may not be tampered with or interfered with during any proposed development. It is important to note that the possibility of encountering human remains during subsurface earthmoving works anywhere on the landscape is ever present. Although the possibility of encountering previously unidentified burial sites is low along the area earmarked for development due to the heavily degraded environment using agricultural activities, should such sites be identified during subsurface construction work, they are still protected by applicable legislation, and they should be protected. The outcomes of the study confirmed the following key archaeological attributes highlighted in Appendix C-5.

Table 23: Summary Archaeological Findings

Period in Archaeology/Key Features	Findings on Site
The Stone Age	No sites or relics dating to the Stone Age were found
Iron Age	No sites or relics dating to the Iron Age were found.
Burial Grounds	No burial grounds were recorded.

7.8.1 HISTORY OF SUGARCANE IN THE LOWVELD

The archaeology specialist reports (Matenga, 2024) provided a brief background of the sugarcane history in the Lowveld, highlighting that Businessman Rob Ferreira founded the Malelane Development Company as a vehicle for the establishment of the town. Malelane was established in 1949. The name means the place of ilala trees, referring to a species of palm trees growing in the Crocodile River valley.

Transvaal Sugar Limited was founded in 1965 in the Onderberg region (Malelane) of the South Eastern Transvaal Lowveld, now Mpumalanga.

RCL Foods Sugar and Milling (Pty) Ltd – Sugar refineries at Komati and Malelane produce 600,000 tons of sugar annually, marketed under Selati. Part of the raw sugar produced by RCL Foods is refined at the Malelane, and the balance is exported via the sugar terminal in Maputo, Mozambique.

7.8.2 ARCHAEOLOGICAL SITE SENSITIVITY VERIFICATION

The Screening Tool Report characterised the site as being of low sensitivity in terms of heritage and palaeontological classification for the power facility, powerline, and gas pipeline routes.

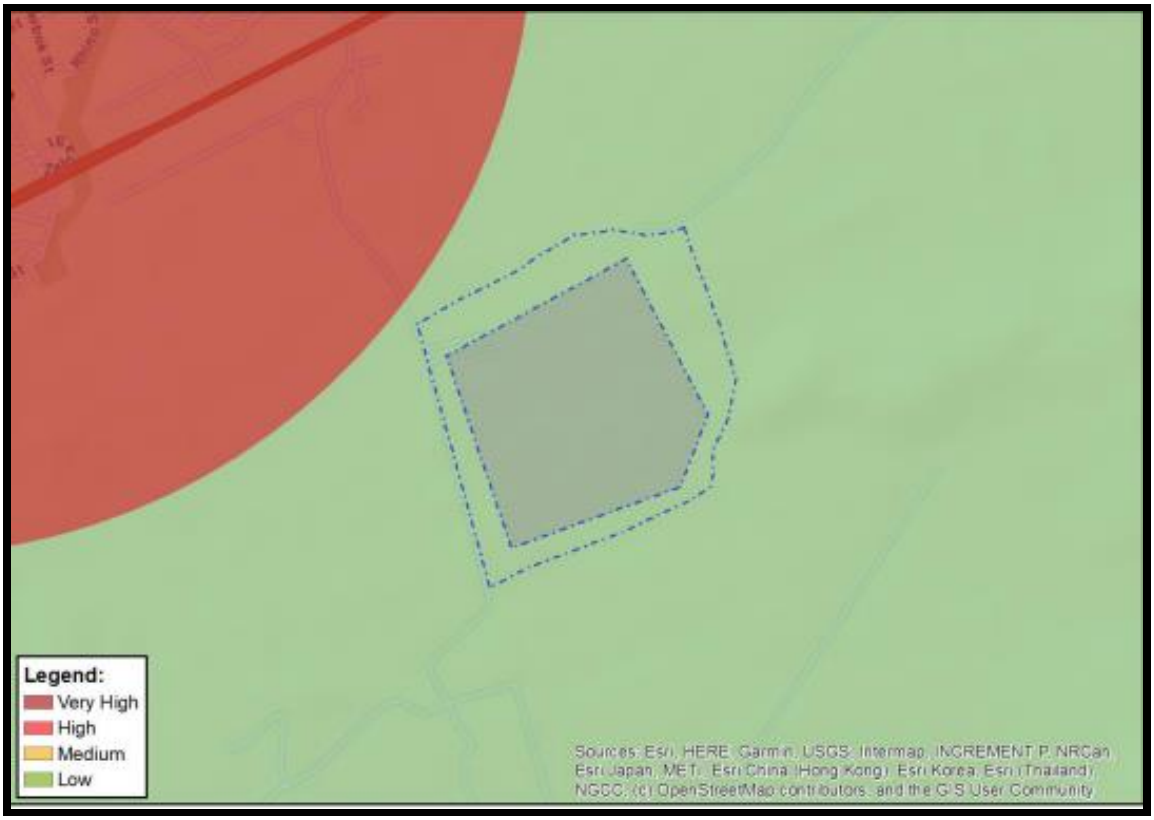


Figure 29: Heritage and Palaeontological theme (DFFE Screening Tool, 2024)

The Archaeological specialist conducted a ground survey on 28 February 2024. The site is presently under sugar cane farming. It was confirmed that due to the active sugar cane farming at both sites, a comprehensive ground survey was not possible, and windshield views were limited to the access roads between cane fields. Based on the available information, the specialist confirmed that the site sensitivity is low and recommended that the proposed gas power plant development proceed. Should some important discoveries be made during construction, operations should be halted, and the provincial Heritage Resources authority or SAHRA should be notified for an investigation and evaluation of the findings to take place.

Table 24: Archaeology and Heritage Site Sensitivity Verification

Site Activities	Screening Tool Sensitivity	Verified Sensitivity
Preferred Site	Low	Low
Powerline	Low	Low
Road	Low	Low

The Archaeology/Heritage SSV is attached in **Appendix B-5**.

7.9 AIR QUALITY AND POLLUTION

Air quality is an issue of concern in Mpumalanga, as it is in many other parts of South Africa. Poor air quality's driving forces include human activities and natural processes. Driving forces associated with human activities include economic activity, urbanization, industrial development, and population growth. Forces from natural processes can include climate change, natural disasters, and many others. These driving forces lead to pressures on the natural environment, such as increased demand for resources, habitat change, and increased development. The pressures, in turn, lead to impacts on the natural, social, political, and economic environments (Mpumalanga DACE, 2003).

A wide variety of natural and anthropogenic sources of air pollution exist in Mpumalanga, ranging from veld fires to industrial processes, agriculture, mining activities, power generation, paper and pulp processing, vehicle use, and domestic use of fossil fuels. Different pollutants are associated with each activity, ranging from volatile organic compounds and heavy metals to dust and odours (Mpumalanga DACE, 2003).

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

The outdoor sources of air pollution resulting from human activities comprise three broad categories.

Stationary sources can be subdivided into rural area sources, e.g., agriculture, mining, and quarrying, and industrial point and area sources, e.g., chemical manufacturing, non-metallic mineral products, basic metal industries, and power generation.

Community sources include heating homes and buildings, municipal waste and sewage sludge incinerators, fireplaces, cooking facilities, laundry services, and cleaning plants.

Mobile sources include combustion-engine vehicles, such as light-duty petrol-powered cars, light and heavy-duty diesel-powered vehicles, motorcycles, and aircraft, and line sources, such as fugitive emissions from vehicle traffic.

Air pollutants are traditionally classified into suspended particulate matter (dust, fumes, mists, and smoke), gaseous pollutants (gases and vapors), and odors. Few sources of air pollutants exist within and around the proposed area. Motor vehicles along the N4 may sometimes result in elevated particulates and Nitrogen oxide (NO2) concentrations.

Dust generation is expected from the agricultural areas around the study area.

The technical guidelines exhaust gas emissions can be expected. Due to the low peak combustion temperature in the engines, the emission of nitrogen oxides(NOx) is relatively low. Running on clean natural gas, the engines have inherently low particulate matter (PM) and sulfur dioxide (SO2) emissions. Emission levels at steady 100% load, constant speed 500RPM or 514RPM, CR = 11; However, during start, stop, and transient load variations, the exhaust gas emissions may temporarily deviate from the steady state conditions.

The air quality specialist report by EHRCON (2024) defines receptors as sites (or areas) that may potentially be impacted by the process or activity. In their study, sensitive receptors were selected based on proximity to the project and comprise farmsteads, small holdings, residences, wildlife conservancies, recreation, commerce, utilities, and light/heavy industrial and mining processes up to 5 kilometers from the power plant.

Air quality analysis was limited to Site Option 1 based on the conclusions reached in the final Scoping Report which concluded that Site Option 1is the preferred location for the project.

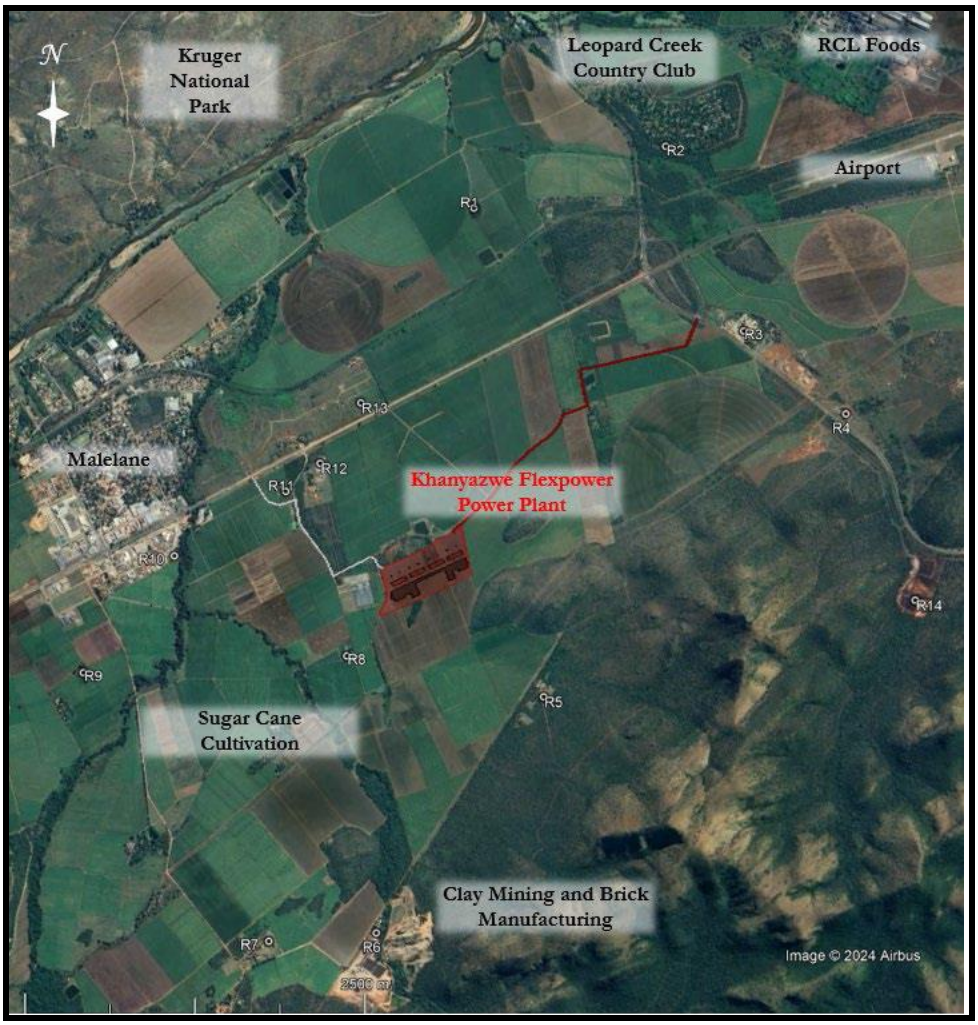


Figure 30: KPF Receptors (EHRCON, 2024)

Following a thorough modelling exercise, the following impacts were identified:

- Impact of controlled total suspended particulate, fine particulates, and gaseous emissions during construction.
- Impact of PM10, SO2, and VOC emissions during normal operations.
- Impact of NO2 emissions from the use of ICE technology with 30m clusters during normal operations affecting R1, R2, R3, R6, R7, R8, R9, R10, R11, R12, R13, R4, R5, R14 receptor

From the impact significance analysis for the KFP Power Plant, EHCRON (2024) made the following conclusions:

- The incremental impact of all pollutants during construction is expected to be negligible. Current industry standard techniques should be maintained and supplemented with administrative control measures to maintain the residual impact at the nearest sensitive receivers at current background levels.
- The incremental impact of all pollutants during construction is expected to be negligible. Current industry-standard techniques should be supplemented with administrative control measures to maintain the residual impact at the nearest sensitive receivers at current background levels.

- The incremental impact of PM10, SO2, and VOC during normal operation of ICE technology is expected to be negligible. Current industry-standard techniques should be maintained and supplemented with administrative control measures to maintain the residual impact at the nearest sensitive receivers at current background levels.
- The incremental impact of NO2 during normal operation of ICE technology is expected to be negligible at a cluster height of 30 metres. Current industry-standard techniques should be supplemented with administrative control measures to maintain the residual impact at the nearest sensitive receivers at current background levels.

The cumulative modelling was not undertaken as there are no power plants within the vicinity, and the report recommended ICE technology as one of the best available industry technologies.

7.10 SUMMARY OF THE BIODIVERSITY CHARACTERISTICS ASSOCIATED WITH THE STUDY AREA

The study area falls within an area characterised as follows:

- **Biome:** The study area is within the Savanna Biome.
- **Bioregion:** The study area is located within the Lowveld Bioregion.
- **Vegetation Type:** The study area is within the Granite Lowveld vegetation type.

7.10.1 NATIONAL THREATENED ECOSYSTEMS 3 (2011)

According to Scientific Terrestrial Services' (2020) desktop study, the study area is within an ecosystem of Least Concern. The sensitivity of the ecosystem associated with the study area was confirmed with a formal site visit on 24 March 2024. The NEMBA provides for listing threatened or protected ecosystems in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU), or protected. Listing threatened ecosystems primarily aims to reduce the rate of ecosystem and species extinction. This includes preventing further degradation and loss of threatened ecosystems' structure, function, and composition.

7.10.2 NATIONAL BIODIVERSITY ASSESSMENT (2018)

The study area falls within the least concerned vegetation type (Granite Lowveld) currently well-protected (WP). Ecosystem types are categorised as “not protected,” “poorly protected,” “moderately protected,” and “well protected” based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act, 2003 (Act No. 57 of 2003), and compared with the biodiversity target for that ecosystem type. The ecosystem protection level status is assigned using the following criteria:

- If an ecosystem type has more than 100% of its biodiversity target protected in a formally protected area, either A or B, it is classified as Well Protected;

- When less than 100% of the biodiversity target is met in formal A or B-protected areas, it is classified as Moderately Protected;
- If less than 50% of the biodiversity target is met, it is classified as Poorly Protected; and
- If less than 5%, it is Hardly Protected.

7.10.3 SAPAD (South Africa Protected Areas Database) (2019, Q4); SACAD (South Africa Conservation Areas Database) (2019, Q4); NPAES (National Protected Areas Expansion Strategy) (2009)

The SAPAD4 (2019, Q4) and NPAES (2009) database indicate that the Kruger National Park is situated ± 3 km north of the study area (Figure). NPAES (2009) additionally shows the Informal Dumaneni Reserve (Conservation Area System), located approximately 2.3 km southeast of the proposed gas pipeline. No other protected areas are located within 10 km of the study area. Refer to below for the nationally protected and informally protected areas associated with the study area.

7.10.4 IBA (Important Bird Area) (2015)

Kruger National Park is also identified as an IBA. It harbours globally threatened species, regionally threatened species, restricted range species, and biome-restricted species (Refer to Appendix B2—Biodiversity Compliance Statement).

7.10.5 National Web-Based Environmental Screening Tool (2020)

- Terrestrial Sensitivity - The terrestrial sensitivity for the entire study area is considered Low Sensitivity.
- Plant Species - for the Plant Species theme, the study area is considered to have a Medium Sensitivity due to the potential presence of the sensitive species *Caesalpinia rostrata*.
- Animal Species - for the Animal Species theme, the study area is deemed to be a Medium Sensitivity due to the potential presence of sensitive species such as *Reptilia-Kinixys natalensis* (Natal hinge-back tortoise); Mammalia-*Lycaon pictus* (African wild dog); *Dasymys robertsii* (Robert's shaggy rat) and Aves-*Ciconia nigra* (Black Stork).

7.10.6 Mpumalanga Biodiversity Sector Plan (MBSP) (2014)

- Ecological Support Area (ESA): Protected Area (PA) Buffer - the entire study area is within an ESA Protected Area Buffer associated with the Kruger National Park. These areas surrounding protected areas moderate the impacts of undesirable land uses that may affect the ecological functioning or tourism potential of PAs, as illustrated on the map below. Buffer distance varies according to reserve status: National Parks - 10 km; Nature Reserves - 5 km buffer; and Protected Environments — 1 km buffer.
- Heavily Modified—The majority of the study area is classified as "Heavily Modified." These are areas that have been modified to such an extent that valuable biodiversity and ecological functions have been lost.

- Other Natural Areas - the remaining portions of the study area are classified as “Other Natural Areas.” These areas have not been identified as A priority in the current systematic biodiversity plan but retain most of their natural character and perform a range of biodiversity and ecological infrastructural functions.

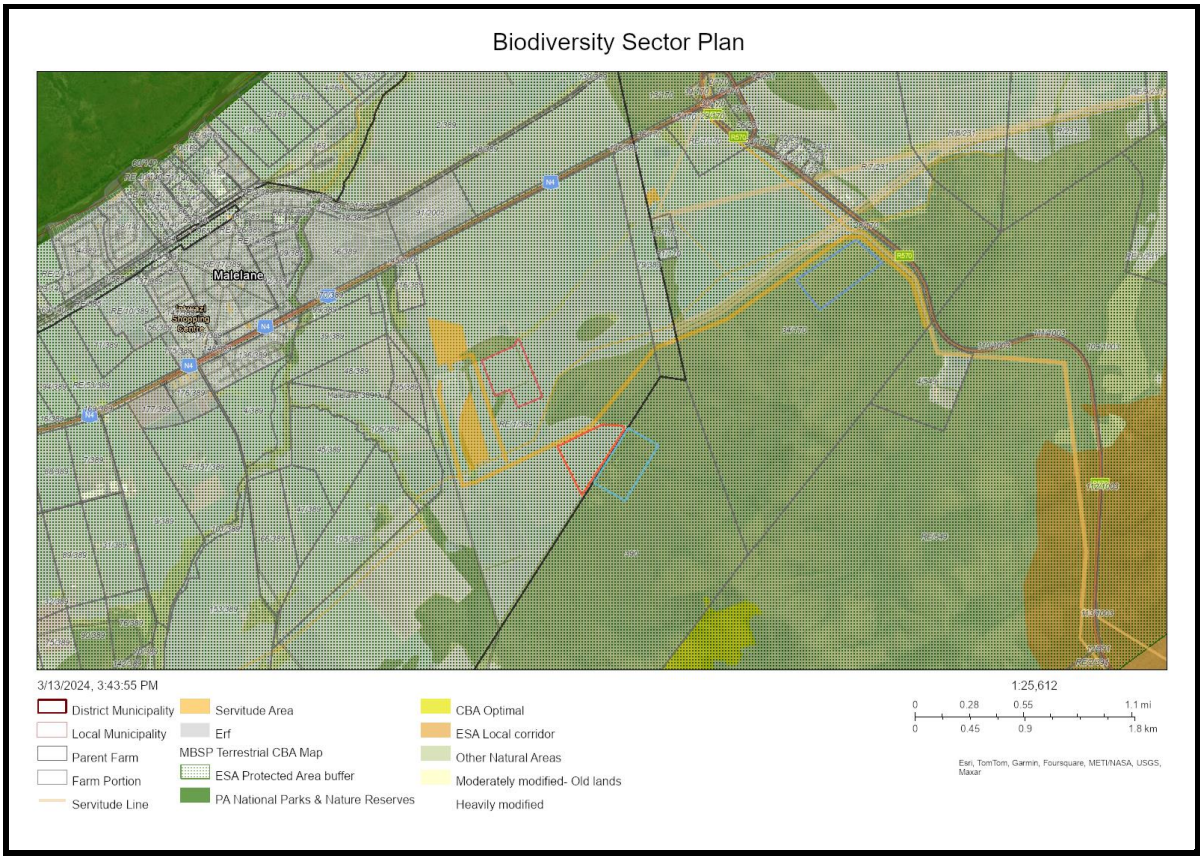


Figure 31: Biodiversity Sector Plan Map in relation to the proposed site options

7.11 FAUNAL AND FLORAL STRUCTURE AND COMPOSITION

Based on the preliminary desktop assessment (STS 2020), the study area is not located within a protected area; however, it is situated approximately 3 km south of the Kruger National Park. According to the Mpumalanga Biodiversity Sector Plan (MBSP, 2014), the north-eastern portion of the study area is located within an Ecological Support Area (ESA) local corridor, and a small portion of the power station and most of the proposed gas pipeline is located within an irreplaceable Critical Biodiversity Area (CBA). The remaining portions of the study area are situated in areas classified as either “heavily modified” or “other natural areas.”

The study area has a very high terrestrial sensitivity, according to the National Web-based Environmental Screening Tool (2024); this is attributed to the ESA within the study area, Figure 32. The study area is considered to have a medium sensitivity for plant species due to the potential presence of sensitive species such as *Pavetta zeyheri* subsp. *Microlancea,* For the Animal Species theme, the majority of the study area is considered to have a medium sensitivity due to the potential presence of sensitive species such as Sensitive species 2 and Aves – *Circus ranivorus* (African

marsh harrier) and *Sagittarius serpentarius* (Secretarybird). Scattered portions throughout the study area are considered to be of high animal sensitivity due to sensitive species such as Aves – *Ephippiorhynchus senegale* (saddle-billed stork).

The Compliance Statement compiled in terms of Protocol GN 320: Part B: Biodiversity combines terrestrial biodiversity, terrestrial plant species, and animal species.

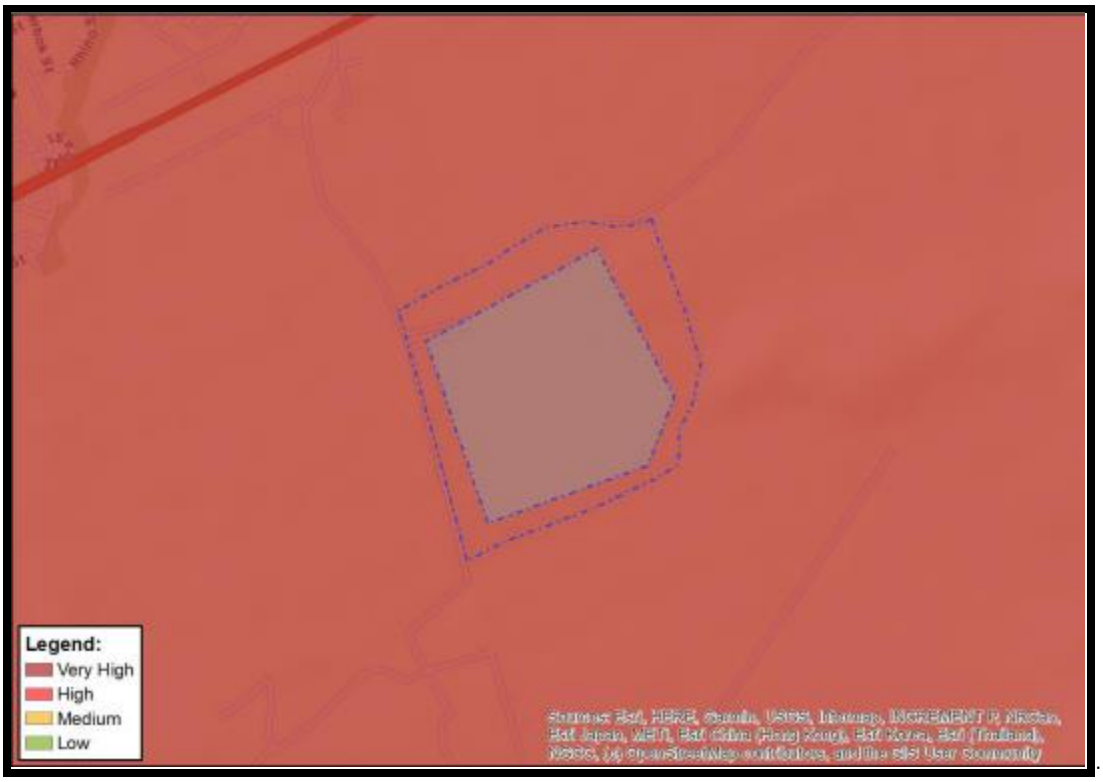


Figure 32: Terrestrial Biodiversity theme (DFFE Screening Tool)

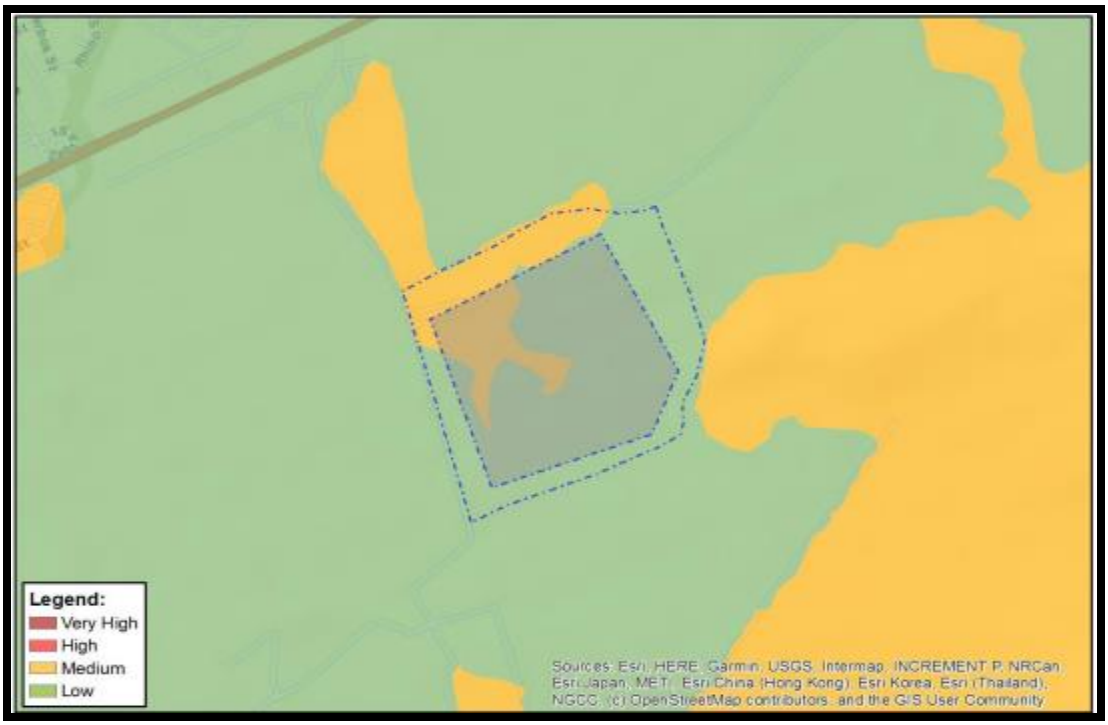


Figure 33: Plant Species Theme (DFFE Screening Tool)

Figure 34: Animal Species theme sensitivity (DFFE Screening Tool)

The desktop analysis indicates that several floral and faunal Species of Conservation Concern (SCC) were identified as having the potential to be observed within the study area, according to the Plant of Southern Africa online database and the Mpumalanga State of Environment Report. As these species are provincially important, should they be present

within the study area, they will require rescuing and relocation to a similar habitat within the vicinity of the study area before any construction activities commence.

7.11.1 SITE SENSITIVITY VERIFICATION

This site assessment was undertaken by Amanzi Environmental in March 2024, which constitutes a late wet-season survey. The different habitat types within the PAOI were delineated and identified based on observations during the field assessment, supported by available satellite imagery. These habitat types were assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of species of conservation concern, and their ecosystem processes.

Two (2) primary terrestrial habitat types were delineated within the PAOI:

- Bushveld; and
- Transformed.

The specialist highlighted that the proposed developability of the PAOI is as follows:

- Avoidance mitigation wherever possible. Minimisation mitigation (High SEI Areas) – Changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high-impact activities.
- Minimisation mitigation (Very Low SEI Habitats) – development activities of medium to high impact are acceptable, and restoration activities may not be required.

Table 25: Biodiversity Theme Site Sensitivity Verification

Site Activities	Screening Tool Sensitivity	Verified Sensitivity
Terrestrial	High	Very low
Plant	Medium/ Low	Very Low
Animal	Medium	Very low

The impact assessment report is attached in Appendix C-2.

7.12 SOIL AND LAND CAPABILITY

The agricultural sector plays an essential role in the fight against poverty and securing food security for the people of Mpumalanga. The role of agriculture in supplying employment to unskilled workers, ensuring food security to rural people, and stimulating other sectors in the value chain, such as manufacturing and trade, makes it an important sector for attaining growth and development. The current land utilisation by agriculture is determined by natural resources such as soil, water climate, and land ownership. Land utilised for commercial farming is about 90% of the total farmland, whilst small-scale/emerging farming is less than 10%. In terms of agricultural production, summer

cereals and legumes (sunflower seed, sorghum, dry beans, soybeans, potatoes, cotton, and maize) dominate the Highveld region, while sub-tropical and citrus fruit and sugar are grown extensively in the Lowveld (Malelane area). **Error! Reference source not found.**Figure 36 shows the soil and agricultural potential of the study area, drawing attention to the proposed alternatives.

7.12.1 DOMINANT SOIL FORMS WITHIN THE STUDY AREA

7.12.1.1 Mispah/Glenrosa

Lithic soils such as the Glenrosa are regarded as shallow soils, attributed to their shallow pedogenic and effective depth. The shallow nature of the dominant soil forms can be largely attributed to limited rock weathering and convex topography, which result in divergent water flow, which ultimately may result in soil erosion and, in some instances, leaving rocky outcrops behind. However, these soils can also be subject to preferential flow paths, which give rise to preferential flow paths and influence the pattern of plant root development. Provided that slope conditions, machinery for ripping and irrigation water are made available, these soils can be cultivated, although under intense management systems. Under dryland conditions, these types of soils are usually avoided for intensive use and thus left and thus left for grazing, forestry, and wildlife land uses. Due to depth and fertility limitations, these soils are classified under the Grazing (Class VI) land capability class. Figure 35 below depicts the soils associated with the Glenrosa soil form.

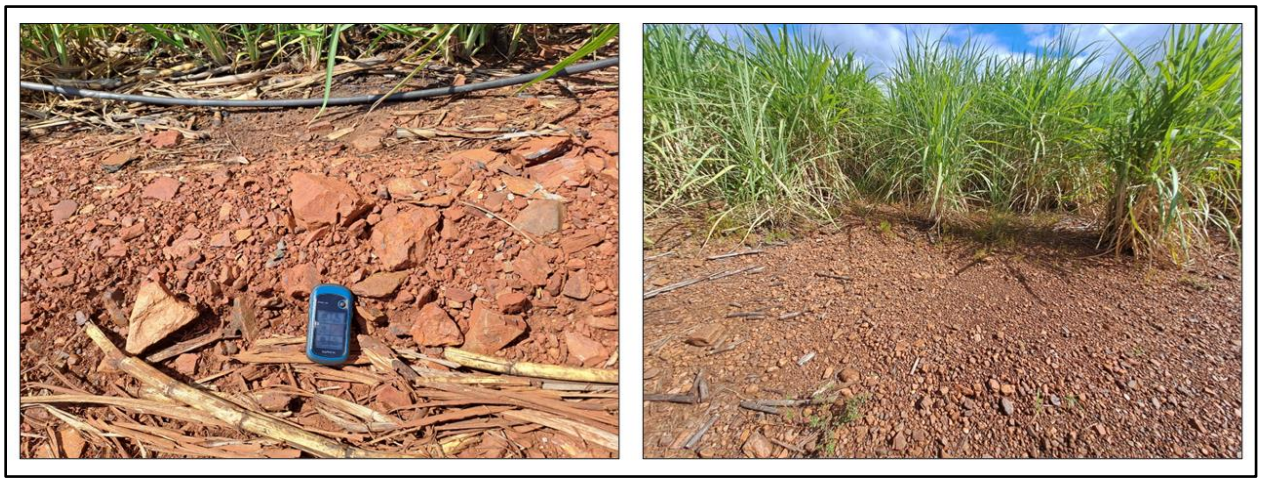


Figure 35: View of the identified Glenrosa soil formation.

Table 26: Soil forms in hectares (ha) occurring within the study area.

Khanyazwe Flexpower Study Area				
Soil Forms	Area (Ha)	Percentage (%)	Land Capability Class – According to (Smith, 2006)	Agricultural Potential
Mispah/Glenrosa	29,81	100	Grazing (Class VI)	Low

Khanyazwe Flexpower Study Area				
Total Enclosed	29,81	100		

Table 27: Land capability (DAFF, 2017) associated with the soils occurring within the study area.

Soil Form	Land Capability Groups	DAFF (2017) Classification
Glenrosa	Grazing Land	6. Low- Moderate

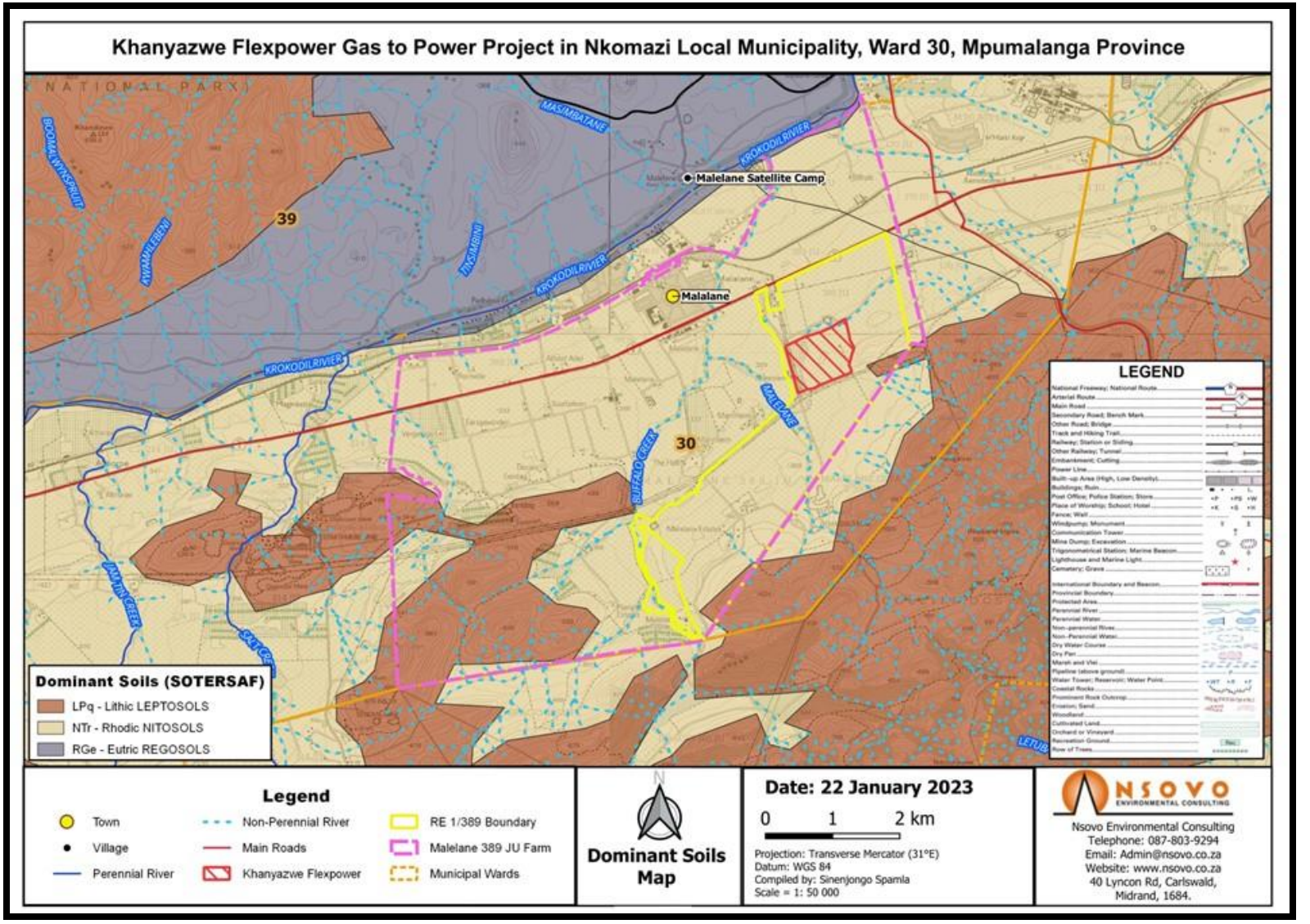


Figure 36:Soils around the study area.

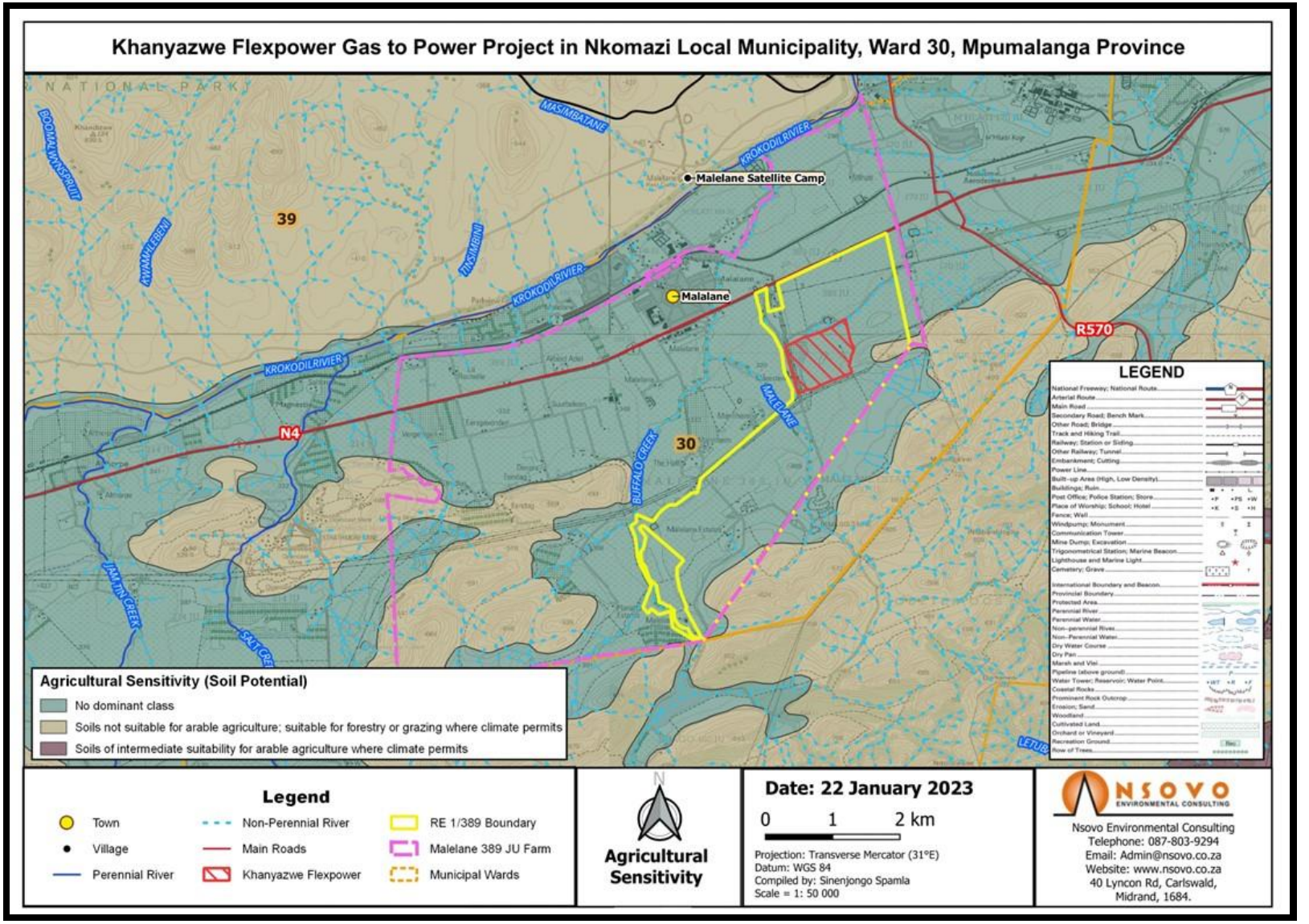


Figure 37: Agricultural Potential of the Study Area

7.12.2 SOIL AND LAND CAPABILITY SITE SENSITIVITY VERIFICATION

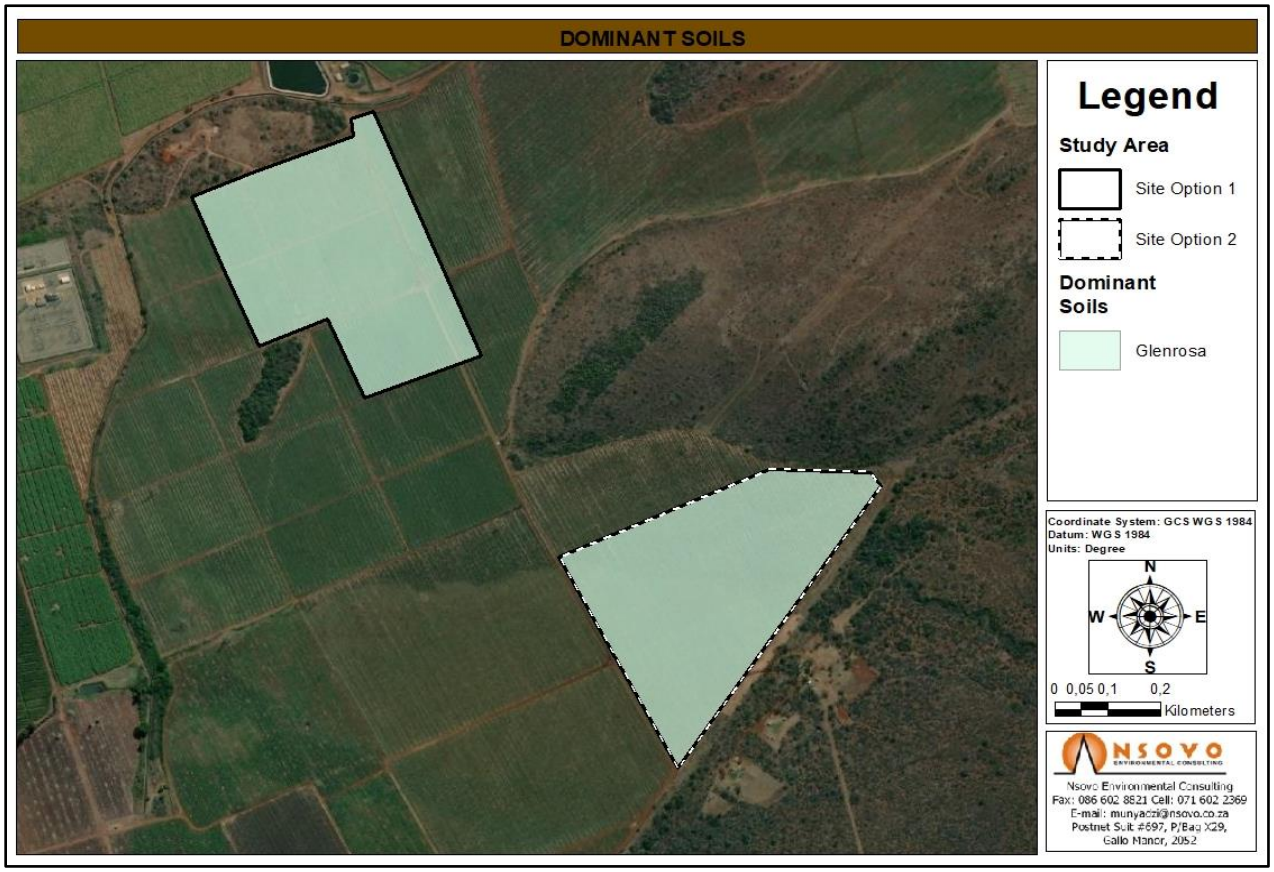


Figure 38: Dominant soils form within the study area

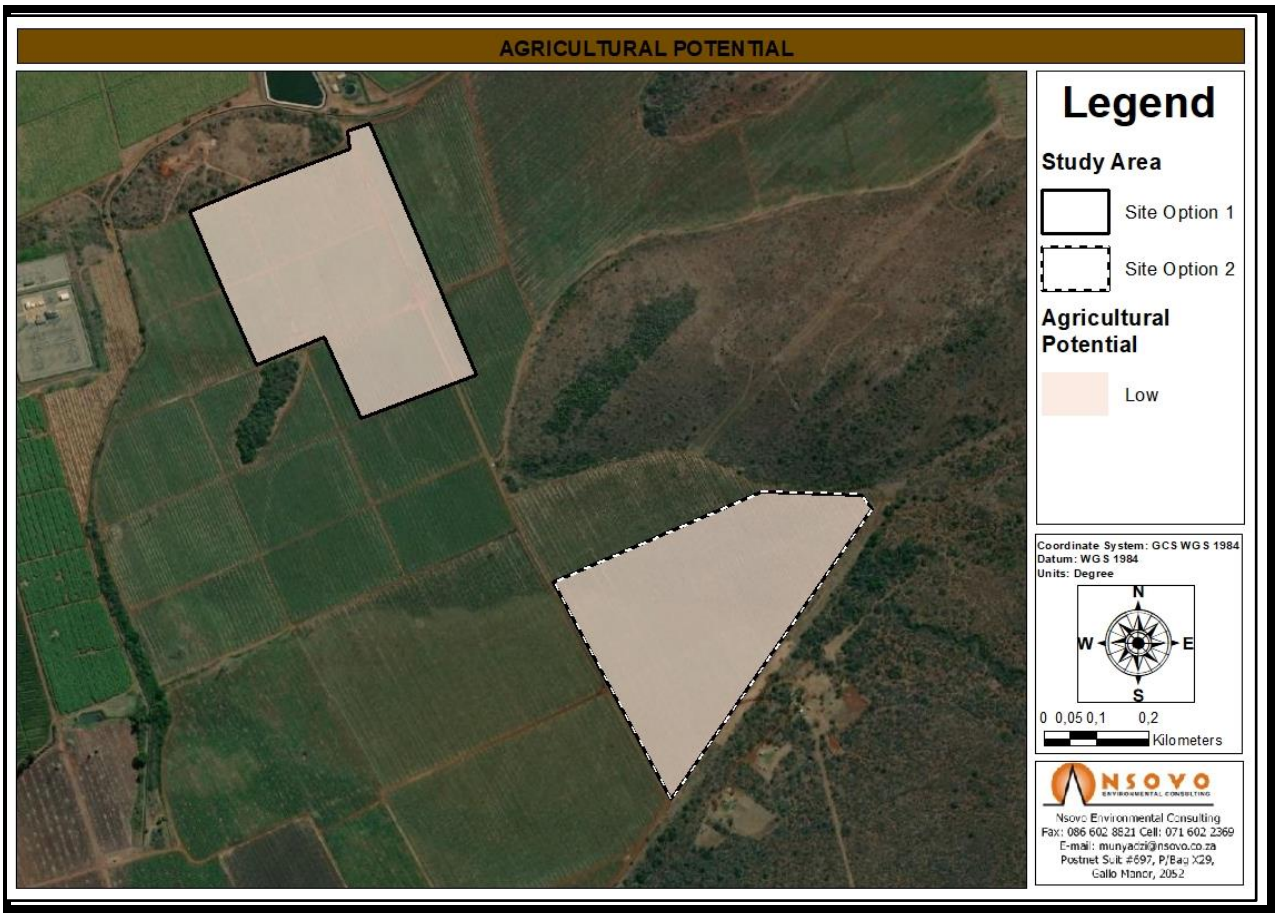


Figure 39: Agricultural potential for soils associated with the soils occurring within the study area

The development footprint areas (site options 1 and 2) present areas of active cultivation with sugarcane under irrigation. Thus, the proposed development on either Site Option 1 or Site Option 2 is likely to impact sugarcane production. The cumulative loss from a soil and land capability point of view is anticipated to be of moderately high significance. The reason is that a significant portion of soil under cultivation will be subject to different forms of soil degradation due to the different operations to take place during the construction of the proposed development. These proposed activities may potentially have a negative impact on agriculture on a local and regional scale. Surface soil stripping and landscape fragmentation are anticipated to impact agricultural productivity through loss of farmland, thus resulting in land use intensification and loss of income. Reduced farmlands may lead to shorter fallow periods, often causing further soil erosion, fertility loss, and yield potential.

Irrigated agriculture utilises large portions of South Africa's water resources' however, it is responsible for the production of high-value crops. Thus, the Preservation and Development of Agricultural Land Framework Bill published on 18 September 2020, although not approved yet, stipulates that land under irrigation is automatically regarded as high potential, even though the soils within the study area can generally be classified as low potential soils due to their inherent physical properties (i.e., stoniness, insufficient depth) which are generally not ideal for

cultivation. This is due to the high production capability and the possibility of exponentially increasing crop yields, and this is of high importance for food security at a local and regional scale. These irrigated areas usually indicate high capital investments made onto the farm. As such, these areas typically fall under protected agricultural areas, as depicted in Figure 40 below.

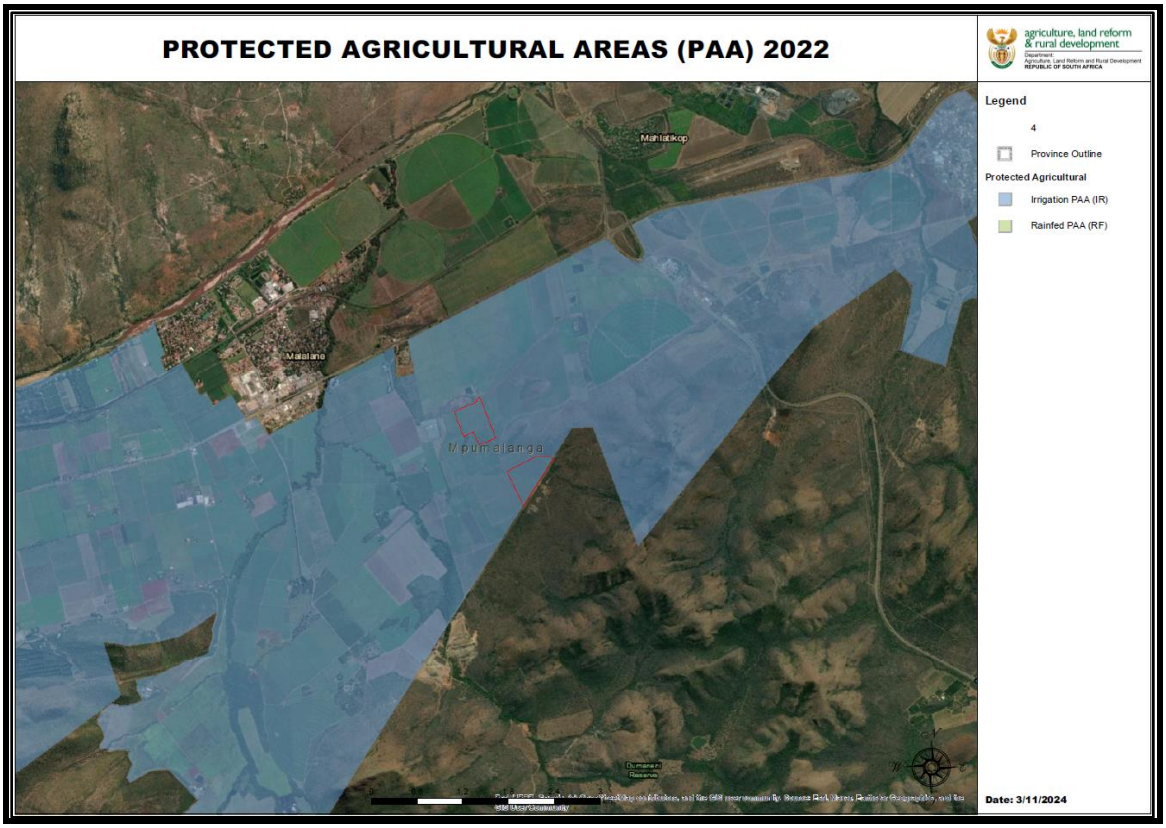


Figure 40.: Protected Agricultural Areas along the study area

If possible, sites outside protected agricultural areas should be sought where agricultural impacts are expected to be low, and the proposed development makes logistical sense. Should the proposed development proceed, the loss of agricultural soil and the permanent change in land use will be localised within the study area. It is the opinion of the specialist that the unmitigated scenario poses a threat to the sustainability of sugarcane production since it is the dominant land use within the study area. Therefore, integrated mitigation measures must be implemented accordingly to minimise the potential loss of these valuable soils, considering the need for sustainable development and increased electricity generation and transmission capacity.

The screening tool analysis was conducted, which presented the findings as the impact on agricultural resources being very sensitive in terms of agricultural potential. The outcomes of field verification results largely supported the screening tool due to the favourable conditions for commercialized sugarcane agriculture.

The specialist believes that this study provides the relevant information required for the Environmental Impact Assessment phase of the project to ensure that appropriate consideration of the agricultural resources in the study area is made in support of the principles of Integrated Environmental Management (IEM) and sustainable development.

Table 28: Agriculture Theme Site Sensitivity Verification

Site Activities	Screening Tool Sensitivity	Verified Sensitivity
Preferred Site	Very High	High
Powerline	Very High	High
Road	Very High	High

A Site Sensitivity Report has been compiled by a suitably qualified specialist and included as Annexure C-5 of the final Scoping report. The Specialist report has been compiled in terms of Protocol GN 320: Part B: Agricultural impact.

7.13 CIVIL AVIATION

SA Civil Aviation Authority Regulations and Technical Standards (CARS and CATS) often require extended Aeronautical Studies for developments deemed by the CAA to present high safety and/or operational risk to nearby aerodromes. CATS 139.01.30, which has recently been amended (SA-CATS2 of 2023 and Amendment 26 of the Civil Aviation Regulations), imposes on aerodrome license holders (as I&AP) the obligation to mitigate certain risks that obstacles or other issues may present to aerodrome or aircraft operations.

GWI (2024) confirmed that there are flight routes between FAKN (Kruger Mpumalanga International Airport) and FQMA (Maputo International Airport), which are the T125 (from FL200 to Fl245 and UT125 from FL245 to FL410). A conventional Route (G745 from FL145 to FL195) also links FAKN to FQMA. All these routes place aircraft potentially overhead the proposed site options. However, no scheduled airline operators are servicing this route. Non-commercial air traffic utilising these routes is estimated at fewer than 10 flights per week (as confirmed by frequent reference to 'Flight Radar24'). The higher altitudes (the lowest being 13 000Ft/ 4km or higher, above the 4 Options) of these aircraft and the E-W orientation of this route make them unlikely to be affected by glare issues from all 4 Options.

Furthermore, there are daily scheduled flight routes between FAKN and FALE (King Shaka International Airport). The first flight arrives at FAKN from FALE at approximately 11:40 (local time), and the second flight departs from FAKN to FALE at approximately 14:00 (local time). When Runway 05 is in use at FAKN, it is the departing flight that might, due to ATC Procedural Clearances, route overhead the proposed Options, and when Runway 23 is in use at FAKN, it is the

arriving flight that might cross overhead the proposed options. However, due to the high altitude (minimum of 9000ft/ 2.7km or higher, above the 4 Options), they are thus most unlikely to be affected by glare issues.

7.13.1 CAA SCREENING TOOL

In the current case, the high sensitivity indicated by the Screening Tool relates to the proximity to FAMN, which is a CAA-licensed aerodrome at Aerodrome Category 2. The South African Civil Aviation Authority (SACAA) is concerned with civil aviation safety and security, and the DFFE is mandated to ensure that the environmental impact of developments on civil aviation infrastructure is within reasonable parameters. To this end, the Protocol specifies distance limits that trigger specialist studies by civil aviation specialists as follows:

- Between 15 and 35km from a civil aviation radar,
- Between 15 and 35km from a major civil aviation aerodrome, or
- Between 8 and 15km of other civil aviation aerodromes, a medium or high sensitivity rating is assigned, triggering a CASS.

7.13.2 CAA SITE SENSITIVITY

The map below illustrates the general location of the aerodrome (FAMN) potentially affected by the proposed development. This information forms the basis for the sensitivity assessment, which considers the background provided above.

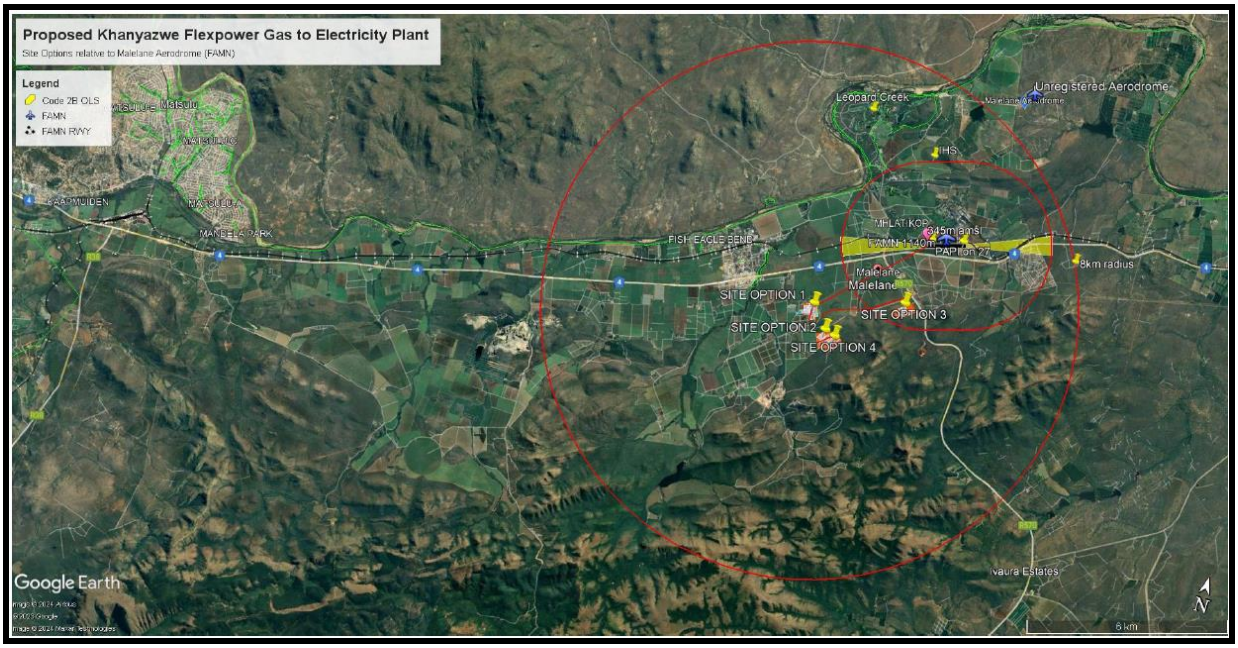


Figure 41: Location of the proposed site in relation to Malelane Aerodrome (FAMN)

According to GWI (2024), the analysis contained in this Aeronautical Study has determined:

- The proposed development and associated ground-based infrastructure for Option 1 is compliant with all relevant ICAO Annex 14 and SACAA (CARS and CATS) standards with respect to obstacle limitation surfaces and can, therefore, be supported for purposes of environmental approval. Options 2 and 4 are not compliant with the CAA 45m limitation within the 8km radius. However, they are mitigated by high-lying terrain between the sites and the FAMN airport, which screens the proposed structures. These options can, therefore, be supported for purposes of environmental approval. Option 3 is not compliant with the CAA 45m limitation within an 8km radius of an airport and would require further mitigations and approvals from the CAA if selected.
- The proposed development will not materially impact civilian radar, navigation, or communications infrastructure in the environs, nor present any material additional risks to operations at Malelane Aerodrome, currently or in the future. On this basis, this CASS recommends that the sensitivity status of the proposed development be amended to 'low' for Options 1, 2, and 4. However, the sensitivity status for Option 3 is recommended to remain as 'high' and requires a further extension of the scope to include a full Aeronautical Study, if requested by the CAA, and procure a Civil Aviation Compliance Statement if there are other considerations (non-aviation sensitivities) which make Options 1, 2 or 4 less feasible.
- The CAA Obstacle Approval process per CA139.27 must be complied with for the approved site.

Table 29: CAA Theme Site Sensitivity Verification

Site Activities	Screening Tool Sensitivity	Verified Sensitivity
Preferred Site	High	Low
Powerline	High	Low
Road	High	Low

The Civil Aviation Sensitivity Study by GWI Aviation Advisory is attached in Appendix C-14.

7.14 AVIFAUNA

Birds are considered good ecological indicators, since their presence or absence are symptomatic of whether the ecosystem is functioning properly or not. Bird communities and ecological conditions are linked to land cover; as the land cover changes, the types of bird species in the area also change. With the Kruger National Park located not far from the focus area (5 km North), the likelihood of avifaunal SCC migrating between the KNP and surrounding areas, including the focus area, or utilising the surrounding areas for foraging is medium. The proposed development site is not considered an important area for avifauna, particularly in terms of supporting breeding populations, and the actual diversity is expected to be made up of moderate numbers of more common and widespread species. Occasionally, some of the more sensitive species may be foraging on site. However, the actual dependence on the

site is probably very low. Within the vegetation type found in the study area and immediate surrounding areas, three major bird micro-habitat systems were identified: agricultural fields, bushveld/savanna, and watercourses.

Agricultural land (Sugarcane) is found within the project development site and is a common micro-habitat. Agriculture is a major environmental problem for threatened bird species, especially for species that depend on savanna for survival. The tilling of soil for cultivated fields is one of the most drastic and irrevocable alternations formed on natural systems, destroying the structure and species composition of the natural vegetation. This disturbance is mainly permanent and thereby has a massive impact on the taxa dependent on that vegetation. Bird species that are able to exploit monoculture and cultivated crops or by-products of cultivation, such as bare ground, may benefit temporarily. Avian species that will be attracted to these areas include Cranes, Harrier species, and Heron species. Arable or cultivated land represents a significant feeding area for many bird species in any landscape for the following reasons:

- Land preparation exposes the soil surface, making many insects, seeds, bulbs, and other food sources readily accessible to birds.
- Seed-eating bird species (granivorous species), such as quelea, doves, and bishops, largely benefit from agricultural lands as their seeds supply food in large quantities.
- The agricultural lands attract insects, which are in turn eaten by birds and
- During the dry season, the arable lands often represent the only green or attractive food sources in an otherwise dry landscape.

The Savanna biome is rich in large raptors and forms the stronghold of Red Data species such as the White-asked Vulture, Cape Vulture, Martial Eagle, and Tawny Eagle. These large raptors may occasionally utilise the study area for foraging arrays. The savanna biome contains a large variety of species (it is the most species-rich community in southern Africa) but is generally less important from a Red Data bird perspective, as very few bird species are restricted to this biome. Apart from Red Data species, the region provides habitat for several non-Red Data raptor species, such as the Brown Snake Eagle, Black-breasted Snake Eagle, Long-crested Eagle, and a multitude of medium-sized raptors such as the migratory Steppe Buzzard, African Harrier Hawk (Gymnogene), Wahlberg's Eagle and African Hawk Eagle.

Watercourses: The study area contains pans/dams, mostly associated with the non-perennial river. No palustrine wetland habitats were observed on the site and adjacent areas. Several artificially created farm dams were observed, and these dams are important refuges for various waterbirds, including species such as African Fish Eagle and Black Stork. The dams and larger rivers may be utilised on a temporary basis for foraging by Yellow-billed Stork and Marabou Storks. Common species that could use pans and dams include Red-knobbed Coot, Black-headed Heron, African Darter, Blacksmith Lapwing, and Egyptian Goose. The non-perennial river on site is considered an important attraction to various bird species. Bird species such as herons, bishops, weavers, cisticolas, and warblers will breed in the reeds growing on the banks of the rivers and will also feed on insects that live within the reeds. Many of these bird species make use of the thorny nature of these trees to build their nests. Water bodies represent sensitive areas because they provide habitat for a wide variety of terrestrial and aquatic species, particularly avifauna. Several more common water-dependent species, e.g., Red-knobbed Coot, Black-headed Heron, African Darter, White-faced Duck, Yellow-

billed Duck, Blacksmith Lapwing, African Sacred Ibis, and Egyptian Goose, are known to utilise these habitat units. The larger rivers near the project site are particularly important for stork species such as Black Stork and Yellow-billed Stork and a variety of other waterbirds. The riparian habitat along the Malelane River (East of the project site) could provide refuge for shy and skulking species, such as the White-backed Night Heron.

Thirty-six (36) bird species were recorded during the field survey. These species were common and widespread, and typical of the savanna biome. No Red Data bird species associated with the study site were recorded.

Figure 42: Photographs of the Glossy starling and long crest eagle on site (Mboneni, 2024)

A project of this nature could impact birds by crash-prone birds colliding with certain sections of the powerline, particularly within watercourses, electrocution of large birds perched on the poles, destruction of habitat, and disturbing birds.

The avifauna report is attached in Appendix C-15.

7.15 ECO-TORURISM

7.15.1.1 Mpumalanga

Ecotourism refers to nature-based forms of tourism in which the main motivation of the tourists is the observation and appreciation of nature and the traditional cultures prevailing in the area. Ecotourism focuses on the conservation of the natural environment with low-impact tourist behavior. There is support for local conservation efforts and a sensitivity and appreciation for local cultures and communities.

When not planned and managed sensitively, many tourism initiatives threaten the natural ecosystems and local cultures, leading to environmental degradation. On the other hand, growth in the tourism industry can create positive opportunities to enhance the environment and produce revenue to protect natural areas and uplift the local

communities. Mpumalanga Province is one of South Africa's top tourist destinations, attracting local and international tourism. It is referred to as “The Place of the Rising Sun,” and few regions match the extraordinary and diverse beauty of the Lowveld and escarpment (www.mpumalanga.com).

Mpumalanga covers nearly 80 000 km² from rolling highlands to the lofty escarpment and the lush wetlands. The Mpumalanga Tourism Authority has created seven regions with specially marked routes that invite visitors to the spectacular Mpumalanga province on an unforgettable journey of the seven regions of Mpumalanga and the "must-see" attractions.

Mpumalanga Province offers tourists a unique and unforgettable experience, from the bushveld landscapes to the escarpment with the start of the Drakensberg mountains. The landscape provides vast open spaces and serenity for its visitors. These landscapes are convenient for mainstream tourists, as there are many resorts, world-class tourist destinations, and tour operators to choose from. Tourist accommodation options range from luxury to budget, attracting tourists from all backgrounds. The most prominent national park in the study area is the Kruger National Park. Malelane, where the site is located, is directly south of the Kruger National Park. It is also the gateway to tourist attractions in Mozambique.

7.15.1.2 Malelane

Tourism infrastructure expanded rapidly in the late 1990’s when the N4 road, as it is known today, was upgraded and became a toll road. A government project was launched that saw significant growth in the area, known as the Maputo Corridor, with big corporations settling there. Malelane Gate was then named as one of the main entrances to the Kruger National Park. This led to a drastic increase in tourism in the area, and many lodges were established.

These include Malelane Lodge, Pestana Lodge, and many bed and breakfasts (B&Bs). Sun International bought Malelane Lodge, and Spar and Pick 'n Pay also invested in branches of their retail shops in the area, establishing new shopping centers. This was beneficial to the area, particularly the agricultural sector. Rather than buying goods from faraway suppliers, Spar and Pick 'n Pay are bought from local farmers. Due to the increase in tourist activities in the area, many contractors were brought in to meet the demands of new developments. Malelane town grew as many people were now living in the town or nearby because their jobs entailed them working at lodges or similar establishments in the immediate area. This boosted the local economy greatly and local shops benefited from the new influx of trade. More trade also came from Mozambique after the civil war.

Future developments saw sections of the Kruger National Park outsourced to large companies and corporations. This had both negative and positive effects on the region. By outsourcing sections of the Kruger National Park, the

companies involved could attract more international tourists, who injected large amounts of foreign money into the area's economy.

- The development of the Leopard Creek Golf Club and housing estate aided in giving the local economy a boost. A bonus to this was the revenue from golf tournaments, such as the Sunshine Tour's Alfred Dunhill Championship, which benefited the town. More lodges and B&B's were also built in the area.
- The nearest B&Bs are the Cycas Guesthouse to the north and the Elegant Guest House to the west of the site.
- The Elegant Guesthouse's main view is to the south, where a river and trees screen the guesthouse from the KFP. Cycas Guesthouse and numerous other guesthouses are in town in a suburban built-up setting, and views to the KFP are screened by other buildings and the N4.
- Many exclusive lodges and golf estates are located on the banks of the Crocodile River south of the border of the Kruger National Park. The lodges face to the north with views towards the river, away from Malelane and KFP. Also, the topography and trees provide screening for the KFP.
- The Malelane Satellite Camp is a camp within the Kruger National Park that may be affected by the proposed KFP. The views from the Malelane Satellite Camp are towards the south onto Malelane town. Malelane has industries, including sugar mills, which will mitigate the presence of the new KFP plant.
- The Kruger National Park is the premier or flagship park in South Africa, which places certain obligations on this park towards the management of biodiversity and ecotourism. It is, in many senses, the pride and joy of an increasing percentage of locals and tends to attract ongoing and often intense interest from concerned citizens, tourists, and civil society. Apart from its biodiversity value, it has cultural resource conservation obligations due to the presence of important archaeological relics.

The specialist highlighted that the majority of the study area is considered to have moderate landscape character sensitivity due to the surrounding natural landscape and high tourism value. However, the proposed preferred site is environmentally degraded and mostly used for agriculture. There is also an industrial character, with the Khanyazwe Substation and powerlines crossing the landscape. There are industries associated with agriculture, such as sugar mills and processing plants. The relatively flat and level landscape provides minimal visual screening. The vegetation in the surrounding areas is a savanna landscape with medium-sized trees and grass, which is mostly dormant in winter and does not afford much screening. The area directly surrounding the site is agriculture, with sugar cane being the most dominant crop noted during the site visit. Previous human-induced activities and interventions have significantly impacted the original landscape character. In this case, industrial and existing infrastructure, including power lines, roads, and residential developments, can be classified as landscape disturbances and elements that reduce the condition of the affected landscape type and negatively affect the quality of the visual resource.

The Specialist Report is attached in Appendix C-16

7.16 SENSORY ASPECTS

7.16.1 NOISE

The study area falls within (a) to (b) type districts because of the type of activities such as main roads, gravel roads, little traffic, and major traffic, which all have an influence on the prevailing ambient noise level for a specific area. There is, therefore, a mixture of activities and higher noise levels as per the above recommended continuous rating levels within, i.e., residential, agricultural activities (seasonal), and feeder roads in proximity to each other or to a farmhouse. A farmhouse next to the R63 road will experience higher noise levels than the farmhouse/s some distance from the roads. Therefore, the ambient noise level will differ throughout the study area, depending on the location and the measuring position in relation to areas with existing noise sources, such as roads.

According to the Noise Regulations, a noise disturbance is created when the prevailing ambient noise level is exceeded by 7.0 dBA or more. Noise is part of our daily exposure to different sources, which is part of daily living, and some of these physical attributes may sometimes be part of the ambient levels that people get used to without noticing the higher levels.

There will be a shift in the prevailing ambient noise level in the immediate vicinity of the Khanyazwe Flexpower Plant Project. People who may work or visit the plant will experience an increase in the prevailing ambient noise level in the vicinity of the Khanyazwe Flexpower project. The prevailing ambient noise levels are largely created by emissions from a combination of noise sources, the main source of which is distant traffic noise, agricultural-type noises, distant train noise, insects, and bird noises. The large variations in the meteorological conditions and the geographical relations between the Khanyazwe Flexpower project footprint and the noise receptors allow for a decrease in the noise as it propagates from the Khanyazwe Flexpower project.

The current noise within the vicinity would primarily be from the following sources:

- The N4
- Shooting Range
- Agricultural Equipment

The receptors are the nearby homesteads, residential communities, and tourists. Two aspects are important when considering the potential impacts of a project:

- The increase in the noise levels; and
- The overall noise levels that the proposed activities will create.

Noise was one of the primary concerns raised during the consultation process. Indeed, there will be an upward shift in the immediate environmental noise levels temporarily during the construction phase and more permanently during the operational phase in the vicinity of the plant. The noise increase at the abutting residential areas is not anticipated to exceed the prevailing ambient noise levels during the construction, operational, and decommissioning phases. The specialist report by DB Acoustics highlighted that the environmental noise impact during the construction and rehabilitation phases will be low and during the operational phase medium after the implementation of acoustic screening measures. The potential noise intrusion from the proposed power-generating activities can, however, be controlled by means of approved acoustic screening measures, state-of-the-art equipment, proper noise management principles, and compliance with the Noise Regulations, 1992, and the International Finance Corporation's Environmental Health and Safety Guidelines.

A detailed noise assessment was undertaken during the EIA phase to determine the direct and indirect impacts during all project phases. The proposed Khanyazwe Flexpower project will be in line with the environmental noise standards and guidelines provided that all the noise mitigatory measures are in place and that the Noise Impact Management Plan (NIMP) and Noise Monitoring Plan (NMP) for the Flexpower project are adhered to.

The Report is attached in Appendix C-4.

7.16.2 Visual Aspects

Visual appreciation or dislike is subjective, and thus, what is aesthetically pleasing to some can be displeasing to others. The visual analysis of a landscape and the impact of new developments and structures tend to be complicated, and it is evident from previous experience that when dealing with the reaction to landscape changes, a large diversity of opinion exists. In this regard, the project developer must be sensitive from a visual impact perspective to the requirements of the local people, notably rural communities and farmers. Many topographical features influence this environment, which will need to be utilized when selecting an alignment to minimize visual impacts and intrusions.

The study area consists of largely agricultural land used for commercial purposes. There are few human settlements, like small towns and farming communities, and the natural landscape is mostly degraded and used for agricultural purposes around these settlements. Within the receiving environment, specific viewers (visual receptors) experience different views of the visual resource and value it differently. They will be affected by alterations to their views due to the proposed project. The visual receptors included in this study are:

- Residents.
- Tourists; and
- Motorists.

The study area is moderately populated, with lower populations in the farming communities and higher populations in the towns. The residents near the proposed study area are in Malelane town and may experience low visual intrusion. The entire study area is considered to have a high tourism potential, primarily because of the Kruger National Park and its proximity to the N4 route connecting to Mozambique.

7.16.2.1 Visual Impact Site Sensitivity Verification

One of the primary concerns raised during the consultations and comment period related to the visual impact of the proposed project, given that the site is close to the KNP, a highly sought-after tourist destination. A visual impact site sensitivity verification was thus commissioned to provide insight into the possible visual impacts. The verification entailed the following:

- A desktop analysis using satellite imagery
- A preliminary on-site inspection
- Any other available and relevant information

Considering the above background, the specialist noted that the visual impact of the project will cause changes in the landscape that are noticeable to viewers experiencing the study area, especially from the N4 and residential areas. The study confirmed that the Visual impacts that would potentially result from project activities are likely to be adverse and long-term and will most likely cause a loss of landscape and visual resources. The visual impact from the Kruger National Park is anticipated to be moderate to low due to the distance from the site and the topography and bushveld landscape with large trees that will help screen the development.

Figure 43 : Views towards the proposed site (Outline Landscapes, 2024)

During the Scoping the specialist recommended conducting a full Visual Impact Assessment to ascertain the extent of the visual impact's significance and comprehensively respond to the concerns raised. This would allow the significance of the visual impact to be rated and assessed using computer modelling techniques that analyse visibility and visual intrusion (Outline, 2024).

The VIA's terms of reference align with the legislation's requirements and the associated protocols. The assessment is aligned with the "Guideline for involving visual & aesthetic specialists in EIA processes: Edition 1," prepared for the Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning. In terms of the guidelines, the proposed project is a Category 5 development; as such, a Level 3 assessment is recommended (Outline, 2024).

The following issues are addressed:

- Establish public concern for the project, specifically visual issues.
- Establish specific management measures (mitigation measures) to reduce the impact of the project were appropriate.

The VIA Specialist Report is attached as Appendix C-8.

7.17 TRAFFIC

Traffic surveys were conducted on Wednesday, 14 April 2021, at the key study intersection previously discussed. From this survey, it was determined that the critical peak traffic hours occurred between 06h45-07h45 (AM peak hour) and 15h30-16h30 (PM peak hour). Light and heavy vehicles constitute 79.5 % and 20.5 % of the total traffic volume. Although it is recommended that traffic data not older than 2 years be used for traffic studies, it was deemed acceptable that this data be used to determine existing traffic volumes based on the following:

- Since the previous traffic counts, no new developments were constructed to the south of the N4, which could have increased traffic along the unnamed gravel road. Traffic volumes along the unnamed gravel road are therefore expected to have remained unchanged, and
- The increase in traffic along the N4 since the previous traffic counts can be accurately determined using recent SANRAL traffic data. Considering the above, an annual growth rate of 2.0% was applied to the traffic volumes of the 2021 traffic survey to get an indication of the existing 2024 traffic volumes at the study intersection.

Considering the expected number of vehicle trips to be generated as a result of the proposed project (discussed in Section 5.4 of the TIA Report attached in Appendix C-12) as well as the expected distribution of these trips on the surrounding road network, the following existing roads were deemed relevant for this study:

- N4: This road is a class 2 (major arterial) and falls under the jurisdiction of the South African National Roads Agency Limited (SANRAL).
- Unnamed Gravel Road: This gravel road can be classified as a class 5 road (access road) and is believed to be a shared private road providing access to several farms and properties south of the N4. It also provides access to the study site.

The intersection of the unnamed gravel road with the N4 is more than 1 km from the next intersection along the N4. A farm access is located opposite the N4 access point approximately 30 m to the east, but as part of the current upgrading of the N4, this farm access will be moved approximately 500 m to the west to the location of the future "Link Road East" intersection.

The above roads' classification is based on the TRH 26, South African Road Classification and Access Management Manual (2). Figure 1 shows their location in relation to the subject site.

The planned realignment of the N4 is underway. The route will be realigned to the south and serve as a ring road around Malelane. The current N4 route passing through the town will be declassified as a class 3 minor arterial road, and the traffic volumes on this route are expected to decrease. The realignment of the N4 is not expected to happen within the next 10 years.

No vulnerabilities or sensitivities have been identified in the study area from a traffic engineering and transportation planning perspective.

7.18 SOCIAL BASELINE

The proposed Project has the potential to have positive and negative socio-economic consequences; therefore, the socioeconomic baseline conditions must be understood to ensure accurate identification and assessment of the potential impacts associated with the proposed Project. This section provides an overview of the socioeconomic baseline of the proposed project area from the district and local municipality levels.

7.18.1 SOCIO-ECONOMIC SENSITIVE AREAS IN PROXIMITY TO THE SITE

The study area is approximately 2 km southwest of Malelane. Neighbouring farms are large, and local communities within a 5 km radius may experience a range of impacts related to the proposed project; as such, these farms and local communities represent the direct influence. No dwellings are located within the project site.

7.18.2 LAND USE

. The land cover is predominantly grassland and cultivated crops. Land use throughout the project proximity is entirely Sugar cane farming. The other areas in the vicinity of the study areas comprise the Eskom substation with transmission and distribution power lines traversing the study area. Residential areas were also observed, as described in Section 3.3 above, as commercial accommodation establishments (i.e., guest houses).

7.18.3 Political and Administrative Structure

The province has a dual system of governance, with political institutions of governance and traditional authority, each of which is briefly detailed below:

- Political Structure of Government

South Africa is a constitutional democracy with a three-tiered government and a separate judiciary. National, provincial, and local governments have legislative and executive authority in their respective sectors. The provincial government is responsible for developing the province's strategic vision and framework. They guarantee inter-municipal cooperation and coordination and ensure that each municipality accomplishes its particular tasks. District municipalities, comprising local municipalities, are responsible for developing IDP and the overall supply of services and infrastructure within the districts. The goal of district and local governments sharing responsibilities for local government is to provide equal access to resources and services to all communities, particularly disadvantaged ones.

- Traditional Authorities

According to GSDM IDP 2019-2020, traditional authorities are primarily found in rural areas, where chiefs and their councils oversee organizing local communities if any investment projects fall under their area of Jurisdiction and handling community administrative duties. The project itself is not situated in the traditional area. However, the House of Traditional Leaders for the district has been established, Figure 44 below.

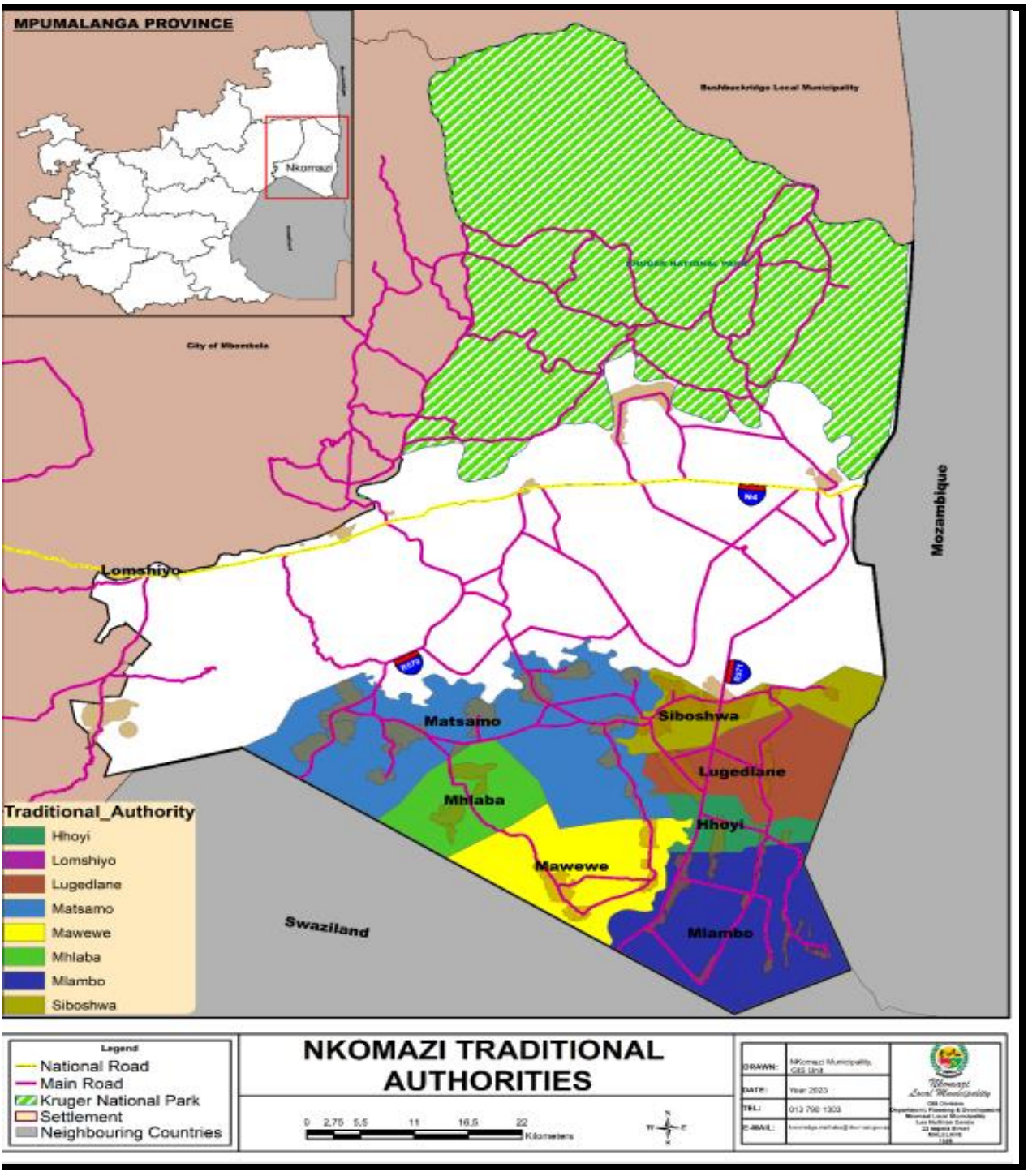


Figure 44: Nkomazi Traditional Authorities (NLM IDP 2024)

7.18.4 POPULATION DYNAMICS AND SPATIAL STATUS

Table 30 shows that the population of Mpumalanga has steadily risen over the years, with the current population recorded as 4 335 963 persons. A comparison between the two census periods reveals that between 2011 and 2016,

the population increased by 7.32% from the 2011 census to the CS 2016. The number of households in the province has also been growing over the years in line with the increase in population. Over 5 years, households have risen from 1 102 205 in Census 2011 to 1,238 861 in CS 2016.

Table 30: Population and Household Growth

Area	Population		Growth p. a	Households		Growth p. a
	2011	2016	2011-2016	2011	2016	2011-2016
DPIKSLM	83,235	85 395	2.6%	19,959	22 547	12.9%
GSDM	1 043 195	1 135 409	8.84%	281 518	333 811	18.6%
Mpumalanga	4 039 939	4 335 963	7.32%	1 102 205	1 238 861	12.40%

Source Stats SA 2011 and Community Survey 2016

According to Stats SA (2016 Community Survey - CS), Nkomazi's population increased from 393 030 in 2011 to 410 907 people in 2016, and it was sitting at 410 830 in 2021; it is said to be the fourth largest population in the province and 23% of total Ehlanzeni population in 2016. Between 2011 and 2016, the population grew by 17 877 and recorded a growth rate of 1.0% per annum – the average annual economic growth rate was higher than the population growth rate, which is positive. The population number for 2019 is 423 358, and for 2030, it is estimated at 472 327 people, given the historical population growth per annum – which will put pressure on the infrastructure, service delivery, and employment opportunities to the Municipality.

7.18.5 EMPLOYMENT

More than a third (34,2%) of the 110 469 economically active (employed or unemployed but looking for work) population in the municipality is unemployed. Among the 64 497 economically active youth (15 – 34 years) in the area, 42,3% are unemployed (Figure 45).

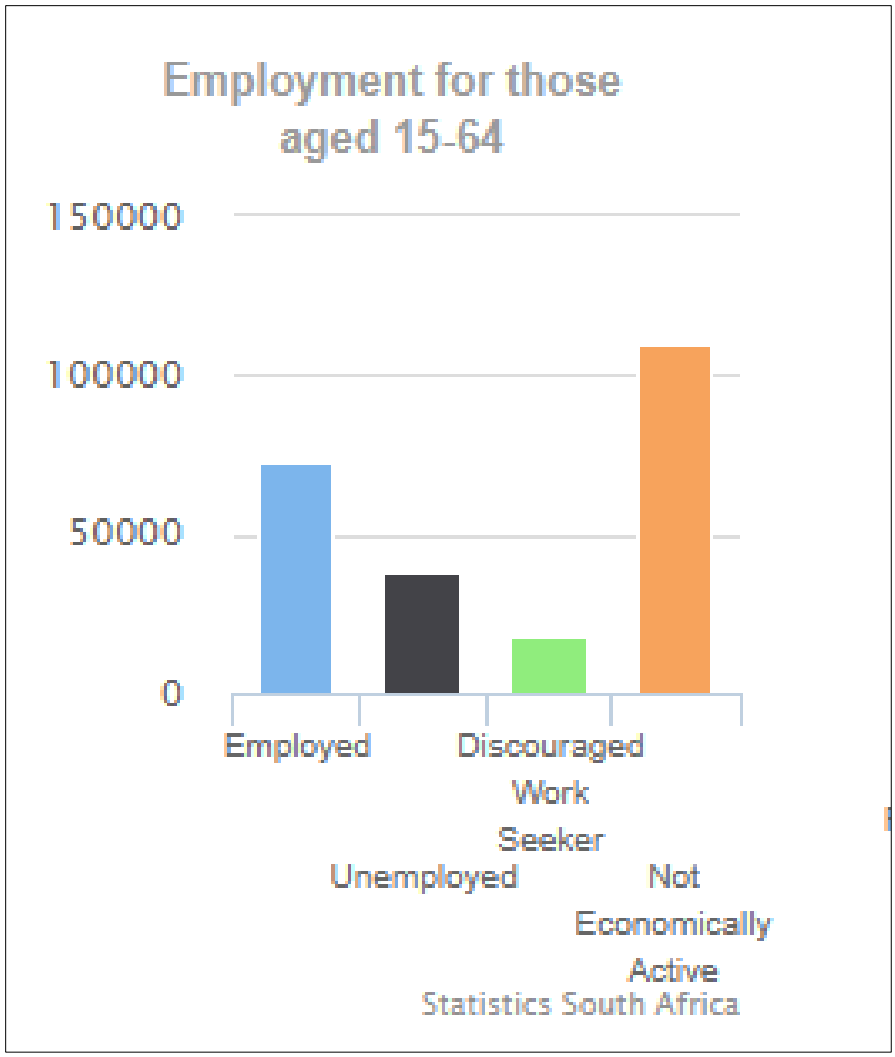
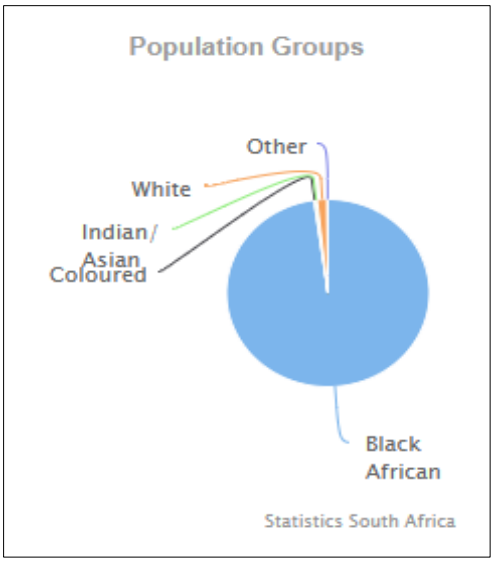


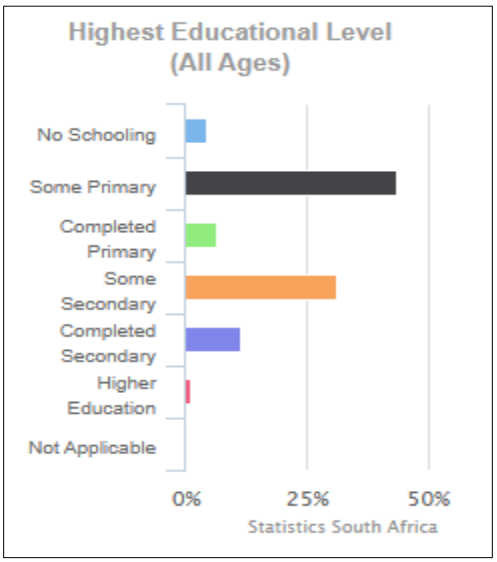
Figure 45: Employment between the age of 15-64 (StatsSA)

7.18.6 Ethnicity and Education Level

According to Census 2011, the Nkomazi Local Municipality has a total population estimated at 393,030, of which 97,7% are Black African, 1,6% are white, with other population groups making up the remaining 0,4%. Population groups **(www.statssa.gov.za)**. Of those 20 years and older, 4,6% have completed primary school, 25,6% have some secondary education, 25,6% have completed matric, and 6,7% have some form of higher education, below.



Population groups (www.statssa.gov.za)



Highest education level (www.statssa.gov.za)

7.18.7 Economic Structure

Mpumalanga's coal mining industry, tourism, agriculture, and renewable energy are significant employers, contributing to 19% of the province's Gross Value Added. The transition to clean energy, agro-processing, and construction sectors is expected to create jobs. Mpumalanga's transition to renewable energy is expected to generate employment through significant investments, necessitating a coherent policy for job creation and a provincial value framework.

The GSDM economic drivers include coal mining, manufacturing, and the chemical industry. Coal mining provides employment opportunities in Ermelo, but concerns arise due to the transition to renewable energy. Manufacturing contributes to employment, while the chemical industry is crucial for job creation and economic growth.

7.18.8 Housing and Services

Using the Statistics SA definitions of a household and a dwelling unit, households can be classified based on the kind of residence. The following are the categories:

- Formal dwellings are buildings constructed per approved plans; examples include homes on separate stands, apartments, townhouses, rooms in backyards, rooms or flats rented elsewhere, etc. However, these buildings do not have flush toilets or running water.
- Informal dwellings include shacks or shanties in informal settlements, serviced stands, or designated townships, as well as shacks in the backyards of other dwelling types.
- Traditional dwellings – constructions of clay, mud, reeds, or other locally accessible materials.

Most of the households with the NLM are formal and informal, and traditional dwellings contribute to 3.9 and 2.9%. The number of households in Nkomazi increased by 7,763 from 96,202 in 2011 to 103,965 in 2016- representing 21,5% of the Ehlanzeni household figure household size, declining from 4.1% between 2011 and 2016. In the youth population (15-35) forma 38.0% of the total population; in 2016, the share of the female population was 52.3% and males 47.7%.

The impacts and risks identified during the impact assessment by EAP and specialists, including nature, significance, consequences, extent, duration, and probability of such impacts, are presented in this section. Information contained herein is also based on input from the specialist.

8 DESCRIPTION OF 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

This section describes the proposed project's potential impacts on the receiving environment. The impacts associated with the relevant environmental components within the study area, as identified, have been assessed based on the EAP's opinion and consultation with specialist studies.

8.1 SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS IDENTIFIED

The impacts and risks identified during the impact assessment by EAP and specialists, including nature, significance, consequences, extent, duration, and probability of such impacts, are presented in this section. Information contained herein is also based on input from the specialist.

This section describes the proposed project's potential impacts on the receiving environment. Impacts associated with the relevant environmental components within the study area as identified have been assessed based on the input from the specialist studies undertaken and the EAP's opinion. The proposed project will be underground, with the highest risk identified being subsidence.

The potential impacts associated with the proposed project include impacts on:

- Aquatic,
- Soil and Agriculture,
- Eco-Tourism,
- Wetlands,
- Avifauna,

- Heritage,
- Civil Aviation,
- Socio-economic; and
- Palaeontology
- Traffic Impact

Table 31: Potential Environmental Impacts Identified

Aspect	Impact	Impact Description	Mitigation Measures
Employment	Positive Impact -Not mitigative require. Measure to enhance are proposed.	Providing employment opportunities during the construction and operational phases. **Direct Employment:** The construction phase will create thousands of jobs, offering immediate employment for skilled and unskilled workers. Once operational, the power plant will require a permanent workforce, including technical, administrative, and maintenance roles. **Indirect Employment:** The project will also generate indirect employment opportunities through the demand for goods and services related to the construction and maintenance of the power plant, benefiting local businesses and service providers. **Skills Development:** Training and capacity-building programs associated with the project will enhance the local workforce's skills, improve employability, and support long-term economic resilience. This focus on skills development aligns with broader regional goals of enhancing human capital and reducing poverty.	• The proposed Khanyazwe Flexpower Project site is an active sugarcane farm employing about 80 farm workers. The project's development will necessitate repurposing this agricultural land, leading to the loss of some these jobs. A strategy should be developed to mitigate the impact, including re-employment opportunities within the project, training programs for new roles, and compensation packages. • Engaging with the affected workers is essential to address their concerns and explore alternative employment opportunities, ensuring their continued economic stability and contribution to the local community. • The project also manages local communities' expectations regarding job opportunities, ensuring transparency and inclusivity throughout employment. Recognising the importance of community engagement and the high demand for local jobs, the project actively communicates the nature, scope, and timeline of employment opportunities to the residents. This involves

Aspect	Impact	Impact Description	Mitigation Measures
			setting realistic expectations about the types of jobs available, the skills required, and the duration of employment, whether during the construction or operational phases. • KFP must promote the creation of employment opportunities for women and youth. The positions reserved for the youth and women may only be filled with persons outside of these categories if it can be demonstrated that no suitable persons can be employed.
Socioeconomic Benefit	Positive	The Khanyazwe Flexpower Project offers numerous economic benefits and opportunities that are poised to drive substantial growth and development in the local and regional economies of Malelane, the Nkomazi Local Municipality, and the broader Mpumalanga Province. By creating jobs, bolstering local enterprises, enhancing infrastructure, and encouraging economic diversification, the project is set to foster a more prosperous and resilient community. The project aligns with broader regional and national development goals by stimulating economic growth, improving infrastructure, and promoting environmental sustainability. Its	

Aspect	Impact	Impact Description	Mitigation Measures
		comprehensive approach to economic and social development ensures that the benefits are widely shared, paving the way for a more prosperous, resilient, and inclusive future for the local community and the broader region.	
Biodiversity	Negative	The PAOI was found to be post harvesting and in the process of burning. Based on the criteria provided in Section 1.4.3 of this report, the habitat within the Project Area was assigned a sensitivity category, i.e., a SEI category. The Project Area was categorised as possessing a single habitat 'Very Low' SEI. This is owing to the disturbed nature of the immediate footprint.	• Areas to be developed/disturbed, including transmission lines, should be specifically demarcated so that only the demarcated areas will be impacted during the construction/activity phase. • Areas of indigenous vegetation outside the direct project footprint should not be fragmented or disturbed further. • The construction area must be fenced off and no ingress into other areas allowed. • Roads and Transmission lines construction must only be considered in transformed habitat. • Adhering to existing roads and servitudes. • An Invasive Alien Plant Management Plan must be compiled and implemented. This should regularly be updated to reflect the annual changed in IAP composition.

Aspect	Impact	Impact Description	Mitigation Measures
			• Areas that have been disturbed during construction but will not undergo development must be revegetated with indigenous vegetation dominant in the area. • Use existing access routes as much as possible before considering new routes. Any selected "new" route must be authorized, minimizing disturbances to undisturbed areas.
Avifauna	Negative	**Potential impacts to avifauna during the pre-/and construction phases** include the following: • Loss/displacement of avifauna species potentially present on site. • Disturbance of local avifauna populations due to construction activities. **Operational Phase** Activities associated with the operational phase include the following: • Vegetation management activities; and • Avifauna management activities. Potential impacts associated with the operational phase, include the following:	• Power line marking will be required to mitigate the collision impact since the project site contains dams and water bodies. • Construction activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of avifaunal species. • Furthermore, environmentally good practices should be applied, such as ensuring strict control of staff, vehicles, and machinery on site and limiting the creation of new roads as far as possible. • To minimize the impacts of collisions from an avifaunal perspective, it is therefore

Aspect	Impact	Impact Description	Mitigation Measures
		• Collision of birds with overhead cables. • Electrocution of birds. • Disturbance of local faunal communities.	recommended from an avifaunal perspective that a "bird-friendly" pylon design be used, which poses little electrocution risk. • Regarding habitat destruction, the recommendations of the ecological and botanical specialist studies must be strictly implemented, especially regarding limiting the construction footprint and rehabilitation of disturbed areas. • Should any nests or breeding sites be found during construction, suitable recommendations should be provided, and the EMPr must be amended. Mitigation measures must be enforced and implemented to reduce any potential direct and acute impact on avifaunal species.
Ecotourism	Negative	Outline Landscape (2024) concluded that the Khanyazwe Flexpower Plant's impact on eco-tourism has been evaluated and is regarded as moderate. The KFP is not directly in sight of any eco-tourism establishment. Eco-tourism developments rely on wild, unspoilt landscapes, and visitors do not want their views to be obstructed by industrial, large-scale powerline structures.	Natural screening should be created at ecotourism establishments, which may have their views impacted on by the construction or operational phases of the project. Endemic plants should be salvaged, if possible, where areas are going to be disturbed through the destruction of vegetation, for example, the establishment of the construction camp. They should

Aspect	Impact	Impact Description	Mitigation Measures
		The guesthouses close to the site are in suburban settings. Important views of the lodges and estates to the north on the banks of the Crocodile River are focused to the north into the Kruger National Park. Tourists may intermittently be exposed to the KFP, especially when travelling to their destinations. The views from the Malelane Satellite Camp, within the Kruger National Park, are towards the south of Malelane town. Malelane has industries, including sugar mills, which will mitigate the presence of the new KFP plant. The severity of the landscape impact on the development of the infrastructure is expected to be moderate. All surface activities will be visible from a certain distance from the site; however, due to the existing industrial developments and Khanyazwe Substation, the visual impact on tourists is expected to be less significant. The *severity of the landscape impact* on the development of the infrastructure is expected to be moderate. All surface activities will be visible from a certain distance from the site; however, due to the	be kept in a controlled environment, such as a nursery, for future re-planting in the disturbed areas as a measure of rehabilitation. Establish an ecotourism/conservation forum for the project by engaging with all tourism associations (local and provincial) to ensure that ongoing communication is provided to all role-players and to ensure that all ecotourism products are aware of the construction timeframes. This will enable ecotourism destinations to plan accordingly in terms of occupancies and potential down times. Provide a dedicated contact point to provide an opportunity for product owners to obtain information on the project and provide information on impacts or problems on an ongoing basis. A response structure should also be set up to support this contact point. This will enable localized impacts to be mitigated more effectively and efficiently. All impacts on fauna or flora within high conservation/ecotourism value land should be rehabilitated immediately to a completely natural state. This should be done by managing removed

Aspect	Impact	Impact Description	Mitigation Measures
		existing industrial developments and Khanyazwe Substation, the visual impact on tourists is expected to be less significant. Tourists travelling to the Kruger National Park and Mozambique will be affected by the visual intrusion when passing through the study area. Although it is difficult to pinpoint particular locations in the study area that are of specific value, the areas next to the roads will be most important. The industrial and agricultural landscape of that stretch of the N4, with large existing developments, will lessen the visual impact, as the association of the area is industrial in nature.	vegetation in a manner that can be re-planted. Compile booklets that interpret the project, where the power is going, and what value the project is adding to the local and provincial economy. Very often, ecotourists see the value in a development project and are willing to accept the associated impact on the environment.
Soil and Land Capability	Agriculture and Soils	The loss of topsoil in South Africa is a national concern, and thus, erosion control should be taken seriously. Soil erosion may occur during the construction phase due to: • Excavations, particularly on steep slopes • Ineffective stormwater management • Excessive use of gravel roads • Use of heavy machinery or vehicles	• If adequate soil erosion measures are implemented during the construction phase of the proposed activity, this impact can be deemed low significance. Where soils are highly erodible, adequate measures must be implemented to prevent undue soil erosion.

Aspect	Impact	Impact Description	Mitigation Measures
		Construction activities may lead to the compaction of disturbed soils; further, the exposure of the soil to environmental factors increases the likelihood of erosion. Removing surface vegetation will cause exposed soil conditions where rainfall and high winds can cause mechanical erosion. Rainfall and inadequate drainage systems would lead to sediments washing down into wetlands and rivers, causing sedimentation. In addition, hardened surfaces and bare areas are likely to increase surface runoff velocities and peak flows received by riparian habitats and wetlands.	
Traffic	Negligible	• Construction phase: • Construction workers will commute to and from the site daily by either making use • of transport provided by the Contractor or private vehicles and • Construction and delivery vehicles will travel to and from the site daily as required. • Operational phase: • Employees will commute to and from the site daily by either making use of transport provided by the Employer or private vehicles and	• No impact mitigation measures are required for the operational phase of the project. However, for the construction phase, it is recommended that pointsmen be assigned at the N4/Gravel Access Road intersection during peak traffic hours.

Aspect	Impact	Impact Description	Mitigation Measures
		• General delivery and maintenance vehicles will travel to and from the site daily. Although some of the traffic generated during the construction or operational phases will be destined regionally or even nationally, the impact (as determined by the defined study area) will be concentrated locally. The traffic influence outside the boundaries of the study area is expected to be insignificant.	
Agriculture	Negative	90% of the proposed sites are currently sugar cane farming; as such, the proposed activity will reduce the area used for agricultural purposes, resulting in a potential loss of income for the farmers. The Khanyazwe Flexpower Project in Malelane within the Nkomazi Local Municipality of Mpumalanga Province will significantly impact local agriculture. The project site is currently used for sugarcane farming, and its development will bring about changes that can affect both the local agricultural economy and the livelihoods of those involved in farming activities. Displacement of Agricultural Activities- The project site's current use as an active sugarcane farm means	• Engage with local communities and stakeholders throughout the project's development to gather input, address concerns, and ensure the project aligns with community needs and priorities. • Implement policies prioritising hiring local residents for construction and operational roles. • Establish training programs to equip local workers with the skills needed for the project. • Develop procurement policies that prioritise sourcing goods and services from local suppliers. • Work with local suppliers to build their capacity to meet the project's needs.

Aspect	Impact	Impact Description	Mitigation Measures
		that its development into a power plant will displace existing agricultural activities. This displacement will directly affect the cultivation of crops and the associated economic activities that support the local farming community. This will contribute to, amongst others **Job Loss:** The cessation of farming activities will result in the loss of agricultural jobs, impacting approximately 80 farmworkers who rely on these positions for their livelihoods. Identified impacts include **Economic Disruption**: The local economy, which benefits from the sale and processing of sugarcane, will experience a disruption, potentially leading to decreased economic activity in the agricultural sector. **Loss of Agricultural Land:** The conversion of agricultural land for industrial use will reduce the available farmland, which could impact local food production and the region's agricultural output. Although sugarcane is not a staple food, reducing agricultural land could have broader implications for food security if it leads to a shift in land use priorities away from food crops.	• Create programs that offer alternative livelihoods for individuals affected by the displacement of agricultural activities, such as training in new skills and support for starting new businesses.

Aspect	Impact	Impact Description	Mitigation Measures
		Economic Diversification and Support for Agri-Business- The project provides an opportunity to diversify the local economy by introducing industrial activities alongside traditional agriculture. This can reduce the region's economic dependence on agriculture and create new economic opportunities. **Socio-Economic Impact on Farming Communities**— The project may have a socio-economic impact on farming communities, including shifts in employment patterns and changes in land use.	
Development	Positive	The Project has the potential to contribute to community infrastructure, including enhancements to roads, schools, and healthcare facilities through socio-economic development contributions. This contribution is envisioned to result in improved living conditions and increased access to essential services for the local population. This will include **Energy Infrastructure**: Constructing a modern natural gas-fired power plant will enhance the reliability and stability of the local electricity supply, supporting residential, commercial, and industrial energy needs. **Energy Access and Affordability**	

Aspect	Impact	Impact Description	Mitigation Measures
		The Khanyazwe Flexpower Project is poised to significantly improve energy access and affordability in Malelane, the Nkomazi Local Municipality, and the broader Mpumalanga Province. The project addresses critical energy challenges by developing a reliable and cost-effective natural gas-fired power plant, ensuring that more residents and businesses benefit from stable and affordable electricity. **Regional Integration and Development** The proposed project will contribute to regional integration and development by enhancing energy security in the Nkomazi Local Municipality and establishing it as a key energy hub. It will also boost regional trade and investment by improving infrastructure along strategic routes like the Maputo Development Corridor, promoting economic growth and cooperation. Its impact extends beyond local benefits, fostering interconnected economies and supporting broader socio-economic development goals across Mpumalanga Province and beyond.	
Community Health and safety	Negative	The construction and operation of Flexpower can pose potential risks to community health and safety, especially concerning the transport, storage, use,	The following safety measures should be in place. • Install advanced gas leak detection systems that continuously monitor for the presence of gas and

Aspect	Impact	Impact Description	Mitigation Measures
		and disposal of hazardous materials. Understanding and assessing these concerns, our approach incorporates stringent safety standards and health protocols to mitigate risks, ensuring that the community's well-being remains a priority. Construction-Related Risks •The **construction phase** of the Khanyazwe Flexpower Project is likely to pose several health risks to the local community. These risks include exposure to dust, noise pollution, and potential contaminants from construction materials and activities. This will include o Increased dust and particulate matter can lead to respiratory problems, particularly in vulnerable populations such as children and older people. o Elevated noise levels from machinery and construction activities can cause stress, hearing loss, and sleep disturbances. o Potential exposure to hazardous chemicals used in construction The influx of construction vehicles and increased traffic around the project site can lead to higher risks	automatically shut down equipment if a leak is detected. • Equip the plant with fire suppression systems, such as water sprinklers, foam systems, and fire extinguishers, strategically placed throughout the facility. • Develop and regularly update an emergency response plan that includes evacuation procedures, emergency contact information, and drills to ensure readiness in case of an incident. Gas power plants often require storing and handling hazardous materials, such as natural gas, chemicals for water treatment, and lubricants. • Store hazardous materials in designated, well-ventilated areas with secondary containment to prevent leaks and spills • Maintain updated MSDS for all hazardous materials on-site and ensure that all personnel know the safe handling procedures. • Equip the plant with spill response kits and train staff to use them effectively to contain and clean up hazardous material spills.

Aspect	Impact	Impact Description	Mitigation Measures
		of road accidents and pose safety concerns for residents and other motorists, especially on the N4. Natural gas is highly flammable, and leaks or uncontrolled releases can lead to fires or explosions. This poses significant risks to plant personnel and surrounding communities.	Gas power plants operate under high pressures, particularly in boilers and turbines. A failure in these systems can result in dangerous explosions or equipment damage. • Pressure relief valves should be installed to prevent over-pressurization and safely vent excess pressure. • Conduct routine inspections and maintenance of high-pressure systems to identify and address potential issues before they become critical. • Use real-time monitoring systems to track pressure levels and other critical parameters, enabling prompt response to any abnormalities. The generation and transmission involve high voltages, which pose risks of electrical shock, arc flashes, and fires. • Implement a Lockout/Tagout (LOTO) program to ensure equipment is de-energized and cannot be accidentally restarted during maintenance. • Equip workers with arc flash protective gear and ensure that electrical systems are designed and maintained to minimise the risk of arc flashes.

Aspect	Impact	Impact Description	Mitigation Measures
			• Ensure all electrical equipment is properly grounded and bonded to prevent electrical shocks and fires.
Traffic	Negative	During the construction phase, increased heavy vehicle traffic will be expected. Without management, such increased traffic loads may negatively impact existing traffic flow. Further, unmanaged construction vehicles may decrease road safety for other road users, and uncontrolled movement of construction vehicles may result in unnecessary environmental impacts through vegetation and habitat destruction. The proposed site is adjacent to the N4, a major road leading to the Mozambican border. A new access road to the site will be constructed from the N4. Without mitigation, this impact may be high; however, implementation of mitigation measures may result in medium/low significance.	• The delivery of construction material and equipment should be limited to hours outside peak traffic times (including weekends) prevailing on the surrounding roads where possible. • Existing access roads must be used. • Delivery vehicles must comply with all traffic laws and bylaws. • Inform communities of planned construction activities affecting vehicle/ pedestrian traffic.
Heritage	Negative	According to the heritage report dated 2024, the entire site earmarked for the proposed development is degraded from current land uses such as access road, Eskom distribution power line, Eskom substation, and sugarcane cultivation. No evidence	• The proposed development should be approved to proceed as planned under the observation that the proposed dimensions of the gas plant do not extend beyond the study area.

Aspect	Impact	Impact Description	Mitigation Measures
		suggests any potential for recovering archaeological remains during earth-moving activities. There is an established associated infrastructure development, roads, and other associated infrastructures across the entire project receiving area. The field survey identified no cultural heritage or archaeological resources within an area earmarked for the proposed development. Negative impacts range from partial to total destruction of surface and under-surface movable/immovable relics during grubbing and preparation of foundations for buildings and other structures.	• The footprint impact of the proposed development and associated infrastructure should be kept to minimal to limit the possibility of encountering chance finds. • There were no burial sites (graves) identified during the field investigation. However, should unidentified graves and burial sites be discovered during the cause of construction activities, all construction activities should cease. The site must be barricaded, and SAHRA/MPHRA or the professional archaeologist must be informed. • Should any unmarked burials be exposed during construction, affected families must be trekked and consulted, and relevant rescue/relocation permits must be obtained from SAHRA and the Mpumalanga Department of Health before any grave relocation can take place. Furthermore, a professional archaeologist must be retained to oversee the relocation process by following the National Heritage Resources Act 25 of 1999. • Should chance archaeological materials or human burial remains be exposed subsurface, construction work on any section of the

Aspect	Impact	Impact Description	Mitigation Measures
			development laydown sites, work should cease on the affected area, and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimize disruption in construction scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the PHRA and NHRA reg. • If archaeological or other heritage relics deemed of high significance are found when physical works commence, heritage authorities will be advised immediately, and a heritage specialist will be called to attend.
Visual Impact	Negative	The visibility analyses considered worst-case scenarios, using line-of-sight based on topography. Within the receiving environment, specific viewers (visual receptors) experience different views of the visual resource, such as the proposed plant, and value it differently. Viewers will be affected because of the alterations of the views due to the proposed development (power plant facility and 275 kV and/or	• Keep the construction sites and camps neat, clean, and organised to portray a tidy appearance. • Screen the construction camp and lay-down areas; Rehabilitate disturbed areas around pylons as soon as possible after construction. This should be done to restrict extended periods of exposed soil. • Plant fast-growing endemic trees along the facility's boundary, especially along the N4. The trees will,

Aspect	Impact	Impact Description	Mitigation Measures
		132kV transmission line). The visual receptors will include tourists who visit the Kruger National Park, the residents of Malelane, as well as motorists who travel between South Africa and Mozambique via the N4.	with time, create a screen and increase the biodiversity of the area. • Locate access routes to limit modification to the topography and to avoid the removal of established vegetation. • Utilise existing screening features such as dense vegetation stands or topographical features to place the construction camps and lay-down yards out of the view of sensitivity visual receptors.
Noise	Negative	Noise-generating activities on site include the following: • Earthworks. • Delivery of building material. • Civil construction activities. • Earth drilling. • TLB activities. • Foundations and pouring of concrete. This noise is expected to impact several receptors. In addition, the facility is near the CBD and a residential area, which may have an impact if not well managed. • During construction, an increase in noise is expected as these activities will generate noise of medium significance without mitigation. If the	• The following mitigation measures must be considered: • The following aspects are addressed in the acoustical design of power plant: o Optimising the plant layout, selection, and location of noise-critical components. o Attenuation of the charge air intake and exhaust outlet. o Engine cooling system: type and location of the radiator or other cooling equipment. o Plant ventilation system: ventilation air intake, fan-generated noise, outlet noise emission.

Aspect	Impact	Impact Description	Mitigation Measures
		mitigations are adhered to, the noise impact will be manageable and of low significance.	○ Power plant building design: optimal wall structures. • Manage speed limits of vehicles and ensure all vehicles are maintained to reduce noise. • Given that the impact is anticipated to be low during the operational phase, monitoring is proposed if there are noise complaints or if people in the future settle closer than 2,000 m from the power plant. • Ensure that all construction equipment is well serviced as per the manufacturer's manual throughout the construction phase. • The Noise Control Regulations (2013) requirements must be adhered to.
Air quality	Negligible	Decreased ambient air quality. The scale of the impact is related to whether the predicted ambient concentrations of the pollutants exceed the limit values of the NAAQS in sensitive areas, i.e., residential or non-industrial areas. The incremental impact of NO2 during normal operation of ICE technology is expected to be negligible at a cluster height of 30 50 meters. The incremental impact of PM10, SO2 and VOC during normal operation of	• Current industry-standard techniques should be maintained and supplemented with administrative control measures to maintain the residual impact at the nearest sensitive receivers at current background levels. • Controlled emissions can be effectively mitigated by applying the best available industrial control measures and sound environmental

Aspect	Impact	Impact Description	Mitigation Measures
		either CCGT or ICE technology is expected to be negligible.	management principles. A reduction in emissions of up to 98% can be achieved. • Continuous monitoring of ambient PM10, SO2, NO2, and VOC concentrations for a minimum period of one (1) year before commissioning of the plant and in accordance with the AEL requirements, thereafter, should be performed. For background monitoring, one monitoring station placed in the main impact area of the future plant should suffice. Background monitoring data will be critical to determine the proportional impact of the plant in the cumulative setting. • Ambient monitoring should be used in combination with modelling and emission inventory to assess the effectiveness of control measures at source and receiver throughout the project's life. It will also contribute to open communication with all stakeholders. **Technical** • The engines must be optimized to achieve the best economic and environmental performance.

Aspect	Impact	Impact Description	Mitigation Measures
			• Develop and implement servicing programs for all operational components of the facility. • Stocking critical components to ensure the availability of spares in the event of mechanical faults.
Climate change impact	Negative	• Construction operations will probably include mobile and stationary diesel combustion emissions for construction operations. • KFP Power Plant's GHG emissions include Scope 1, Scope 2, and Scope 3 emissions. Scope 1 emissions include emissions from stationary combustion of natural gas and diesel. Scope 2 emissions consist of emissions from purchased electricity. Scope 3 includes emissions from mobile diesel combustion contracted to third-party suppliers. • The magnitude of the impact of GHG emissions from the construction operations was estimated to be negligible. • The magnitude of GHG emissions from the KFP Power Plant's operations (2 524 378.66 tCO2e) is considered **Very High,** as GHG emissions are greater than 1 000 000 tCO2e annually.	• Mitigation measures will not alter the impacts of GHG emissions in terms of the extent, duration or probability of the impact, however the intensity of the impact can be reduced, notably by reducing the quantity of GHG emissions, which is where efforts shall be focused. • It is important that the plant's thermal efficiency is maximized throughout the life of the plant to reduce the gas consumption and, therefore, GHG emissions per unit of electricity (i.e., kWh or MWh) generated. The plant should seek to identify specific measures that can be implemented to maximise thermal efficiency and therefore minimise GHG intensity over time. • While noting that any reduction in the operating time or load factor (i.e., annual power generation in MWh) is likely to result in decreased total annual emissions from the plant, such changes to

Aspect	Impact	Impact Description	Mitigation Measures
		• The impact of GHG emissions from the KFP Power Plant was **rated High** with or without mitigation measures. • The project's GHG emissions will contribute to the local Energy Sector and to the global energy related GHG emissions. The project's GHG emissions may contribute to anthropogenic climate change, which is likely to be accelerated and extended as GHG emissions accumulate in the atmosphere. Based on the climate threat outline, potential climate risks include increased temperature, reduced rainfall, extreme events, and wind impacts. Increased temperature and heat waves can pose a health risk to employees, influence productivity, and reduce plant efficiencies and available generation capacity.	cycling philosophies could have an adverse impact on thermal efficiency and GHG intensity per MWh generated because of increased start-ups and wear and tear on the plant. As such, the potential impact of future changes in operating philosophy should be investigated and managed through upgrades to plant hardware and modifications to operating practices, as applicable. • Measuring GHG emissions on an annual basis (2), which will require data on the total amount of gas consumed, its chemical properties, GHG emissions factor; and the consumption of any other fuels such as LPG for the black starts; and plant heat rate / thermal efficiency should be closely monitored over time as this is closely correlated to the GHG intensity of the plant. • Setting short-, medium-, and long-term targets for maximizing and maintaining heat rate / thermal efficiency and GHG intensity (CO_2e per MWh generated) over time, against which performance can be assessed.

Aspect	Impact	Impact Description	Mitigation Measures
			• Allocating responsibility to key individuals for managing and reporting on the GHG performance of the plant. • Communicating the Plan, including its key objective and any actions being taken, to staff working at the plant to ensure buy-in. • Encourage employee participation in the GHG management plan, including contributing ideas relating to improvement opportunities. • Reporting progress over time with respect to annual gas consumption and GHG emissions, GHG reductions/heat rate improvements achieved, and progress against targets set. • Ensuring best industry practice is followed and implemented. • Ensuing regular maintenance is conducted to prevent unnecessary machinery inefficiencies from arising.
Water consumption and site efficiency	Negative	With radiator cooling, which is the most common cooling method, the cooling water is circulated in a closed circuit. There are no wastewater results from	• Zero discharge approach must be adopted. • Ensure that the site develops a water conservation strategy from the on-set. • Implement recycling initiatives.

Aspect	Impact	Impact Description	Mitigation Measures
		the process. Any contaminated water, for instance, water used for cleaning the equipment, is collected in a tank. The process water consumption when using radiator cooling is negligible (less than 4 litters per produced MWh), and no de-mineralized water is needed.	

Furthermore, the potential impacts associated with the proposed project will also include impacts on:

- Biodiversity (flora and fauna).
- Aquatic.
- Heritage and Palaeontology.
- Wetland.
- Avifauna
- Civil
- Major Hazardous Installation
- Socio-economic
- Traffic.
- Agriculture
- Air quality
- Climate change
- Noise
- Visual impacts
- Eco-tourism

8.2 PROJECT SOCIO-ECONOMIC RISKS AND MANAGEMENT STRATEGY

The sections above focus on stakeholder management during the permit acquisition process. It provides a guideline for ensuring that the principles of stakeholder management are regulated, transparent, and inclusive. While this section aims to address the potential social impact and variables associated with the project, the section identifies the risks and proposes a strategy to ensure that the risks are well managed.

The potential social impact variables identified in association with the proposed project are in accordance with Vanclay's list of social impact variables clustered under the following main categories as adapted by Wong (Vanclay, 2002; Wong, 2013) and include:

1. Health and social well-being
2. Quality of the living environment (Liveability)
3. Economic
4. Cultural.

These categories are not exclusive and, at times, tend to overlap, as specific processes may have an impact within more than one category.

The construction phase may impact the surrounding landowner if not properly managed. Other social-related issues may include the following:

- As a result of perceptions around job creation, increased expectations around employment opportunities may be created.
- Influx as a result of expectations around job and supply chain opportunities, resulting in pressure on land, social services, relationships, and other social infrastructure.
- Access to private, more accessible business sites will be made easier, resulting in potential criminal intrusion, including theft, in private areas.

The socio-economic aspects have both positive and negative impacts. The significance of positive socio-economic benefits associated with the proposed development exceeds the significance of negative socio-economic impacts. The proposed project will result in the creation of employment opportunities and procurement of goods and services. The negative socioeconomic consequences associated with the project include the loss of crop fields and grazing land, disruption of farm activities and social networks, and health and safety. These social risks are of medium significance; however, they can be reduced to low with proper mitigation.

Table 32 below identifies risks and refers to management strategies that must be developed. This includes the EMPr that will be developed as part of the EIA phase and the developers' policies and procedures for managing the identified risks. The following documents must be consulted to address the identified risks:

- EMPr; and
- Flexpower policies and procedures.

Table 32: Potential Socio-Economic Impacts

Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
Health and social well-being	Air quality	Negative	Dust impacts will be more prevalent during construction (during site clearance for the plant and access road). During operations, dust from the proposed project activities is likely to be concentrated within the site of these facilities. The impact will be low; however, dust management measures must be included in the EMPR.	• Implement measures proposed in the EMPr. • Appoint a Community Liaison Officer to deal with complaints and grievances from the public. • Regulate speed and enforce speed limits on trucks using the access road to minimise the creation of excessive dust.
	Noise	Negative	Noise can impact the health and social well-being of local communities. The proposed development will significantly impact the surrounding communities. The noise impact on surrounding communities must be monitored, and measures for the construction and operational phases must be included in the EMPr.	• Maintain all vehicles and construction machinery to ensure the noise levels do not cause unnecessary and avoidable nuisance to the workforce and local communities. • Appoint a community liaison officer to deal with complaints and grievances from the public.
	Hazard Exposure	Negative	The use of heavy equipment and vehicles and an increase in vehicle traffic within the vicinity of the construction site will result in an increased risk to the personal safety of people and animals. There is also a risk of fires brought about by construction workers lighting fires for cooking and warmth during cold	• During construction, the sites should be fenced off to prevent access. • Fencing should be inspected regularly and properly maintained by the contractor.

Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
			periods. The construction of the access and exit from the National Road N4 will result in traffic restrictions, which may pose a risk to motorists if not implemented accordingly. Successful implementation of the recommended mitigation measures will result in these risks remaining at acceptable levels; such measures will be included in the EMPr.	• Ensure that the appropriate warning signs are erected on all boundary fences, cautioning against entering the construction area. • Clear and visible signage during the construction of the access and exit from the N4 • Ensure all construction equipment and vehicles are always maintained. • Ensure operators and drivers are properly trained and make them aware, through regular toolbox talks, of any risk they may pose to the community. Place specific emphasis on vulnerable populations, such as children and the elderly. • Ensure that fires lit by construction staff are only ignited in designated areas and that the appropriate safety precautions, such as not lighting fires in strong winds and completely extinguishing fires before leaving them unattended, are strictly adhered to.

Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
				• Make staff aware of the dangers of runaway fire during regular toolbox talks.
	Increase in crime	Negative	The site is near a residential area and a popular tourist region along the N4 Corridor. Projects in proximity to populated areas have heightened expectations for job opportunities. Subsequently, an influx of job seekers could result in an increase in crime in the area. It is more likely that this risk would be higher during the construction phase and would be associated with opportunistic criminal activities. The operational may continue experiencing a certain level of crime relating to any movables. The site is associated with electricity, which may attract cable theft criminals to the site.	All workers should carry identification cards and wear identifiable clothing. • Fence off the construction site and control access to the site. • Appoint an independent security company to monitor the site. • Implement extra security measures on high-risk equipment and cabling. • Encourage local people to report any suspicious activity associated with the construction site to the security company. • If applicable, consult with the Community Policing Forums near the project.
	The influx of job seekers	Negative	The construction of the activities will likely result in an influx of job seekers, particularly given the current unemployment rate in the country. This impact can be significant and requires a proper recruitment management strategy.	• Communicate, through Community Leaders and Ward Councillors, the situation regarding job opportunities created by the project.

Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
				• Develop and implement a local procurement policy that prioritizes "locals first" to prevent the movement of people into the area in search of work. • Develop a project recruitment policy in consultation with Community Leaders and Ward Councillors and ensure its compliance. • Cooperate with local authorities to ensure all legislation preventing illegal settlement is always enforced.
	Increased risk of Transmittable Disease Infections	Negative	The risk of infections would be highest during the project's construction phase, as the number of construction staff increases and an influx of transient workers/job seekers increases. This will increase exposure and vulnerability to transmittable diseases.	Awareness Raising
	Noise	Negative	**Construction Phase** – Grading and building of new roads and trenches Noise may be generated by construction activities and the use of construction equipment such as Graders, TLBs, and Front-end loaders. The use of this equipment will increase noise levels in the immediate vicinity of the	• As per the Noise Management Plan. • The following are the Environmental, Health and Safety Guidelines of the IFC of the World Bank, which should be implemented during the construction, operational and rehabilitation phases of the project:

Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
			construction activities and, in some cases, at some distance from them. Preparation of the footprint, digging of trenches, earthworks, and construction of the base of the plant. Noise could be generated by the following activities: • generator noise, civil construction, and, in extreme cases, localized blasting. • Construction of the plant footprint on site. • The construction of the plant could generate localised noise increase, particularly the use of cranes and generators during the assembly stage of the different plant components. • Construction traffic to and from the site would create a temporary linear noise source. Operational Phase – Turbines – mechanical noise • Plant - normal wear and tear and the lack of preventative maintenance. 38 Noise could be generated through the lack of a cyclic maintenance program to identify normal wear and tear of the essential components.	• Selecting equipment with lower sound power levels. • Installing silencers for fans. • Installing suitable mufflers on engine exhausts and compressor components. • Installing acoustic enclosures for equipment causing radiating noise. • Installing vibration isolation for mechanical equipment. • Re-locate noise sources to areas that are less noise sensitive to take advantage of distance and natural shielding. • Taking advantage during the design stage of natural topography as a noise buffer. • Develop a mechanism to record and respond to complaints.

Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
			• Traffic Vehicle movement creates traffic noise, and mechanical noise, rattles, and road surfaces play important roles in the noise levels along or some distance from roads. • Sub-station and overhead power lines A substation can generate noise from the blowers, transformers, and corona noise from the overhead power lines. These noise levels are site-specific. • Maintenance activities The regular maintenance activities may give rise to a site-specific increase in noise levels.	
Quality of the living environment (Liveability)	Annoyance factor, access, and disruption of daily living patterns, particularly in remote farmlands.	Negative	Construction activities related to irregular on-site deliveries and the use of construction vehicles and equipment disrupt daily living patterns. During the project's operational phase, these disruptions are likely to subside as operational schedules and traffic patterns become more predictable.	• Appoint a Community Liaison Officer to deal with complaints and grievances from the public. • Regularly monitor the effect of construction activities on public infrastructure and immediately report any damage to the appropriate authority.

Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
				• Closely monitor the access road construction from the N4 and ensure that contractors adhere to traffic management protocols.
	Increased traffic due to construction activities	Negative	During Construction activities, heavy vehicles delivering material to the site, construction vehicles, and contractor staff vehicles will move more frequently. This will significantly impact the rural setting of the surrounding area and may cause an increase in incidences on National Road N4.	• Implement the mitigation measures in the EMPr and SES. • Enforce speed controls on the access roads. • Closely monitor the access road construction from the N4 and ensure that contractors adhere to traffic management protocols.
Cultural	At a social level, any cultural impacts would be associated with sensitive archaeological and/or heritage sites that may be found.		At a social level, any cultural impacts would likely be associated with sensitive archaeological and/or heritage sites that may be found. In this regard, a desktop heritage study was undertaken in which recommendations were made.	• Chance Find Protocol • EMPr

8.3 METHODOLOGY FOR ASSESSING THE SIGNIFICANCE OF POTENTIAL IMPACTS

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

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

The criteria in Table 33 below will be used to evaluate. The nature of each impact will be assessed and described in relation to the extent, duration, intensity, significance, and probability of occurrence attached to it. This will be evaluated in detail for pre- and post-mitigation during the EIA phase.

Table 33: Methodology used in determining the significance of potential environmental impacts

Status of Impact The impacts are assessed as either having a: the negative effect (i.e., at a `cost' to the environment), positive effect (i.e., a `benefit' to the environment) or Neutral effect on the environment. **Extent of the Impact** (**1**) Site (site only), (**2**) Local (site boundary and immediate surrounds), (**3**) Regional

(4) National, or

(5) International.

Duration of the Impact

The length that the impact will last is described as either:

(1) immediate (<1 year)

(2) short term (1-5 years),

(3) medium-term (5-15 years),

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

(5) Permanent.

Magnitude of the Impact

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

(0) none,

(2) Minor,

(4) Low,

(6) Moderate (environmental functions altered but continue),

(8) High (environmental functions temporarily cease), or

(10) Very high / Unsure (environmental functions permanently cease).

Probability of Occurrence

The likelihood of the impact occurring is indicated as either:

(0) None (the impact will not occur),

(1) improbable (probability very low due to design or experience)

(2) low probability (unlikely to occur),

(3) medium probability (distinct probability that the impact will occur),

(4) high probability (most likely to occur), or

(5) Definite.

Significance of the Impact

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

S=(E+D+M) P

The significance ratings are given below.

(<30) low (i.e., where this impact would not have a direct influence on the decision to develop in the area),

(30-60) medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),

(>60) high (i.e., where the impact must influence the decision process to develop in the area).

8.4 AN ASSESSMENT OF THE SIGNIFICANCE OF EACH ISSUE AND RISK AND AN INDICATION OF THE EXTENT TO WHICH THE ISSUE AND RISK COULD BE AVOIDED OR ADDRESSED BY THE ADOPTION OF MITIGATION MEASURES

The following section presents the impacts and the significance as rated by the specialists as well as the EAP. The tables below highlight the significance of the identified impacts for the project's construction, operational, decommissioning, rehabilitation, and closure phases.

The ratings are assessed with and without mitigation and color-coded as follows to indicate the significance:

High
Medium High
Medium
Low

8.4.1 CONSTRUCTION AND OPERATION PHASE IMPACTS

8.4.1.1 Heritage

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
No burial grounds, iron age, or stone age were recorded.							
	No	Negative	1	2	4	2	Low 14

Impact on heritage resources	Yes	Negative	1	1	2	1	Low 4

Mitigation Measures:

- If archaeological or other heritage relics deemed of high significance are found when physical works commence, heritage authorities will be advised immediately, and a heritage specialist will be called to attend.

8.4.1.2 Waste Management

Issue	Corrective Measure	Impact Rating Criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Human inhibition of sites results in waste generation. During the construction phase, a variety of waste materials will be produced. The Contractors must adhere to all recommended measures and provide adequate waste skips and bins on the site. Waste must be regularly removed from the site and disposed of at appropriate disposal sites. With mitigation measures implemented, this impact can be kept at a Low significance.							
Waste Management.	No	Negative	2	3	8	2	<26 = Low.
	Yes	Negative	1	2	6	2	<18 = Low.
Mitigation Measures	• No waste will be buried on-site or incorporated into the foundation trenches. • The workforce must be encouraged to sort waste into recyclable and non-recyclable waste. • Waste bins/skips must be appropriately labelled. • No burning of waste is allowed on site. • Waste must be regularly removed from the site and disposed of at a registered waste disposal facility, and safe disposal certificates will be filed appropriately and						

	• Where permits are required, they must be obtained from the relevant authority.

8.4.1.3 Traffic

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Although some traffic generated during the construction or operational phases will be destined regionally or nationally, the impact (as determined by the defined study area) will be concentrated locally. The traffic influence outside the boundaries of the study area is expected to be insignificant.							
Construction	No	Negative	4	3	3	6	Medium 60
Operation	No	Negative	4	3	3	2	Low 20
Mitigation Measures: • No impact mitigation measures are required for the project's operational phase. • For the construction phase, it is recommended that pointsmen be assigned at the N4/Gravel Access Road intersection during peak traffic hours.							

8.4.1.4 Noise Management

Construction Phase

Activity	Clearing and stripping of topsoil and vegetation
Impact Summary	Noise increase in excess of the threshold value for a noise disturbance of 7.0dBA above the ambient noise level at the boundary of the Plant footprint and at the abutting residential areas

Potential Impact Rating	Magnitude	Duration	Scale	Irreplaceable	Reversibility	Probability	Significance score	Significance
	4	2	2	3	3	3	42	Medium
Mitigation measures	Earthwork activities are to be done only during the daytime if the prevailing ambient noise level is not exceeded during nighttime.							
After Management Impact rating	Probability	Duration	Extent	Magnitude	Reversibility	Probability	Significance score	Significance
	2	2	2	3	3	3	36	Low
Activity	Construction activities at the Plant structure							
Impact Summary	Noise increase in excess of the threshold value for a noise disturbance of 7.0dBA above the ambient noise level at the boundary of the Plant footprint and at the abutting residential areas							
Potential Impact Rating	Magnitude	Duration	Scale	Irreplaceable	Reversibility	Probability	Significance score	Significance
	4	2	2	3	3	3	42	Medium
Mitigation measures	Plant structure preparation should be done only during the day if the prevailing ambient noise level is not exceeded during the night.							
After Management Impact rating	Probability	Duration	Extent	Magnitude	Reversibility	Probability	Significance score	Significance
	2	2	2	3	3	3	36	Low
Activity	Civil Construction activities at the Plant footprint							
Impact Summary	Noise increase in excess of the threshold value for a noise disturbance of 7.0dBA above the ambient noise level at the boundary of the Plant footprint and at the abutting residential areas							

Potential Impact Rating	Magnitude	Duration	Scale	Irreplaceable	Reversibility	Probability	Significance score	Significance
	4	2	2	3	3	3	42	Medium
Mitigation measures	Construction activities are to be done only during the day and if the prevailing ambient noise level is not exceeded during the night.							
After Management Impact rating	Probability	Duration	Extent	Magnitude	Reversibility	Probability	Significance score	Significance
	2	2	2	3	3	3	36	Low

Activity	Installation of Plant/equipment							
Impact Summary	Noise increase in excess of the threshold value for a noise disturbance of 7.0dBA above the ambient noise level at the boundary of the Plant footprint and at the abutting residential areas							
Potential Impact Rating	Magnitude	Duration	Scale	Irreplaceable	Reversibility	Probability	Significance score	Significance
	4	2	2	3	3	3	42	Medium
Mitigation measures	Construction activities are to be done only during the daytime if the prevailing ambient noise level is not exceeded during nighttime.							
After Management Impact rating	Probability	Duration	Extent	Magnitude	Reversibility	Probability	Significance score	Significance
	2	2	2	3	3	3	36	Low

Activity	Cladding of the Plant structure							
Impact Summary	Noise increase in excess of the threshold value for a noise disturbance of 7.0dBA above the ambient noise level at the boundary of the Plant footprint and at the abutting residential areas							
Potential Impact Rating	Magnitude	Duration	Scale	Irreplaceable	Reversibility	Probability	Significance score	Significance

	4	2	2	3	3	3	42	Medium
Mitigation measures	Construction activities are to be done only during the daytime if the prevailing ambient noise level is not exceeded during nighttime.							
After Management Impact rating	Probability	Duration	Extent	Magnitude	Reversibility	Probability	Significance score	Significance
	2	2	2	3	3	3	36	Low
Activity	Construction activities at the offices, workshop, and ablution							
Impact Summary	Noise increase in excess of the threshold value for a noise disturbance of 7.0dBA above the ambient noise level at the boundary of the Plant footprint and at the abutting residential areas.							
Potential Impact Rating	Magnitude	Duration	Scale	Irreplaceable	Reversibility	Probability	Significance score	Significance
	4	2	2	3	3	3	42	Medium
Mitigation measures	Construction activities are to be done only during the daytime if the prevailing ambient noise level is not exceeded during nighttime.							
After Management Impact rating	Probability	Duration	Extent	Magnitude	Reversibility	Probability	Significance score	Significance
	2	2	2	3	3	3	36	Low
Activity	Construction of OHP line and Pylons							
Potential Impact Rating	Magnitude	Duration	Scale	Irreplaceable	Reversibility	Probability	Significance score	Significance
	4	2	2	3	3	3	42	Medium
Mitigation measures	Construction activities are to be done during the day only if the prevailing ambient noise level is not exceeded during the night.							
After Management Impact rating	Probability	Duration	Extent	Magnitude	Reversibility	Probability	Significance score	Significance
	2	2	2	3	3	3	36	Low

IMPACT ASSESSMENT DURING THE OPERATIONAL PHASE

Activity	Flexpower power generation							
Impact Summary	Noise increase in excess of the threshold value for a noise disturbance of 7.0dBA above the ambient noise level at the boundary of the Plant footprint and at the abutting residential areas							
Potential Impact Rating	Magnitude	Duration	Scale	Irreplaceable	Reversibility	Probability	Significance score	Significance
	8	6	2	4	4	4	96	Medium-High
Mitigation measures	Noise monitoring on an annual basis to identify noise intrusion levels on a pro-active basis. Acoustic screening measures in place and fully operational according to acoustic screening methods.							
After Management Impact rating	Probability	Duration	Extent	Magnitude	Reversibility	Probability	Significance score	Significance
	6	5	2	2	3	3	54	Medium
Activity	Fan cooling radiators – acoustic louvres							
Impact Summary	Noise increase in excess of the threshold value for a noise disturbance of 7.0dBA above the ambient noise level at the boundary of the Plant footprint and at the abutting residential areas							
Potential Impact Rating	Magnitude	Duration	Scale	Irreplaceable	Reversibility	Probability	Significance score	Significance
	8	6	2	4	4	4	96	Medium-High

Mitigation measures	Noise monitoring on an annual basis to identify noise intrusion levels on a pro-active basis. Acoustic screening measures in place and fully operational according to acoustic screening methods.							
After Management Impact rating	**Probability**	**Duration**	**Extent**	**Magnitude**	**Reversibility**	**Probability**	**Significance score**	**Significance**
	6	5	2	2	3	3	54	Medium
Activity	**Exhaust gas ducting**							
Impact Summary	Noise increase in excess of the threshold value for a noise disturbance of 7.0dBA above the ambient noise level at the boundary of the Plant footprint and at the abutting residential areas							
Potential Impact Rating	**Magnitude**	**Duration**	**Scale**	**Irreplaceable**	**Reversibility**	**Probability**	**Significance score**	**Significance**
	8	6	2	4	4	4	96	Medium-High
Mitigation measures	Noise monitoring on an annual basis to identify noise intrusion levels on a pro-active basis. Acoustic screening measures in place and fully operational according to acoustic screening methods.							
After Management Impact rating	**Probability**	**Duration**	**Extent**	**Magnitude**	**Reversibility**	**Probability**	**Significance score**	**Significance**
	6	5	2	2	3	3	54	Medium
Activity	**Ventilation intake**							
Impact Summary	Noise increase in excess of the threshold value for a noise disturbance of 7.0dBA above the ambient noise level at the boundary of the Plant footprint and at the abutting residential areas							
Potential Impact Rating	**Magnitude**	**Duration**	**Scale**	**Irreplaceable**	**Reversibility**	**Probability**	**Significance score**	**Significance**

	8	6	2	4	4	4	96	Medium-High
Mitigation measures	Noise monitoring on an annual basis to identify noise intrusion levels on a pro-active basis. Acoustic screening measures in place and fully operational according to acoustic screening methods.							
After Management Impact rating	**Probability**	**Duration**	**Extent**	**Magnitude**	**Reversibility**	**Probability**	**Significance score**	**Significance**
	6	5	2	2	3	3	54	Medium
Activity	**Roof monitors**							
Impact Summary	Noise increase in excess of the threshold value for a noise disturbance of 7.0dBA above the ambient noise level at the boundary of the Plant footprint and at the abutting residential areas							
Potential Impact Rating	**Magnitude**	**Duration**	**Scale**	**Irreplaceable**	**Reversibility**	**Probability**	**Significance score**	**Significance**
	8	6	2	4	4	4	96	Medium-High
Mitigation measures	Noise monitoring on an annual basis to identify noise intrusion levels on a pro-active basis. Acoustic screening measures in place and fully operational according to acoustic screening methods.							
After Management Impact rating	**Probability**	**Duration**	**Extent**	**Magnitude**	**Reversibility**	**Probability**	**Significance score**	**Significance**
	6	5	2	2	3	3	54	Medium
Activity	**Step up transformers**							
Impact Summary	Noise increase in excess of the threshold value for a noise disturbance of 7.0dBA above the ambient noise level at the boundary of the Plant footprint and at the abutting residential areas							

Potential Impact Rating	Magnitude	Duration	Scale	Irreplaceable	Reversibility	Probability	Significance score	Significance
	8	6	2	4	4	4	96	Medium-High
Mitigation measures	Noise monitoring on an annual basis to identify noise intrusion levels on a pro-active basis. Acoustic screening measures in place and fully operational according to acoustic screening methods.							
After Management Impact rating	Probability	Duration	Extent	Magnitude	Reversibility	Probability	Significance score	Significance
	6	5	2	2	3	3	54	Medium

Activity	Emergency generator							
Impact Summary	Noise increase in excess of the threshold value for a noise disturbance of 7.0dBA above the ambient noise level at the boundary of the Plant footprint and at the abutting residential areas							
Potential Impact Rating	Magnitude	Duration	Scale	Irreplaceable	Reversibility	Probability	Significance score	*Significance*
	8	6	2	4	4	4	96	Medium-High
Mitigation measures	Noise monitoring on an annual basis to identify noise intrusion levels on a pro-active basis. Acoustic screening measures in place and fully operational according to acoustic screening methods.							
After Management Impact rating	Probability	Duration	Extent	Magnitude	Reversibility	Probability	Significance score	*Significance*
	6	5	2	2	3	3	54	Medium

IMPACT ASSESSMENT DURING THE REHABILITATION PHASE

Activity	**Removal of structures, equipment and machinery**							
Impact Summary	Noise increase in excess of the threshold value for a noise disturbance of 7.0dBA above the ambient noise level at the boundary of the Plant footprint and at the abutting residential areas							
Potential Impact Rating	**Magnitude**	**Duration**	**Scale**	**Irreplaceable**	**Reversibility**	**Probability**	**Significance score**	**Significance**
	4	2	2	3	3	3	42	Medium
Mitigation measures	Demolition activities to be done during daytime periods only							
After Management Impact rating	**Probability**	**Duration**	**Extent**	**Magnitude**	**Reversibility**	**Significance score**	**Significance score**	**Significance**
	2	2	2	3	3	3	36	Low
Activity	**Earthworks and planting of vegetation**							
Impact Summary	Noise increase in excess of the threshold value for a noise disturbance of 7.0dBA above the ambient noise level at the boundary of the Plant footprint and at the abutting residential areas							
Potential Impact Rating	**Magnitude**	**Duration**	**Scale**	**Irreplaceable**	**Reversibility**	**Probability**	**Significance score**	**Significance**
	4	2	2	3	3	3	42	Medium
Mitigation measures	Earthworks and planting of vegetation to be done during daytime periods only.							
After Management Impact rating	**Probability**	**Duration**	**Extent**	**Magnitude**	**Reversibility**	**Significance score**	**Significance score**	**Significance**

	2	2	2	3	3	3	36	Low

8.4.1.5 Fire hazard

Issue	Corrective Measure	Impact Rating Criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Construction activities may increase the risk of veld fires, which would result from activities such as smoking and cooking food and storing fuel and other flammable solvents on site. These uncontrolled fires on site could damage infrastructure, the biophysical environment, and the working environment. This impact is considered to be of medium significance. Should the recommended mitigation measures be implemented, the significance of the impact will be even lower and negative.							
Fire Hazards	No	Negative	Local	Short term	Low	High	Medium.
	Yes	Negative	Local	Short term	Low	Low	Low.
Mitigation Measures	• Campsites and laydown areas will not be allowed within the sensitive area. • Areas where flammable substances are kept must have proper warning signs on display (e.g. highly flammable, no smoking etc.) to warn personnel of risks associated with such areas; • No burning of waste and cooking will be allowed on site. • Contracting personnel must be well versed in the relevant existing fire and safety management procedures and activities on site. • Implement fire hazard sensitive on- and offloading procedures. • Designate a site safety official and ensure that personnel are adequately trained regarding fire hazards and procedures. • Firefighting equipment (fire beaters, fire extinguishers, etc.) must be made available on-site; and • Strategically placed emergency access points along servitude at times when access is restricted to ensure that landowners and emergency services can respond to any fire outbreak.						

8.4.1.6 Visual Impact

Issue	Corrective Measure	Impact Rating Criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
The proposed activity will indeed change the visual character of the site, particularly considering that sections of the site can be viewed from the nearby roads. Local variations in topography and man-made structures could cause local obstruction of views in certain parts of the view shed. Given the site's topography and location, the impact can be considered definite, long-term, and local in extent and medium in significance. The impacts of both alternatives are of medium negative significance; however, with mitigation, the impacts can be reduced to low during the construction phase.							
Visual Impact	**No**	**Negative**	**2**	**2**	**6**	**4**	40
	Yes	**Negative**	**1**	**2**	**4**	**2**	14.
Mitigation Measures	<u>Access Roads</u> • Make use of existing access roads where possible. • Where new access roads are required, the disturbance area should be kept to a minimum. The two-track dirt road will be the most referred option. • Locate access routes so as to limit modification to the topography and to avoid the removal of established vegetation. • Maintain no or minimum cleared road verges. • If clearing vegetation for a road is necessary, avoid doing so in a continuous straight line. Alternatively, curve the road in order to reduce the visible extent of the cleared corridor; and • Provide strategically distributed crossing points to secure existing access routes the public uses. <u>Construction Camp and Laydown Area</u> • Locate construction camps in areas that are already disturbed or where it isn't necessary to remove established vegetation like for example, naturally bare areas. • Utilise existing screening features such as dense vegetation stands or topographical features to place the construction camps and lay-down yards out of the view of sensitivity visual receptors.						

	• Keep the construction sites and camps neat, clean and organised in order to portray a tidy appearance; and • Screen the construction camp and lay-down yards by enclosing the entire area with dark green or black shade material at least 2 m high. • Keep disturbed areas to a minimum. • No clearing of land to take place outside the demarcated footprints. • Institute a planting regime around the boundaries of the project site to 'soften' the views onto the infrastructure from the respective receptors. Only indigenous plant species to be introduced. • The contractor should maintain good housekeeping on site to avoid litter and minimise waste. • Erosion risks should be assessed and minimised.

8.4.1.7 Climate Change Impacts

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
It was found that the foreseen impacts of climate change on the Ehlanzeni District Municipality are generally negative and are likely to impact, amongst others, agriculture, biodiversity, human health, human settlements, water resources, and quality within the District. Climate-related effects may result in new engineering challenges and increased capital costs for accessing and developing energy resources. It may also affect the reliability of transportation, logistics, and distribution channels. In addition to the direct effects of climate-induced volatility, companies will continue to experience increased political pressure and rising consumer and investor expectations for emissions accountability and the exploration of renewable energy supply.							
	No	Negative	5	3	0	4	32

	Yes	Negative	5	3	0	4	32

Mitigation Measures:

- Optimising construction activities and logistics – performing as efficiently and effectively as possible.
- Implementing a fuel management strategy, which encourages more efficient use of vehicles, planning, logistics, driver education and maintenance.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Emissions inventory for the KFP Power Plant is high							
High emission	No	Negative	5	5	10	5	High 100
	Yes	Negative	5	5	10	5	High 100

Mitigation Measures:

- Optimising energy utilisation efficiency.
- Utilising the cleanest fuel economically available.
- Selecting the best power generation and pollution control technology for the chosen fuel.
- Utilising high-performance monitoring and process control techniques, good design and maintenance of the combustion system.
- Developing and implementing a GHG management plan.
- Developing and implementing a leak detection and repair program.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Increased temperature and heatwaves can pose a health risk to employees.							
	No	Negative	2	4	6	3	Medium 36

Health risks to employees	Yes	Negative	2	4	4	3	Medium 30

Mitigation Measures:

- Integrating the risk and management of heat-related illnesses in the Occupational Health and Safety Plans.
- Educating staff to recognise early symptoms of heat stress.
- Monitoring of temperature and humidity levels.
- Providing adequate cooling and ventilation.
- Introducing systems to limit exposure to heat.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Increased temperature and heatwaves can reduce plant efficiencies and available generation capacity.							
Increased Temperatures	No	Negative	4	4	6	3	Medium 42
	Yes	Negative	4	4	4	3	Medium 36

Mitigation Measures:

- Monitoring of ambient temperature levels.
- Improving operations and infrastructure to enhance transmission and distribution systems' safety, reliability, and performance.
- Assessing the risk of wildfires in relation to infrastructure and facilities.
- Implementing adequate monitoring, fire detection, and suppression systems

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Water scarcity and drought can constrain operations.							

Water Scarcity	No	Negative	2	4	4	4	Medium 40
	Yes	Negative	2	4	2	4	Medium 32

Mitigation Measures:

- Conducting regular monitoring of operational water requirements and available resources.
- Developing a contingency response plan in the event of short-, medium-, or long-term water shortages.
- Develop a water policy to manage and minimize water usage. Setting clear objectives and targets to improve efficiency.
- Developing a contingency response plan in the event of short-, medium-, or long-term water shortages.
- Develop a water policy to manage and minimize water usage. Setting clear objectives and targets to improve efficiency.
- Considering community participation with regards to water infrastructure and management.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Floods, cyclones and storms may affect water quality and increase the spread of disease. Integrating the possible effects of floods and storms on water quality and the possible spread of disease in the Occupational Health and Safety Plans.							
Extreme weather	No	Negative	2	4	4	4	Medium 40
	Yes	Negative	2	4	2	4	Medium 32

Mitigation Measures:

- Conducting regular monitoring of operational water requirements and available resources.
- Developing a contingency response plan in the event of short-, medium-, or long-term water shortages.
- Develop a water policy to manage and minimize water usage.
- Setting clear objectives and targets to improve efficiency.
- Developing a contingency response plan in the event of short-, medium-, or long-term water shortages.
- Developing a water policy to manage and minimise water usage. Setting clear objectives and targets to improve efficiency.

- Considering community participation about water infrastructure and management.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
High wind speeds and gusts may damage infrastructure.							
Extreme weather	No	Negative	4	4	6	4	Medium 56
	Yes	Negative	4	4	4	4	Medium 48
Mitigation Measures: • Conducting a site-specific risk assessment to identify areas vulnerable to high wind speeds and gusts.							

8.4.1.8 Agriculture

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Clearing vegetation and levelling soils where necessary, such as removing topsoil material to create the foundation for the construction of the power plant and temporary laydown areas potentially encroaching cultivated areas.							
Loss of land capability	No	Negative	3	2	8	5	Medium 65
	Yes	Negative	2	1	6	4	Medium 36
Mitigation Measures:							

- The project operations should be kept within the demarcated footprint areas as far as possible to minimise edge effects.
- Unnecessary trafficking and movement over the areas targeted for construction must be avoided, especially heavy machinery.
- No site-clearing activities should take place during periods of heavy rainfall.
- Loosening of the soil through ripping and discing before the stripping process is recommended to break up crusting.
- Access roads should be aligned with the existing road as much as practically possible to avoid further agricultural impact and unnecessary soil disturbance.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Potential frequent movement of earth-moving machinery within loose and exposed soils, leading to excessive erosion. Site clearing, removal of vegetation, and associated disturbances to soils, leading to increased runoff, erosion, and consequent loss of land capability in cleared areas and subsequent loss of soils utilised for cultivation.							
Soil erosion	No	Negative	2	2	4	5	Medium 40
	Yes	Negative	2	1	4	4	Medium 28

Mitigation Measures:

- The project operations should be kept within the demarcated footprint areas as far as possible to minimise edge effects.
- Unnecessary trafficking and movement over the areas targeted for construction must be avoided, especially heavy machinery.
- No site-clearing activities should take place during periods of heavy rainfall.
- Loosening of the soil through ripping and discing before the stripping process is recommended to break up crusting.
- Loosening of the soil through ripping and discing before the stripping process is recommended to break up crusting.
- Compacted soils should be ripped at least 20cm to alleviate.
- Access roads should be aligned with the existing road as much as practically possible to avoid further agricultural impact and unnecessary soil disturbance.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Site clearing and associated disturbances to soils increase runoff, soil compaction, and consequently, the loss of land capability in cleared areas.							

Soil compaction	No	Negative	2	2	4	5	Medium 40
	Yes	Negative	2	1	4	4	Medium 28

Mitigation Measures:

- The project operations should be kept within the demarcated footprint areas as far as possible to minimise edge effects.
- Unnecessary trafficking and movement over the areas targeted for construction must be avoided, especially heavy machinery.
- No site-clearing activities should take place during periods of heavy rainfall.
- It is recommended that the soil be loosened through ripping and discing before the stripping process to break up crusting.
- Loosening of the soil through ripping and discing before the stripping process is recommended to break up crusting.
- Compacted soils should be ripped at least 20cm to alleviate.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Site clearing, removal of vegetation, and associated disturbances to soils lead to increased runoff, soil compaction and consequent loss of land capability in cleared areas.							
Soil contamination	No	Negative	2	2	6	4	Medium 40
	Yes	Negative	2	1	4	4	Medium 28

Mitigation Measures:

- The project operations should be kept within the demarcated footprint areas as far as possible to minimise edge effects.
- Ensure proper handling and storage of hazardous chemicals and materials (e.g., fuel, oil, cement, concrete, reagents, etc.) as per their corresponding Safety Data Sheets.
- Vehicle and equipment maintenance should be carried out in designated facilities fitted with spillage containment, floors, and sumps to capture fugitive oils and greases.
- Implementing regular site inspections for materials handling and storage.
- Development of detailed procedures for spill containment and soil clean up.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Clearing and levelling soils where necessary, such as removing topsoil material to create a smooth road foundation.							
Loss of land capability	No	Negative	2	2	6	4	Medium 40
	Yes	Negative	1	1	4	3	Medium 18

Mitigation Measures:

- To minimise edge effects, the project operations must be kept within the demarcated footprint areas as far as practically possible.
- Establish the site boundary/servitude at the start of construction and keep all activities within this boundary/servitude.
- Use geotextiles and contours to control soil erosion and revegetate exposed soil surfaces where possible.
- Rehabilitate and landscape-disturbed areas not occupied by infrastructure.
- Always strip a suitable time before commencing construction activities to avoid soil loss and contamination.
- The proposed road development within the study area should aim to minimise the impact on soils used for cultivation as far as practically possible.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Clearing levelling soils where necessary, such as removing topsoil material to create a smooth road foundation.							
Soil erosion	No	Negative	2	4	6	3	Medium 36
	Yes	Negative	1	4	4	3	Medium 27

Mitigation Measures:

- The project operations should be kept within the demarcated footprint areas as far as possible to minimise edge effects.
- Unnecessary trafficking and movement over the areas targeted for construction must be avoided, especially heavy machinery.

- No site-clearing activities should take place during periods of heavy rainfall.
- Loosening of the soil through ripping and discing before the stripping process is recommended to break up crusting.
- Compacted soils should be ripped at least 20cm to alleviate.
- Access roads should be aligned with the existing road as much as practically possible to avoid further agricultural impact and unnecessary soil disturbance.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Heavy vehicle traffic within and around the study area and potentially compacting the soil during construction.							
Soil compaction	No	Negative	2	4	6	3	Medium 36
	Yes	Negative	1	4	4	3	Medium 27

Mitigation Measures:

- The project operations should be kept within the demarcated footprint areas as far as possible to minimise edge effects.
- Unnecessary trafficking and movement over the areas targeted for construction must be avoided, especially heavy machinery.
- No site-clearing activities should take place during periods of heavy rainfall.
- Loosening of the soil through ripping and discing before the stripping process is recommended to break up crusting.
- Compacted soils should be ripped at least 20cm to alleviate.
- Access roads should be aligned with the existing road as much as practically possible to avoid further agricultural impact and unnecessary soil disturbance.

OPERATIONAL PHASE

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Operation and maintenance of the KFP plant; constant traffic and frequent soil disturbances resulting in land capability loss.							

Loss of land capability	No	Negative	2	4	6	4	Medium 48
	Yes	Negative	1	4	4	3	Low 27

Mitigation Measures:

- Maintenance vehicles should be checked for hydrocarbon leakages before commencement of maintenance activities.
- Disturbed areas adjacent to the footprint should be revegetated with indigenous grass mix to limit potential soil erosion.
- Use geotextiles and contours to prevent soil erosion and revegetate exposed soil surfaces where possible.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Operation and maintenance of the KFP power plant; constant traffic and frequent disturbances of soils resulting in soil compaction.							
Soil Compaction	No	Negative	2	4	6	3	Medium 36
	Yes	Negative	1	4	4	3	Medium 27

Mitigation Measures:

- Loosening of the soil through ripping and discing before the stripping process is recommended to break up crusting.
- Unnecessary trafficking and movement over the areas targeted for maintenance must be minimised as far as practically possible, especially heavy machinery.
- Disturbed areas adjacent to the footprint area should be revegetated with indigenous grass mix to limit potential soil compaction.
- Access roads should be inspected and maintained as necessary.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Direct chemical spills on soils from KFP power plants, construction vehicles, or other construction equipment used.							
Soil Contamination	No	Negative	2	2	6	3	Medium 30
	Yes	Negative	2	1	4	3	Medium 18

Mitigation Measures:

- Ensure proper handling and storage of hazardous chemicals and materials (e.g., fuel, oil, cement, concrete, reagents, etc.) per their corresponding Safety Data Sheets.
- Vehicle and equipment maintenance should be carried out in designated facilities fitted with spillage containment, floors, and sumps to capture fugitive oils and greases.
- Implementing regular site inspections for materials handling and storage.
- Development of detailed procedures for spill containment and soil clean up.

Access, Construction and New Eskom Roads Impact Ratings

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Operation and maintenance of the access and construction roads, constant traffic, and frequent soil disturbances are resulting in a loss of land capability.							
Loss of land capability	No	Negative	2	4	6	4	Medium 48
	Yes	Negative	1	4	4	3	Medium 27

Mitigation Measures:

- Maintenance vehicles should be checked for hydrocarbon leakages before commencement of maintenance activities.
- Disturbed areas adjacent to the footprint should be revegetated with indigenous grass mix to limit potential soil erosion.
- Use geotextiles and contours to prevent soil erosion and revegetate exposed soil surfaces where possible.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Operation and maintenance of the roads; constant traffic and frequent disturbances of soils resulting in soil compaction.							
Soil Erosion	No	Negative	2	4	6	3	Medium 36
	Yes	Negative	1	4	4	3	Medium 27

Mitigation Measures:

- Unnecessary trafficking and movement over the areas targeted for maintenance must be minimised as far as practically possible, especially heavy machinery.
- Disturbed areas adjacent to the roads should be revegetated with indigenous grass mix to limit potential soil compaction.
- Access roads should be inspected and maintained as necessary.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Direct chemical spills on soils from the hydrogen plants, construction vehicles, or other construction equipment used. Operation and maintenance of the access, construction, and new Eskom road; constant traffic and frequent disturbances of soils resulting in soil compaction.							
Soil Contamination	No	Negative	2	4	6	3	Medium 36
	Yes	Negative	1	4	4	3	Medium 27

Mitigation Measures:

- Ensure proper handling and storage of hazardous chemicals and materials (e.g., fuel, oil, cement, concrete, reagents, etc.) as per their corresponding Safety Data Sheets.
- Vehicle and equipment maintenance should be carried out in designated facilities fitted with spillage containment, floors, and sumps to capture fugitive oils and greases.
- Implementing regular site inspections for materials handling and storage.
- Development of detailed procedures for spill containment and soil clean up.

8.4.1.9 Avifauna

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Loss of avifaunal habitat, species, and avifaunal SCC							

Habitat disruption	**No**	**Negative**	2	4	4	3	Moderate 30
	Yes	**Negative**	1	2	2	2	Low 10
Disturbance of bird roosts and breeding sites	**No**	**Negative**	1	4	4	3	Low 27
	Yes	**Negative**	1	2	2	2	Low 10
Displacement of priority species	**No**	**Negative**	2	4	4	3	Moderate 30
	Yes	**Negative**	1	2	2	2	Low 10

Mitigation Measures:

- In terms of Tower infrastructure, the commencement of construction should be, if possible, limited to the months of December, January, February, March, April, May, September, October, and November (latest) to minimize dust effects and subsequent destruction of the avifaunal habitats, especially during foraging and breeding season.
- Mitigation for disturbance includes the establishment and monitoring of an EMP by an onsite ECO during construction. Construction activity should be restricted to the immediate footprint of the infrastructure.
- Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species.
- Existing access roads should be used to the maximum extent possible, and new roads should be constructed to a minimum. Development planning must ensure that loss of vegetation and disturbance are restricted within the recommended site layout footprint.
- Demarcate the construction footprint before clearing vegetation.
- A pre-construction environmental induction must be conducted for all on-site construction staff to ensure that basic environmental principles are followed. This includes awareness of conservation and the importance of SCC, which is Highly probable on-site.
- Before the commencement of any excavations, the required disturbance footprint will be demarcated, and all activities will be located within the demarcated area. No vegetation disturbance will take place outside the demarcated area.
- The mitigation measures proposed by the vegetation specialist must be strictly enforced.

- If avian SCC nests are located, a qualified avifaunal specialist should be consulted to determine the best management options. If nests are known to have nestlings or eggs within, these should be allowed to fledge before the nest removal.
- The infrastructure design should be environmentally sound, all construction equipment to be utilised must be in good working condition, and all possible precautions must be taken to prevent potential avifaunal collisions, electrocutions, and mechanical spills and/or leaks.
- No hunting/trapping or collecting of avifaunal species is allowed.
- The development footprint should be demarcated, and no development-related activities should occur outside of the demarcated footprint. This final footprint area
- Any structures that may act as perching sites for birds should be installed with anti-perching spikes.
- Anti-collision devices should be installed along the powerline. These must be approved, durable devices, as the area is prone to strong winds. Anti-collision devices must be installed as soon as the wires are strung. The devices must be installed 5m apart and alternate between light and dark colours to increase the earth wires' visibility.

8.4.1.10 Avifaunal Impact

Issue	Corrective Measure	Impact Rating Criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Direct interactions occur when birds collide with powerlines, possibly because they fail to see the wires as they are focusing on something that lies beyond, e.g., a perch or food source. Birds might also be killed by striking power lines support structures. The likelihood of birds colliding with power lines depends on various aspects. Faulting which is caused by bird on power lines is rated medium with proper mitigation in place; the potential impact of faulting is one that can be reduced to low significance.							
Bird Collision	**No**	**Negative**	2	4	4	3	Moderate 30
	Yes	**Negative**	1	2	2	2	Low 10
Electrocution	**No**	**Negative**	2	4	4	3	Moderate 30
	Yes	**Negative**	1	2	2	2	Low 10
Loss of avifaunal habitat, species, and SCC	**No**	**Negative**	2	5	8	4	Moderate 60
	Yes	**Negative**	2	4	4	3	Moderate 30
Mitigation Measures:	• Mitigation of collisions involves routing the line correctly and installing anti-collision marking devices where necessary. • Only a bird-friendly pylon structure is permissible for constructing the new proposed power line. This will ensure that large birds can perch and roost safely on the hardware. • Fitment of devices on the earth wires to make the lines more visible • All construction and maintenance activities should be carried out according to generally accepted environmental best practices.						

	• The bird flight diverters should be installed on the line for the span length on the earth wire. Light and dark-coloured devices must be alternated to provide contrast against dark and light backgrounds, respectively. These devices must be installed as soon as the conductors are strung. • During the operational phase, any nest found on the lines should be managed in accordance with Eskom Distribution Nest Management Guidelines and relevant provincial and national legislation. • To prevent the electrocution of any birds on the poles, all poles should be fitted with a standard type, Eskom-approved "bird perch" at the top of the pole. This will provide ample safe perching space for any bird well clear of the dangerous hardware. • All vehicles should be restricted to traveling only on designated roadways to limit the ecological footprint of the development activities. • Continuous monitoring (monthly) should be undertaken, and a record of potential bird electrocutions or collisions should be kept and reported to the ECO. Mitigation measures should be updated annually depending on monitoring results

8.4.1.11 Visual Impact

Issue	Corrective Measure	Impact Rating Criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Khanyazwe Flexpower	No	Negative	2	4	6	4	Medium 48
	Yes	Negative	2	4	4	3	Medium 30
Above Ground Gas Pipeline	No	Negative	2	4	4	2	Low 20
	Yes	Negative	2	4	2	2	Low 16
Access Road	No	Negative	2	4	4	2	Low 20
	Yes	Negative	2	4	2	2	Low 16
EXTENSION OF A Busbar at Eskom Khanyazwe sub-station	No	Negative	2	4	6	3	Medium 36
	Yes	Negative	2	4	4	3	Medium 30
Overhead Transmission Line	No	Negative	2	4	6	4	Medium 44

	Yes	Negative	2	4	4	3	Medium 30
Mitigation Measures:	• A hydroseeding application (mix of organic material and endemic veld grass) is recommended to be applied over the disturbed areas as a measure of rehabilitation. • Rehabilitate disturbed areas around buildings as soon as practically possible after construction to restrict extended periods of exposed soil. • Plant fast-growing endemic trees along the building yard and service roads. The trees will, with time, create a screen and increase the biodiversity of the area. • It is also recommended that trees be planted in areas where there is a direct view of the power station to reduce the visual impact on viewers. • Make use of existing access roads where possible • Where new access roads are required, the disturbance area should be kept to a minimum. A two-track dirt road will be the most preferred option. • If it is necessary to clear vegetation for a road, avoid doing so in a continuous straight line. Alternatively, curve the road in order to reduce the visible extent of the cleared corridor • Locate the alignment and the associated cleared servitude so as to avoid the removal of established vegetation. • Avoid a continuous linear path of cleared vegetation that would strongly contrast with the surrounding landscape character. Feather the edges of the cleared corridor to avoid a clearly defined line through the landscape. • If practically possible, locate construction camps in areas that are already disturbed or where it isn't necessary to remove established vegetation like for example naturally bare areas. • Utilise existing screening features such as dense vegetation stands or topographical features to place the construction camps and lay-down yards out of the view of sensitive visual receptors. • Keep the construction sites and camps neat, clean and organised in order to portray a tidy appearance. • Screen the construction camp and lay-down yards by enclosing the entire area with a dark green or black shade cloth of no less than 2m height. • Shielding the sources of light by physical barriers (walls, vegetation, or the structure itself).						

	• Directing light sources away from residential units and roads. • Limiting mounting heights of lighting fixtures. • Making use of minimum lumen or wattage in fixtures. • Making use of down-lighters or shielded fixtures. • Making use of low impact lighting. • Making use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes

8.4.1.12 ECO-TOURISM IMPACT ASSESSMENT

Issue	Corrective Measure	Impact Rating Criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Impact on Existing Eco-Tourism Establishments							
Khanyazwe Flexpower Plant and Associated Infrastructure	**No**	**Negative**	3	5	6	4	Medium 56
	Yes	**Negative**	3	5	4	3	Medium 48
Visual Impact on Tourists and Travelers							
Khanyazwe Flexpower Plant and Associated Infrastructure	**No**	**Negative**	3	5	6	4	Medium 56
	Yes	**Negative**	3	5	4	2	Medium 48
Impact on Protected Areas							
Khanyazwe Flexpower Plant and Associated Infrastructure	**No**	**Negative**	3	5	6	4	Medium 56
	Yes	**Negative**	3	5	4	4	Medium 48
Impact on Sense of Place							

Khanyazwe Flexpower Plant and Associated Infrastructure	No	Negative	3	5	6	3	Medium 42
	Yes	Negative	3	5	4	2	Low 24
Impact of Dust/Noise Pollution during Construction							
Khanyazwe Flexpower Plant and Associated Infrastructure	No	Negative	3	4	6	4	Medium 30
	Yes	Negative	3	4	4	3	Low 24
Poaching of Animals							
Khanyazwe Flexpower Plant and Associated Infrastructure	No	Negative	3	5	4	3	Medium 30
	Yes	Negative	3	5	4	2	Low 24

8.4.1.13 SURFACE AND GROUNDWATER POLLUTION

Issue	Corrective Measure	Impact Rating Criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	

Oil Spills may occur from construction vehicles, and machinery spillages may occur when the existing facility is removed from the site. Potential sources of pollution to this resource result from surface and subsurface activities that could possibly leak and/or spill hazardous substances onto the surface, which are then transported to the groundwater body through the underlying soils. It is anticipated that the significance rating can be reduced to low with the implementation of mitigation measures.							
Surface and Ground Water Pollution.	**No**	**Negative**	2	1	6	4	36
	Yes	**Negative**	2	1	4	3	21
Corrective Actions	• Drip trays must be placed underneath parked construction equipment. • Adequate spill kits must be provided on site. • Possible leaks and spills of hazardous substances into the ground should be avoided at all times; and • In the event of a spillage of a hazardous substance the requirements of the EMPr must be implemented.						

8.4.1.14 SOIL EROSION

Issue	**Corrective Measure**	**Impact Rating Criteria**					**Significance**
		Nature	**Extent**	**Duration**	**Magnitude**	**Probability**	
Clearing vegetation and soil exposure during facility decommissioning may lead to erosion of these surfaces due to rain and wind. With the implementation of the recommended mitigation measures, the significance of this impact can be reduced from medium negative to low negative.							
Surface and Ground Water Pollution.	**No**	**Negative**	2	1	6	4	**36**
	Yes	**Negative**	2	1	4	2	**14**

Corrective Actions	• No unnecessary clearing of vegetation will be allowed. • Construction vehicles and machinery to be driven on designated roads and • Areas cleared of vegetation must be re-vegetated with indigenous vegetation.

Issue	Corrective Measure	Impact Rating Criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Post Construction and Decommissioning							
Rehabilitation/landscaping of the site after construction activities	No	Negative	1	4	4	3	27
	Yes	Negative	3	5	10	4	72
• Mitigation Measures: • Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction • The plant material to be used for rehabilitation should be like what is naturally found in the surrounding area. • When rehabilitating the construction footprint site, it is imperative that as far as possible, the habitat that was present prior to disturbances is improved, so that avifaunal species that were displaced by vegetation clearing and construction activities can recolonize the rehabilitated area. • All disturbed areas can be re-vegetated with an indigenous grass mix to re-establish a protective grass strip within the power line servitude to minimize soil erosion and dust emission.							

8.4.2 CLIMATE CHANGE

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Impact of GHG emissions from the construction operations was rated medium with or without mitigation measures.							
Power plant construction and operation	No	Negative	5	3	0	4	32
	Yes	Negative	5	3	0	4	32
Mitigation Measures: • Optimising construction activities and logistics – performing as efficiently and effectively as possible. • Implementing a fuel management strategy, which encourages more efficient use of vehicles, planning, logistics, driver education, and maintenance •							

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Calculated GHG emissions inventory for the KFP Power Plant amounts to 12.374% of South Africa's carbon budget (510 Mt CO2e). The impact of GHG emissions from the operations was rated High with or without mitigation measures							
	No	Negative	5	5	10	5	100
	Yes	Negative	5	5	10	5	100
Mitigation Measures: • Optimising energy utilisation efficiency. • Utilising the cleanest fuel economically available. • Selecting the best power generation and pollution control technology for the chosen fuel. • Utilising high-performance monitoring and process control techniques, good design and maintenance of the combustion system. • Developing and implementing of a GHG management plan.							

- Developing and implementing a leak detection and repair program
-

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
The impacts of increased temperature on operations were rated Medium without mitigation measures and Medium to Low with mitigation measures.							
Power plant construction and operation	No	Negative	2	4	6	3	36
	Yes	Negative	2	4	4	3	30

Mitigation Measures:

- Integrating the risk and management of heat related illnesses in the Occupational Health and Safety Plans.
- Educating staff to recognise early symptoms of heat stress.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Increased temperature and heatwaves can influence productivity.							
Power plant construction and operation	No	Negative	2	4	4	3	30
	Yes	Negative	2	4	2	3	24

Mitigation Measures:

- Monitoring of temperature and humidity levels.
- Providing adequate cooling and ventilation.
- Introducing systems to limit exposure to heat

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Increased temperature and heatwaves can reduce plant efficiencies and available generation capacity.							
.	No	Negative	4	4	6	3	32
	Yes	Negative	4	4	4	3	32
Mitigation Measures: • Monitoring of ambient temperature levels. • Improving operations and infrastructure to enhance the safety, reliability, and performance of transmission and distribution systems.							

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Increased temperature and heat waves can cause transmission line losses and extension of transmission line cables.							
	No	Negative	4	4	4	3	42
	Yes	Negative	4	4	10	3	36
Mitigation Measures: • Monitoring of ambient temperature levels. • Improving operations and infrastructure to enhance the safety, reliability, and performance of transmission and distribution systems, including increasing line tension and adding coolers to transformers							

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
The impacts of increased temperature on operations were rated Medium without mitigation measures and Medium to Low with mitigation measures.							
	No	Negative	2	4	4	3	30

	Yes	Negative	2	4	2	3	24

Mitigation Measures:

- Assessing the risk of wildfires in relation to infrastructure and facilities.
- Implementing adequate monitoring, fire detection and suppression systems.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Increased temperature and heatwaves can influence productivity.							
	No	Negative	4	4	4	3	36
	Yes	Negative	4	4	2	3	30

Mitigation Measures:

- Assessing the risk of wildfires in relation to infrastructure and facilities.
- Implementing adequate monitoring, fire detection and suppression systems.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
The impacts of reduced rainfall on operations were rated Medium without mitigation measures and Medium to Low with mitigation measures.							
Water scarcity and draught can constrain operations.	No	Negative	4	4	6	3	48
	Yes	Negative	4	4	4	3	36

Mitigation Measures:

- Conducting regular monitoring of operational water requirements and available resources.

- Developing a contingency response plan in the event of short-, medium-, or long-term water shortages.
- Develop a water policy to manage and minimise water usage. Setting clear objectives and targets to improve efficiency.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Water scarcity and drought can lead to water conflicts with communities.							
	No	Negative	3	4	4	3	33
	Yes	Negative	3	4	2	3	27

Mitigation Measures:

- Conducting regular monitoring of operational water requirements and available resources.
- Develop a contingency response plan in the event of short, medium short-, medium-, or long-term water shortages.
- Develop a water policy to manage and minimise water usage. Setting clear objectives and targets to improve efficiency.
- Considering community participation with regard to water infrastructure and management.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
The impacts of increased temperature on operations were rated Medium without mitigation measures and Medium to Low with mitigation measures.							
Water scarcity and draught may further exacerbate water quality	No	Negative	3	4	4	3	33
	Yes	Negative	3	4	2	3	27

Mitigation Measures:

- Conducting regular monitoring of operational water requirements and available resources.

- Develop a contingency response plan in the event of short, medium short-, medium-, or long-term water shortages.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
The impacts of floods, cyclones, and storms were rated Medium without and with mitigation measures.							
Floods, cyclones, and storms may cause physical risks to employees.	No	Negative	2	4	6	4	48
	Yes	Negative	2	4	4	4	40

Mitigation Measures:

- Integrating the risk related to floods and storms in the Occupational Health and Safety Plans.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Increased temperature and heatwaves can reduce plant efficiencies and available generation capacity.							
Floods, cyclones and storms may affect water quality and increase the	No	Negative	2	4	4	4	40
	Yes	Negative	4	4	2	4	32

spread of disease.							

Mitigation Measures:

- Integrating the possible effects of floods and storms on water quality and the possible spread of disease in the Occupational Health and Safety Plans.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Floods, cyclones, and storms may cause the discharge of contaminated water into surrounding areas.							
	No	Negative	2	4	6	4	48
	Yes	Negative	2	4	10	4	40

Mitigation Measures:

- Conducting a site-specific risk assessment to identify areas vulnerable to flooding.

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
The impacts of increased temperature on operations were rated medium without mitigation measures and medium to low with mitigation measures.							
Floods, cyclones and storms may cause damage to infrastructure and facilities.	No	Negative	4	4	6	4	56
	Yes	Negative	4	4	4	4	48

Mitigation Measures:

- Conducting a site-specific risk assessment to identify areas vulnerable to flooding and infrastructure vulnerable to cyclones and storms.
- Developing a contingency response plan should operations become inaccessible due to floods

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Increased temperature and heat waves can influence productivity.							
Floods, cyclones, and storms may cause reduced accessibility due to flooding of roads.	No	Negative	2	4	6	4	48
	Yes	Negative	2	4	4	4	40

Mitigation Measures:

- Conducting a site-specific risk assessment to identify areas vulnerable to flooding and infrastructure vulnerable to cyclones and storms.
- Developing a contingency response plan should operations become inaccessible due to floods

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Increased temperature and heat waves can influence productivity.							
Lightning may cause damage	No	Negative	4	4	6	4	56
	Yes	Negative	4	4	4	4	48

a short circuit in transmission lines.							
Mitigation Measures: • Increasing lightning protection of the site.							
Issue	**Corrective measures**	**Impact rating criteria**					**Significance**
		Nature	**Extent**	**Duration**	**Magnitude**	**Probability**	
The impacts of high wind speeds and gusts were rated Medium without and with mitigation measures.							
High wind speeds and gusts may damage infrastructure.	No	Negative	4	4	6	4	56
	Yes	Negative	4	4	4	4	48
Mitigation Measures: • Conducting a site-specific risk assessment to identify areas vulnerable to high wind speeds and gusts.							

8.4.1.2 Terrestrial Biodiversity Compliance Statement

Summary of the Site Ecological Importance of habitat types delineated within the study area

Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance	Site Ecological Importance (SEI) Guidelines for interpreting SEI in the context of the proposed development activities
	Low	Very low	Very Low	High	Very Low	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.
Transformed	< 50% of the receptor contains natural habitat with limited potential to support SCC.	Several major current negative ecological impacts.		Habitat that can recover relatively quickly		

Summary of the Screening tool vs specialist assigned sensitivities

Screening Tool Theme	Screening Tool rating	Specialist rating	Screening Tool Validated or Disputed by Specialist - Reasoning
Anima Theme	Medium	Low	Disputed– Habitat is transformed, and no SCC is expected.
Plant Theme	Medium	Low	Disputed– Habitat is transformed, and no SCC is expected.

Terrestrial Theme	Very High	Low	Disputed– The area is transformed but is still importance to the KNP and ESA buffer zone.

8.4.3 CUMULATIVE IMPACTS, THE NATURE, SIGNIFICANCE, CONSEQUENCES OF THE IMPACT, RISK, EXTENT, DURATION AND PROBABILITY

Cumulative impacts in relation to an activity means the past, present, and reasonably foreseeable future impacts of an activity, considered together with the impacts of activities associated with that activity that may not be significant but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities (DEA, 2014 EIA Regulations).This section provides cumulative impact ratings associated with the proposed project, including waste generation, traffic, and air quality, socio-economic, and visual impacts. It also outlines the mitigation measures of each rated cumulative impact as follows:

8.4.3.1 Waste Generation

During the construction phase of the proposed power station, powerline, and gas pipeline, the access road will produce various waste streams within the project site. Most of this waste will end up at landfill sites within the municipality.

Aspect	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Waste	No	Negative	2	2	8	5	60
	Yes	Negative	1	2	4	4	28
Corrective Actions	• No waste will be buried on site or incorporated into the foundation trenches. • The work force must be encouraged to sort waste into recyclable and non-recyclable waste. • No burning of waste will be allowed on site; and • Waste must be regularly removed from site and disposed of at a registered waste disposal facility.						

8.4.4 Soil and Land Capability

Sixty-six percent (66%) of Mpumalanga Province's irrigated land is in the Ehlanzeni District, where most are in the Nkomazi Local Municipality. The plantation lands are located mainly at the Province's center, forming a belt stretching north to south along the escarpment. The surrounding areas where the proposed activities occur are dominated by sugar cane farming activities. The conversion of land use will impact the province's agricultural economy, The loss of farm soils, and the permanent change in land use will be localized.

The loss of agricultural soils and the permanent change in land use will be localized within the study area; the cumulative loss of agricultural resources locally and regionally is moderate without mitigation and low with mitigation measures. It is the opinion of the specialist that the unmitigated scenario poses a threat to the sustainability of high-potential agricultural soils. Therefore, integrated mitigation measures must be implemented accordingly, with the aim of minimizing the potential loss of these valuable soils, considering the need for sustainable development. Mixed land use, such as sheep grazing between solar arrays, should be considered to retain agricultural production while generating renewable energy.

8.4.5 Water resources

The cumulative impacts of developments within the catchments will cause an increase in surface water runoff and a decrease in infiltration, which will potentially result in an increase in erosion potential and sedimentation to the wetlands downstream. Attenuation of surface water runoff and its subsequent diffused release is imperative to control on-site and not accentuate the problem within the larger catchment. The development of a comprehensive surface runoff and sensitive stormwater management plan is therefore required, indicating how all surface runoff generated because of the development (during both the construction and operational phases) will be managed (e.g., artificial wetlands/stormwater and flood retention ponds/ attenuation and diffuse release mechanisms) prior to entering any local/regional drainage system. This plan should, therefore, indicate how surface runoff will be retained and subsequently released to simulate natural hydrological conditions. Furthermore, special care must be taken with regard to the design, construction, and maintenance of linear infrastructure, e.g., cabling, water, and sewage infrastructure, as the smectic clays on site can cause serious damage to especially linear infrastructure due to the swelling and shrinking properties

8.5 THE POSSIBLE MITIGATION MEASURE THAT COULD BE APPLIED AND LEVEL OF RESIDUAL RISK

Section 8.4 above provides details on the significance of each issue with and without mitigation and further provides mitigation measures as recommended by the specialists. Further mitigation measures for the proposed project are detailed in the Environmental Management Programme (EMPr), which will be a blueprint throughout the project lifecycle.

8.6 IF NO ALTERNATIVE DEVELOPMENT FOOTPRINT FOR THE ACTIVITY WERE INVESTIGATED, THE MOTIVATION FOR NOT CONSIDERING SUCH

The Project considered several alternatives in Section 6.1. The development footprint has been determined and presented in the layout.

8.7 A CONCLUDING STATEMENT INDICATING THE LOCATION OF THE PREFERRED ALTERNATIVE DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE AS CONTEMPLATED IN THE ACCEPTED SCOPING REPORT

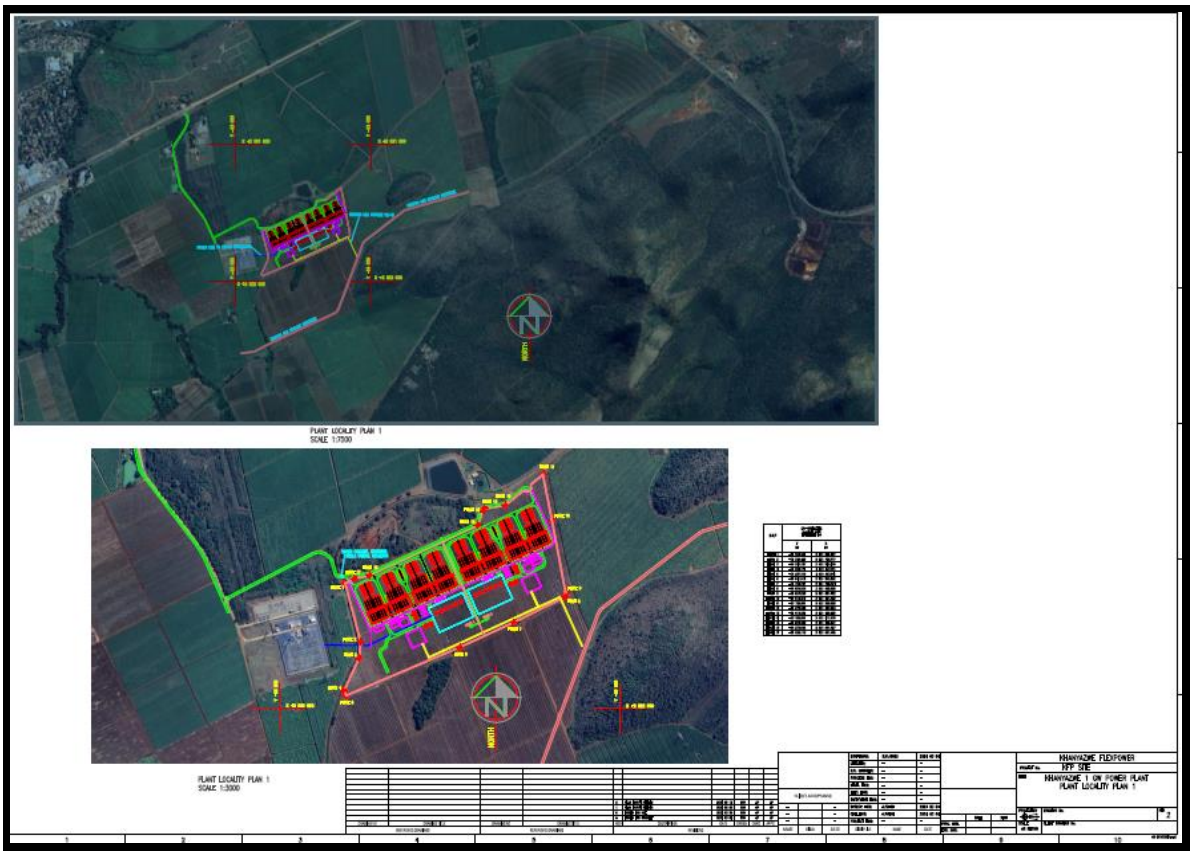


Figure 46: Final Layout for the Khanyazwe Flexpower power plant in Malelane

8.7.1 A MAP AT AN APPROPRIATE SCALE THAT SUPERIMPOSES THE PROPOSED ACTIVITY AND ITS ASSOCIATED STRUCTURES AND INFRASTRUCTURE ON THE ENVIRONMENTAL SENSITIVITIES OF THE PREFERRED DEVELOPMENT FOOTPRINT ON THE APPROVED SITE AS CONTEMPLATED IN THE ACCEPTED SCOPING REPORT INDICATING ANY AREAS THAT SHOULD BE AVOIDED, INCLUDING BUFFERS

The maps below show the proposed activities and their associated structures and infrastructure in relation to the environmental sensitivities of the proposed study area, as contemplated in the accepted Scoping Report. The

Maps at an appropriate scale showing all the proposed activities in relation to environmental sensitivities are attached in Appendix A

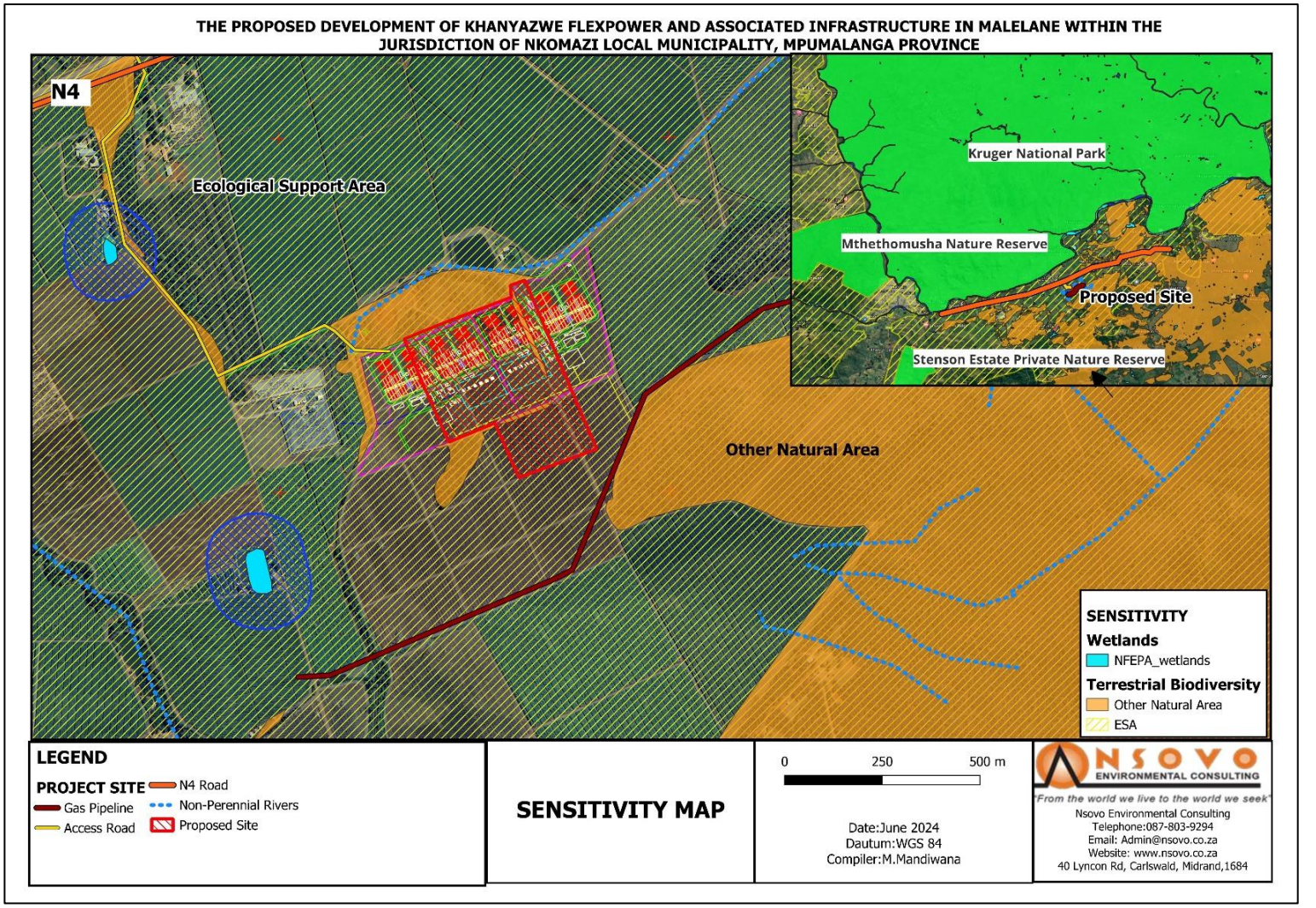


Figure 47: Proposed activities in the environmental sensitivity area

9 WHERE APPLICABLE, A SUMMARY OF THE FINDINGS AND RECOMMENDATIONS OF ANY SPECIALIST REPORT COMPLYING WITH APPENDIX 6 TO THESE REGULATIONS AND AN INDICATION AS TO HOW THESE FINDINGS AND RECOMMENDATIONS HAVE BEEN INCLUDED IN THE FINAL ASSESSMENT REPORT.

Input from specialists has been considered throughout the compilation, and it is the same information referenced during the elimination of alternatives. Further, the specialist studies' findings are included in Section 8.

All specialist studies were prepared per Appendix 6 of the EIA Regulations of 2014 as amended and undertaken by qualified, experienced, and registered specialists. The specialist studies will take into consideration the Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Section 24(5) (a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation ("the Protocols") promulgated in Government Notice ("GN") No. 320 on 20 March 2020.

10 AN ENVIRONMENTAL IMPACT STATEMENT WHICH CONTAINS—

10.1 A SUMMARY OF THE KEY FINDINGS OF THE ENVIRONMENTAL IMPACT ASSESSMENT

This draft EIR primarily assesses the likely impact the development may have on the surrounding environment and provides recommendations regarding available alternatives, mitigation, and management measures. The process aims to ensure that impacts are identified and where negative impacts are anticipated, prevented, minimized, and remedied (should these be unavoidable), and where positive impacts are identified, these are enhanced as far as possible.

The EIR presents the relevant information to the Competent Authority for the purposes of decision-making. In deciding regarding this application, the key findings and other information contained within this report must be considered. The suggested mitigation measures must also be considered, and compliance should form a condition of any decision to proceed with the development. In addition, these conditions should be incorporated into a Construction Phase EMPr which serves to guide and inform sustainable environmental practices during the construction process. The complete identified management and mitigation measures are listed in the EMPr. These measures include those detailed in Section 8 of this report.

10.1.1 PLANNING AND DEVELOPMENT PHASE

Impacts associated with the planning and development phase of the proposed activity include the creation of job opportunities for skilled engineers and planning professionals. This positive impact will be definite and short-term in duration. No significant negative impact has been associated with this phase and the proposed activity.

10.1.2 CONSTRUCTION PHASE

The positive impacts identified for this phase include job creation and a positive economic outlook for the mining community, the province, and the country at large; these impacts will be enhanced in order to maximize the benefits. The negative impacts associated with the construction phase of the proposed activity can be regarded as being of low /medium significance. These include the following:

- Impact on flora.
- Impact on fauna.
- Impact on Social.
- Impact on Avifauna
- Impacts on water resources
- Noise impact
- Visual impact;
- Impacts on Eco-tourism
- Impacts on Air Quality
- Impacts on Climate Change
- Impact on agriculture.
- Impact on Tourism
- Impact on Traffic

Impacts of medium to high significance include the following:

- Safety and security; and
- Resettlement.

With corrective measures in place and the implementation of the specialist's recommendations, none of the identified negative impacts are a fatal flaw.

10.1.3 OPERATION PHASE

Significant negative impacts can be associated with the operational phase of the proposed activity, including the following:

- Noise Impact
- Climate Change Impact
- Visual Impact

- Avifauna Impact

Positive impacts include

- Employment opportunities
- Socioeconomic Benefit
- Development
    - Energy Infrastructure and stability to the national energy grid
    - Energy Access and Affordability
    - Regional Integration and Development

10.1.4 DECOMMISSIONING PHASE

It must be noted that decommissioning will not take place in the foreseeable future. However, negative impacts associated with the decommissioning phase include dust generation, loss of flora, and potential surface and groundwater pollution. If decommissioning were to take place, it would have a negative impact due to job losses and waste generation and would be subject to the relevant regulations and approvals.

The proposed activity's decommissioning phase will not occur in the foreseeable future. However, if it were to occur, it would have a negative impact due to job losses, dust generation, potential soil erosion, waste generation, and surface and groundwater pollution.

10.2 BASED ON THE ASSESSMENT, AND WHERE APPLICABLE, RECOMMENDATIONS FROM SPECIALIST REPORTS, THE RECORDING OF PROPOSED (IMPACT MANAGEMENT OUTCOMES FOR THE DEVELOPMENT FOR INCLUSION IN THE EMPR AS WELL AS FOR INCLUSION AS CONDITIONS OF AUTHORISATION

10.2.1 THE FINAL PROPOSED ALTERNATIVES THAT RESPOND TO THE IMPACT MANAGEMENT MEASURES, AVOIDANCE, AND MITIGATION MEASURES IDENTIFIED THROUGH THE ASSESSMENT

Sixteen specialist studies were undertaken, and input from these studies was key in preparing this EIA report. The specialist's recommendation guided the consideration of the most suitable and preferred alternative. Further, although none of the alternatives were considered fatal flaws, the specialists made several recommendations to be included in the EMPr to reduce the severity of the identified impacts on the environment. The recommendations are highlighted in Section 8.

A comparative analysis of the alternative was thoroughly conducted in Section 6, and reasons for reasons provided. The final recommended alternatives are provided in the Table below.

Table 34: Recommended Alternatives for approval

Alternatives	Recommended Option
Site	Site Option 1
Technology	ICE
Water source	Borehole
Grid Connection	Either 275kV or 132kV with the addition of a 500MVA transformer at Khanyazwe Substation

10.2.2 ANY ASPECTS THAT WERE CONDITIONAL TO THE FINDINGS OF THE ASSESSMENT EITHER BY THE EAP OR SPECIALIST WHICH ARE TO BE INCLUDED AS CONDITIONS OF AUTHORISATION

Given the comprehensiveness of the impact assessment undertaken to this end, it is recommended that the proposed project be authorised. The conditions that must be included in this Environmental Authorisation are as follows:

- All mitigation measures detailed in this report and the specialist studies must be implemented.
- The EMPr, as contained within Appendix D, must be used as a blueprint throughout all project phases.
- An independent ECO must be appointed during construction to ensure environmental compliance monitoring and timeous reporting.
- It is further recommended, by way of an alternative mitigation measure aimed at accommodating parties likely to be affected by construction and operational noise (referring in particular to Noise Receptor A as shown in Table 9 on page 33 of the report by environmental noise and ground vibration specialist BJB Van der Merwe of dBAcoustics titled “Environmental Noise Impact Assessment Report” dated 13 June 2024) as well as in the report titled “Social Impact Assessment Report” by SIA Specialist Vhahangwele Manavhela dated 12 June 2024 on the need to develop and implement appropriate resettlement plans including fair compensation and support to affected parties in the event of their resettlement. The applicant must consider all possible options, including opportunities to relocate them in the best possible, legal, reliable, safe, and acceptable manner.
- Noise and air quality monitoring must be conducted throughout the operational phases at a frequency determined by the specialist.
- A Community Liaison Officer must be appointed to manage community-related matters.
- Rehabilitate the project area by ripping, landscaping, and re-vegetating with local species.
- Ensure that the management of hazardous and general waste is managed in accordance with the provisions of the Waste Act and associated norms and standards as applicable.
- All parties involved in the construction and ongoing maintenance (including Contractors, Engineers, and the Developer) are, in terms of NEMA’s “Duty of Care” and “Remediation of Damage” principles (Section 28),

required to prevent any pollution or degradation of the environment, be responsible for preventing impacts occurring, continuing or recurring and for the costs of repair of the environment.

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11 DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES, AND KNOWLEDGE GAPS THAT RELATE TO THE ASSESSMENT AND MITIGATION MEASURES PROPOSED

11.1 ASSUMPTIONS AND LIMITATIONS

The technical data supplied by the client when the draft EIA report was compiled is assumed to be correct and valid. Furthermore, the alternatives presented by Khanyazwe Flexpower are assumed to be feasible.

11.2 PUBLIC PARTICIPATION PROCESS

Public meetings and focus group meetings will be held, and the meeting minutes will be submitted with the final EIA report. However, various means will be afforded for the public to participate in the EIA process and comment on the draft reports (EIA).

11.3 LITERATURE REVIEW

This report was based on various literature reviews and the previous specialist input, which were considered correct at the time. However, it is acknowledged that there might be some gaps in knowledge regarding the literature reviewed, although concerted efforts were made to attain as much information as possible. Further specialist studies will be undertaken to enhance the literature review.

11.4 SPECIALIST ASSUMPTIONS AND LIMITATIONS

All specialist reports completed include gaps and limitations associated with the specific themes.

11.4.1 CLIMATE CHANGE IMPACT ASSESSMENT

Data limitations and assumptions associated with the climate change impact assessment in support of the KFP Power Plant are listed below:

- The inventory included all practical and economically feasible sources to assess.
- The GHG inventory for the project includes the construction operations and the KFP Power Plant.
- Construction operations will probably include emissions from mobile and stationary diesel combustion. However, GHG emissions for these operations could not be determined due to a lack of data availability.

- KFP Power Plant's GHG emissions include Scope 1, Scope 2, and Scope 3 GHG emissions.
- KFP Power Plant's project life is estimated at 25 years.
- Limitations exist with climate change projections to inform future climate scenarios.

11.4.2 AGRICULTURE

The following assumptions, uncertainties, limitations, and gaps were applicable for the soil, land use, and land capability assessment:

- It is assumed that the infrastructure components will remain as indicated on the layout and that the activities for the construction and operation of the infrastructure are limited to that typical for a project of this nature.
- The soil survey was confined to the study area outline with consideration of various land uses outside the study area.
- During the site assessment and compilation of the report, employment figures pertaining to the study area could not be sourced.
- Soil profiles were observed using a 1.5m hand-held soil auger; thus, a description of the soil characteristics deeper than 1.5m cannot be given; and
- It can be challenging to Classify soils as one specific form due to the infinite variations in the soil continuum. Therefore, the classifications presented in this report are based on the "best fit" to South Africa's soil classification system.

11.4.3 VISUAL IMPACT ASSESSMENT

This assessment was undertaken during the project's conceptual stage and is based on information available.

- This level of assessment excludes surveys to establish viewer preference and their sensitivity. Viewer sensitivity is determined by employing a commonly used rating system.

11.4.4 WETLAND DELINEATION

During the present study, the following limitations were experienced:

- To obtain definitive data regarding the biodiversity, hydrology, and functioning of particular wetlands, studies should ideally be conducted over several seasons and several years. The current study relied on information gained during a single field survey conducted during a single season, desktop information for the area, professional judgment and experience.
- Wetland and riparian delineation in transformed landscapes, such as urban or agricultural settings or mining areas with existing infrastructure, is complex. These areas are often affected by disturbances that limit the use of available wetland indicators, such as hydrophytic vegetation or soil indicators. The delineations

provided in this study are based on available indicators and the author's interpretation of the current extent and nature of the wetlands and riparian areas associated with the proposed activity.

- Some precision agricultural techniques, such as topographical manipulation and soil redistribution ploughing, were evident within the study area, which in some instances could obscure pedological signs of wetness and hydric soil forms.
- Wetland and riparian assessments are conducted using qualitative methods developed by the Department of Water and Sanitation (DWS). These methods, while valuable, have inherent limitations due to the wide range of interdisciplinary aspects they must consider. The current and historic anthropogenic disturbance in and around the study area has led to soil profile disturbances and changes in species composition, deviating from the original or expected benchmark condition.
- Delineations of wetland areas were largely dependent on the extrapolation of field indicator data obtained during field surveys, 5m contour data for the study area, and from the interpretation of georeferenced orthophotos and satellite imagery as well as historical aerial imagery data sets received from the National Department of Rural Development and Land Reform. As such, inherent orthorectification errors associated with data capture and transfer to electronic format are likely to decrease the accuracy of wetland boundaries in many instances.
- Wetlands outside the study area boundary were extrapolated using aerial imagery. However, some sampling was done outside the study boundaries to confirm findings and better interpret the Hydropedological characterization of the study area.
- Cumulative impacts should be considered from a regional level, thus DWS Mpumalanga.
- Furthermore, invasion by *Dichrostachys cinerea* also reduced field accessibility to accurately delineate riparian habitat along the total length of the watercourse.

11.4.5 SOCIAL IMPACT ASSESSMENT

The SIA must be based on current and accurate project information. Similarly, the geographic extent of the SIA is influenced by project design and overall planning processes. The report is based on current information received while compiling the feasibility study and considers project information relating to planning and design, implementation, and infrastructure placement.

- This study was carried out with the information available to the specialist when executing the study within the available timeframe and budget. The sources consulted are not exhaustive; additional information might exist, which might strengthen arguments or contradict the information in this report.
- It was assumed that the motivation for and the ensuing planning and feasibility studies of the Project were done with integrity and that the information provided to date by the other stakeholders was deemed accurate.
- As is the nature of social research, the results of this study cannot be generalised and applied to the entire population across the whole area and are restricted to the specific study area.

- Also, people's actions can never be predicted with 100% accuracy, even when circumstances don't change, and predictions are based on rigorous research results. The different potential impacts, therefore, must be assessed holistically and not in isolation.

11.4.6 ECO-TOURISM

This assessment was undertaken during the project's conceptual stage and is based on the information available.

- The exact alignment of the proposed line and position of the pylons are not yet determined.

11.4.7 NOISE

The following assumptions were used in the noise impact assessment:

- Power generation operations will take place on a 24-hour basis.
- The abutting occupants of the farmhouses (depending on the location of the houses in the proposed project areas) are exposed to distant noise, such as traffic noise, train noise, and insects during the day and the night.
- Seasonal agricultural activities increase the prevailing ambient noise level accordingly.
- The prevailing wind direction propagates the noise in a northerly, northwesterly and southerly direction most of the time; and
- Power generation is a necessity in South Africa.

There were no limitations at the time of compiling the report, as the Environmental Assessment Practitioner provided all the relevant information for the project.

12 REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORIZED IF THE OPINION IS THAT IT SHOULD BE AUTHORISED, ANY CONDITIONS THAT SHOULD BE MADE IN RESPECT OF THAT AUTHORISATION

The project should thus be authorised for the following reasons:

- The project motivation highlighted the need and desirability of the proposed project and the subsequent benefits, which include the following:
    - Job creation and skills development
    - Local economic development
    - Reliable supply of electricity
    - Improvement of South Africa’s socio-economic status.

- Given the current state of the economy, a project of this nature and magnitude cannot be ignored. It is acknowledged that the various phases of the proposed project will yield negative impacts on the environment; however, given the mitigation measures proposed, it can be confirmed that the identified socio-economic benefits far outweigh the negative consequences identified.
- The undertaking of the EIA is a positive step taken by the applicant to ensure environmental sustainability and to embrace the right to a healthy living environment in line with the requirements of the South African legislative framework.
- The proposed alternatives have been under detailed assessment. The primary objective has been to assess the suitability of the proposed study area for the intended use from an environmental perspective. This thorough investigation was furthermore enhanced by input from ecologists, archaeologists, visual, avifauna, social, ecotourism, and agricultural climate change, avifauna, social, and other specialists.
- The findings of the investigations from the specialists' input and the EAP have been comprehensively documented in this report, together with the specified recommendations. Based on the investigations, no fatal flaws or highly significant impacts that would impede the proposed development or necessitate redesign or termination of the project have been identified.
- Based on the reasons highlighted above, the Project alternatives recommended above should be approved, and all management and mitigation measures should be put in place to reduce the environmental impact, particularly the avifauna, visual, ecotourism, and noise.
- The no-go alternative was assessed, and consideration of this option will have even greater social and economic consequences, particularly if the security of the electricity supply is compromised. Therefore, given the various industrial and residential developments taking place across the country, the need to secure reliable supply is vital.
- The project has considered a transparent approach in undertaking the PPP process and continues to do so during this phase.

With mitigation measures proposed and recommendations made by the specialist; the impacts are manageable.

13 WHERE THE PROPOSED ACTIVITY DOES NOT INCLUDE OPERATIONAL ASPECTS, THE PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED AND, THE DATE ON WHICH THE ACTIVITY WILL BE CONCLUDED, AND THE POST-CONSTRUCTION MONITORING REQUIREMENTS FINALISED

The proposed project's authorisation is required for 25 years.

14 AN UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP IN RELATION TO THE FOLLOWING

14.1 THE CORRECTNESS OF THE INFORMATION PROVIDED IN THE REPORTS

In undertaking this project, the EAP has considered the requirements stipulated in the EIA 2014 Regulation as amended and other relevant Acts and Regulations. Furthermore, the EAP considered the information provided by the client and the specialist on the project as true and correct. Subsequently, in the compilation of the reports and consolidating information from other parties, the EAP confirms the correctness of the information provided in the report.

Furthermore, to allow comprehensiveness and increased accuracy in assessing the proposed project's impacts on the environment, input was sought from specialists in the various fields, as indicated above. This report is a culmination of the EAP's independent opinion based on experience, expertise, and input from specialists. The EAP confirms that specialist observations and recommendations have been comprehensively included in the Draft EIA Report where relevant and their reports attached accordingly. Should there be any form of misrepresentation, it was not intended.

14.2 THE INCLUSION OF COMMENTS AND INPUTS FROM STAKEHOLDERS AND I&APS

The EIA process is undertaken in accordance with the requirements of the Regulations as highlighted above; further, the process adhered fully to the principles of public participation, i.e., transparent and afforded a fair opportunity to stakeholders and I&APs to participate meaningfully.

Subsequently, the EAP confirms that all comments and issues raised by stakeholders and I&APs will be addressed fully and included in all communication to the Authorities. Further comments from this draft Report will be addressed in the final submission.

14.3 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

Throughout the process, several notices and documentation were shared with stakeholders and I&APs. Furthermore, several engagements, both public and focus group meetings, will be held to share information and address any concerns. The information and responses provided to these parties, either in writing or verbally, are confirmed to be accurate and correct.

15 WHERE APPLICABLE, DETAILS OF ANY FINANCIAL PROVISION FOR THE REHABILITATION, CLOSURE, AND ONGOING POST-DECOMMISSIONING MANAGEMENT OF NEGATIVE ENVIRONMENTAL IMPACTS

No Financial Provision Regulations, 2015 (Government Notice Regulation [GN R] No. 1147), published under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) as amended, in Government Gazette 39425 is required for the proposed development.

16 AN INDICATION OF ANY DEVIATION FROM THE APPROVED SCOPING REPORT, INCLUDING THE PLAN OF STUDY, INCLUDING–

16.1 ANY DEVIATION FROM THE METHODOLOGY USED IN DETERMINING THE SIGNIFICANCE OF POTENTIAL ENVIRONMENTAL IMPACTS AND RISKS

The methodology used in determining the significance of the identified potential impacts is as proposed in the approved Scoping and Plan of Study for EIA; therefore, there is no deviation.

17 ANY SPECIFIC INFORMATION THAT MAY BE REQUIRED BY THE COMPETENT AUTHORITY.

The DFFE accepted the scoping report with conditions on April 25, 2024. The conditions are included hereunder and addressed accordingly in the EIR and EMPR. The conditions are included verbatim as follows.

Table 35: Information required by the DFFE.

DFFE Comments	EAP Response or Reference in the Report
(a) Listed Activities	
(i) The Project description provided for activity 4 of listing notice 3 must be amended to indicate the name of the protected area and the distance where the proposed project will be situated next to.	The proposed project will require the development of a 1.2 km 10 m wide access road to the development site. These roads will also serve as service roads during the operational phase. The road is within 10km of the Kruger National Park. **The description has been amended.**
(ii)Two similar listed activities under listing notice 1 and listing notice 2, which relate to the construction of a powerline, have been applied for. The project description provided stated that the power to be generated will be evacuated through either a 132kV or two 275kV powerlines. You are required to provide clarity in the EIAR whether both powerlines (i.e. 132kV and	Only one is required however the client is awaiting final confirmation from Eskom. The final EIR will present the one they are approved for.

DFFE Comments	EAP Response or Reference in the Report
275kV) are proposed as connection lines for the proposed power plant.	
Further, the project description indicates that a 132kV switch yard will be constructed. However, the project description provided for activities 11 and 9 does not mention the required substation. This must be rectified.	The switchyard extension has been included in the description and the layout. The Khanyazwe 275/132kV substation will be expanded to accommodate the 500MVA transformer bay.
Please ensure that all relevant listed activities are applied for, are specific, and can be linked to the development activity or infrastructure as described in the project description. Also ensure to choose the correct and relevant sub listing. Additionally, note that the onus is thus on the applicant and the environmental assessment practitioner (EAP) to ensure that all the applicable listed activities are included in the application. Failure to do so may result in unnecessary delays in the processing of the application.	The application has been updated to include all applicable activities and resubmitted.
The EIAr must provide an assessment of the impacts and mitigation measures for each of the listed activities applied for.	Impact mitigation included in Section 8.4
If the activities applied for in the application form differ from those mentioned in the final EIAr, an amended application form must be submitted. Please note that the Department's application form template has been amended and can be downloaded from the following link https://www.environment.gov.za/documents/forms.	The application has been resubmitted.
(b)Public Participation	
(i) Please ensure that comments from all relevant stakeholders are submitted to the Department with the EIAr. Comments must be obtained from this Department's Biodiversity Section, Air Quality Section and Climate Change Section)	The Draft Report has been submitted to the Biodiversity Section, and comments will be included.
(ii) Please ensure that all issues raised, and comments received during the circulation of the draft SR and draft EIAr from registered I&APs and organs of state which have	Comments raised throughout the public participation phase will be responded to and documented in the C&R.

DFFE Comments	EAP Response or Reference in the Report
jurisdiction in respect of the proposed activity are adequately addressed in the final EIAr. Proof of correspondence with the various stakeholders must be included in the final EIAr. Should you be unable to obtain comments, proof should be submitted to the Department of the attempts that were made to obtain comments.	
(iii) A Comments and Response trail report (C&R) must be submitted with the final EIAr. The C&R report must incorporate all comments for this development. The C&R report must be a separate document from the main report, and the format must be in the table format indicated in Appendix 1 of this comments letter. Please refrain from summarising comments made by I&APs. All comments from I&APs must be copied verbatim and responded to clearly. Please note that a response such as "noted" is not regarded as an adequate response to I&AP's comments. Please ensure that the comments and trail report are in the format provided by the department. This must include all comments received on this application.	All comments received on this application will be responded to. Comments will be written verbatim.
(iv) Comments from I&APs must not be split and arranged into categories. Comments from each submission must be responded to individually.	Comments from each submission will be responded to individually.
(v) The Public Participation Process must be conducted in terms of Regulation 39, 40, 41, 42, 43 & 44 of the EIA Regulations, 2014, as amended.	Public Participation Process will be conducted in terms of Regulation 39, 40, 41, 42, 43 & 44 of the EIA Regulations, 2014, as amended
(vi) The EAP is requested to contact the Department to make the necessary arrangements to conduct a site inspection before the submission of the final EIAr.	The Department will be contacted to decide to conduct a site inspection before the submission of the final EIAr.
(vii) All evidence of public participation must be included in the final EIR, including site notices and newspaper articles	All evidence of public participation will be included in the final EIR, including site notices and newspaper articles.
(c) Cumulative Assessment	

DFFE Comments	EAP Response or Reference in the Report
Should there be any other similar projects within a 30km radius of the proposed development site, the cumulative impact assessment for all identified and assessed impacts must be refined to indicate the following: • Identified cumulative impacts must be clearly defined, and where possible, the size of the identified impact must be quantified and indicated, i.e., hectares of cumulatively transformed land. • Detailed process flow and proof must be provided to indicate how the specialist's recommendations, mitigation measures, and conclusions from the various similar developments in • conclusion and mitigation measures were drafted for this project. • The cumulative impacts significance rating must also inform the need and desirability of the proposed development. • A cumulative impact environmental statement on whether the proposed development must proceed.	Cumulative impacts have not been assessed as no similar projects are within a 30km radius of the proposed site.
(d) Specialist assessments	
(i) The EAP must ensure that the specialist studies to be conducted must include the following: A detailed description of the study's methodology, an indication of the locations and descriptions of the development footprint, and all other associated infrastructures they have assessed and are recommending for authorizations. • Provide a detailed description of all limitations to the studies. All specialist studies must be conducted in the right season; providing that as a limitation will not be allowed. • Please note that the Department considers a 'no-go' area an area where no development of infrastructure is allowed; therefore, no development	All specialists were conducted in line with the protocols attached in Appendix C.

DFFE Comments	EAP Response or Reference in the Report
of associated infrastructure, including access roads, is allowed in the 'no-go' areas. • Should the specialist definition of 'no-go' area differ from the Departments definition; this must be clearly indicated. The specialist must also indicate the 'no-go' area's buffer if applicable. • All specialist studies must be final, and provide detailed/practical mitigation measures for the preferred alternative and recommendations, and must not recommend further studies to be completed post EA. Should a specialist recommend specific mitigation measures, these must be clearly indicated. • Regarding cumulative impacts: o Clearly defined cumulative impacts and where possible the size of the identified impact must be quantified and indicated, i.e. hectares of cumulatively transformed land. o A detailed process flow to indicate how the specialist's recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project. o Identified cumulative impacts associated with the proposed development must be rated with the significance rating methodology used in the process. o -The significance rating must also inform the need and desirability of the proposed development. o A cumulative impact environmental statement on whether the proposed development must proceed.	

DFFE Comments	EAP Response or Reference in the Report
Should the appointed specialists specify contradicting recommendations, the EAP must indicate the most reasonable recommendation and substantiate this with defendable reasons; if necessary, it must include further expertise advice.	A specialist integration session was held to ensure alignment.
i It is further brought to your attention that Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation, which was promulgated in Government Notice No. 320 of 20 March 2020 (i.e., "the Protocols"), and in Government Notice No. 1150 of 30 October 2020 (i.e., protocols for terrestrial plant and animal species), have come into effect. Please note that specialist assessments must be conducted in accordance with these protocols.	Acknowledged and considered.
(iv) The screening tool output: The screening tool and the gazetted protocols (GN R320 of 20 March 2020 and GN R 1150 of 30 October 2020) require a site sensitivity verification to be completed to either confirm or dispute the findings and sensitivity ratings of the screening tool. It is the responsibility of the EAP to confirm the list of specialist assessments and motivate in the assessment report the reason for not including any of the identified specialist studies, including the provision of photographic evidence of the site situation. The site sensitivity verification for each of the recommended studies, as per the protocols submitted as part of SR, must be included in the EIAr.	The site sensitivity verification to confirm or dispute the screening toll findings and sensitivity rating was completed, and the reports were submitted with the final Scoping report and specialist reports are included in **Appendix C** of this report.
(v) In addition, the SR must include a table summarising the specialist studies required by the Screening Tool and its	Section 7 details the SSV outcomes for all themes.

DFFE Comments	EAP Response or Reference in the Report
sensitivity rating (very high, high, medium, low), another column indicating the site's sensitivity after the EAP/Specialist conducted the Site Verification Assessment, and a column indicating whether these studies are conducted or that a compliance statement is conducted.	
For the themes identified as low and medium which require compliance statements, please ensure that these specialists must be identified as specialists to be conducted who compliance statements are to be included in the EIAr.	Compliance Statements are included for the following: (i) Heritage (ii) Biodiversity (iii) Paleontology (iv) Wetland
(vii) Additionally, the protocols specify that an assessment must be prepared by a specialist who is an expert in the field and is SACNASP registered. For example, an aquatic assessment must be prepared by a specialist registered with SACNASP, with expertise in aquatic sciences.	Specialist qualifications are included in the attached reports and declarations.
Additionally, the protocols specify that an assessment must be prepared by a specialist who is an expert in the field and is SACNASP registered. For example, an aquatic assessment must be prepared by a specialist registered with SACNASP, with expertise in aquatic sciences.	Acknowledged and considered.
Please be reminded that section 2(3) of NEMA requires developments to be socially, environmentally, and economically sustainable, while section 2(4)(i) of NEMA requires the social, economic, and environmental impacts of activities, including disadvantages and benefits, to be considered, assessed and evaluated.	Included in the impact assessment Section 8
The Screening tool report identified the Health Impact Assessment as part of the specialist studies to be commissioned for the proposed project. However, these studies are not included in the plan of study. Please take note that this study was identified by screening tool based on the type of the proposed project and the known impacts	A MHI exemption has been prepared to address measure hazards as low.

DFFE Comments	EAP Response or Reference in the Report
associated with the proposed development. It is the responsibility of EAP to confirm this list and to motivate in the assessment report the reason for not including any of the identified specialist studies, including the provision of photographic evidence of the site situation. Based on the above, the Health Impact Assessment must be included as part of specialist studies to be commissioned for the proposed project, and it must therefore be included in the draft EIAr.	
The following Specialist Assessments have been identified as specialists that will form part of the EIAr. As per comments above, the Health Impact Assessment study must be included:	All specialist prepared and included in **Appendix C**.
Locality, Site Layout and Sensitivity Maps	
The draft EIAr must provide the following: (i) A clear description of all associated infrastructure. This description must include, but is not limited to the following: • Powerlines and substation; • Internal road infrastructure; and; • All supporting onsite infrastructure such as laydown area and auxiliary buildings, dangerous goods facility, etc. (ii)All necessary details regarding all possible locations and sizes of the proposed project infrastructure. (iii)A copy of the final preferred layout map. All available biodiversity information must be used in the finalisation of the layout map. Existing infrastructure must be used as far as possible, e.g. roads. The layout map must indicate the following: • Permanent laydown area footprint; • Internal roads indicating width (construction period width and operation period width) and with numbered sections between the other site elements	Maps and layouts presented in the report and Attached in **Appendix A**.

DFFE Comments	EAP Response or Reference in the Report
which they serve (to make commenting on sections possible); • Wetlands, drainage lines, rivers, streams, and water crossings of roads and cables indicating the type of bridging structures that will be used; • The location of sensitive environmental features on-site e.g. CBAs, ESA, heritage sites, wetlands, drainage lines, etc., that will be affected by the facility and its associated infrastructure; • Substation(s) and/or transformer(s) sites, including their entire footprint; • Location of access and service roads; • Connection routes (including pylon positions) to the distribution/transmission network; • All existing infrastructure on the site, especially railway lines and roads; • Buffer areas; • Buildings, including accommodation; • All "no-go" areas; and • A north arrow and legend/key, to enable the Department to interpret the layout map. (iv)An environmental sensitivity map indicating environmentally sensitive areas and features identified during the assessment process. (v)A map combining the final layout map superimposed (overlain) on the environmental sensitivity map.	
(j) Projects coordinates:	
The coordinates of the proposed facility and all associated infrastructures as applied for must be provided. You must also provide the start, middle and end point coordinates for all linear infrastructures.	Coordinates are included in Section 3.4
(k) Environmental Management Programme (EMPr)	

DFFE Comments	EAP Response or Reference in the Report
It is drawn to your attention that for substation and overhead electricity transmission and distribution infrastructure, when such facilities trigger activity 11 or 47 of the EIA Regulations Listing Notice 1 of 2014, as amended, and any other listed and specified activities necessary for the realisation of such facilities, the generic Environmental Management Programmes (EMPr), contemplated in Regulations 19(4) must be used over and above the EMPr for the facility. Accordingly, there needs to be a generic EMPr for the on-site substation, a generic EMPr for the overhead powerline, and a third, separate EMPr for the facility. • Please ensure that the mitigation measures specified in the EIAr and specialist reports are also incorporated into the EMPr. • In addition, ensure that the EMPr complies with the content of the EMPr in terms of Appendix 4 of the EIA Regulations, 2014, as amended. • Please also include in the EMPr a recommended frequency for the auditing of compliance with the conditions of the EA and EMPr, and for the submission of such compliance reports to the competent authority. • EMPr must include an environmental sensitivity map indicating environmental sensitive areas and features identified during the assessment process. • A map combining the final layout map superimposed (overlain) on the environmental sensitivity map. • EMPr must include measures to protect hydrological features such as streams, rivers, pans, wetlands, dams and their catchments, and other environmentally sensitive areas from construction impacts including the direct or indirect spillage of pollutants.	EMPr is attached as Appendix D.
(I)General	
(i)The EIAr must provide the technical details for the proposed facility in a table format as well as their description and/or	Included in Section 4

DFFE Comments	EAP Response or Reference in the Report
dimensions. A sample for the minimum information required is listed under Annexure 2 below.	
Recommendations of conditions to be included in the EA, must be done per project.	Included in 10.2.2
Details of the future plans for the site and infrastructure after decommissioning in 20-30 years and the possibility of upgrading the proposed infrastructure to more advanced technologies must be indicated.	Details and future plans will be included in the final EIR.
The EAP must provide landowner consent for all farm portions affected by the proposed project, whether the project component is linear or not, i.e., all farm portions where the access road, solar panels, and associated infrastructure are to be located.	The land owner consent form was attached to the application and will be re-submitted.
Please also ensure that the EIAr includes the period for which the Environmental Authorisation is required and the date on which the activity will be concluded as per Appendix 3 of the NEMA EIA Regulations, 2014, as amended.	The period for which the authorisation is required is included in Section 18.

18 THE PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED, THE DATE ON WHICH THE ACTIVITY IS CONCLUDED, AND THE POST-CONSTRUCTION MONITORING REQUIREMENTS FINALISED

The proposed EA is required for **25 years.**

19 ANY OTHER MATTERS REQUIRED IN TERMS OF SECTION 24(4) (A) AND (B) OF THE ACT.

This Report has been prepared in terms of NEMA, its respective 2014 EIA Regulations as amended, and other various Acts.

20 CONCLUSION AND RECOMMENDATION

The EIA was conducted as dictated by the NEMA and the EIA Regulations of December 2014, as amended, and associated regulations. This report has comprehensively addressed the potential positive and negative impacts associated with the proposed Khanyazwe Flexpower Plant. A team of environmental specialists informed this environmental impact assessment report, and their studies are attached hereto. Furthermore, the EIA identified

critical issues and concerns based on inputs from the relevant stakeholders, I&APs, and the EAP's professional judgment based on experience and expertise in the field.

Various alternatives have been proposed and assessed. The primary objective was to determine the suitability of each option for the intended use and the suitability of each option based on its identified impacts. The EIA further duly considered the suitability of the overall project within its developmental – and environmental context.

No fatal flaws or highly significant impacts were identified during the EIA phase that would necessitate substantial redesign or termination of the project. Potential negative impacts have been identified, and where the impacts were detrimental to the environment, alternatives were proposed, and mitigation measures were recommended.

The report is subject to a 30-day comment and review period to allow input from stakeholders and I&APs. The comments received via email, calls, and meetings will be considered and incorporated in the report and comprehensively addressed in the CRR. Furthermore, the EIA provides a detailed assessment of the identified issues and their significance ratings and proposes mitigation measures as applicable. Any further recommendations the DFFE makes will be duly addressed and incorporated before submitting the final report for decision-making.

20.1 RECOMMENDATIONS

Nsovo herewith recommends authorisation of the following as described in Section 9 above:

- All mitigation measures recommended by the specialists must be considered during the construction and operational phases.
- Khanyazwe Flexpower shall ensure that fluids are stored and handled properly in concrete-to-cement-lined storage areas with berm walls to avoid seepage into the groundwater resources and ensure that the storage area's design can contain leaks or spills.
- The Environmental Management Programme is attached hereto as a living document that guides the construction and operational phases of the proposed project.
- That all necessary permits and licenses required by any Act, Policy, Law, or By-Law be obtained before construction.
- Implement an integrated waste management approach based on waste minimization, incorporating reduction, reuse, recycling, and disposal where appropriate.
- The necessary Water Use License must be obtained from the Department of Water and Sanitation.
- Excessive wash-down of soil shall be prevented, and the disturbed areas shall be rehabilitated on an ongoing basis to prevent erosion.
- Issues of land ownership must be dealt with before construction.

- The National Environmental Management principles must be adopted, and strict adherence maintained.

The undertaking of this EIA has fully complied with the requirements of the NEMA and associated regulations. It is therefore recommended that the proposed development proceed.

21 REFERENCE

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