

**DRAFT SCOPING REPORT FOR THE PROPOSED  
DEVELOPMENT OF KHANYAZWE FLEXPPOWER  
(PTY) LTD (KFP) AND ASSOCIATED  
INFRASTRUCTURE IN MALELANE WITHIN THE  
JURISDICTION OF NKOMAZI LOCAL  
MUNICIPALITY, MPUMALANGA PROVINCE**

**NSOVO REF: F002- 24**

**DATE:**

**25 JANUARY 2024**

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DOC CONTROL		
Draft Scoping Report	25 January 2024	REV000





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**DOCUMENT CONTROL**

**PROJECT TITLE:**

**DRAFT SCOPING REPORT FOR THE PROPOSED DEVELOPMENT OF KHANYAZWE FLEXPPOWER GAS-TO-POWER FACILITY AND ASSOCIATED INFRASTRUCTURE IN MALELANE WITHIN THE JURISDICTION OF NKOMAZI LOCAL MUNICIPALITY, MPUMALANGA PROVINCE**

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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 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 (maximum) 800MW natural gas-fired power plant using either Gas Engines (or Internal Combustion Engines (ICE)) or Combined Cycle Gas Turbines (CCGT). 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. KFP is also proposing the development of approximately two 500m 275 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 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 utilised in the 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.
- Medium Speed Gas Engines for the generation of electricity through the use of natural gas
- Waste storage facilities (general and oily water)
- Clustered exhaust stacks for the discharge of combustion gases into the atmosphere
- 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 power line to connect the project to the national grid to evacuate the generated electricity.
- LNG liquefaction; storage; and regassification infrastructure with associated LNG truck loading and unloading facilities.

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<sub>2</sub> 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<sub>2</sub> emissions, like replacing natural gas with "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.

Based on the preliminary desktop assessment (STS 2020), the study area is not located within a protected area; however, it is situated approximately 4 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 study area has a very high terrestrial sensitivity, according to the

National Web-based Environmental Screening Tool (2024; this is attributed to the majority of the study area has been modified by agricultural activities.

The EIA process is being undertaken in accordance with the requirements of Appendix 2 of the NEMA EIA Regulations of 2014 as amended.

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

- i. identify the relevant policies and legislation relevant 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 impacts 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 entailed a detailed description of the baseline environment, forming the backdrop of the impact assessment phase. Further, it allows 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 in the field.

Any EIA process has to consider alternatives, such as technological, structural, and locality considerations. A thorough discussion of the discovered options and the no-go alternative forms part of the Scoping Report. The selection of the preferred option will be based on a combination of specialist studies, public input, and technical and environmental factors.

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

- Layout Alternatives within the preferred site.
- Technical alternative - the technology to be used in the activity.
- Water supply.
- Liquid Natural Gas (LNG) Storage.
- Site Access alternatives; and
- The no-go alternative.

The scoping phase assessed technical and structural alternatives of the Flexpower gas-to-power facility, powerline, and pipeline. These alternatives will be assessed further during the EIA phase. The preferred alternatives will be the one with the least environmental impacts as well as providing the most benefits to the socio-economy.

KFP has considered various technology options, which include the Open Cycle Gas Turbines (OCGT), Combined Cycle gas Turbines (CCGT), and Internal Gas Combustion Engines (ICE). The preferred alternatives, including technical, economic, and site alternatives, will be determined as the project advances into the EIA phase. Several aspects, including technical, economic, and environmental, are considered in selecting the most suitable technology. However, of the many technologies available, the project is considering the CCGT and the Internal Gas Combustion Engines. These will be assessed further in the EIA Phase.

The alternatives identified and considered for this project include the following:

**Layout Alternatives within the preferred site:** The project has only one site earmarked for the proposed development. Layout alternatives have been considered within the larger area following thorough sensitivity mapping. In determining the preferred location within the site, four primary factors were considered, namely:

- Avoidance of Eskom servitudes.
- Proximity to a nearby dwelling.
- Proximity to potential water supply; and
- Proximity to the gas pipeline.

Two of these layout options are being considered.

- Layout Option A (East of Khanyazwe Substation) The site layout is approximately 650 m from a possible nearby dwelling and approximately 100 m away from the irrigation dam, as depicted in the image below. The Site to the East does not traverse over any known servitudes.
- Layout Option B (South of Khanyazwe Substation) The alternative site to the South goes over Eskom servitudes. It is also located approximately 350m away from a possible nearby dwelling and approximately 600m away from the nearby irrigation dam.

**Power generation Technology:** KFP has considered various technology options, which include 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 technology for gas available but are less flexible. The sections below describe the technologies considered and a comparative analysis. Both alternatives are feasible and will be assessed further in the EIA phase.

**Water supply:** The power plant's water consumption will be comparable to that of 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 not expected to have material net negative effect on water consumption within the region. The anticipated water consumption will be approximately 400m<sup>3</sup> – 1000m<sup>3</sup> per week. Three water supply alternatives have been identified for the proposed project. The alternatives include municipal water supply, adjacent irrigation canal, and groundwater supply through a borehole. These options will be assessed, and a preferred alternative will be determined in the EIA Phase.

**LNG Storage:** It is prudent, and a requirement of the GASIPPPP, that an alternate supply of gas be considered; as such, the project design will include LNG infrastructure on site, which consists of liquefaction capacity, LNG tanks, and regasification capacity. GASIPPPP RFP, which calls for 2-days' worth of storage at full load, it is anticipated that a total storage capacity of 14,000m<sup>3</sup> would be required. The power plant can use an LNG supply for rapid dispatch changes if the ROMPCO pipeline cannot handle fluctuations. An LNG truck offloading facility can also enable a 'virtual gas pipeline' from other sources in case of ROMPCO supply compromise. Two LNG storage have been identified to accommodate these requirements. At this size of storage, the project can consider either a flat-bottom tank or a pressurized LNG tank. These options will be assessed, and a preferred alternative will be determined in the EIA Phase.

**Site Access Alternatives:** 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, and two access routes are proposed to access the actual power plant near the Eskom Khanyazwe substation.

**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 will be undertaken in the EIA Phase.



To assess the potential impacts on the environment associated with the construction and operation of the proposed Flexpower power plant and associated infrastructure, detailed specialist studies to address the above issues will be undertaken during the EIA phase.

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.

This draft Scoping Report (DSR) is made available to the Interested and Affected Parties (I&APs) and the Organs of State for thirty (30) days to allow for review and comment. All comments received will be included in the Comments and Response (C&R) report, which will form part of the final Scoping Report. The Plan of Study for the EIA has been incorporated into the DSR. It will be submitted to the Competent Authority (CA), the Department of Forestry, Fisheries, and the Environment (DFFE), in terms of section 24C of the National Environmental Management Act (NEMA). The Scoping Report has been prepared as dictated by the 2014 EIA Regulations, as amended, and thus achieved the primary objectives as detailed above.

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## LIST OF ACRONYMS AND ABBREVIATIONS

<b>AEL</b>	Atmospheric Emission License
<b>CARA</b>	Conservation of Agricultural Resources Act, 1983 (43 of 1983)
<b>CBA</b>	Critical Biodiversity Area
<b>CBD</b>	Central Business District
<b>CCGT</b>	Combined Cycle Gas Turbines
<b>DBSA</b>	Development Bank of Southern Africa
<b>DEFEAT</b>	Department of Economic Development, Environmental Affairs and Tourism
<b>DEFF</b>	Department of Environment, Forestry, and Fisheries
<b>DFFE</b>	Department of Forestry, Fisheries, and the Environment
<b>DHSWS</b>	Department of Human Settlement, Water, and Sanitation
<b>DMRE</b>	Department of Mineral Resources and Energy
<b>EA</b>	Environmental Authorisation
<b>EAP</b>	Environmental Assessment Practitioner
<b>EIA</b>	Environmental Impact Assessment
<b>EIR</b>	Environmental Impact Report
<b>EMPr</b>	Environmental Management Programme
<b>ERA</b>	Electricity Regulation Act, 2006 (4 of 2006)
<b>FSRU</b>	Floating Storage Regasification Unit
<b>GA</b>	Gas Act, 2001 (48 of 2001)
<b>GASIPPPP</b>	Gas Independent Power Producer Procurement Programme
<b>GHG</b>	Greenhouse Gas Emissions
<b>GNR</b>	Government Notice Regulations
<b>GSA</b>	Gas Supply Agreement
<b>HSA</b>	Hazardous Substances Act, 1973 (56 of 1973)
<b>I&amp;APs</b>	Interested and Affected Parties
<b>ICE</b>	Internal Combustion Engine
<b>IDP</b>	Integrated Development Plan
<b>IEA</b>	International Energy Agency
<b>IEP</b>	Integrated Energy Plan

<b>IPPPP</b>	Independent Power Producers Procurement Programme
<b>IRP</b>	Integrated Resource Plan
<b>LNG</b>	Liquefied Natural Gas
<b>MBSP</b>	Mpumalanga Biodiversity Sector Plan
<b>MPRDA</b>	Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
<b>MDARDLA</b>	Mpumalanga Department of Agriculture, Rural Development and Land Administration
<b>MW</b>	Megawatt
<b>NCRECA</b>	Noise Control Regulations under the Environmental Conservation Act, 1989 (73 of 1989)
<b>NDP</b>	National Development Plan
<b>NEMA</b>	National Environmental Management Act, 1998 (Act 107 of 1998)
<b>NEMAQA</b>	National Environmental Management: Air Quality Act, 2004 (No. 39 of 2004)
<b>NEMBA</b>	National Environmental Management: Biodiversity Act, 2004 (No. 10 of 2004)
<b>NEMPA</b>	National Environmental Management: Protected Areas Act, 2003 (57 of 2003)
<b>NEMWA</b>	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
<b>NHRA</b>	National Heritage Resources Act, 1999 (No. 25 of 1999)
<b>NLM</b>	Nkomazi Local Municipality
<b>NO<sub>2</sub></b>	Nitrogen dioxide
<b>NPA</b>	National Ports Act, 2005 (12 of 2005)
<b>NPAES</b>	National Protected Areas Expansion Strategy (2009)
<b>NWA</b>	National Water Act, 1998 (Act No. 36 of 1998)
<b>OCGT</b>	Open Cycle Gas-Turbine
<b>OHSA</b>	Occupational Health and Safety Act, 1993 (Act 85 of 1993)
<b>PPP</b>	Public Participation Process
<b>SACAD</b>	South Africa Conservation Areas Database
<b>SAHRA</b>	South African Heritage Resources Agency
<b>SANBI</b>	South African National Biodiversity Institute
<b>SAPAD</b>	South Africa Protected Areas Database)
<b>ToR</b>	Terms of Reference
<b>WULA</b>	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<sub>2</sub> 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<sub>2</sub> emissions, like replacing natural gas with "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.







On the 4<sup>th</sup> 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 behavior 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.

	Coal	Gas – IPP Programme	Gas - Eskom	Dispatchable Capacity	Nuclear	Hydro	Pumped Storage	CSP	Solar PV	Wind	Hybrid IPP Programme	Distributed Generation <sup>h</sup>	BESS – IPP Programme	BESS - Eskom	Unreserved Energy (TWh)
Current Base (MW)	38 800	1 005	2 825	-	1 860	1 600	2732	500	2 287	3 443	-	5 000	-	20	
2024	720							100			150	900		199	13.06
2025	720	1 220							2 115	644	476	900	513	141	7.63
2026										140		900			7.66
2027		1 000								684		900	2 000	615	4.55
2028		1 000	3 000					500				900	615		0.22
2029								500	1 500			900			0.25
2030		1 000		1 376				500	1 500			900			0.27
Additional New Capacity (MW)	1 440	4 220	3 000	1 376				100	3 615	4 468	626	6 300	3 743	360	

	Installed Capacity
	Capacity under construction
	Capacity procured
	New Capacity
	Distributed Generation Capacity for own use
	Unreserved Energy, preferred as low as possible

**Figure 1: The emerging plan from Horizon 1 analysis in the draft IRP2023.**

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 projects for the earmarked areas will include:

- Delivery of natural gas from the ROMPCO gas pipeline to the power plant using a gas pipeline extension.
- Building of an LNG liquefaction, storage, and regasification facility to provide an alternate supply option of trucked LNG to the power plant and to function as an LNG distribution hub(s) for third-party off-take and

Building a 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 a Gas Turbines and/ or Internal Combustion Engine power facility and associated infrastructure with a maximum capacity of 800 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 of 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 Human Settlement, Water and Sanitation (DHSWS) 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 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 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 1 presents the details of the EAP involved, including relevant experience. A detailed Curriculum Vitae and Qualifications are attached as **Appendix B**

**Table 1: Details of the Environmental Assessment Practitioner (EAP)**

<b>Name of Company</b>	Nsovo Environmental Consulting
<b>Person Responsible</b>	Rejoice Aphone
<b>Professional Registration</b>	Environmental Assessment Practitioners Association of South Africa EAP EAPASA (Reg 2019/1227)

<b>Postal Address</b>	40 Lyncon Rd Carlswald 1684
<b>Telephone Number</b>	087 803 9294
<b>Fax Number</b>	086 602 8821
<b>Email</b>	<a href="mailto:rejoice@nsovo.co.za">rejoice@nsovo.co.za</a>
<b>Qualifications &amp; Experience</b>	B.Sc. Honours Environmental and Water Science <b>10 years of experience</b>
<b>Project Related Expertise</b>	<p>In terms of project-related expertise, the Environmental Assessment Practitioner has completed the following projects:</p> <ul style="list-style-type: none"> <li>• EIA for the proposed Tubatse strengthening phase 1 – Senakangwedi B integration within the jurisdiction of Greater Tubatse Local Municipality in Limpopo Province.</li> <li>• EMPr, WULA, and EA amendment for the proposed Juno Gromis 400kV power line</li> <li>• Basic Assessment for the proposed Decommissioning and Demolition of Verwoedberg Substation and 275kV powerline.</li> <li>• Basic Assessment for Bloemendal Substation and in loop-in and outlines.</li> <li>• Environmental Impact Assessment process for the proposed development of the Eskom Agulhas 400kV MTS within the jurisdiction of Swellendam Local Municipality, Western Cape.</li> <li>• Environmental Management Plan and Eskom characterization for the upgrading of Eskom distribution lines in Gauteng</li> <li>• Basic Assessment for the proposed Transnet Ores Feeder substations (Aries, Garona, Helios, and Juno substations) within the Northern and Western Cape provinces.</li> <li>• Basic Assessment for the proposed upgrading of the Rand Water A13 water pipeline, Gauteng.</li> <li>• Basic assessment of the proposed development of the Transnet Capital Projects substations (Bosmanskop, Leeufontein, and Rietkuil substations).</li> </ul>

	<ul style="list-style-type: none"><li>• Construction Environmental Management Plan for constructing the Eskom Simmerpan MTS and refurbishing the 275kV power line.</li><li>• Construction Environmental Management Programme for the proposed Eskom Juno- Gromis 400kV power line in the Northern and Western Cape Provinces.</li><li>• Construction Environmental Management Programmes for the proposed Transnet Orex Feeder substations (Aries, Garona, Helios, Juno) within the Northern and Western Cape provinces.</li></ul>
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### **3 DESCRIPTION OF THE LOCALITY AND THE PROPERTY ON WHICH THE ACTIVITY IS TO BE UNDERTAKEN AND THE LOCATION OF ACTIVITY ON THE PROPERTY**

This section provides detailed information on the location of the proposed project. 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 2 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 2 is the locality map that shows the location of the proposed Khanyazwe Flexpower. Refer to Appendix A for the A3 locality and sensitivity maps.



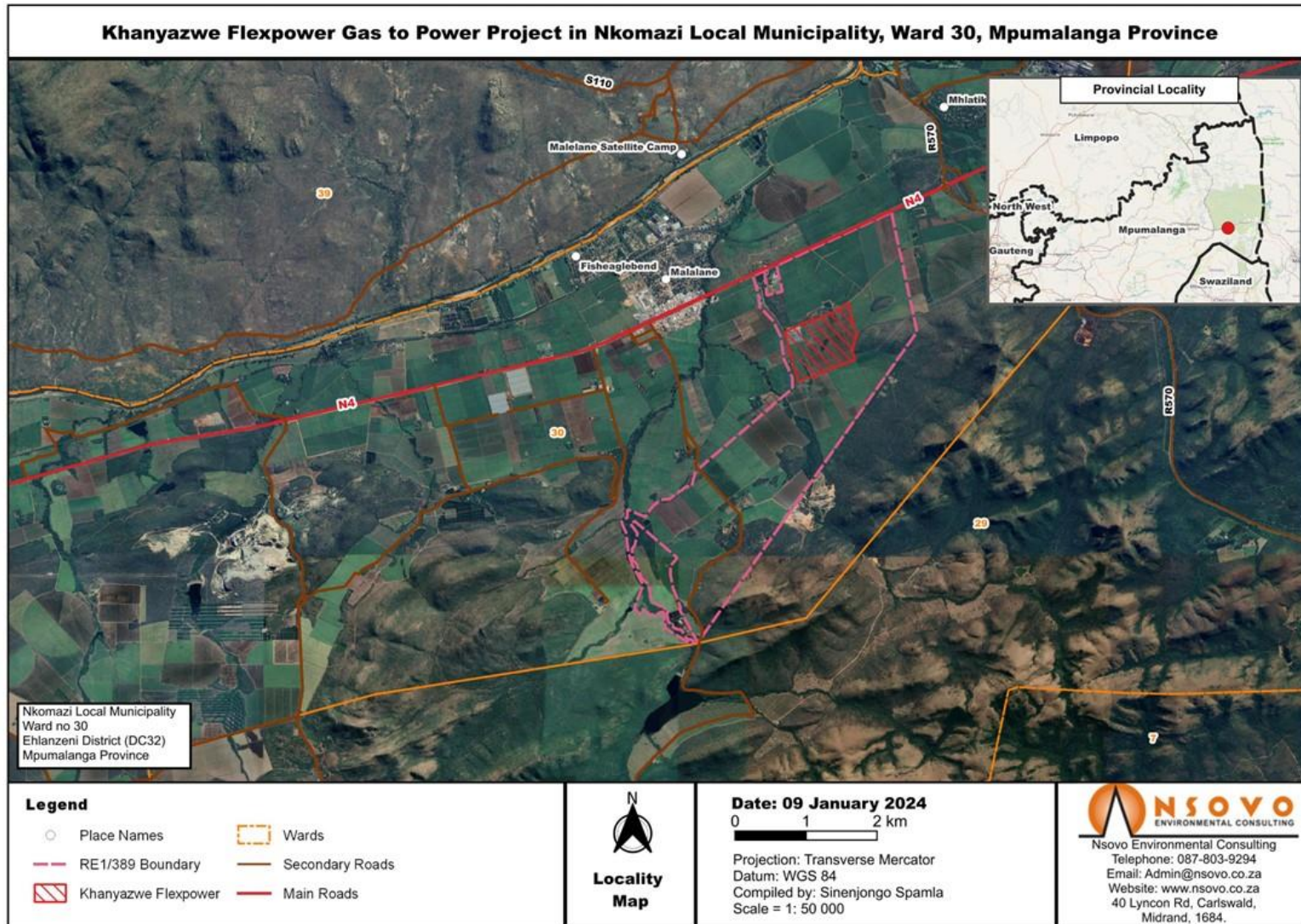
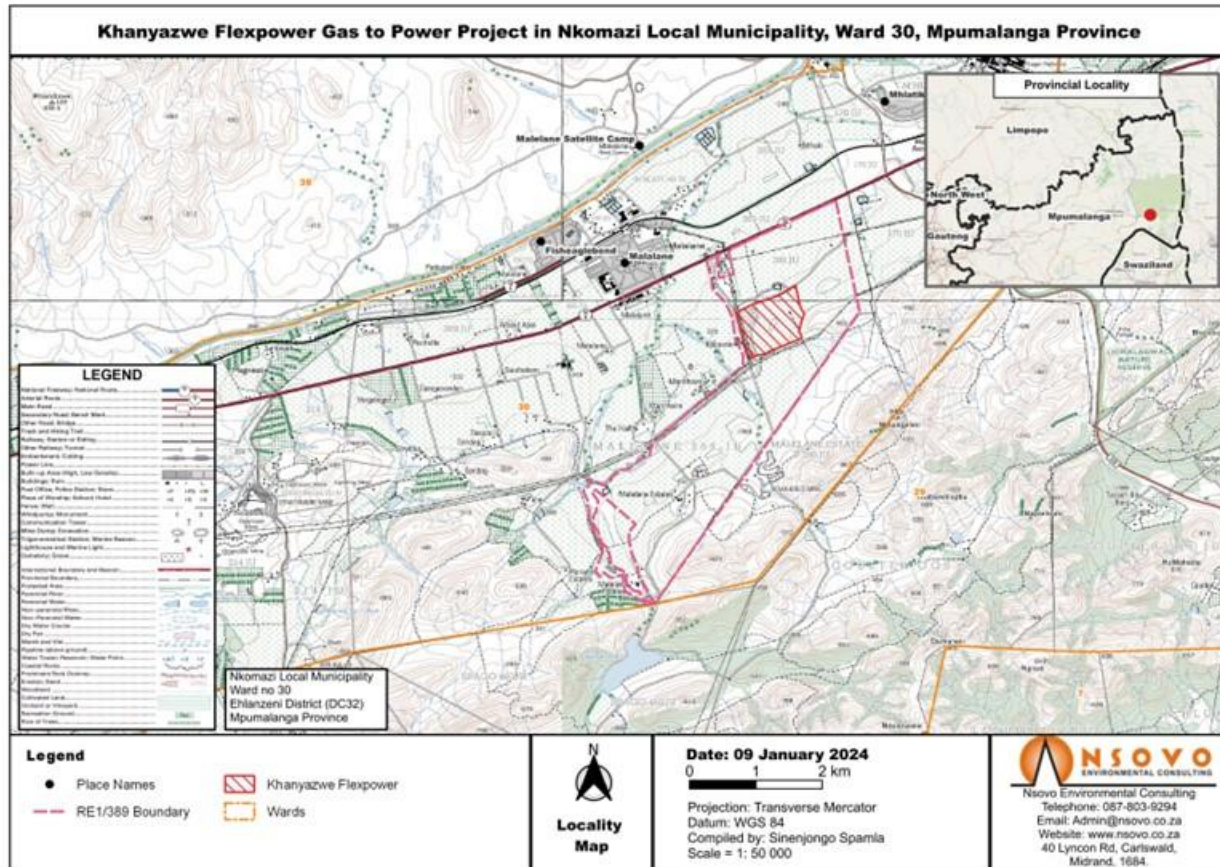


Figure 2: Locality map showing the proposed site for the Khanyazwe Flexpower power plant in Malelane.



**Figure 3: Topographical 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, Freestate, and Kwazulu Natal in the South. The Province also borders Swaziland (North of Swaziland) and Mozambique (east of Mozambique).

### 3.1.2 MUNICIPALITY AND WARD

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

## 3.2 DESCRIPTION OF THE AFFECTED PROPERTIES

The proposed development of the Khanyazwe power plant and associated infrastructures will be located on the Farms listed in Table 2.

**Table 2: Property Details**

Farm Name	Portion Number	Surveyor General 21 Digit Code
Malelane 389 FP	1	TOJU00000000038900001
Malelane 389 FP	4	TOJU00000000038900004
Malelane 389 FP	39	TOJU00000000038900039
Malelane 389 FP	99	TOJU00000000038900099
Malelane 389 FP	96	TOJU00000000038900096
Malelane 389 FP	RE116	TOJU00000000038900116

### 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 center are discussed as follows:

#### 3.3.1 RESIDENTIAL

The immediate surroundings of the proposed development site are mainly comprised of agricultural lands. The residential communities adjacent to the proposed development site include informal, semi-suburban (township), and suburban households. Table 3 provides names and descriptions of communities affected by the proposed development.

**Table 3: Names and descriptions of communities that may be affected by the proposed project.**

COMMUNITY	DESCRIPTION
Malelane town	<ul style="list-style-type: none"> <li>A farming town along the N4, bordering the Kruger National Park.</li> <li>A low-medium income residential household located adjacent to the site.</li> </ul> <p>The town is 9.3 km from the Malelane Gate into Kruger Park, 50 km from the Mozambique border, and 46 km from the Eswatini border.</p>
Hectorspruit	<ul style="list-style-type: none"> <li>Emjejane (formerly known as Hectorspruit) is a small farming town situated between Kaapmuiden and Komatipoort on a southern tributary of the Crocodile River</li> <li>The town is located 19km from Malelane.</li> </ul>
Farms	<ul style="list-style-type: none"> <li>There is active farming around the site.</li> </ul>



### **3.3.2 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.

### **3.3.3 AGRICULTURE AND FARMING**

The town is along the N4 Corridor of South Africa. The town's economy relies on farming and numerous guest houses and guest farms in the area.

### **3.3.4 SURFACE INFRASTRUCTURE**

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

#### **3.3.4.1 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.

#### **3.3.4.2 Existing Powerlines and Associated Infrastructure**

There is an existing Eskom Khanyazwe substation and powerlines within the proposed study area. Other infrastructures include transmission and distribution power lines within the proposed study area. The proposed site is located  $\pm 2$  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 centers, police stations, schools, post offices, etc. In addition, a residential area is 2 km north of the proposed site.

## 4 DESCRIPTION OF THE PROPOSED ACTIVITIES

This section describes the proposed activities, including the proposed project's scope, mainly focusing on the listed activities that trigger the EIA process.

### 4.1 BACKGROUND AND THE PROPOSED SCOPE OF WORK

The project involves developing, constructing, and operating a (maximum) 800MW natural gas-fired power plant. 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 either be Gas Engines (or Internal Combustion Engines (ICE)) or Combined Cycle Gas Turbines (CCGT). 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 800 MW.

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

**LNG Storage Tanks:** The project includes the installation of LNG storage tanks, along with associated liquefaction and regasification capacity, to provide buffer gas supply capacity and backup gas supply should there be a loss in supply from the ROMPCO gas pipeline. The LNG facility will also serve as a facility from which LNG trucks can both offload and load LNG should an alternate gas supply to ROMPCO be required. It will also have the capability of delivering gas into the local market. The LNG tank farm will consist of multiple pressurized bullet tanks and a truck-loading and unloading facility.

**Connection to the Eskom Distribution 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.

**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, and two access routes are proposed to access the power plant near the Eskom Khanyazwe substation.

- Building an approximately 10m wide access road.

**Associated Infrastructure: This will include.**

- Water and lube oil tanks for water and oil required for the gas turbine/engine 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 include municipal water supply, adjacent irrigation canal, and groundwater supply through a borehole.

The general surface areas for the project components are listed in Table 4.

**Table 4:Primary infrastructure**

Project component	Area/Length/Size	Servitude	Purpose
Power Plant	15 hectares	n/a	Generation of electricity using the Combined Cycle Gas Turbines (CCGT) and/or 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/132kV Overhead transmission line	500	2x 47 m	Transmission of electricity to the existing Eskom Khanyazwe substation.

Access/Service Road	1.2 km	10 m	Access to the site for construction and service roads during the operational phase.
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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, which is that of sugar cane farming.

#### 4.1.1 ACTIVITIES ASSOCIATED WITH THE PROJECT CONSTRUCTION PHASE

The construction phase of the proposed project would take approximately 36 months, and the activities to be undertaken are discussed hereunder.

The proposed development will ultimately include constructing and assembling the following associated infrastructures listed above.

The construction phase of the proposed project will entail the following:

**Table 5: 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 12-15 hectares footprint.	Vegetation clearance of the foundation footings along 2 x 47 m wide servitude.	Vegetation clearance of the 10m wide corridor.

Activity	Gas Pipeline	Power Plant Facility	Transmission Line	Access road
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.
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.

#### 4.1.2 REHABILITATION

Upon completion of construction work, the site will be rehabilitated as per the specifications of the EMPr and approved method statements 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.

#### 4.2 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 6 below:

Table 6: Listed activities applicable to the project

Listed Activity	Describe the portion of the proposed project to which the applicable listed activity relates.	
<b>Applicable activities listed under the EIA Regulations of 2014 as amended – Listing Notice 1</b>		
<p><b><u>GNR 983</u></b> <b><u>Activity 11 (ii)</u></b></p>	<p><i>The development of facilities or infrastructure for the transmission and distribution of electricity-</i></p> <p><i>(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or</i></p> <p><i>(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-</i></p> <p><i>(a) temporarily required to allow for maintenance of existing infrastructure.</i></p> <p><i>(b) 2 kilometers or shorter in length.</i></p> <p><i>(c) within an existing transmission line servitude; and</i></p> <p><i>(d) will be removed within 18 months of the commencement of development.</i></p>	<p>The project involves the transmission powerline with a capacity of 275kV and/or 132kV inside an urban area, from the power station to the Khanyazwe substation.</p>
<p><b><u>GNR 983</u></b>  Activity 24</p>	<p><i>“The development of a road:</i></p> <p><i>(ii) A road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 meters.”</i></p>	<p>The proposed project will require the development of a 10m wide access road to the development site along the pipeline and powerline, which will also serve as a service road during the operational phase.</p>
<p><b><u>GNR 983</u></b>  <b><u>Activity 27</u></b></p>	<p><i>The clearance of an area of 1 hectare or more but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—</i></p>	<p>The proposed power station will require a footprint clearance of approximately 15ha of vegetation.</p>

Listed Activity	Describe the portion of the proposed project to which the applicable listed activity relates.
<p>(i) the undertaking of a linear activity; or</p> <p>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p>	
<p><b>GNR 983</b></p> <p>Activity 28</p> <p>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:</p> <p>(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares or</p> <p>excluding where such land has already been developed for residential, mixed, retail, commercial, industrial, or institutional purposes.</p>	<p>The proposed facility will be developed in an urban area that is currently used for agriculture. The footprint of the development will be bigger than 5 hectares.</p>
<b>Applicable activities listed under the EIA Regulations of 2014 as amended – Listing Notice 2</b>	
<p><b>GNR 984,</b></p> <p><b>Activity 2</b></p>	<p><i>“The development and related operation of facilities or infrastructure for generating electricity from a non-renewable resource where the electricity output is 20 megawatts or more”.</i></p> <p>The proposed project entails the development of a gas-to-power facility with a maximum output of 800 MW and associated infrastructure.</p>
<p><b>GNR 984,</b></p> <p><b>Activity 4</b></p>	<p><i>The development and related operation of facilities or infrastructure, for storing, storing, and handling a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.</i></p> <p>The project proposes commissioning ±20 LNG tanks with a combined capacity to store 14000m<sup>3</sup> LNG.</p>
<p><b>GNR 984,</b></p> <p><b>Activity 5</b></p>	<p><i>The development and related operation of facilities or infrastructure for the processing of a petroleum resource, including the beneficiation or refining of gas, oil, or petroleum products with an installed capacity of 50 cubic</i></p> <p>The proposed project intends to liquefy and vaporize gas and develop an LNG truck loading/offloading facility.</p>

Listed Activity		Describe the portion of the proposed project to which the applicable listed activity relates.
	<p><i>meters or more per day, excluding activities that are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008), in which case the National Environmental Management: Waste Act, 2008 applies.</i></p>	
<p><b>GNR 984, Activity 6</b></p>	<p><i>“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 affluent.”</i></p>	<p>The proposed development of the gas-to-power plant will require an Atmospheric Emission License (AEL) in terms of the National Environmental Management: National Environmental Air Quality Act (Act 39 of 2004) (NEMAQA) for the burning of natural gas.</p>
<p><b>GNR 984, Activity 7</b></p>	<p><i>“The development and related operation of facilities or infrastructure for the bulk transportation of dangerous goods-</i></p> <ul style="list-style-type: none"> <li><i>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”.</i></li> </ul>	<p>The proposed project entails the development of a gas pipeline from the existing ROMPCO gas pipeline to the power plant.</p>
<p><b>GNR 985, Activity 4</b></p>	<p><i>The development of a road wider than 4 metres with a reserve less than 13.5 metres.</i></p> <p><i>In Mpumalanga</i></p> <ul style="list-style-type: none"> <li><i>(i) (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the</i></li> </ul>	<p>The proposed project will require the development of a 10m wide access road to the development site along the pipeline and powerline, which will also serve as a service road during the operational phase.</p>

Listed Activity	Describe the portion of the proposed project to which the applicable listed activity relates.
<p><i>core areas of a biosphere reserve, excluding disturbed areas; or”.</i></p>	

It must be noted that the proposed project triggers listed NEM: AQA Section 21 listed activities detailed in Table 7 below. 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 7). Subsequently, in terms of the application for an Atmospheric Emission Licence (AEL), the two processes (EIA-AEL) are running concurrently with each other, with only one public participation process as elucidated in the National Air Quality Management Framework of South Africa.

**Table 7: 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 800MW at its maximum capacity.
Category 1.5: Reciprocating Engines	The proposed project proposes using Combined Cycle Gas Turbines (CCGT) and, alternatively, Internal Gas Combustion Engines technology.

The proposed project triggers listed activities under Section 21 of the NWA, as detailed in Table 8 below. The application has been lodged with the responsible authority, the DHSWS.

**Table 8: Listed Activities under Section 21 of NWA, 1998**

The National Water Act, 1998 (Act 36 of 1998) Activities	
<b><u>Section 21 (c)</u></b> <i>21(c) Impeding or diverting the flow of water in a watercourse; and</i>	The proposed development is close to a watercourse (river).
<b><u>Section 21 (i)</u></b> <i>21(i) Altering the Bed, Banks, Course, or Characteristics of a Water Course</i>	The proposed development is close to a watercourse (river).

## 5 APPLICABLE LEGISLATION AND GUIDELINES

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 9 below.

Municipal policies, plans, by-laws, KFP policies, and world best practices Will be considered during the EIA process. Table 9 below describes legislations that apply to the project; it is not an exhaustive analysis but provides a guideline to the relevant aspects of each legislation.

**Table 9: Legislation pertaining to the proposed project.**

Aspect	Relevant Legislation	Brief Description
Environment	<ul style="list-style-type: none"> <li>National Environmental Management: Act 1998 (Act No. 107 of 1998) as amended.</li> <li>Environmental Impact Assessment Regulations, December 2014, as amended</li> </ul>	<p>The overarching principles of sound environmental responsibility, as reflected in the National Environmental Management Act, 1998 (Act No. 107 of 1998), apply to all listed projects. Construction and operation of activities must be conducted in line with the accepted principles of sustainable development, integrating social, economic, and environmental factors.</p> <p>The EIA process followed complies with the NEMA and the 2014 EIA Regulations of as amended. The proposed development involves “listed activities,” as defined by NEMA. Listed activities may potentially have detrimental impacts on the environment and, therefore, require an EA from the relevant Competent Authority, in this case, DFFE.</p>
Biodiversity	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	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 National Spatial Biodiversity Assessment was developed as part of its implementation strategy.
Protected Areas	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)	This Act aims to protect, conserve, and manage ecologically viable areas representative of South Africa’s biological diversity and natural landscapes.
Heritage Resources	National Heritage Resources Act, 1999 (Act No. 25 of 1999)	The National Heritage Resources Act, 1999 (Act No. 25 of 1999) legislates the necessity for cultural and heritage impact assessment in areas earmarked for development that exceed 0.5 ha. The Act makes provision for the potential destruction of existing sites,



Aspect	Relevant Legislation	Brief Description
		<p>pending the archaeologist’s recommendations through permitting procedures. Permits for this specific project would be administered by the Mpumalanga Heritage Agency or South African Heritage Resources Agency (SAHRA).</p>
<p>Air quality management and control</p>	<p>National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)</p>	<p>The objective of the Act is to protect the environment by providing reasonable measures for the protection and enhancement of air quality and to prevent air pollution. The Act provides measures to control dust, noise, and offensive odors.</p> <p>Section 32 of The National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) deals with dust control measures in respect of dust control. The National Dust Control Regulations (2013) provide for the management and monitoring of dust.</p> <p>Chapter 5 of NEMAQA deals with the control and management of emissions and relates to listing activities that are sources of emissions and issuing emission licenses with respect to these activities. These activities are listed in terms of GN 893 of 22 November 2013. They are broken up into 10 categories and associated sub-categories, including ‘Liquid Fuel Combustion Installations’ (Subcategory 1.2), ‘Gas Combustion Installations’ (Subcategory 1.4), ‘Reciprocating Engines’ (Subcategory 1.5) as well as the storage and handling of petroleum products (Subcategory 2.4).</p>
<p>Noise Management and Control</p>	<p>Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)</p>	<p>The assessment of impacts relating to noise pollution management and control, where appropriate, must form part of the EMP. Applicable noise management and control laws refer to the National Noise Control Regulations issued in terms of Environment Conservation 1989 (Act 73 of 1989).</p>
<p>Water Resources Management</p>	<p>National Water Act, 1998 (Act 36 of 1998)</p>	<p>This Act provides for fundamental law reform relating to water resources and use. The preamble to the Act recognizes that the ultimate aim of water resource management is to</p>

Aspect	Relevant Legislation	Brief Description
		<p>achieve sustainable use of water for the benefit of all users and that the protection of the quality of water resources is necessary to ensure the sustainability of the nation's water resources in the interests of all water users.</p> <p>The proposed activities will encroach on watercourses such as the wetlands within and near the study area. Therefore, the WUL process is underway through the DHSWS.</p>
Agricultural Resources	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	The Act aims to provide control over the utilization of natural agricultural resources to promote the conservation of the 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.
Human	The Constitution of South Africa, 1996 (Act No. 108 of 1996)	<p>The Constitution provides for an environmental right (section 24). The State is obliged “to respect, protect, promote and fulfill the social, economic and environmental rights of everyone...”</p> <p>The environmental right states that:</p> <p>“Everyone has the right -</p> <ol style="list-style-type: none"> <li>a) To an environment that is not harmful to their health or well-being; and</li> <li>b) To have the environment protected for the benefit of present and future generations through reasonable legislative and other measures that -</li> </ol>

Aspect	Relevant Legislation	Brief Description
		<ul style="list-style-type: none"> <li>• Prevent pollution and ecological degradation.</li> <li>• Promote conservation; and</li> <li>• Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”</li> </ul>
Waste	National Environmental Management: Waste Act, 2008 (Act 59 of 2008)	This Act provides fundamental reform of the law regulating waste management to protect health and the environment by providing reasonable measures for preventing pollution and ecological degradation and securing ecologically sustainable development. This Act also ensures the provision of national norms and standards for regulating waste management by all spheres of government. Further, it provides for specific waste management measures, licensing and control of waste management activities, remediation of contaminated land, compliance and enforcement, and matters connected therewith.
Hazardous Substance Act	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-generating under certain circumstances and may injure, cause ill health, or even death in humans.
Gas Act	Gas Act, 2001 (48 of 2001)	<p>The Gas Act 48 of 2001 intends:</p> <ul style="list-style-type: none"> <li>• to promote the orderly development of the piped gas industry.</li> <li>• to establish a national regulatory framework.</li> <li>• to establish a National Gas Regulator as the custodian and enforcer of the national regulatory framework; and</li> </ul>

Aspect	Relevant Legislation	Brief Description
		<ul style="list-style-type: none"> <li>• to provide for matters connected therewith.</li> </ul> <p>The objects of this Act are to:</p> <p>(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.</p> <p>(b) facilitate investment in the gas industry.</p> <p>(c) ensure safety and efficiency—economical and environmentally responsible transmission, distribution, storage, liquefaction, and re-gasification of gas.</p> <p>(d) promote companies in the gas industry owned or controlled by historically disadvantaged South Africans using license conditions to enable them to become competitive.</p> <p>(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.</p> <p>(f) promote skills among employees in the gas industry.</p> <p>(g) promote employment equity in the gas industry.</p> <p>(h) promote the development of competitive markets for gas and gas services.</p> <p>(i) facilitate gas trade between the Republic and others.</p> <p>(j) promote access to gas affordably and safely.</p>
Electricity Regulation Act	Electricity Regulation Act, 2006 (Act 4 of 2006)	<p>The Electricity Regulation Act 4 of 2006 intends:</p> <ul style="list-style-type: none"> <li>• to establish a national regulatory framework for the electricity supply industry.</li> </ul>

Aspect	Relevant Legislation	Brief Description
		<ul style="list-style-type: none"> <li>• to make the National Energy Regulator the custodian and enforcer of the national electricity regulatory framework.</li> <li>• to provide for licenses and registration as to how generation, transmission, distribution, trading, and the import and export of electricity are regulated; and</li> <li>• to provide for matters connected therewith.</li> </ul>
Conservation	Mpumalanga Nature Conservation Act, 1998 (Act No. 10 of 1998)	This Act makes provisions with respect to 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.
Climate Change	Climate Change Bill (2018)	<p>The objects of the Act are to:</p> <ol style="list-style-type: none"> <li>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.</li> <li>b) provide for the effective management of inevitable climate change impacts through enhancing adaptive capacity, strengthening resilience, and reducing vulnerability to climate change to build social, economic, and environmental resilience and an adequate national adaptation response in the global climate change response.</li> <li>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.</li> </ol>

Aspect	Relevant Legislation	Brief Description
		<p>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.</p>

## 5.1 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.
- Integrated Environmental Management Information Series (Booklets 0 to 23) (DEAT, 2002 – 2005).

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

This section justifies the need and desirability of the proposed development, focusing on its associated benefits and importance to the locals and the region.

### 6.1 MOTIVATION FOR THE DEVELOPMENT

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 the form of 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 transitional role of gas was further highlighted at the COP28. This is primarily because it has significantly lower CO<sub>2</sub> emissions than coal and is a complementary technology to balance renewable energy. It also has the potential for conversions towards lower CO<sub>2</sub> 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<sub>2</sub> intensive than conventional coal-fired electricity generation. Significantly, with the proposed maximum capacity of 800 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.

## 6.2 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 t intends to fulfill several critical requirements South Africa needs today while also serving as a long-term sustainable energy source for South Africa's future.

The immediate benefit of this project is that by introducing 800MW 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<sub>2</sub> 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 also accommodating and supporting the socio-economic development needs of the country.

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

- In the short term, there will be minimal job opportunities during the construction of the proposed infrastructure. These include skilled, semi-skilled, and under-skilled laborers, consisting of locals (in and around the industrial area), including regional and national communities.
- Natural gas can provide more than just electrical power; it will also 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<sub>2</sub> emissions per unit of power than coal, partly due to greater efficiency but to the hydrogen content. Rapid start-up, ramp-up, and ramp-down times enable gas power systems to follow variable and rapidly change generation patterns of renewable energy sources.
- 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.

The Khanyazwe Flexpower project will contribute to South Africa's '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 socio-economic development needs of the country.

### **6.3 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; and the Integrated Resources Plan 2010–2030 present the case for natural gas as a significant contributor to South Africa's energy mix.

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

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

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, i.e., limiting potential appeals. To manage this risk, the proponent has already engaged and garnered support for the development of this project, with the appropriate consent to undertake this EIA having been obtained from the landowners.
- **Proximity to the Eskom Grid** – The proposed project facility requires a connection to the grid to transmit the generated electricity. 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.

The above reasons make the proposed site suitable for the proposed power plant. Consideration of an alternative location may 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.

Following confirmation of the preferred and only site available, the Integrated Environmental (IE) tools such as Geographic Information System (GIS) and DFFE Screening Tool Report were used by the EAP and specialist teams to identify and assess the sensitive and no-go areas. The Screening tool outcomes highlighting the site's sensitivity are presented in Table 10 below, accompanied by a site sensitivity map.

#### **Table 10: Site Screening Tool Outcomes**

Specialist Study	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Agricultural Theme	X			
Animal Species Theme		X		
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme				X
Civil Aviation Theme		X		
Defence Theme				X
Paleontology Theme			X	
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			

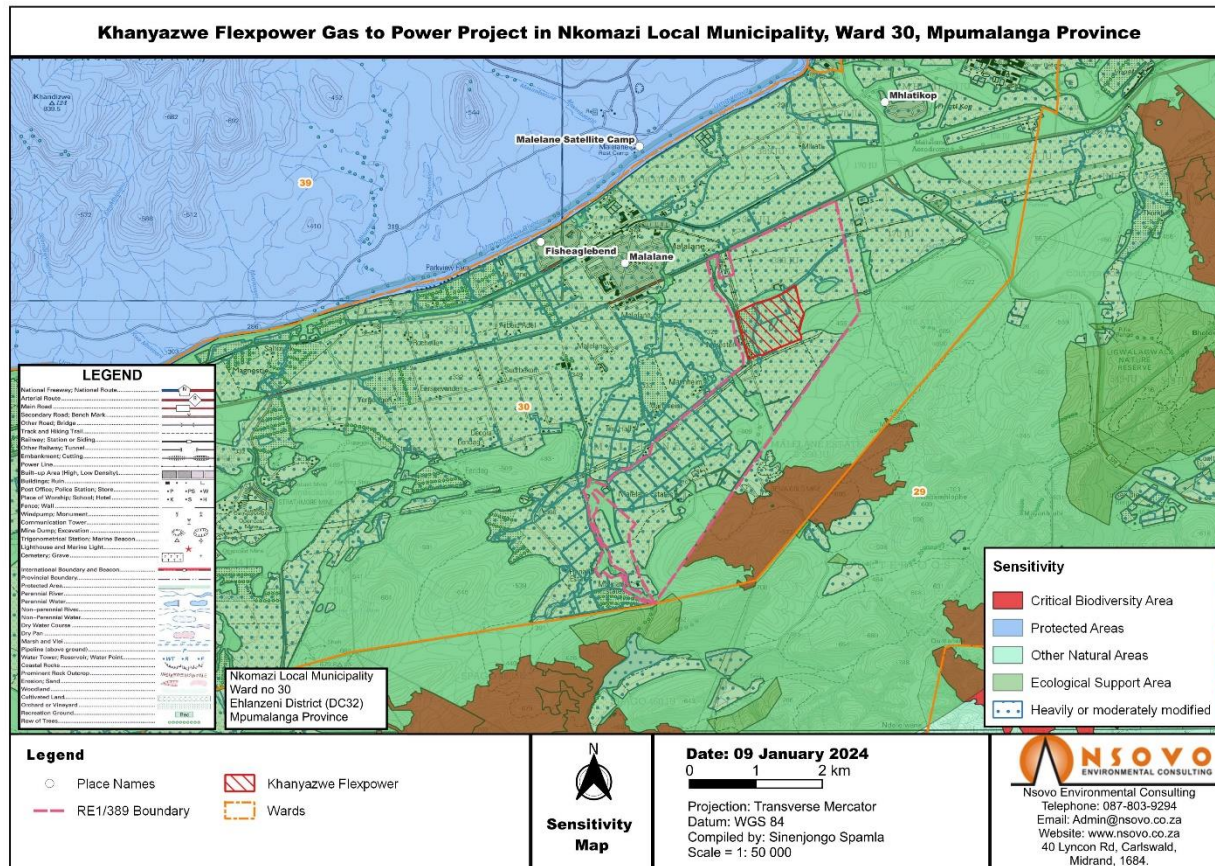


Figure 4: Sensitivity map of the study area

Other technical and layout alternatives will be assessed in the larger area to ensure that the most feasible options are selected considering their functionality and the environment. Consideration of specialist and technical input will

culminate in selecting the preferred alternative. As part of the EIA process, the exact footprint within the power plant site and power and pipeline corridors will be determined. Such will be achieved by undertaking a walk down with the specialist team, particularly the wetland, heritage, and avifauna. The profiling of the powerline will seek to avoid sensitive environments as far as practically possible.

Furthermore, a detailed public consultation is being undertaken to assess the viability of the selected site to meet the project's needs.



## 8 ALTERNATIVES CONSIDERED

Consideration of alternatives is a crucial requirement for any EIA process and includes technical, structural, and locality. 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:

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

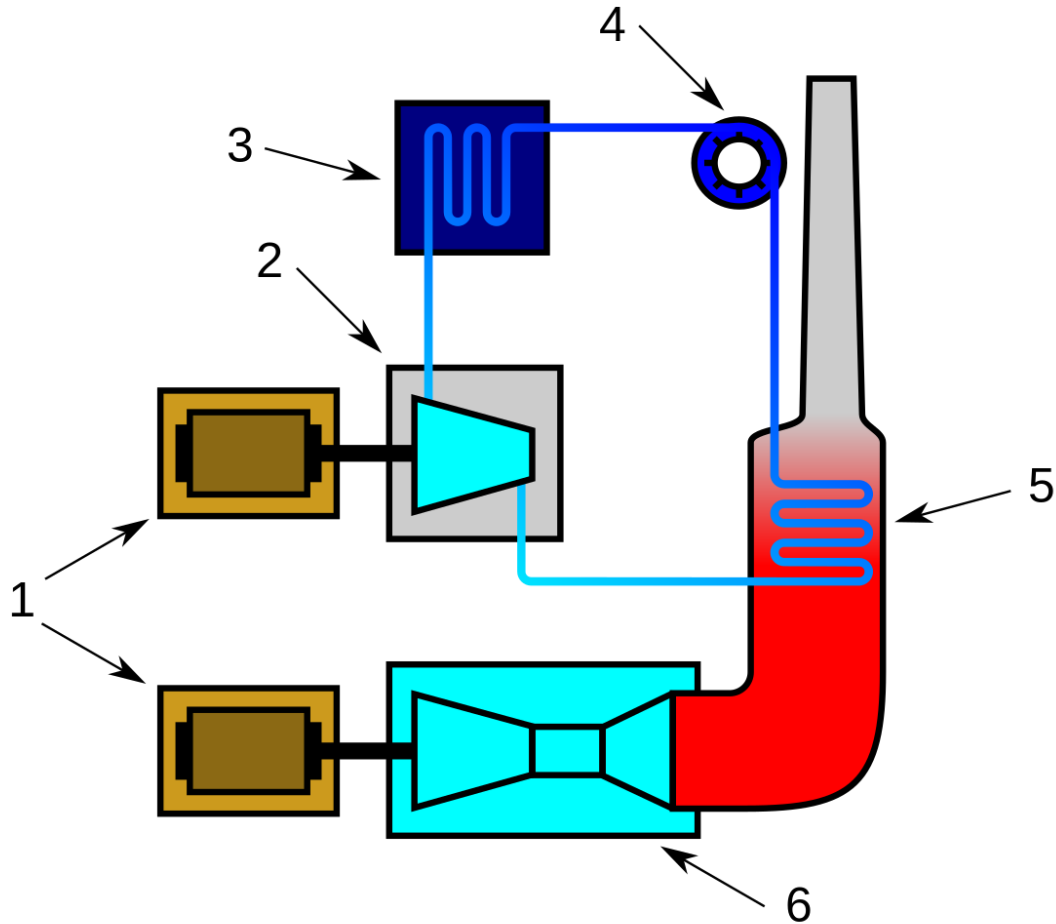
### 8.1 TECHNICAL ALTERNATIVES (POWER GENERATION TECHNOLOGY)

KFP has considered various technology options, which include 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 technology for gas available but are less flexible. The sections below describe the technologies considered and a comparative analysis. Both alternatives are feasible and will be assessed further in the EIA phase.

#### 8.1.1 COMBINED CYCLE GAS TURBINES (CCGT)

Combined Cycle Gas Turbines (CCGT) are a highly efficient energy generation technology that combines a gas-fired turbine with a steam turbine. The technology converts natural gas into electricity using a gas turbine generator as waste heat from this initial process is used to make steam to generate additional electricity via a steam turbine. Figure 5 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 5: 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)**

The proposed design consists of a 2-2-1 configuration, which means there are two gas turbines, each with its heat recovery boiler, which will supply steam into a single steam turbine. This, however, may be revised following the completion of the detailed technical studies.

The steam cycle will require a source of demineralized water; therefore, a water treatment plant will be needed for this project. Air-cooled condenser technology will be considered for this project to minimize the water consumption requirements.

Depending on the final turbine model selected, it may be possible to blend Hydrogen into the fuel mix from 40-85% vol%.

Figure 6 below is an illustration of a typical CCGT. The exact CCGT configurations will be finalised during the detailed design stage of the project and presented in the EIA report.





**Figure 6: 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 utilised in the 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 includes access roads, warehousing, buildings, access control and workshop areas, storage facilities, emergency backup generators, firefighting systems, laydown areas, and 275/132kV switchyard.
- A power line will connect the project to the national grid to evacuate the generated electricity.
- LNG liquefaction, storage, and regasification infrastructure with associated LNG truck loading and unloading facilities.

### 8.1.2 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 similar to the normal petrol-fuelled engine in a car, 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.

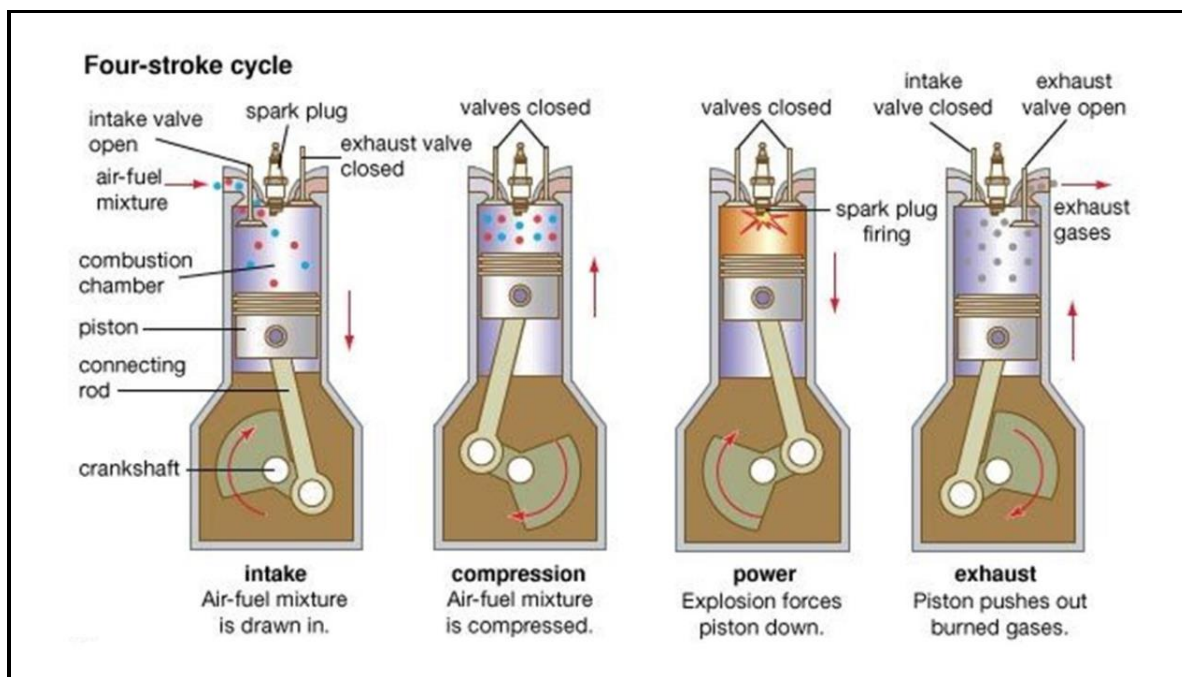


Figure 7: Four Stroke Cycle (Encyclopedia Britannica, Inc. 2007)

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

- Each ICE can produce approximately 18-22 MW, so to generate 800 MW, one would require approximately 40 engines. Engines are typically clustered into groups of 4-6 and housed in separate engine halls per cluster.
- Each ICE is capable of completely independent operations, and compressed air is used to start the engines, which can take as short as 2 minutes from initiation to full load.

Cooling for ICE power plants utilise air-cooled radiators placed on the roof of the engine halls. This design consumes no water and saves on space needed for the power plant footprint.

To further improve efficiency, it is possible to capture the exhaust heat from each engine and generate a further ~10% more power using a steam cycle.

A typical layout for an ICE power plant with exhaust heat captured is depicted in Figure 8 below.

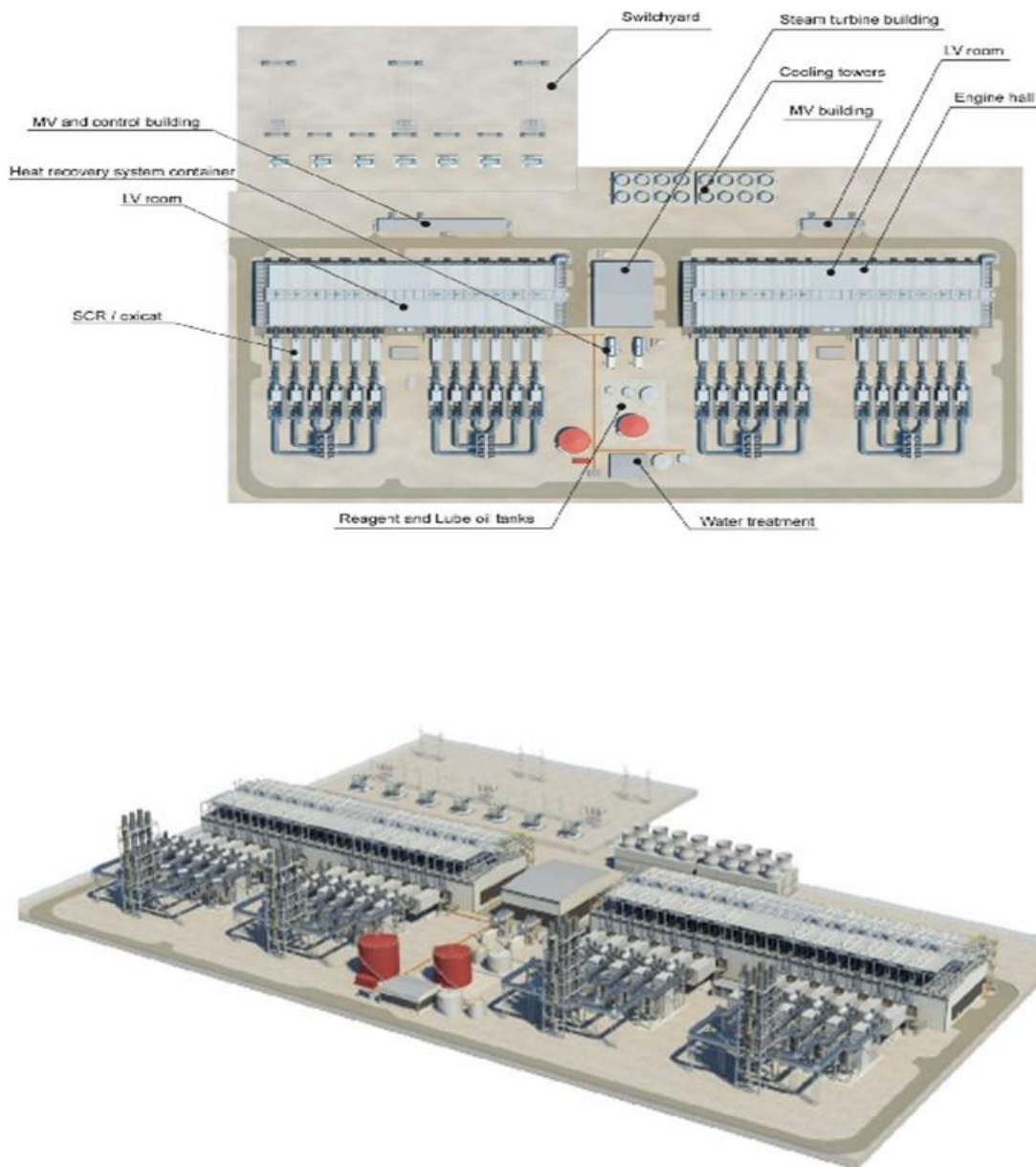


Figure 8: Typical site layout example for a 24x18MW combined cycle ICE power plant.

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

- Medium Speed Gas Engines for the generation of electricity through the use of 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.
- LNG liquefaction, storage, and regasification infrastructure with associated LNG truck loading and unloading facilities.

There are two ICE power plants located on the same gas supply as is being considered for KFP, namely, the 175MW 'Sasolburg Gas Engine Power Plant,' situated in Sasolburg, South Africa, and the similarly sized, 'Centro Termica de Ressano Garcia power plant located in Ressano Garcia, Mozambique. Both of these plants were built by Wartsila using the Wartsila's 9MW Gas engines.

#### **8.1.2.1 COMPARATIVE ANALYSIS OF THE TECHNOLOGY ALTERNATIVES**

Each technology has advantages and disadvantages, and the preferred technology will be confirmed following a detailed study. Herewith below is a preliminary comparison of some of the key parameters that will be considered in the final selection:

**Table 11: Comparative Analysis**

	ICE	CCGT
<b>Operational Flexibility</b>	It is the most flexible technology and is suitable for Peaking and Mid-merit applications.	It is the least flexible technology suitable for high mid-merit and baseload applications.
<b>Energy Efficiency</b>	Moderately good efficiency of 45-50%.	Best efficiency of 55-60%.
<b>Construction Time</b>	Short construction time of <28 months.	Long construction time of up to 3 years.
<b>Footprint</b>	A larger footprint is required due to the need for multiple smaller units.	Smaller footprint due to the use of fewer large units.
<b>Water requirements</b>	Negligible water consumption with air-cooled radiator technology.	Higher water consumption for top-up of water in the steam cycle
<b>CO2 Emissions</b>	They have slightly higher emissions due to their lower efficiency.	Low emissions due to high efficiency.
<b>Job creation potential</b>	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.

## 8.2 LAYOUT ALTERNATIVE (LOCATION WITHIN THE SITE)

As indicated above, only one site is earmarked for the proposed development, and the reasons for this are provided in Section 7. Layout alternatives have been considered within the larger area following thorough sensitivity mapping. In determining the preferred location within the site, four primary factors were considered, namely:

- Avoidance of Eskom servitudes.
- Proximity to a nearby dwelling.
- Proximity to potential water supply; and
- Proximity to the gas pipeline.

The layout alternatives considered are detailed hereunder.

### 8.2.1 LAYOUT OPTION A (EAST OF KHANYAZWE SUBSTATION)

The site alternative is depicted in green in the figure below. The site layout is approximately 650 m from a possible nearby dwelling and approximately 100 m away from the irrigation dam, as depicted in the image below. The Site to the East does not traverse over any known servitudes.



## 8.2.2 LAYOUT OPTION B (SOUTH OF KHANYAZWE SUBSTATION)

The site alternative is depicted in red in the figure below. The alternative site to the South goes over Eskom servitudes. It is also located approximately 350m away from a possible nearby dwelling, and where the irrigation water is used, it is located approximately 600m away from the nearby irrigation dam.

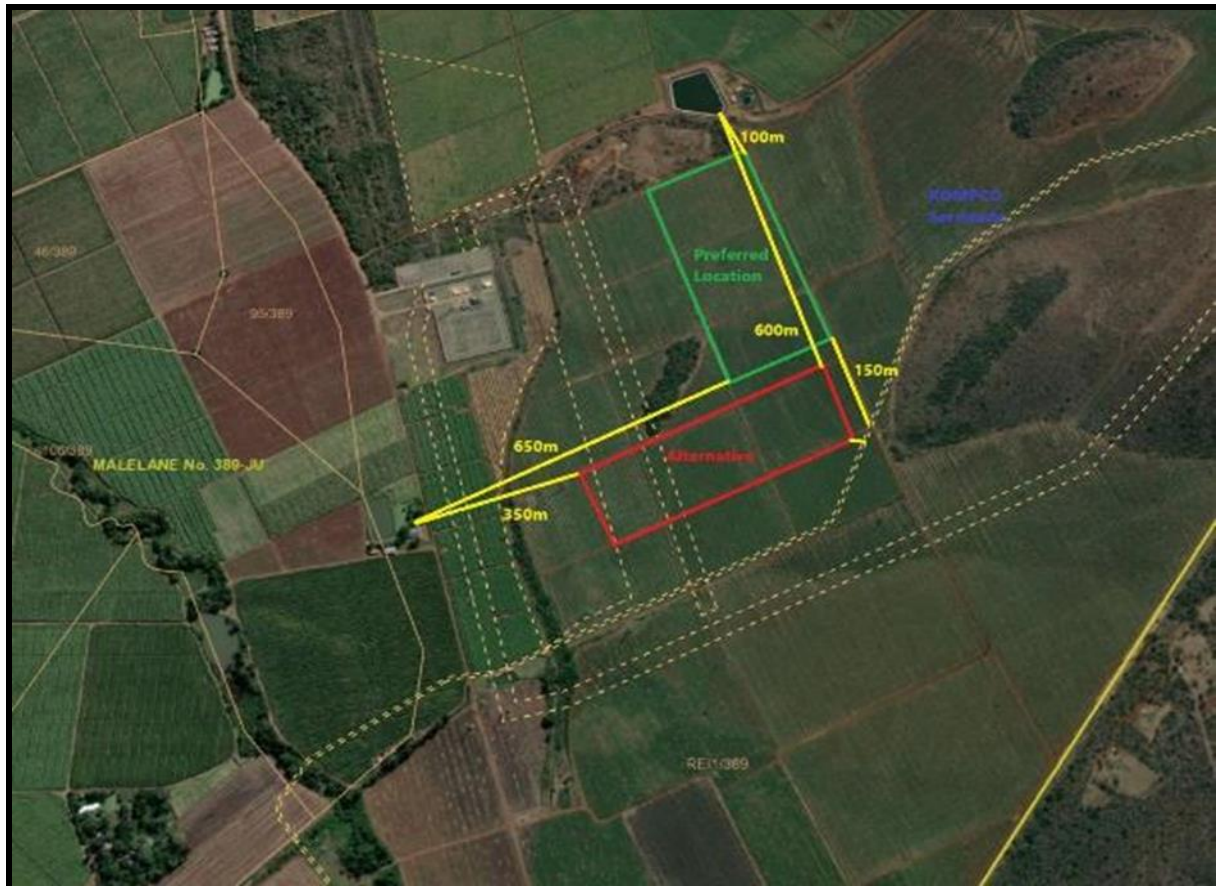


Figure 9: Alternative Site Layout (Green Preferred and Red Alternative)

### 8.2.2.1 COMPARATIVE ANALYSIS OF THE LAYOUT OPTIONS WITHIN THE SITE

The table below provides a comparative analysis of the layout options and highlights the reasons for the preferred alternative.

**Table 12: Comparative analysis of the layout within the site**

LAYOUT OPTION A -EAST OF KHANYAZWE	LAYOUT OPTION B -SOUTH OF KHANYAZWE
It does not traverse over any known servitudes	Traverses the Eskom servitudes
Located 600 m away from a nearby dwelling	Located approximately 350m away from a nearby dwelling
Located 100m from the irrigation dam, should this water source be considered	600 m away from the irrigation dam
Safely distanced away from the ROMPCO pipeline, the 150 m creates a safety buffer, especially during construction, when various earthworks and large equipment traverse the area.	Borders the ROMPCO pipeline

As depicted on the map below, Alternative Site A is the preferred site. The site is preferred for the following reasons:

- Avoidance of Eskom servitudes.
- Proximity to a nearby dwelling.
- Proximity to potential water supply; and
- Proximity to the gas pipeline.

The site assessment further considered the technology options within the layout, which is further discussed and assessed below.

### 8.2.3 TECHNOLOGY LAYOUT ALTERNATIVE A (EAST OF KHANYAZWE -PREFERRED)

Figure 10 shows the two layout alternatives being considered for the two alternative technologies east of the Khanyazwe substation. A1 illustrates the ICE technology, while A2 illustrates the CCGT layout within the area earmarked for development.



Figure 10: The preferred location of the ICE and CCGT power plant is to the east of Khanyazwe Substation.

Table 13: Comparative Analysis of ICE and CCGT Layout South of Khanyazwe

	B1: ICE TECHNOLOGY ON THE EAST OF KHANYAZWE	B2: CCGT TECHNOLOGY ON THE EAST OF KHANYAZWE
Footprint	15ha	12ha
Length of Pipeline	400m	450m
Length of the Eskom powerline	350m	400m
General Sensitivity	Encroaches on highly sensitive aquatic biodiversity	It avoids the susceptible aquatic biodiversity site

#### 8.2.4 TECHNOLOGY LAYOUT OPTION B (SOUTH OF KHANYAZWE SUBSTATION)

Figure 11 shows the two layout alternatives being considered for the two alternative technologies south of the Khanyazwe substation. B1 illustrates the ICE technology, while B2 illustrates the CCGT layout within the area earmarked for development.





Figure 11: The alternative location of the ICE and CCGT power station to the South of Khanyazwe Substation.

Table 14: Comparative Analysis of ICE and CCGT Layout South of Khanyazwe

	A1 ICE TECHNOLOGY ON THE SOUTH OF KHANYAZWE	A2: CCGT TECHNOLOGY IN THE SOUTH OF KHANYAZWE
Footprint	15ha	12ha
Length of Pipeline	300m	300m
Length of the Eskom powerline	250m	200m
General Sensitivity	Encroaches on highly sensitive aquatic biodiversity.	Encroaches on highly sensitive aquatic biodiversity.

The EIA phase will consider the environmental, physical, socioeconomic, and cultural characteristics of the preferred and proposed alternatives based on more detailed site layouts and make the necessary recommendations.

### 8.3 WATER SUPPLY ALTERNATIVES

A summary of the estimated potable and raw water requirements for upper and lower dispatch levels is contained in the table below. By using the air-cooled technology, as described in the technology descriptions section, the power plant's water consumption will be comparable to that of 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 not expected to have material net negative effect on water consumption within the region. The anticipated water consumption will be approximately 400m<sup>3</sup> – 1000m<sup>3</sup> per week.

Table 15: Preliminary water requirements for the technology alternatives

Technology	Capacity Factor	Potable Water	Raw water
800MW ICE	40%	960 litres per hour	1632 litres per hour
800MW ICE	65%	1560 litres per hour	2652 litres per hour
800MW CCGT	40%	2912 litres per hour	4950 litres per hour
800MW CCGT	65%	4732 litres per hour	8044 litres per hour

The proposed project has identified three water supply alternatives. The alternatives include municipal water supply, adjacent irrigation canal, and groundwater supply through a borehole. The alternatives are briefly described below.

	Alternative 1	Alternative 2	Alternative 3
	Municipal supply	Irrigation Canal supply	Borehole supply
Description	Water is to be sourced directly from the Municipality.	Water is to be sourced from an existing irrigation canal that passes the power plant.	This will be from an existing borehole within the far. Additional boreholes may be drilled if deemed necessary.
Considerations	<ul style="list-style-type: none"> <li>• Most costly alternative</li> <li>• May place strain on the current Malelane municipal water supply</li> </ul>	<ul style="list-style-type: none"> <li>• Water will need to be purified before used in the power plant.</li> </ul>	<ul style="list-style-type: none"> <li>• Water will need to be purified before it's used in the power plant.</li> <li>• More susceptible to supply interruptions</li> </ul>

The technology will determine the water source that will likely be adequate. As indicated above, a water treatment plant will be needed for this project. Final water requirements and supply will be confirmed and assessed further in the EIA phase.

#### 8.4 LNG STORAGE:

One of the primary reasons for having selected the proposed project was the proximity to the ROMPCO gas pipeline, which has been a reliable source of gas for South Africa since its construction in 2004 and with the LNG import initiatives ongoing in Matola to supplement the declining Pande/Temane gas reserves, there is little reason for there to be concerns around future gas supplies through this pipeline. However, it is prudent, and a requirement of the GASIPPPP,

that an alternate supply be considered; as such, the project design will include LNG infrastructure, which consists of liquefaction capacity, LNG tanks, and regasification capacity. c

- First, in the event that the power plant is requested to undertake rapid dispatch changes, should the ROMPCO pipeline not be able to handle such fluctuations, then the LNG supply can step in to service these fluctuating gas requirements until the pipeline supply can reliably continue providing gas directly to the power plant; and
- Second, by adding an LNG truck offloading facility, implementing a 'virtual gas pipeline' from other gas sources will be possible should gas supply through ROMPCO be compromised for any specific reason.

To align with the requirements of the GASIPPPP RFP, which calls for 2-days' worth of storage at full load, it is anticipated that a total storage capacity of 14,000m<sup>3</sup> would be required. At this size storage, two alternatives are considered: either a flat-bottom tank or a pressurized LNG tank, as shown in Figure 12 below.

Table 16 below summarizes some of the key differences between these two LNG storage technologies:

**Table 16: Comparative analysis of the LNG Storage**

	Flat bottom	Pressurized LNG tank
Number of units	one	Multiple
Containment volume needed	the whole volume of storage	single tank volume
Ground area needed	small	larger
Design of concrete foundations and containment	expensive	lower cost
Method of manufacturing	On-site with shop preparation	Shop manufactured
Lead time of shop work	Several weeks	Several months
Lead time of site construction	24-36 months	Days to weeks
Possibility of sequential building up and commissioning	no	Yes
Easy to move in case of change in market conditions	no	yes
Typical max pressure	atmospheric	8
Need of discharge pump	yes	No
Operators access to inspection and maintenance	Difficult (all on the roof)	Easy (ground level)
Expansion		Pressurized tanks provide flexibility in their installation and can be added on as required.



**Figure 12: Illustration of the Flatbottom and the pressurized LNG tanks**

Due to the greater degree of flexibility and scalability and the short construction times, pressurized LNG tanks are deemed the preferred technology to store LNG for the project. To meet the 14,000m<sup>3</sup> storage volume requirement, it is proposed that twenty 700m<sup>3</sup> tanks be built. The final size of the tanks may vary at the detailed design stage.

A further use of integrating this LNG storage with truck loading facilities is that in the event that this infrastructure is not fully utilized by the power plant, there is the opportunity to create a localized gas distribution network to service local industries or even for use in the transport sector to replace diesel and petrol.

These options will be assessed with input from the Major Hazard Installation specialist, and a preferred alternative will be confirmed as the project progresses in the Final Scoping and EIA phases.

## 8.5 ACCESS ALTERNATIVES:

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 and two access routes (temporary and permanent) are proposed constructed to link the proposed power station with the nearby existing road network, including the N4, which is approximately 1km away.

N4 Trac confirmed that there are plans to develop a 'ring road' which will divert highway traffic around Malelane. Based on these plans, there are several access road options that can be considered, as shown by the brown lines in **Figure 13** below.



**Figure 13: The brown routes indicate the various road options from the existing and planned highway ring road (shown in yellow).**

A final design of the access road will be determined following further consultation with the relevant authorities and undertaking a detailed road survey and traffic specialist study.

## **8.6 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. The no-go alternative will be used as a baseline throughout the assessment process, against which potential impacts will be compared and assessed in the EIR.

## 9 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 application or proposed application which is subjected to the public involvement. Further, 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.



## 9.1 APPROACH AND METHODOLOGY

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.

### 9.1.1 IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES

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

**Table 17: List of Stakeholders**

<ul style="list-style-type: none"> <li>• Mpumalanga Department of Agriculture and Rural Development and Land and Environmental Affairs</li> <li>• Mpumalanga Department of Water and Sanitation.</li> <li>• Mpumalanga Department of Transport and Public Works.</li> <li>• Mpumalanga Tourism Park Agency.</li> <li>• Southern African Agricultural Initiative</li> <li>• National Road Agency.</li> <li>• N4 Trans African Concessions (TRAC)</li> <li>• South African Heritage Resource Agency.</li> <li>• Mpumalanga Heritage Resources Agency.</li> <li>• South African National Parks.</li> <li>• Wildlife and Environmental Society of South Africa.</li> <li>• AGRI SA.</li> <li>• Eskom SOC Limited – Transmission</li> <li>• Ehlanzeni District Municipality</li> <li>• Nkomati Local Municipality</li> <li>• ROMPCO</li> </ul>
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### 9.1.2 PUBLIC PARTICIPATION DATABASE

In accordance with the requirements of the EIA Regulations under Section 24 (5) of NEMA, Regulation 42 of GN R. 982, a register of I&APs must be kept by the public participation practitioner. To fulfill this requirement, such a register is compiled, and details of I&APs, including their comments, will be updated throughout the project cycle. The database will be attached to the Final Scoping Report.

### 9.1.3 SITE NOTICES

A2 size notices indicating the availability of the draft Scoping Report 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 4 different languages and distributed accordingly.

The site notices will be fixed in strategic areas to ensure maximum visibility, and such areas include:

- Eskom Khanyazwe substation,
- Malelane Public Library,
- Along the N4, and
- Around the shopping center, Shoprite, Spar,
- Kruger Malelane Gate,
- Police station,
- Licence Department,
- Caltex garage.
- Lowveld clay target club

The photographic evidence of site notices will be submitted with the final Scoping Report.

### 9.1.4 PLACEMENT OF ADVERTISEMENT IN THE LOCAL NEWSPAPER

Advertisements will be placed in The Lowvelder and the Star newspapers in English on the 25<sup>th</sup> of January 2024 to inform I&APs of the availability of the Scoping Report for review and comment and to provide details of the public meetings. Newspaper advertisements will only be in English.

### 9.1.5 COMMENT AND REVIEW OF THE DRAFT SCOPING REPORT

The draft Scoping Report will be available in hard and soft copies (Email) to stakeholders mentioned in Section 9.1.1 above and registered I&AP. Hard copies and memory cards will be available at easily accessible public institutions, including the local Municipality, Library, etc. The electronic version of the report will also be available on request via a link or accessed on the Nsovo website ([www.nsovo.co.za](http://www.nsovo.co.za)).

The comment and review period will be from 25 January 2024 to 25 February 2024. This allows for 30 days as required by legislation. Proof of placement will be submitted with the Final Scoping Report.



### **9.1.6 PUBLIC MEETINGS**

As part of the PPP, public meetings will be arranged accordingly, and the details will be placed in conspicuous places and advertised in the local newspapers (The Lowvelder and Mpumalanga News). Public meetings will be held at easily accessible central locations within the community. The Nsovo PPP team will facilitate the meetings and engagements and will take cognizance of the local languages in the area, i.e., isiZulu, Siswati, English, and Afrikaans.

Furthermore, the public meetings will be two-fold, including:

- Focus group meetings with directly affected parties such as landowners and other stakeholders; and
- Public meetings open to all Interested and Affected Parties.

Provision will be made for online meetings with any identified stakeholders or recognized community groups. These meetings will be scheduled upon request.

Public meetings will be held in the morning and afternoon to accommodate various groups within the community.

## **9.2 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) and attached to the Final Scoping Report. The report will be updated until submission of the Final EIR.

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

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

### **10.1 SOCIO-ECONOMIC DESCRIPTION**

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

#### **10.1.1 PROVINCIAL DESCRIPTION OF THE PROPOSED PROJECT**

Mpumalanga Province is in the north-eastern part of South Africa. The province borders two of South Africa's neighboring countries, viz. Mozambique, 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 rolls eastwards for hundreds of kilometers. The northeast rises towards mountain peaks and terminates in an immense escarpment ([www.municipalities.co.za](http://www.municipalities.co.za)).

The Mpumalanga Province covers 76 495km<sup>2</sup> 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.

#### **10.1.2 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](http://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.

### **10.1.3 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 787km<sup>2</sup> 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.

## **10.2 CLIMATIC CONDITION OF THE PROPOSED AREA**

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. The Figure below shows that the average temperature for the Nkomazi Local Municipality is between 22.1 °C and 23.7 °C.

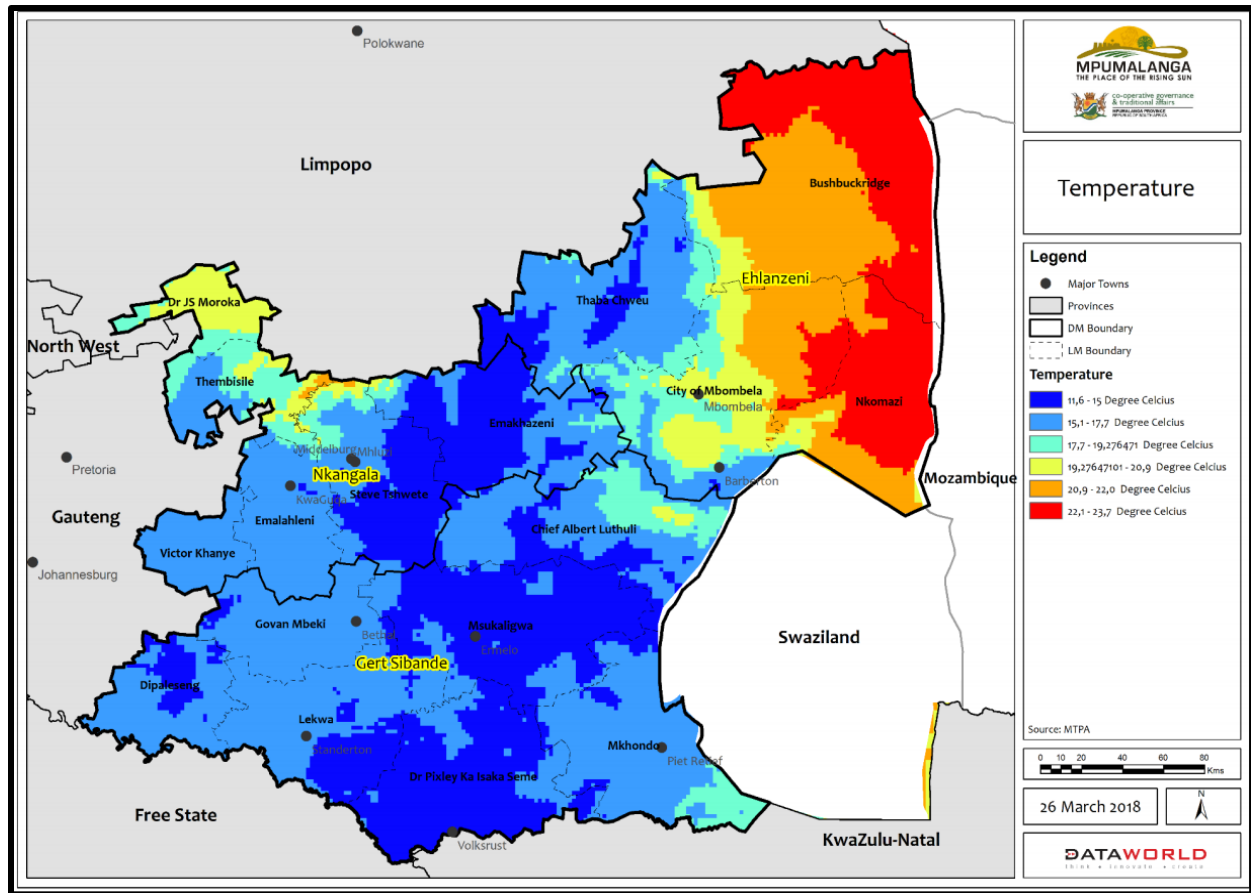


Figure 14: Temperature in Mpumalanga (Mpumalanga Development Spatial Framework, 2018).

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 mainly thunderstorms. Figure 15 below shows that the mean annual rainfall in Malelane is between 593.1mm and 748mm.

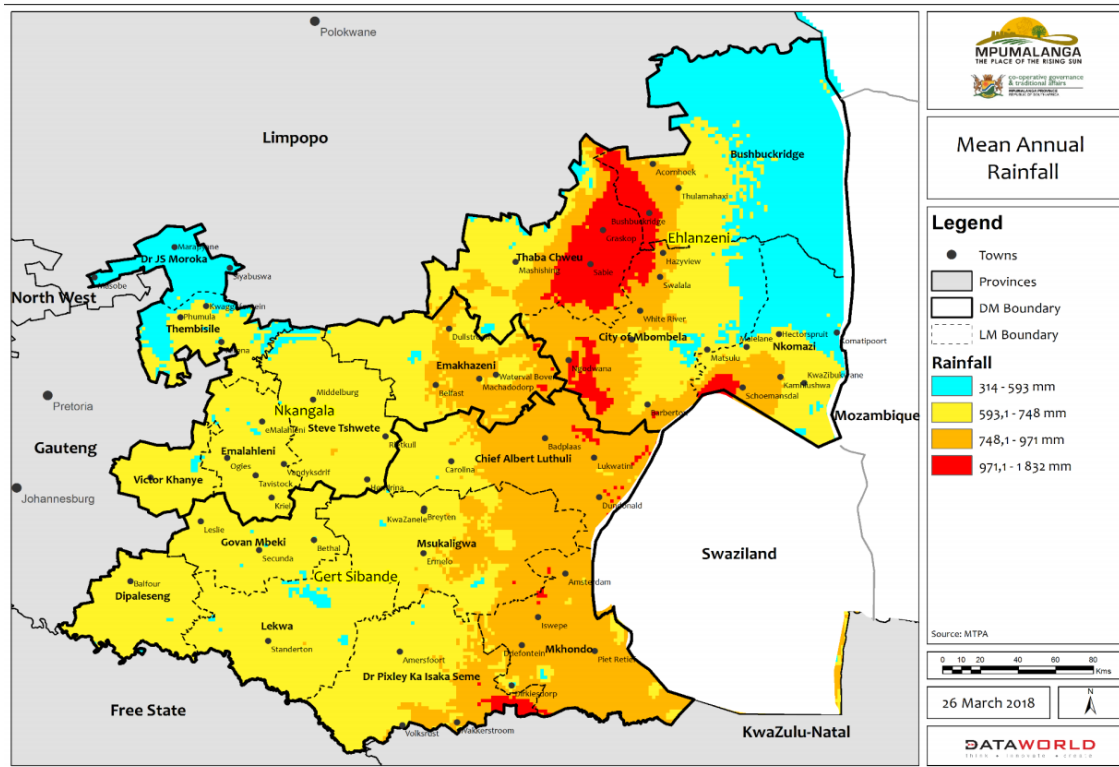


Figure 15: Mean annual rainfall in Mpumalanga (Mpumalanga Development Spatial Framework, 2018).

### 10.3 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 underlain 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 region. 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 dolerite. According to Figure 16, 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.



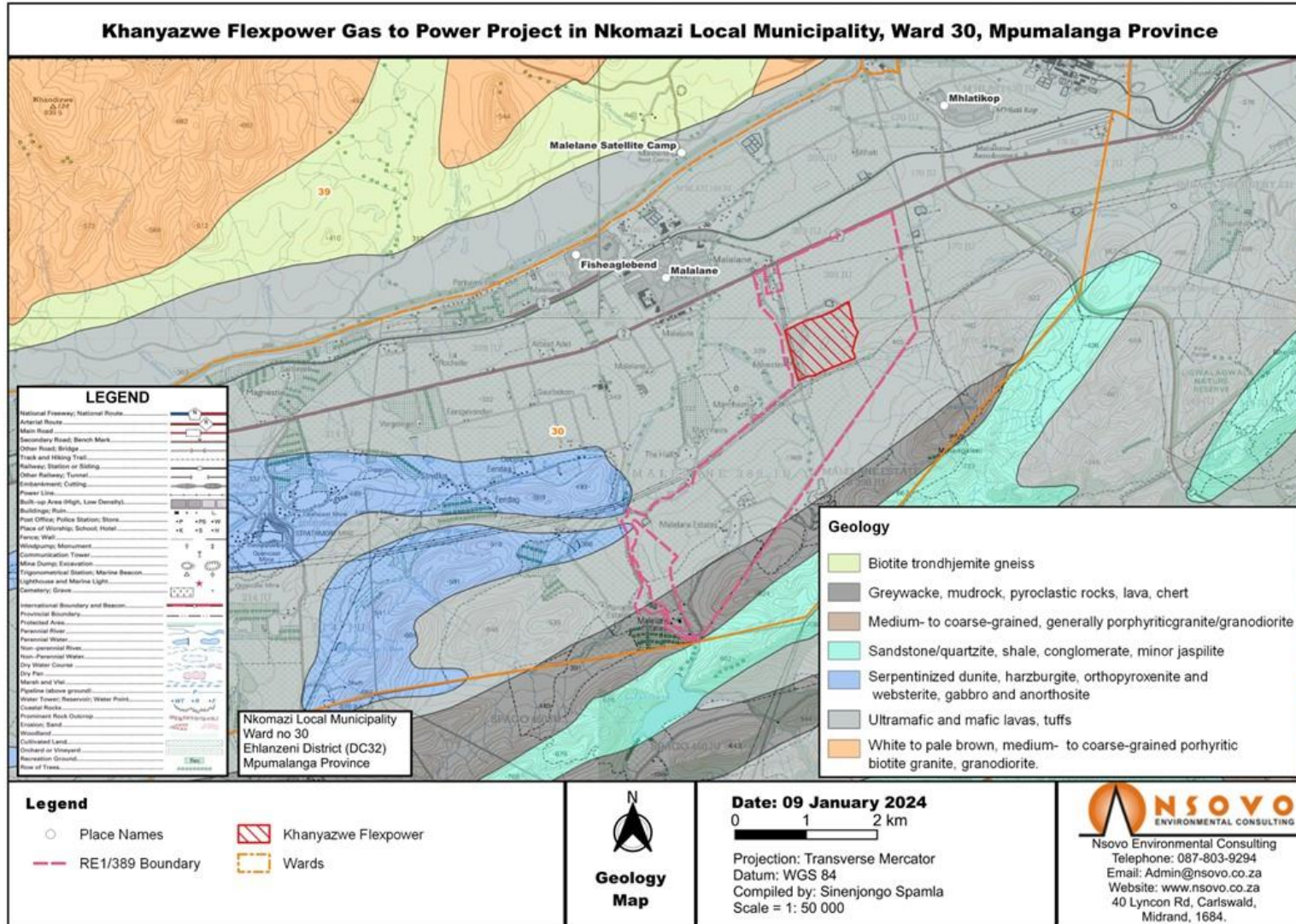


Figure 16: Geological map of the study area

## 10.4 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 kilometers 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.

## 10.5 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 Malelane 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 17 below for the hydrological map.



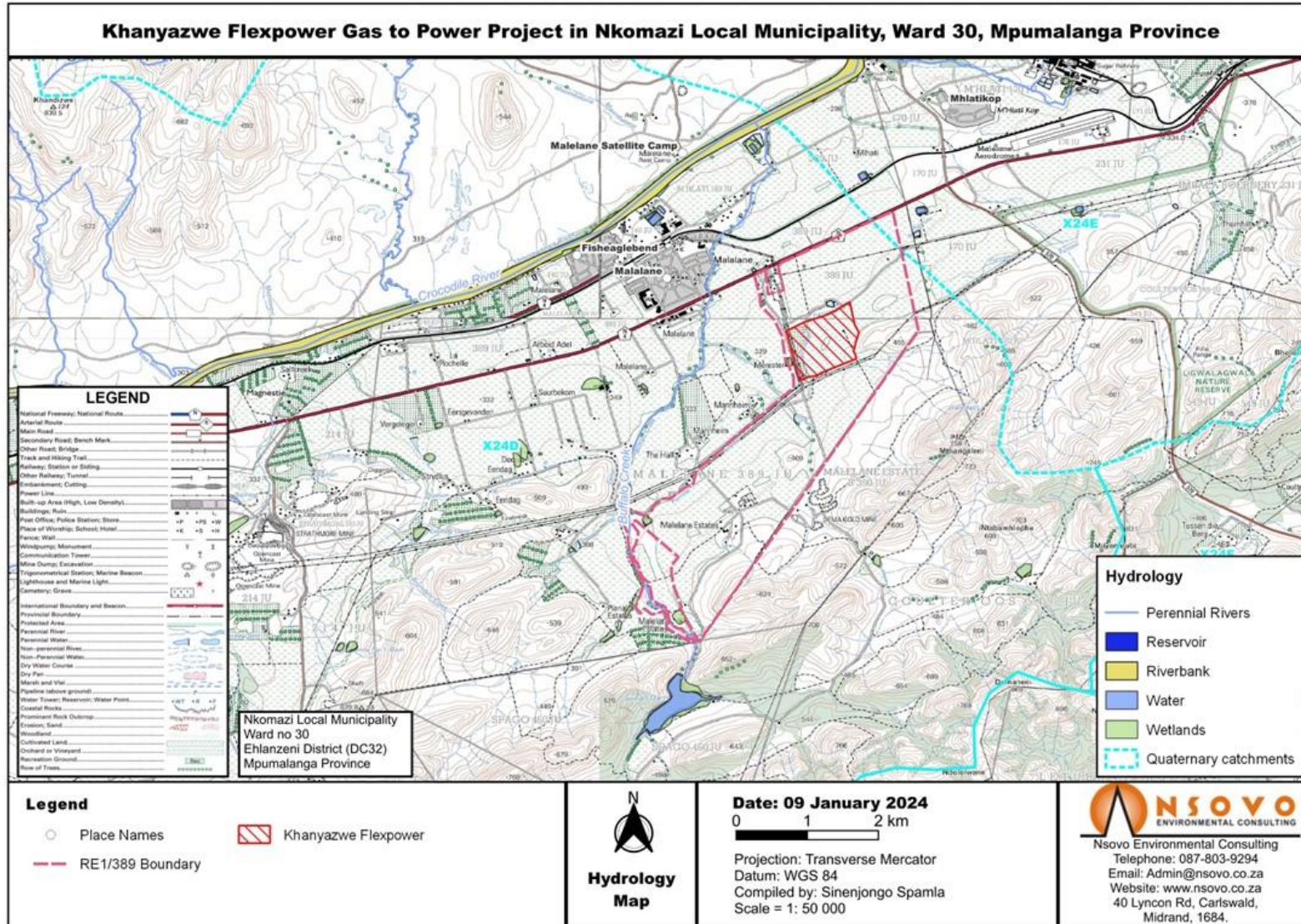


Figure 17:Hydrological map of the proposed location.

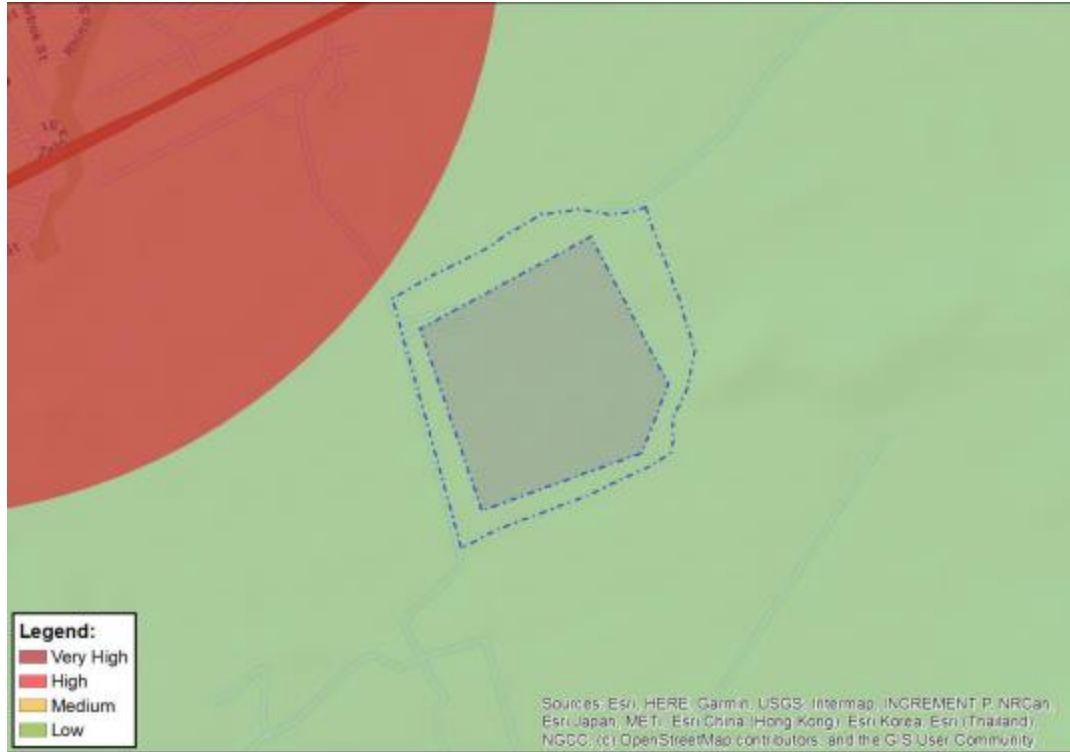
## 10.6 SITES OF ARCHAEOLOGICAL AND CULTURAL SIGNIFICANCE

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 communities and 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 listed specific historical sites are 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 of 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.

Figure 18 below shows the heritage and palaeontological map for the study area, as per the Screening Tool Report. The map shows that the study area has low sensitivity in terms of heritage and palaeontological classification for the power facility, powerline, and gas pipeline routes.



**Figure 18: Heritage and Palaeontological theme (DFFE Screening Tool, 2024)**

## 10.7 AIR QUALITY AND POLLUTION

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:

- Railway line (Train).
- Agricultural activities.
- Biomass burning (veld fires).
- Domestic fuel burning (wood and paraffin).
- Vehicle emissions.
- Waste treatment and disposal.
- Dust from infrastructural development.
- Dust from unpaved roads; and
- Other fugitive dust sources, such as wind erosion of exposed areas.

There are few sources of air pollutants within and around the proposed area. The motor vehicle along the N4 may sometimes result in elevated concentrations of particulates and Nitrogen Oxides (NO<sub>2</sub>). Dust generation is expected from the agricultural areas around the study area.

## 10.8 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.

### 10.8.1 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 should be ground-truthed with a formal site visit. The NEMBA provides for listing threatened or protected ecosystems in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU), or protected. The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction. This includes preventing further degradation and loss of threatened ecosystems' structure, function, and composition.

### 10.8.2 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 formal 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.



### 10.8.3 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  $\pm 2$  km north of the study area (Figure). NPAES (2009) additionally shows the Informal Dumaneni Reserve (Conservation Area System), which is 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.

### 10.8.4 IBA (IMPORTANT BIRD AREA) (2015)

The Kruger National Park is identified as an IBA as well. It harbours globally threatened species, regionally threatened species, restricted range, and biome-restricted species.

### 10.8.5 NATIONAL WEB-BASED ENVIRONMENTAL SCREENING TOOL (2020)

- Terrestrial Sensitivity - The terrestrial sensitivity for the entire study area is considered to have a 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).

### 10.8.6 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. Buffer distance varies according to reserve status: National Parks - 10 km; Nature Reserves - 5 km buffer; and Protected Environments — 1 km buffer.
- Heavily Modified - most of the study area is classified as an area that is "Heavily Modified." These are areas currently modified to such an extent that any 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.

## 10.9 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 4 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 is 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 19. The study area is considered to have a medium sensitivity for plant species, Figure 20 For the Animal Species theme, the majority of the study area is considered to have a medium sensitivity Figure 21 below.

A Site Sensitivity Report will be compiled by a suitably qualified specialist and submitted with the final Scoping report. The report will be compiled in terms of Protocol GN 320: Part B: Biodiversity, the terrestrial biodiversity and terrestrial plant species and animal species will be combined.



Figure 19: Terrestrial Biodiversity theme (DFFE Screening Tool)

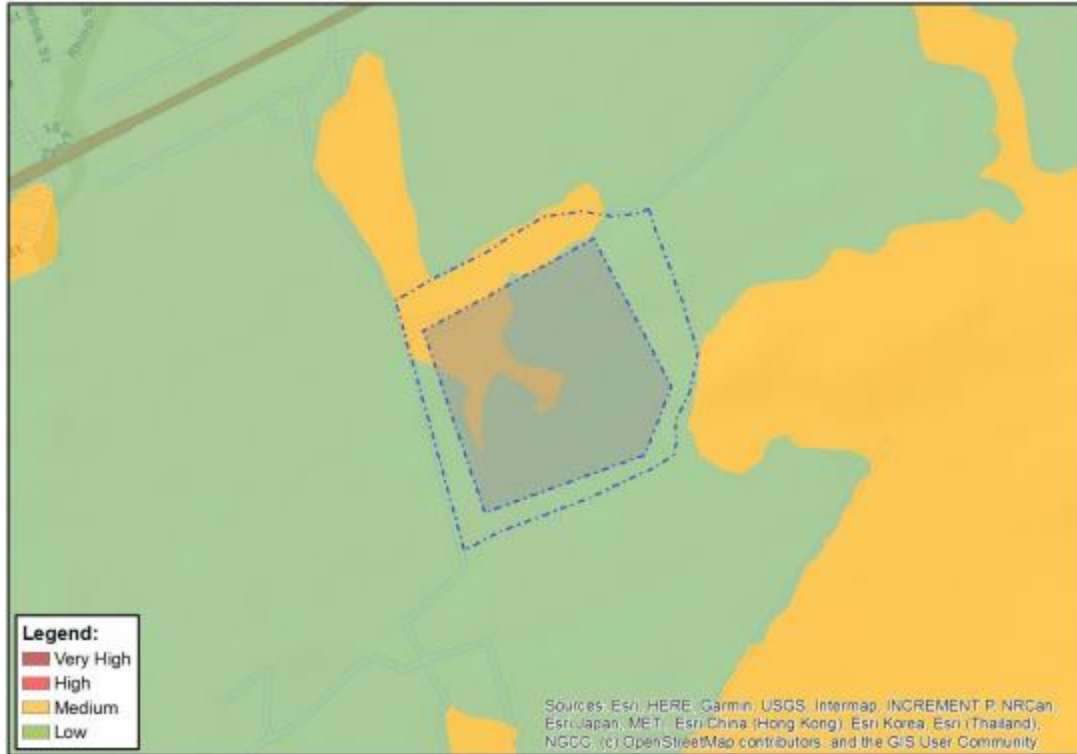


Figure 20: Plant Species Theme (DFFE Screening Tool)



Figure 21: Animal Species theme sensitivity (DFFE Screening Tool)



## 10.10 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 as well as stimulating other sectors in the value chain such as manufacturing and trade makes it an important sector towards the attainment of growth and development. The current land utilisation by agriculture is determined by natural resources such as soils, water and climate, and land ownership. Land utilised for commercial farming is about 90% of the total farmland, whilst for 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). Figure 22 shows the soil and agricultural potential of the study site.

The study area has a very high to medium agricultural sensitivity, according to the National Web-based Environmental Screening Tool (2024), this is because the site is underlain by Agricultural Pot 1 type, which is the Glenrosa and/or Mispah from lime rare or absent in upland soils but generally present in low-lying soils, Figure 22 and Figure 23 below. Figure 24 shows the agricultural sensitivity of the site and surrounds.

A Site Sensitivity Report will be compiled by a suitably qualified specialist and submitted with the final Scoping report. The report will be compiled in terms of Protocol GN 320: Part B: Agricultural impact.



**Figure 22: Agriculture theme Sensitivity (DFFE Screening Tool)**

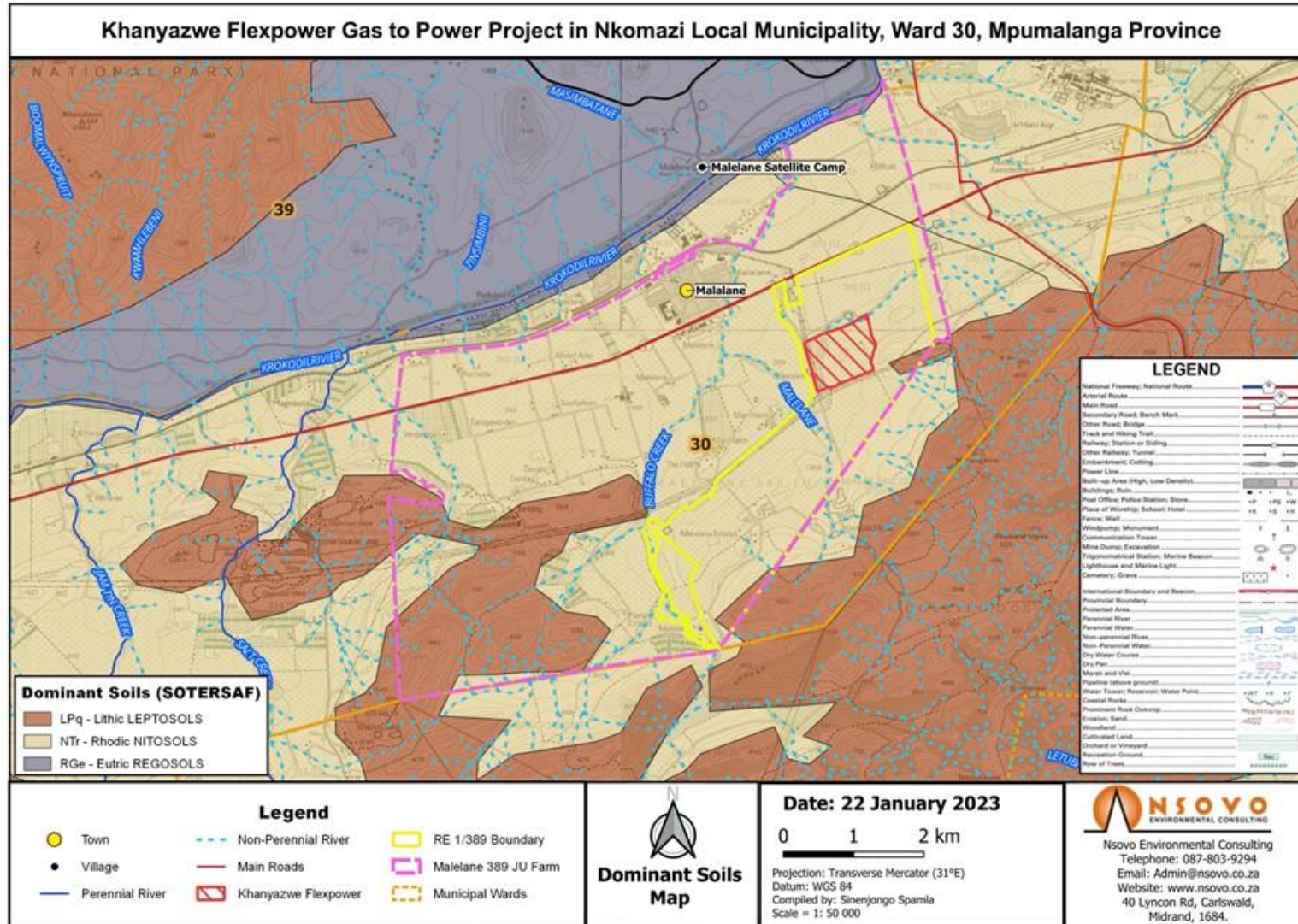


Figure 23: Soils around the study area.



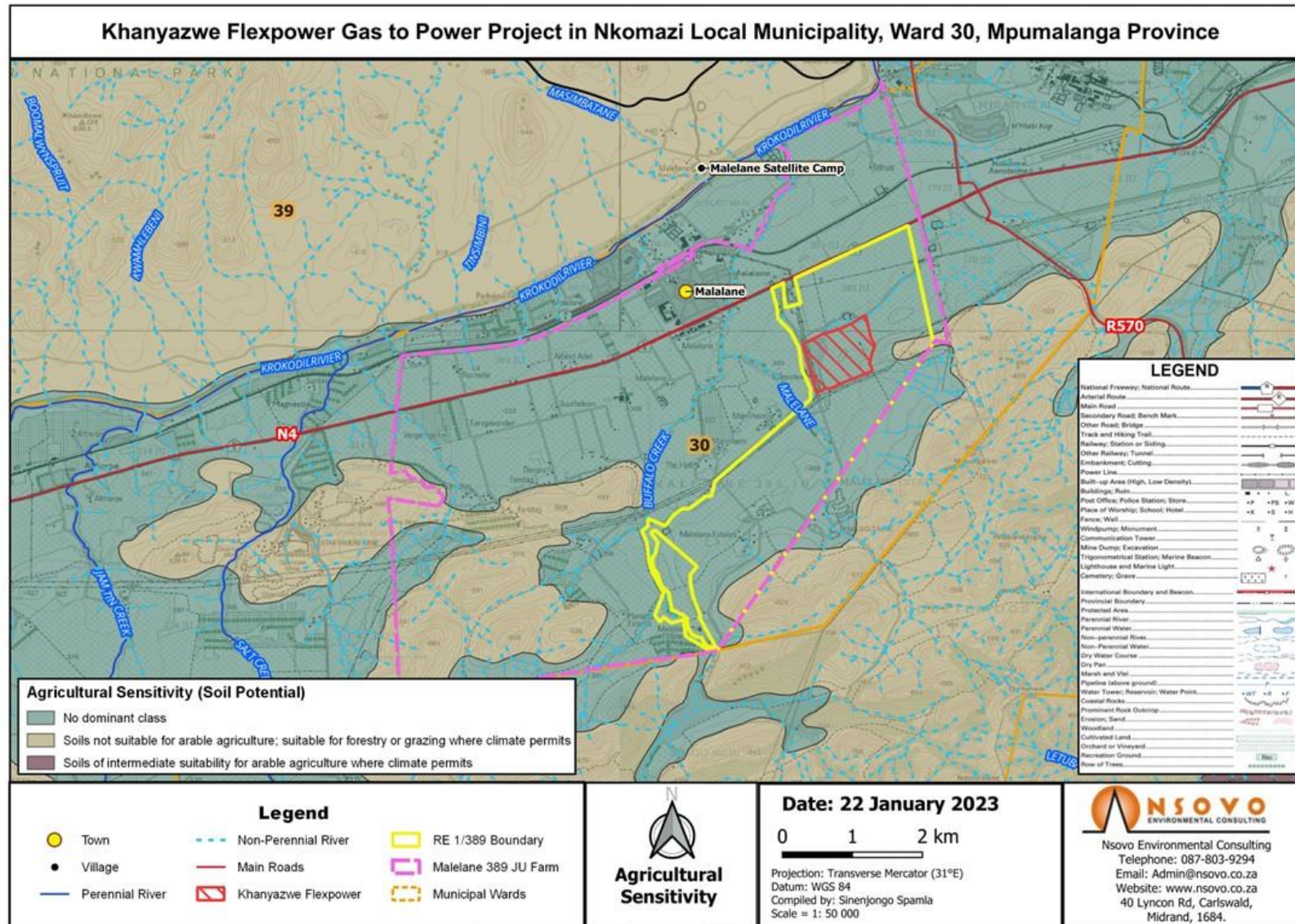


Figure 24: Agricultural Potential of the study area

## 10.11 SENSORY ASPECTS

### 10.11.1 NOISE

In terms of 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 various sources, which is part of daily living, and some of these physical attributes may, at times, be part of the ambient levels that people get used to without noticing the higher levels.

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.

There will be an upward shift in the immediate environmental noise levels during the construction phase temporarily and on a more permanent basis during the operational phase in the vicinity of the different mine expansion activities. 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. A detailed noise assessment will be undertaken during the EIA phase to determine the direct and indirect impacts, as well as an assessment of the identified impacts.

### 10.11.2 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 tends to be complicated, and it is evident from previous experience that when dealing with 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 large agricultural land used for commercial purposes. There are few human settlements, like small towns and farming communities, and the landscape is degraded 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 a low degree of

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.

### **10.11.3 CLIMATE CHANGE IMPACT**

Scientific opinion suggests that the continued emission of greenhouse gases, principally carbon dioxide and methane, due to human activities may bring about significant and long-term changes to the functioning of the earth's atmosphere. Of great uncertainty still are the possible impacts and damage attributable to such climate change, although indications are that their scale could be significant. According to the White Paper on Energy, South Africa is responsible for 1,6% of global greenhouse gas emissions, and the country's energy sector is the single largest source of greenhouse gas emissions in Africa, being dependent on coal for more than 75% of the country's primary energy needs during 1997. This level of emissions is also mainly because of the high level of coal use by the electricity generation and synthetic fuels industries and the high level of industrialisation producing high energy content products. To fulfill the national energy policy of making clean, affordable, and appropriate energy available to all population sectors, a balanced least-cost mix of energy supply is promoted. Although the country is faced with obligations to reduce its greenhouse gas emissions soon, international governance of this problem is an evolving area.

Burning natural gas releases polluting gases such as sulphur dioxide, nitrogen oxide and carbon dioxide. Further, the use of natural gas may result in fugitive methane. Methane is the naturally occurring product of the decay of organic matter. Methane accounts for 10.55% of greenhouse gas emissions created through human activity. According to the Intergovernmental Panel on Climate Change, methane has a global warming potential 21 times greater than carbon dioxide over a 100-year timeline. However, when used in power generation, natural gas emits 45% to 55% lower greenhouse gas emissions than coal.

## **10.12 SOCIAL BASELINE**

The proposed Project has the potential to have positive and negative socio-economic consequences; therefore, it is important that the socio-economic baseline conditions are 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.

### **10.12.1 SOCIO-ECONOMIC SENSITIVE AREAS IN PROXIMITY TO THE SITE**

The study area is approximately 1 km northeast of Malelane. Neighboring 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.

### **10.12.2 LAND USE**

The study area consists of flat land; the Crocodile River runs 600m to the west of the site. The study area is within the Amersfoort Highveld clay grassland, which comprises undulating grassland plans. The land cover is predominantly grassland and cultivated crops. Land use throughout the project proximity is entirely Sugar cane farming, with a portion that has been left intact and is of high aquatic sensitivity.

### **10.12.3 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 are in charge of 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 25 below.



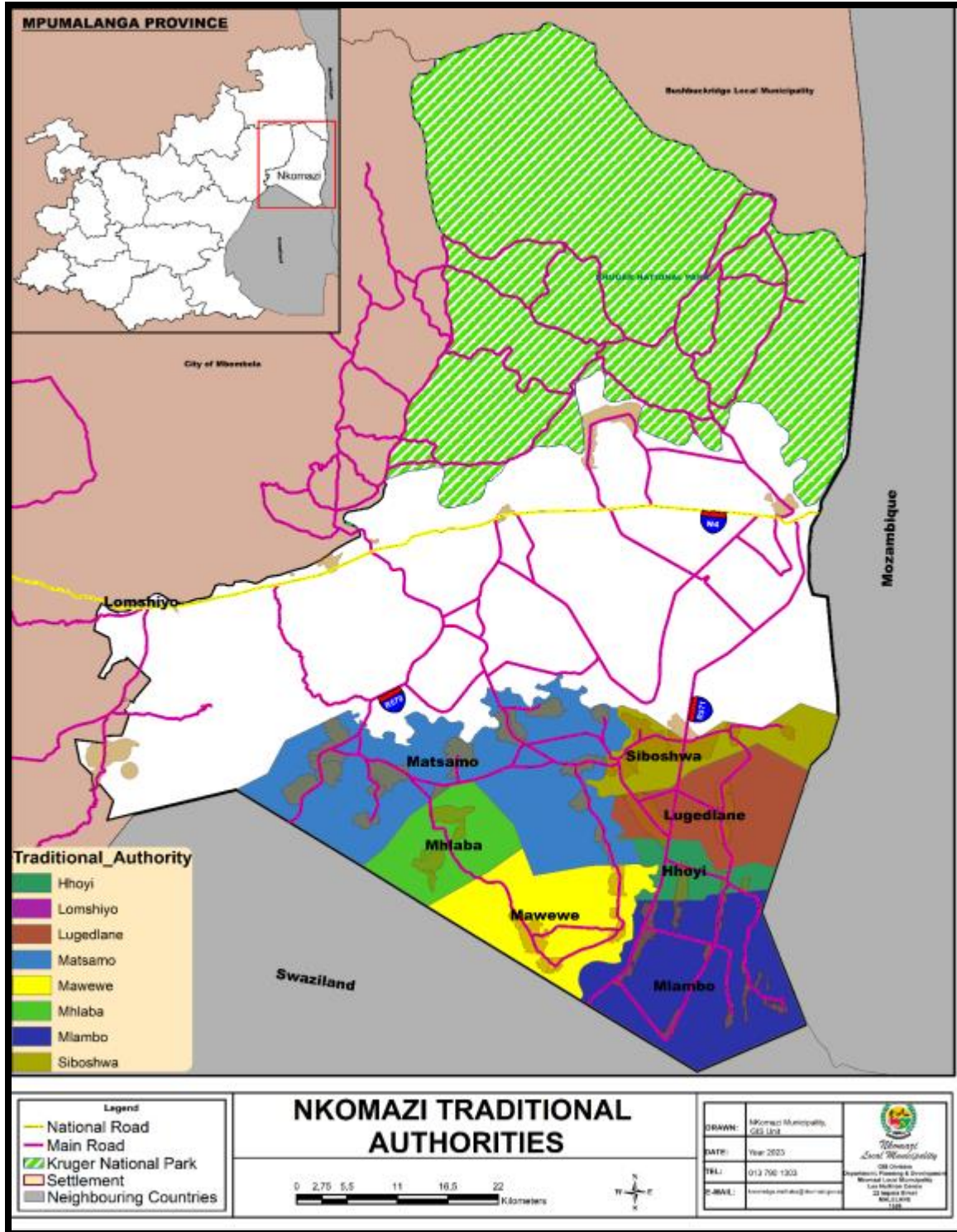


Figure 25: Nkomazi Traditional Authorities (NLM IDP 2024)



- **Population dynamics and spatial status**

Table 18 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 18: 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.

#### 10.12.4 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 26).

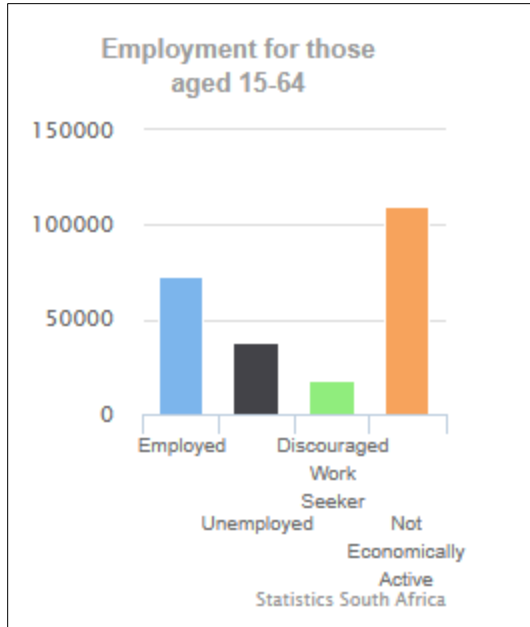


Figure 26: Employment between the age of 15-64 (Statssa)

### 10.12.5 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%. Figure 27. Of those aged 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, Figure 28.

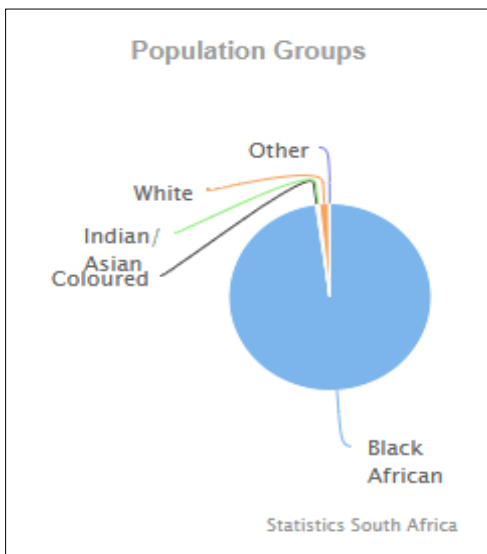


Figure 27: Population groups ([www.statssa.gov.za](http://www.statssa.gov.za))

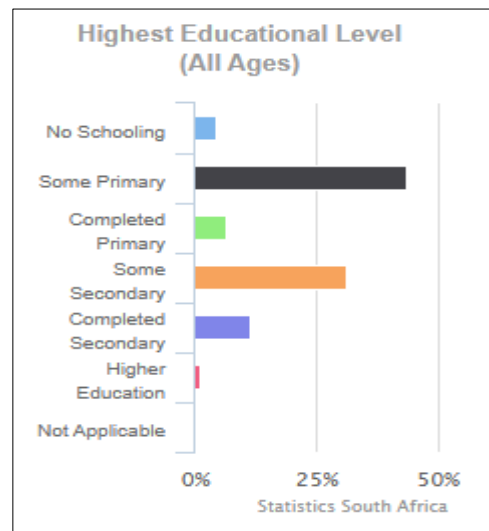


Figure 28: Highest education level ([www.statssa.gov.za](http://www.statssa.gov.za))

### 10.12.6 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 are 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.

### 10.12.7 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%.

## 11 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. From these criteria, a significance rating is obtained, 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 19 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 19: Methodology used in determining the significance of potential environmental impacts.**

<p><b>Status of Impact</b></p> <p>The impacts are assessed as either having a:</p> <p>the negative effect (i.e., at a `cost' to the environment),</p> <p>positive effect (i.e., a `benefit' to the environment) or</p> <p>Neutral effect on the environment.</p> <p><b>Extent of the Impact</b></p> <p>(1) Site (site only),</p> <p>(2) Local (site boundary and immediate surrounds),</p> <p>(3) Regional</p> <p>(4) National, or</p> <p>(5) International.</p> <p><b>Duration of the Impact</b></p> <p>The length that the impact will last is described as either:</p> <p>(1) immediate (&lt;1 year)</p> <p>(2) short term (1-5 years),</p> <p>(3) medium term (5-15 years),</p> <p>(4) long-term (ceases after the operational life span of the project),</p> <p>(5) Permanent.</p> <p><b>Magnitude of the Impact</b></p> <p>The intensity or severity of the impacts is indicated as either:</p> <p>(0) none,</p> <p>(2) Minor,</p>
--

- (4) Low,
- (6) Moderate (environmental functions altered but continue),
- (8) High (environmental functions temporarily cease), or
- (10) Very high / Unsure (environmental functions permanently cease).

#### Probability of Occurrence

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

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

#### Significance of the Impact

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

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

**The significance ratings are given below.**

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

## 12 DESCRIPTION OF THE ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS, INCLUDING CUMULATIVE IMPACTS IDENTIFIED

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 EAP's opinion and consultation with specialist studies. Refer to the table below for the potential impacts identified.

### 12.1 PRELIMINARY IMPACT ASSESSMENT

The Scoping phase of the EIA Process identified the potential positive and negative environmental (biophysical and social) impacts of the proposed project. Site-specific evaluations were undertaken for the proposed project options to establish the best environmentally and technically practicable site/location to evaluate in the EIA phase. The process involved a range of physical, biological, social, and technical criteria.

## 12.2 SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS IDENTIFIED

Potential environmental impacts identified during the Scoping phase are described in Table 20 below. This is not an exhaustive list but insight into the potential impacts associated with the proposed project. It must be borne in mind that the EIA phase may identify more potential impacts and will assess them in more detail.

**Table 20: Potential Environmental Impacts Identified**

Aspect	Impact	Impact Description	Mitigation Measures
Socio-economic benefit	Positive- No mitigation required	The planning and design of the development require input from various individuals, resulting in employment opportunities for such persons. This employment would include both direct (e.g., Environmental Consultants, Engineers, Project Managers, Planners, etc.) and indirect (e.g., reviewing and commenting authorities such as the local authority planning authorities and the environmental authorities). The extent and magnitude of this impact are relatively low and short-term in duration compared to the other economic impacts and are restricted to a limited number of professionals. The significance is rated as medium, and an enhancement strategy is proposed.	<ul style="list-style-type: none"> <li>• Skills Transfer</li> <li>• Training</li> <li>• Gender Equality</li> </ul>



Aspect	Impact	Impact Description	Mitigation Measures
		<p>The proposed project will result in the creation of employment opportunities and procurement of goods and services.</p>	
Employment	<p>Positive Impact - Not mitigative require. Measure to enhance are proposed.</p>	<p>Providing employment opportunities during the construction and operational phases. The proposed facility may impact on the skills of the local personnel through teaching and learning.</p>	<ul style="list-style-type: none"> <li>• Employment of skilled, semi-skilled, and unskilled labourers during the construction of the proposed project within the receiving environment and Inkomati Local Municipality.</li> <li>• 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.</li> </ul>
Noise and vibration		<p>Noise may be generated by construction activities (e.g., earthmoving vehicles, service vehicles, generators drilling, etc.). It is expected that this noise may impact on fauna living in the proposed location or that habitat within the Malelane River. In addition, the facility is near the CBD and a residential area, which may have an impact if not well managed.</p>	<ul style="list-style-type: none"> <li>• Ensure that all construction equipment is well serviced as per the manufacture’s manual throughout the construction phase.</li> <li>• The Noise Control Regulations (2013) requirements must be adhered to.</li> </ul>
Waste generation and Disposal	Negative	<p>Construction waste is expected, which will impact the environment through soil and water contamination.</p>	<ul style="list-style-type: none"> <li>• Inform all staff about sensitive species and the responsible disposal of construction waste.</li> </ul>

Aspect	Impact	Impact Description	Mitigation Measures
		<p>Waste can also have an impact on biodiversity. Waste has a negative impact on the visual aesthetics of an area. This impact is rated as 'medium' without mitigation and is reduced to 'low' with proper mitigation.</p>	<ul style="list-style-type: none"> <li>• Suitable handling and disposal protocols must be clearly explained, and sign boarded.</li> <li>• All domestic and general waste generated must be disposed of responsibly.</li> <li>• All reasonable measures must be implemented to ensure no littering and that construction waste is adequately managed.</li> <li>• Staff must be regularly reminded about the detrimental impacts of pollution on animal and plant species, and suitable handling and disposal protocols must be clearly explained, and sign boarded.</li> <li>• The 'reduce, reuse, recycle' policy must be implemented where possible.</li> </ul>
Surface water	Negative	<p>Hydrocarbon-based fuels or lubricants spilled from construction vehicles, construction materials that are not adequately stockpiled, and litter deposited by construction workers may be washed into the surface water bodies. Should appropriate ablution facilities not be provided for construction workers at the camps, the potential exists for surface water resources and surroundings to be contaminated by raw sewage. The utilisation of watercourses for disposal of water used for washing could decrease</p>	<ul style="list-style-type: none"> <li>• Construction vehicles are to be maintained in good working order to reduce the probability of leakage of fuels and lubricants.</li> <li>• A concrete bund with adequate storage capacity should be used, and insecticides, as appropriate, in well-ventilated areas well-ventilated areas to accommodate substances such as fuel, oil, paint, herbicides, and insecticides, as appropriate.</li> <li>• Storage of potentially hazardous materials must be removed from preferential flow paths and/or stormwater</li> </ul>

Aspect	Impact	Impact Description	Mitigation Measures
		<p>the abundance and diversity of aquatic macro-invertebrates inhabiting the section of the Malelane River and riparian areas further downstream.</p>	<p>infrastructure. These materials include fuel, oil, cement, bitumen, etc.</p> <ul style="list-style-type: none"> <li>• Surface water draining off contaminated areas containing oil and petrol would need to be channelled towards a sump separating these chemicals and oils.</li> <li>• Concrete is to be mixed on mixing trays only, not on exposed soil; Concrete and tar shall be mixed only in areas that have been specially demarcated for this purpose.</li> <li>• After all the tar concrete/tar mixing is complete, all waste concrete/tar shall be removed from the batching area and disposed of at an approved waste dump.</li> <li>• Any proclaimed weed or alien species germinating during the operational period shall be cleared by hand before flowering.</li> <li>• The release of clean water from the clean and dirty water separation infrastructure must be diffused and not reach stream habitat as concentrated flows where it will have severe negative impacts.</li> <li>• The stormwater plan must include adequate attenuation facilities to ensure that peak flows do not cause negative impacts on streams.</li> </ul>

Aspect	Impact	Impact Description	Mitigation Measures
			<ul style="list-style-type: none"> <li>• Caution must be taken to ensure building materials are not dumped or stored within the proximity of the streams.</li> <li>• Emergency plans must be in place in case of spillages.</li> <li>• All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds for the minimum amount of time necessary.</li> <li>• A phased planned approach must be taken when construction is initiated. Areas must only be stripped directly before construction and expose soils to erosion for the minimum necessary period. Where possible, re-vegetation of areas must be implemented as soon as possible.</li> </ul>
Groundwater	Negative	<p>Contaminated runoff from concrete mixing and sediment release, including hydrocarbon spillages, may infiltrate into the groundwater.</p> <p>Use of groundwater for the proposed development is an option and potential to impact ground water yield should this be the primary water source for the entire development and development gas power plant process.</p>	<ul style="list-style-type: none"> <li>• Place drip trays under stationary machinery, only re-fuel machines at the temporary fueling station, and install temporary structures to trap fuel spills at the temporary fueling station.</li> <li>• Immediately clean oil and fuel spills and dispose of contaminated material (soil, etc.) at licensed sites only.</li> <li>• Equip the site with sufficient ablution facilities. Secure chemical toilets to ensure they do not blow over in windy conditions.</li> <li>• Do not release any pollutants into the environment, including sediment, sewage, cement, fuel, oil, chemicals, hazardous substances, wastewater, etc.</li> </ul>

Aspect	Impact	Impact Description	Mitigation Measures
			<ul style="list-style-type: none"> <li>• Compile a procedure for storing, handling, and transporting different hazardous materials and ensure that it is strictly adhered to.</li> <li>• Ensure vehicles and equipment are in good working order, and drivers and operators are trained with respect to actions to be taken in the case of a fuel spill or leak.</li> <li>• Ensure that good housekeeping rules are applied.</li> </ul>
Traffic	Negative	<p>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.</p>	<ul style="list-style-type: none"> <li>• The delivery of construction material and equipment should be limited to hours outside peak traffic times (including weekends) prevailing on the surrounding roads where possible.</li> <li>• Existing access roads must be used.</li> <li>• Delivery vehicles must comply with all traffic laws and bylaws.</li> <li>• Inform communities of planned construction activities affecting vehicle/ pedestrian traffic.</li> </ul>

Aspect	Impact	Impact Description	Mitigation Measures
Agriculture	Negative	<p>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.</p>	<ul style="list-style-type: none"> <li>• Minimise the construction footprint of the power plant.</li> </ul>
Biodiversity	Negative	<p>The impact on terrestrial biodiversity is considerable during the construction phase. Most of the identified impacts are of medium significance with mitigation measures. Such impacts include:</p> <ul style="list-style-type: none"> <li>• Loss of indigenous vegetation</li> <li>• Loss of exotic vegetation</li> <li>• Loss of or displacement of fauna</li> <li>• Increase in alien invasive vegetation.</li> <li>• Loss of ecological function</li> </ul> <p>According to the DFFE Screening Tool report (2024), the study area is within a High terrestrial biodiversity theme.</p>	<ul style="list-style-type: none"> <li>• Avoid or minimise loss of sensitive habitats.</li> <li>• Avoid any disturbance to the No-Go habitats (Protected Areas).</li> <li>• Minimise the physical destruction of any remaining primary vegetation, especially in or near wetland areas. In general, minimise clearing and operations in habitats with a High sensitivity rating and delineate and maintain a no-go buffer of at least 100 m around such habitats.</li> <li>• Use existing gravel roads and already disturbed areas to access the facility as far as possible to avoid creating new roads or access routes across natural areas.</li> <li>• Avoid blocking and/or destroying any streams/rivers and wetlands.</li> <li>• After the final layouts of the operation components have been approved and before any new groundwork, conduct a thorough footprint investigation (during summer) to assess all Protected or Threatened plant species (population location and size).</li> </ul>

Aspect	Impact	Impact Description	Mitigation Measures
			<ul style="list-style-type: none"> <li>• Parking and operational areas should be regularly inspected for hazardous substance spills and covered with an impermeable or absorbent layer (with the necessary stormwater control).</li> <li>• If filling material is to be used, this should be sourced from areas free of invasive species, and alien plant control measures are to be applied to all areas used for sourcing fill materials.</li> <li>• Efforts must be taken to minimise the footprint of short-duration activities and/or linear infrastructure. Efforts to minimise such footprints will include grouping all infrastructure to the same servitude and/or as close as possible to existing and planned long-term physical disturbances; this will reduce habitat fragmentation.</li> </ul>
Flora	Negative	<p>The key activities associated with development activities that may affect the ecology of the area include:</p> <ul style="list-style-type: none"> <li>• The utilisation of temporary tracks to the footprint areas.</li> <li>• Alien species proliferation due to edge effects caused by vegetation clearing for access roads and site establishment.</li> </ul>	<ul style="list-style-type: none"> <li>• A walkdown/active search for Floral SCC must be conducted within the focus area before any activities occur.</li> <li>• Floral SCC encountered within the footprint will be either protected in situ or relocated as appropriate. This specifically relates to species that can potentially be successfully rescued and relocated if a permit application for the disturbance of these protected species is approved.</li> <li>• Keep the proposed development footprint as small as possible.</li> </ul>



Aspect	Impact	Impact Description	Mitigation Measures
		<ul style="list-style-type: none"> <li>• Trenching for the establishment of the gas pipeline.</li> <li>• Site levelling.</li> <li>• Digging for the pylons of the powerlines.</li> </ul>	<ul style="list-style-type: none"> <li>• As far as possible, development within sensitive habitat units must be avoided.</li> <li>• All disturbed areas must be concurrently rehabilitated during the construction of access roads and vegetation clearing for temporary contractor’s laydown areas.</li> <li>• The existing integrity of flora surrounding the focus area should be upheld, and no activities should occur outside the footprint area.</li> <li>• Edge effect control must be implemented to avoid further habitat degradation outside the proposed footprint area.</li> <li>• All sensitive areas are to be demarcated and access into these areas should be minimised as far as possible.</li> </ul>
Fauna	Negative	The key activities associated with the impact on Faunal Species of Conservation Concern are similar to the Floral Species listed above.	<ul style="list-style-type: none"> <li>• The proposed development footprint areas should remain as small as possible and, where possible, be confined to already disturbed areas.</li> <li>• As far as possible, development within sensitive habitat units must be avoided.</li> <li>• Edge effects of all development activities, such as erosion and alien plant species proliferation, which may affect faunal habitat within surrounding areas, need to be strictly managed.</li> <li>• All disturbed areas must be concurrently rehabilitated.</li> </ul>

Aspect	Impact	Impact Description	Mitigation Measures
			<ul style="list-style-type: none"> <li>• All informal fires in the vicinity of the development footprint should be prohibited, and</li> <li>• No trapping or hunting of fauna is to take place.</li> </ul>
Agriculture and Soils		<p>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:</p> <ul style="list-style-type: none"> <li>• Excavations, particularly on steep slopes</li> <li>• Ineffective stormwater management</li> <li>• Excessive use of gravel roads</li> <li>• Use of heavy machinery or vehicles</li> </ul> <p>Construction activities may lead to the compaction of disturbed soils; further to this, 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</p>	<ul style="list-style-type: none"> <li>• Any disturbance of high potential agricultural soils must be actively avoided. Should this not be feasible, the footprint of the proposed power facility should be demarcated to restrict the planned activities within the infrastructure footprint as far as possible, thus minimizing edge effects and reducing the extent and overall significance of impact.</li> <li>• An adequate stormwater management plan must be carefully designed and implemented to avoid topsoil erosion on adjacent arable soils throughout all the phases. In this regard, special mention is made of:                         <ul style="list-style-type: none"> <li>○ Sheet runoff from cleared areas, paved surfaces, and access roads needs to be curtailed.</li> <li>○ The strategic placement of berms should slow down runoff from paved surfaces; and</li> <li>○ All stockpiles and waste stockpiles must have berms and/or catchment paddocks at their toe to contain runoff from the facilities.</li> </ul> </li> </ul>

Aspect	Impact	Impact Description	Mitigation Measures
		<p>increase surface runoff velocities and peak flows received by riparian habitats and wetlands.</p> <p>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.</p>	<ul style="list-style-type: none"> <li>• Construction activities should be scheduled to coincide with low rainfall periods as far as possible. These periods may reduce erosive runoffs and wind impacts.</li> <li>• As the footprints of the proposed development are not vegetated, it is best to be regularly dampened with water to suppress dust during construction, especially when strong wind conditions are predicted according to the local weather forecast.</li> <li>• Bare soils adjacent to the infrastructural areas can be vegetated with an indigenous grass mix, if necessary, to re-establish a protective cover, to minimise soil erosion and dust.</li> <li>• Erosion control is critical as most soils are susceptible to erosion.</li> <li>• Compaction of soil can be mitigated by ripping the footprint and introducing both organic and inorganic fertilizers.</li> <li>• Unnecessary disturbances of the potentially arable soils outside the demarcated areas can be avoided where possible to minimise the loss of arable soils.</li> <li>• The footprint should be ripped at 25 cm to alleviate compaction as part of rehabilitation.</li> </ul>

Aspect	Impact	Impact Description	Mitigation Measures
			<ul style="list-style-type: none"> <li>The footprint should be re-vegetated with a grass seed mixture as soon as possible, preferably in spring and early summer, to stabilize the soil and prevent soil loss during the rainy season.</li> </ul>
Impact on heritage		<p>According to the heritage report dated 2020, 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 suggests any potential of 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 did not identify any cultural heritage resources or archaeological resources within an area earmarked for the proposed development.</p>	<ul style="list-style-type: none"> <li>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. The footprint impact of the proposed development and associated infrastructure should be kept to minimal footprint impact of the proposed development and associated infrastructure should be kept to a minimum to limit the possibility of encountering chance finds.</li> <li>There are no burial sites (graves) identified during the field investigation.</li> <li>Furthermore, should unidentified graves and burial sites be discovered during the course of construction activities, all construction activities should cease and the site must be barricaded, and SAHRA/MPHRA or the professional archaeologist must be informed.</li> <li>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</li> </ul>

Aspect	Impact	Impact Description	Mitigation Measures
			<p>Health before any grave relocation can take place. Furthermore, a professional archaeologist must be retained to oversee the relocation process with following the National Heritage Resources Act 25 of 1999.</p> <ul style="list-style-type: none"> <li>• Should chance archaeological materials or human burial remains be exposed subsurface, construction work on any section of the 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 regulations.</li> </ul>
Visual Impact	Negative	The visibility analyses will consider 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	<ul style="list-style-type: none"> <li>• Keep the construction sites and camps neat, clean, and organised to portray a tidy appearance.</li> <li>• 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.</li> </ul>

Aspect	Impact	Impact Description	Mitigation Measures
		<p>views due to the proposed development (power plant facility and 275 kV and/or 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.</p>	<ul style="list-style-type: none"> <li>• Plant fast-growing endemic trees along the facility's boundary, especially along the N4. The trees will, with time, create a screen and increase the biodiversity of the area.</li> <li>• Locate access routes to limit modification to the topography and to avoid the removal of established vegetation.</li> <li>• 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.</li> </ul>
Noise	Negative	<p>Noise-generating activities on site include the following:</p> <ul style="list-style-type: none"> <li>• Earthworks.</li> <li>• Delivery of building material.</li> <li>• Civil construction activities.</li> <li>• Earth drilling.</li> <li>• TLB activities.</li> <li>• Foundations and pouring of concrete.</li> </ul> <p>• During construction, an increase in noise is expected as these activities will generate noise of medium significance without</p>	<ul style="list-style-type: none"> <li>• Manage speed limits of vehicles and ensure all vehicles are maintained to reduce noise.</li> <li>• 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.</li> <li>• In addition, it is proposed that a detailed noise impact assessment be conducted during the EIA phase.</li> </ul>

Aspect	Impact	Impact Description	Mitigation Measures
		<p>mitigation. If the mitigations are adhered to, the noise impact will be manageable and of low significance.</p>	
<p>Air quality and climate change</p>	<p>Negative</p>	<p>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. A detailed air quality impact will be undertaken during the EIA phase to determine the emissions' actual human and environmental impacts.</p>	<ul style="list-style-type: none"> <li>• Develop and implement servicing programmes for all operational components of the facility.</li> <li>• Stocking critical components to ensure the availability of spares in the event of mechanical faults.</li> </ul>
<p>Climate change impact</p>	<p>Negative</p>	<p>In the context of climate change impacts associated with GHG emissions from the proposed project, extent, duration, and frequency are the same, irrespective of the project context and the scale of its GHG emissions. The extent of GHG impacts is global, the impact duration is permanent (residence time for CO<sub>2</sub> in the atmosphere is approximately 100 years), and the impact frequency is constant.</p> <p>As such, GHG impact significance will be determined using benchmarks from international</p>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• 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 cycling philosophies could have an adverse impact on thermal efficiency and GHG intensity per MWh generated</li> </ul>



Aspect	Impact	Impact Description	Mitigation Measures
		<p>lender standards, further informed by reference benchmarks on the GHG intensity of electricity production for similar facilities and according to the grid emissions factor in South Africa, as well as an analysis of the Project’s alignment with South Africa’s energy and climate change policies. This will be studied further during the EIA phase.</p>	<p>because of increased start-ups and wear and tear on the plant. As such, the potential impact of any future changes in operating philosophy should be investigated and managed, through upgrades to plant hardware and modifications to operating practices, as applicable.</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Setting short, medium, and long-term targets for maximizing and maintaining heat rate / thermal efficiency and GHG intensity (t CO2e per MWh generated) over time, against which performance can be assessed.</li> <li>• Allocating responsibility to key individuals for managing and reporting on the GHG performance of the plant.</li> <li>• Communicating the Plan, including its key objective and any actions being taken, to staff working at the plant to ensure buy-in.</li> <li>• Encourage employee participation in the GHG management plan, including the contribution of ideas relating to opportunities for improvement.</li> </ul>

Aspect	Impact	Impact Description	Mitigation Measures
			<ul style="list-style-type: none"> <li>• Reporting progress over time with respect to annual gas consumption and GHG emissions, GHG reductions/heat rate improvements achieved, and progress against targets set.</li> </ul>

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

- Biodiversity (flora and fauna).
- Heritage.
- Wetland.
- Air quality.
- Socio-economic; and
- Visual impacts.

## 12.3 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 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 land owner 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 because 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, on 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, with proper mitigation, they can be reduced to low.

**Table 21** 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, as well as 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 21: 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.	<p>Implement measures proposed in the EMPR.</p> <p>Appoint a Community Liaison Officer to deal with complaints and grievances from the public.</p> <p>Regulate speed and enforce speed limits on trucks using the access road to minimise creation of excessive dust.</p>
	Noise	Negative	Noise can impact the health and social well-being of local communities. The proposed development of the gas power plant will have a medium significant impact on the surrounding communities. The noise impact on surrounding communities must be monitored and measures for the construction and operational phases included in the EMPR.	<p>Maintain all vehicles and construction machinery to ensure the noise levels do not cause unnecessary and avoidable nuisance to the workforce and local communities.</p> <p>Appoint a community liaison officer to deal with complaints and grievances from the public.</p>
	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 periods. The construction of the access and exit from the National Road N4 will result in traffic	<p>During construction, the sites should be fenced off to prevent access.</p> <p>Fencing should be inspected regularly and properly maintained by the contractor.</p> <p>Ensure that the appropriate warning signs are erected on all boundary fences, cautioning against entering the construction area.</p>

Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
			<p>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.</p>	<p>Clear and visible signage during the construction of the access and exit from the N4.</p> <p>Ensure all construction equipment and vehicles are correctly always maintained.</p> <p>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 the vulnerable population sector, such as children and the elderly.</p> <p>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.</p> <p>Make staff aware of the dangers of runaway fire during regular toolbox talks.</p>
	Increase in crime	Negative	<p>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</p>	<p>All workers should carry identification cards and wear identifiable clothing.</p>

Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
			<p>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.</p>	<p>Fence off the construction site and control access to the site.</p> <p>Appoint an independent security company to monitor the site.</p> <p>Implement extra security measures on high-risk equipment and cabling.</p> <p>Encourage local people to report any suspicious activity associated with the construction site to the security company.</p> <p>If applicable, liaise with the Community Policing Forums near the project.</p>
	<p>The influx of job seekers</p>	<p>Negative</p>	<p>It is highly likely that the construction of the activities will result in an influx of job seekers, particularly given the current unemployment rate in the country. This impact can be quite significant and would require a proper recruitment management strategy.</p>	<p>Communicate, through Community Leaders and Ward Councillors, the situation regarding job opportunities created by the project.</p> <p>Develop and implement a local procurement policy that prioritizes “locals first” to prevent the movement of people into the area in search of work.</p> <p>Draw up a project recruitment policy in consultation with Community Leaders and Ward Councillors and ensure compliance with this policy.</p>



Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
	Increased risk of Transmittable Disease Infections	Negative	The risk of infections would be highest during the construction phase of the project, as construction staff increases in numbers and an influx of transient workers/job seekers increases. This will increase exposure and vulnerability to transmittable diseases.	<p>Cooperate with local authorities to ensure all legislation preventing illegal settlement is always enforced.</p> <p>Awareness Raising</p>
<b>Quality of the living environment (Liveability)</b>	Annoyance factor, access, and disruption of daily living patterns, particularly in remote farmlands.	Negative	The disruption of daily living patterns is most likely associated with construction activities related to irregular on-site deliveries and the use of construction vehicles and equipment. Over the operational phase of the project, these disruptions are likely to subside somewhat as operational schedules and traffic patterns become more predictable.	<p>Appoint a Community Liaison Officer to deal with complaints and grievances from the public.</p> <p>Regularly monitor the effect of the construction activities on public infrastructure and immediately report any damage to infrastructure to the appropriate authority.</p> <p>Closely monitor the construction of the access road from the N4 and ensure that contractors adhere to traffic management protocols.</p>
	Increased traffic due to construction activities	Negative	During Construction activities, there will be increased movement of heavy vehicles delivering material to the site, the movement of construction vehicles, and contractor staff vehicle movement. This will significantly impact the rural setting of the	<p>Implement the mitigation measures in the EMP and SES.</p> <p>Enforce speed controls on the access roads.</p>

Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
			<p>surrounding area and may cause an increase in incidences on National Road N4.</p>	<p>Closely monitor the construction of the access road from the N4 and ensure that contractors adhere to traffic management protocols.</p>
<b>Economic</b>	<p>Job creation and skills development</p>	<p>Positive</p>	<p>The project will likely result in the following economic benefits:</p> <ul style="list-style-type: none"> <li>• Job creation and skills development</li> <li>• Local economic development.</li> </ul>	<p>Appoint a community liaison officer to deal with complaints and grievances from the public.</p> <p>Wherever feasible, residents should be given preference to fill semi and unskilled jobs.</p> <p>Women should be given equal employment opportunities and encouraged to apply for positions.</p> <p>Skills transfer plan should be put in place at an early stage allowed, and workers should be allowed to develop skills that they can use to secure jobs elsewhere post-construction.</p>
<b>Cultural</b>	<p>At a social level, any cultural impacts would likely be associated with sensitive</p>		<p>At a social level, it is likely that any cultural impacts would 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.</p>	<p>Chance Find Protocol EMPr</p>

Risk category	Risks Identified	Status	Description	Proposed Mitigation and Management Strategy
	archaeological and/or heritage sites that may be found.			

## 12.4 CUMULATIVE IMPACTS

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). A more robust cumulative assessment will be undertaken as part of the EIA. 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:

### 12.4.1 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.

### 12.4.2 VISUAL IMPACT

The proposed activity will change the area's visual character, particularly considering the proposed site is next to the national road (N4). Given the topography and the proximity to the national highway and Malelane CBD, the impact can be considered term definite and long-term.

### 12.4.3 TRAFFIC IMPACT

During the construction phase, increased heavy vehicle traffic should be expected. There are anticipated disruptions on the N4 during construction. Without management, such increased traffic loads may negatively impact existing traffic flow. Without appropriate traffic management during the N4 access construction this will cause a significant impact on motorist utilising the National Road. 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.

### 12.4.4 SOIL AND LAND CAPABILITY

Sixty-six percent (66%) of Mpumalanga Province's irrigated land is in the Ehlanzeni District, where most of these 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.

## 13 PLAN OF STUDY FOR EIA

The Scoping phase is fundamental as it allows for identifying potential impacts on the environment and facilitating the process of compiling the EIA and Environmental Management Programme (EMPr). This report incorporates information from the client, specialist studies, site visits, literature reviews, and previous environmental studies conducted in the area; therefore, it provides a comprehensive baseline of the environment of the study area.

This Scoping Process has followed the appropriate standards and procedure for the EIA application, as set out in the NEMA and the 2014 EIA Regulations as amended. The study includes a description of the various alternatives and indicates those alternatives which should be pursued as part of the detailed assessment of the EIA process. The impact significance of the proposed activity on the environment will be assessed in the EIA phase (described below) with the assistance of various specialist studies.

This section outlines how the EIA for the proposed development will proceed during the EIA phase. The detailed assessment phase of the EIA process entails integrating the specialist studies for those potential impacts evaluated to be of significance. Relevant mitigation measures will be included in the EMPr. This section provides specific terms of reference and impact assessment methodology for utilisation by the specialist team and EAP. The Plan of Study for EIA is intended to summarize the key findings of the Scoping Phase and describe the activities undertaken during impact assessment. The Plan of Study provides the following:

- A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity.
- A description of the aspects to be assessed as part of the environmental impact assessment process.
- Aspects to be assessed by specialists.
- A description of the proposed method of assessing the environmental aspects, including a description of the proposed method of evaluating the environmental aspects including aspects to be assessed by specialists.
- A description of the proposed method of assessing duration and significance.
- An indication of the stages at which the competent authority will be consulted.
- Particulars of the public participation process that will be conducted during the EIA process.
- A description of the tasks that will be undertaken as part of the EIA process and
- , Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and determine the extent of the residual risks that need to be managed and monitored.

### **13.1A DESCRIPTION OF THE ASPECTS TO BE ASSESSED AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT**

The following aspects have been identified and described as part of the Scoping Report.

- Biodiversity (flora and fauna).
- Soil, land use and land capability (Agricultural potential)
- Heritage and Palaeontology.
- Wetland.
- Traffic.
- Noise.
- Air quality.
- Socio-economic.
- Visual impacts; and
- Climate Change.

### 13.2 ASPECTS TO BE ASSESSED BY THE SPECIALISTS

The following specialist studies will be undertaken during the EIA Phase.

**Table 22: List of specialist sub-consultants**

Specialist Study	Company	Specialist
Wetland and Aquatic Biodiversity Assessment	Amanzi Environmental Services	Rudi Greffrath
Heritage Impact Assessment	Mulaifa Development Projects	Mosses Mabuda
Agricultural Impact Assessment	Nsovo Environmental Consulting	Tshiamo Setsipane
Terrestrial Biodiversity Assessment	Amanzi Environmental Services	Rudi Greffrath
Desktop Paleontological Assessment	Bamford (Pty) Ltd	Dr. Marion Bamford
Social Impact Assessment	Mdumeya Group (Pty) Ltd	Molatela Ledwaba
Air Quality and Climate Change Impact	Ehrcon	Uno Neveling
Geotechnical Assessment	Khanyazwe Flexpower	

All specialist studies will be 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, which came into effect on 09 May 2020.

### **13.3A DESCRIPTION OF THE ALTERNATIVES TO BE CONSIDERED AND ASSESSED WITHIN THE PREFERRED SITE, INCLUDING THE OPTION OF NOT PROCEEDING WITH THE ACTIVITY**

The scoping phase will assess technical and structural alternatives for the Khanyazwe Flexpower facility identified in Section 7 including the “No-Go” alternative. These alternatives will be evaluated further during the EIA phase. The preferred alternatives will be the ones with the least environmental impacts and provide the most socio-economic benefits.

Alternatives to be assessed further include:

- Layout.
- Technical and
- No Go Alternative

#### **13.3.1 A DESCRIPTION OF THE PROPOSED METHOD OF ASSESSING THE ENVIRONMENTAL IMPACTS**

The description of the proposed method of assessing the duration and significance is included in Error! Reference source not found. Above.

### **13.4 AN INDICATION OF THE STAGES AT WHICH THE COMPETENT AUTHORITY WILL BE CONSULTED**



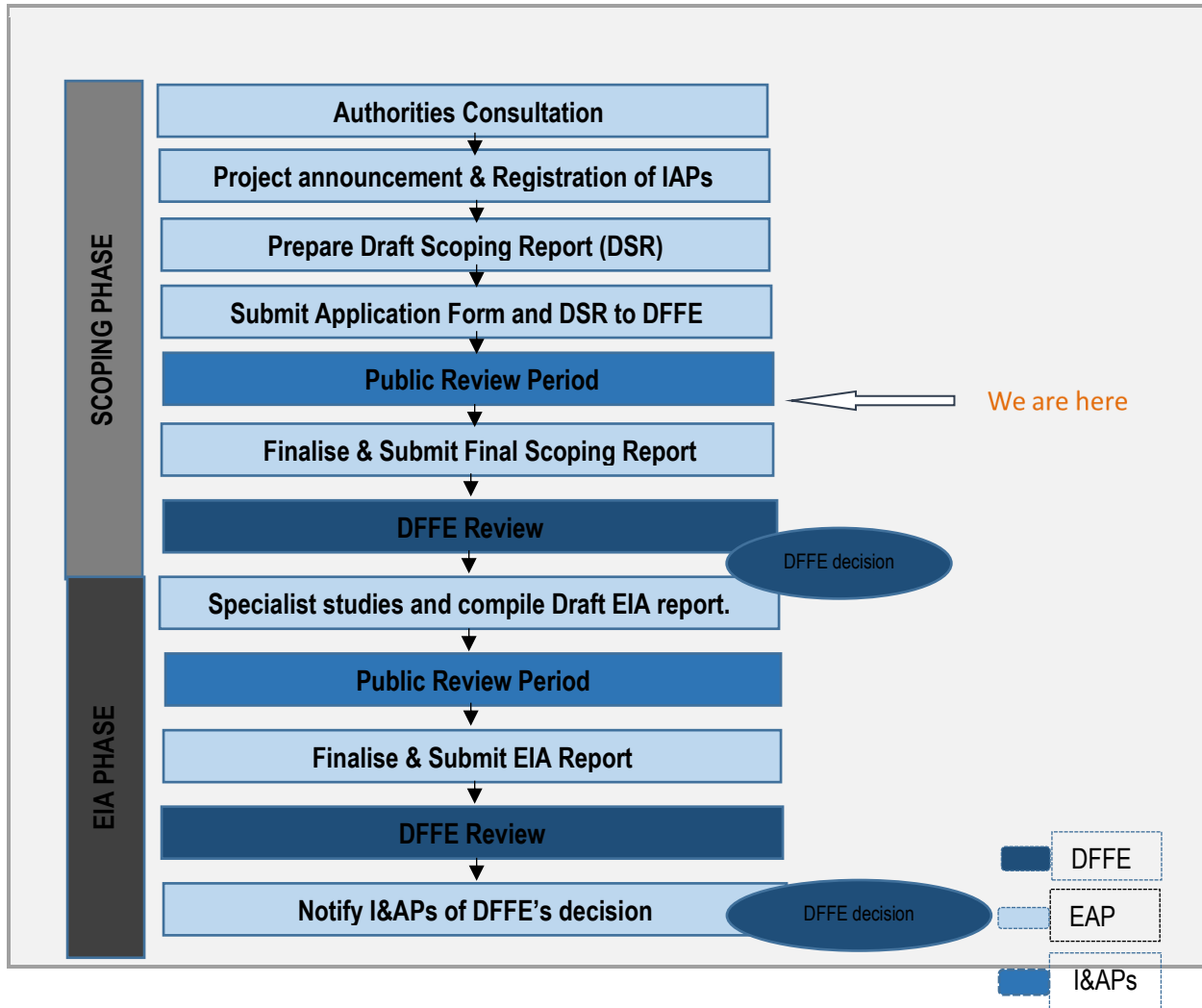


Figure 29: The different stages at which the Competent Authority will be consulted.

### 13.4.1 SCOPING PHASE

The draft Scoping Report will be submitted to the DFFE for review and comment. In addition, the draft report will be sent to all stakeholders to review and comment for 30 days, of which comments or issues raised will be addressed appropriately. The final Scoping Report will be submitted to the DFFE for consideration.

### 13.4.2 ENVIRONMENTAL IMPACT ASSESSMENT PHASE

The draft Environmental Impact Report (EIR) will be prepared and distributed for public review and comments. Further, copies of the draft EIR will be submitted to the DFFE and stakeholders for comment. The final EIR, including all comments received, specialist reports and recommendations, will be submitted to DFFE for decision making.

## 13.5 PARTICULARS OF THE PUBLIC PARTICIPATION PROCESS THAT WILL BE CONDUCTED DURING THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The Public Participation approach adopted in this plan is in line with the process contemplated in Regulations 39 through 44 of the EIA Regulations of 2014 as amended in terms of the National Environmental Management Act, 1998 (Act 107 of 1998), and Annexures 2 and 3 of Government Notice No 43412 of 5<sup>th</sup> of June 2020. 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 facilitated such that they have a reasonable opportunity to comment on the application.

Chapter 6, Regulation 39 through to 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 of an application or proposed application which is subjected to the public involvement.

Public Participation principles hold that those affected by a decision have the right to be involved in the decision-making process. The primary objectives of conducting the PPP are to provide I&APs with an opportunity to express their concerns and views on issues relating to the proposed project. The principles of public participation are to ensure that the PPP:

- Communicates the interests of and meets the process needs of all participants.
- Seek to facilitate the involvement of those potentially affected.
- Involves participants in defining how they participate; and

It is as inclusive and transparent as possible; it must be conducted in line with the requirements of the Regulations as amended.

The database of stakeholders developed during the scoping process will be used to ensure that those stakeholders involved in the Scoping Phase also participate in the EIA phase. The database will also be expanded to include I&As that wish to be involved in the process. Registered I&As will be informed of the availability of the draft EIR for review and will be given 30 days to provide their comments. The comments received will be incorporated into an updated Comments & Response Report (CRR).

Additional public consultation will take place in public meetings and focus group meetings as appropriate. The purpose of the public meetings would be to present the findings of the draft EIR as well as the alternatives considered to the relevant stakeholders, registered I&As, and the affected landowners. The EAP will use this forum to provide more information about the proposed development, including the specialist input, and to provide the stakeholders with the opportunity to comment further on the proposed development. If the comments and issues highlight information that changes or influences the impact evaluation provided in the draft EIR, the necessary amendments will be made to the report. The Final EIR will be submitted to the DFFE after the second phase of public consultation.

### **13.5.1 PUBLIC NOTIFICATION**

The commencement of the EIA process, i.e., the Scoping Phase, will be advertised in two local newspapers. The proposed project will further be announced publicly through the following platforms of information sharing:

- Newspaper adverts of the proposed development and location, as well as contact details of where more information can be obtained and announcing the availability of the draft EIA Report for review and comment.
- A2 site notices in English and IsiSwati will be placed at conspicuous locations along the study area. Notices will also be placed at the Local Municipality office within the proposed study area; and
- Emails will be sent to key stakeholders.

Further advertising will take place during the EIA phase. It will relate to the availability of the reports for public review and for the announcement of public meetings that will be held at strategically located sites, which will allow for allowing maximum attendance.

### **13.5.2 INTERACTION WITH DFFE AND PROVINCIAL DEPARTMENTS**

Interaction with DFFE and other provincial authorities with jurisdiction over the proposed development undertaken during the Scoping Phase will continue into the EIA Phase of the project. Further interaction will occur in the following manner:

- Submission of the Final Scoping Report to DFFE.
- A consultation meeting with various stakeholders and I&APs, as appropriate, to discuss the findings of the draft EIR.
- Submission of the draft EIR following public review; and
- Notification of registered I&APs of the EA once it is issued.

I&AP's, authorities, and key stakeholders will review the draft EIR. Furthermore, the report will also be published and made available on the Nsovo (EAP) website for public review. Table 23 below shows some of the key stakeholders to be consulted:

**Table 23: I&AP's, authorities, and key stakeholders to review draft EIR.**

<ul style="list-style-type: none"> <li>• Mpumalanga Department of Agriculture and Rural Development and Land and Environmental Affairs</li> <li>• Mpumalanga Department of Water and Sanitation.</li> <li>• Mpumalanga Department of Transport and Public Works.</li> <li>• Mpumalanga Tourism Park Agency.</li> <li>• Southern African Agricultural Initiative</li> <li>• National Road Agency.</li> <li>• N4 Trans African Concessions (TRAC)</li> <li>• South African Heritage Resource Agency.</li> <li>• Mpumalanga Heritage Resources Agency.</li> <li>• South African National Parks.</li> <li>• Wildlife and Environmental Society of South Africa.</li> <li>• AGRI SA.</li> <li>• Eskom SOC Limited – Transmission</li> <li>• Ehlanzeni District Municipality</li> <li>• Nkomati Local Municipality.</li> <li>• ROMPCO</li> </ul>
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### 13.5.3 DEVELOPING A STRATEGY AND RESOLVING KEY ISSUES

A strategy for addressing and resolving key issues is to be developed and will include:

- Details on all assessments and investigations carried out.
- Use of the public participation meetings to present the findings of the reports and test the acceptability of priority issues and mitigations.
- Openly and honestly relating both positive and negative impacts of the proposed development during the public meetings; and
- Allowing the public to understand the consequences of the proposed development on the area and their livelihoods.

### **13.6A DESCRIPTION OF THE TASKS THAT WILL BE UNDERTAKEN AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT**

The section below indicates the tasks undertaken as part of the EIA process.

#### **13.6.1 PREPARATION OF THE DRAFT EIR AND EMPR**

The draft EIR and EMPr will be prepared per Appendices 3 and 4 of the 2014 EIA Regulations, respectively, and will include input from the specialist studies as indicated in Section 9.3.2 above. Contents of the draft EIR (Appendix 3) will consist of the following:

- Details and expertise of the EAP;
- Location of the activity.
- A plan that locates the proposed activity or activities applied for, as well as associated structures and infrastructure at an appropriate scale.
- A description of the scope of the proposed activity.
- A description of the policy and legislative context within which the proposed development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context.
- A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location.
- A motivation for the preferred development footprint within the approved site.
- A complete description of the process followed to reach the proposed development footprint within the approved site.
- A complete description of the process undertaken to identify, assess, and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity.

- An assessment of each identified potentially significant impact and risk, including (i) and (vii) as per the Regulations.
- A summary of the findings and recommendations of specialist reports.
- Environmental Impact Statement inclusive of (i) to (iii) as per the Regulations.
- Recommendations from the specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.
- The final proposed alternatives that respond to the impact management measures, avoidance, and mitigation measures identified through the assessment.
- 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.
- A description of any assumption, uncertainties, and gaps in knowledge that relate to the assessment and mitigation measures proposed.
- A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.
- 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 undertaking under oath by the EAP in relation to (i) and (iv) as per the regulations and
- An indication of any deviation from the approved Scoping Report, including the Plan of Study including (i) and (ii) as per the Regulations.

Contents of the EMPr (Appendix 4) will include the following:

- An EMPr must comply with Section 24N of the Act and include - details of the EAP who prepared the EMPr and the expertise of that EAP to prepare an EMPr, including a curriculum vitae.
- A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description.
- A map at an appropriate scale that superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers.
- A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed, and mitigated as identified through the environmental impact assessment process for all phases of the development, including (i) to (v) of the 2014 EIA Regulations as amended.

- A description of proposed impact management actions, identifying how the impact management outcomes contemplated above will be achieved, and must, where applicable, include actions as indicated on (i) to (iv) of the EIA 2014 Regulations as amended.
- The method of monitoring the implementation of the impact management actions contemplated above.
- The frequency of monitoring the implementation of the impact management actions contemplated above.
- An indication of the persons who will be responsible for the implementation of the impact management actions.
- The periods within which the impact management actions contemplated above must be implemented.
- The mechanism for monitoring compliance with the impact management actions contemplated above.
- A program for reporting on compliance, considering the requirements as prescribed by the Regulations.
- An environmental awareness plan describing how-

(i) the applicant intends to inform his or her employees of any environmental risk that may result from their work and

(ii) risks must be dealt with to avoid pollution or the degradation of the environment; and

Any specific information the competent authority may require.

#### **13.6.2 PUBLIC PARTICIPATION PROCESS**

The public participation process will be undertaken as indicated in Sections 9 and 13.5 above.

#### **13.6.3 PREPARATION OF THE FINAL EIA REPORT AND EMPR**

The final EIR and EMPr will be prepared as per Appendices 3 and 4 of the 2014 EIA Regulations as amended; further, it will be forwarded to DFFE as per the rules for submission of reports.

#### **13.6.4 IDENTIFY SUITABLE MEASURES TO AVOID, REVERSE, MITIGATE, OR MANAGE IDENTIFIED IMPACTS AND TO DETERMINE THE EXTENT OF THE RESIDUAL RISKS THAT NEED TO BE MANAGED AND MONITORED**

The aspects that will be assessed have been identified, and their potential impacts and mitigation measures are indicated in Section 9.1 and will be elaborated further in the EMPr. The proposed method of assessing environmental aspects ones included above.



## **14 UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP**

In undertaking the Scoping phase of the project, the EAP has considered the requirements stipulated in the EIA 2014 Regulation as amended and other relevant Acts and Regulations. The EAP hereby confirms that with the information available at the time of preparing the Scoping Report, the following has been considered in preparing this report:

- The correctness of the information provided in the report.
- The inclusion of comments and inputs from stakeholders and interested and affected parties; and
- Any information provided by the EAP to the interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.

Refer to Appendix B for the Declaration of the EAP.

### **14.1AN UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP ABOUT THE LEVEL OF AGREEMENT BETWEEN THE EAP AND INTERESTED AND AFFECTED PARTIES ON THE PLAN OF STUDY FOR UNDERTAKING THE ENVIRONMENTAL IMPACT ASSESSMENT**

The Plan of Study for the EIA forms part of this Reports which will be made available to I&APs and Organs of State for a 30-day review and comment period. Comments/issues raised will be addressed and included in the CRR.

No agreement between the EAP and I&APs is in place.

### **14.2WHERE APPLICABLE, ANY SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY**

There is no specific information needed by the authority at this stage; should it be required; it will be included accordingly.

### **14.3ANY OTHER MATTER REQUIRED IN TERMS OF SECTION 24(4) (A) AND (B) OF THE ACT.**

This, and other Acts report in terms of NEMA, its respective 2014 EIA Regulations, and various other acts. Information that the NEMA requires has been included in this report and will be included in the final Scoping report and the EIA phase.

## 15 DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND KNOWLEDGE GAPS

### 15.1 ASSUMPTIONS AND LIMITATIONS

It is assumed that the technical data supplied by the client was correct and valid at the time of compilation of the Draft Scoping Report. Furthermore, it is assumed that the alternatives presented by the client are feasible.

#### 15.1.1 PUBLIC PARTICIPATION PROCESS

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

#### 15.1.2 LITERATURE REVIEW

This report was based on various literature reviews and the previous specialist input, which were viewed as correct at the time. However, it is acknowledged that there might be some gaps in knowledge regarding to 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.

## 16 IMPACT STATEMENT

No significant impacts were identified that would necessitate substantial redesign or termination of the project. However, the project is within 10 km of. It could negatively impact tourism and biodiversity of the Kruger National Park Malelane Gate. It could have negative impacts on tourism as well as biodiversity, especially during construction activities. The Mpumalanga Tourism and Parks Agency and the South African National Parks have been identified as stakeholders and will be engaged throughout the process. These stakeholders will be further and involved early during the EIA for their comments on the EIA and specialist. Further, potential negative impacts have been identified, and specialist input will determine the extent of the impact and further seek to identify fatal flaws, if any. As the process advances, where detrimental environmental impacts are identified, alternatives will be proposed together with mitigation measures; should the redesign and realignment prove not feasible, the project may be terminated.

The main impacts are outlined below, and recommended mitigation measures and a summary of site suitability and residual impacts will be assessed in detail during the EIA phase. Such potential impacts include the following:

- Impacts on flora and fauna.
- Impacts on heritage and archaeology.
- Visual impact on neighbouring communities, road users, and tourist

- Impact on air quality due to the Power station.
- Impact on noise.
- Climate change impact.
- Ambient air quality; and
- Traffic impact.

The subsequent EIA phase will provide a detailed assessment of the identified aspect, rate the significance accordingly, and propose mitigation measures as applicable. Based on all the findings and assessment of impacts by the EAP, the site is feasible for the proposed development and will, be assessed further in the EIA phase. The No-Go option will also be comprehensively evaluated, considering specialist studies that have been recommended as part of the PPP.

## 17 CONCLUSION

The Draft Scoping Report was undertaken according to the requirements of the NEMA and the EIA Regulations as amended and associated legislations. The Scoping phase entailed a detailed description of the baseline environment, forming the backdrop of the impact assessment phase. Various technical alternatives for the proposed project were identified and assessed.

The alternatives have been proposed, and the primary purpose was to determine the suitability of each alternative for the intended use and desired outcome, as well as to determine the overall impact of project development on the environment. The information provided has been supported by previous specialist studies undertaken in the area, and more project-specific specialist input will be sought in the next area. More project-specific specialist input will be sought in the next area, and more project-specific specialist input will be sought in the subsequent phases. Further, the report will be subjected to a 30-day comment and review period, which will allow more input from stakeholders and I&APs. The comments on the draft will be considered and comprehensively addressed through email correspondence, calls, meetings, and inclusion in the report. The subsequent EIA phase will provide a detailed assessment of the identified issues, rate the significance accordingly, and propose mitigation measures as applicable.

## 18 REFERENCE

- DEAT. (1998). Guideline Document: Environmental Impact Assessment Regulations
- DEAT. (1998). A National Strategy for Integrated Environmental Management in South Africa. Compiled by Environomics
- DEFF. (2024). Screening Tool Proposed development of the Khanyazwe Flex Power (Pty) Ltd. gas power facility and associated infrastructure in Malelane within the Jurisdiction of Nkomazi Local Municipality in the Mpumalanga Province. Online.
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