DNG ENERGY LTD

KHENSANI GAS TO POWER PROJECT ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

DRAFT SCOPING REPORT

23 JULY 2021

DRAFT

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LIST OF ACRONYMS

AEL	Atmospheric Emission License
AIA	Approved Inspection Authority
AIR	Atmospheric Impact Report
AIS	Alien and Invasive Species
AQIA	Air Quality Impact Assessment
BA	Basic Assessment
BOG	Boil-off Gas
CA	Competent Authority
CARA	Conservation of Agricultural Resources Act
CBA	Critical Biodiversity Area
CBD	Central Business District
CCA	chromated copper arsenate
CEMS	Continuous Emissions Monitoring System
CLO	Community Liaison Officer
CO	Carbon Oxide
C02	Carbon Dioxide
CRR	comments and responses report
CV	Curriculum Vitae
DARDLEA	Department of Agriculture, Rural Development, Land and Environmental Affairs
DFFE	Department of Forestry, Fisheries and Environment
DMRE	Department of Mineral Resources and Energy (DMRE
DPWRT	Department of Public Works Road and Transport
DSR	Draft Scoping Report
DWS	Department of Water and Sanitation
E&S	Environmental and Social
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act
ECO	Environmental Control Officer
EDTEA	Economic Development, Tourism and Environmental Affairs
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMP	Environmental Management Plan
EMPr	Environmental management Programme requirements
EMF	Electromagnetic fields
EPC	Engineering, Procurement and Construction
ESA	Ecological Support Area
ESIA	Environmental and Social Impact Assessment
FSR	Final Scoping Report
GA	General Authorisation

GHGs	Greenhouse gases
GIIP	Good International Industry Practice
GN	General Notice
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
HRSG	Heat Recovery Steam Generator
IFC	International Finance Corporation
INDC	Intended Nationally Determined Contribution
IPPC	Intergovernmental Panel on Climate Change
IRP	Integrated Resource Plan
IWULA	Integrated Water Use License Application
kV	Kilovolt
LBPL	Lower bound poverty line
LNG	Liquefied Natural Gas
MAE	Mean Absolute Error
MBSP	Mpumalanga Biodiversity Sector Plan
MES	Minimum emissions standard
MHI	Major Hazardous Installation
MPHRA	Mpumalanga Provincial Heritage Resource Authority
MWth	Megawatt Thermal Input
NAAQS	National Ambient Air Quality Standards
NDP	National Development Plan
NEMA	National Environmental Management Act
NEMAQA	National Environmental Management: Air Quality Act
NEMBA	National Environmental Management: Biodiversity Act
NEMPAA	National Environmental Management: Protected Areas
NHRA	National Heritage Resource Act
NOx	Nitrogen Oxides
NWA	National Water Act
OHTL	Overhead Transmission Lines
PCP	pentachlorophenol
PES	Present Ecological State
PICC	Presidential Infrastructure Coordinating Committee
PPE	Personal Protective Equipment
PP	Public Participation
PS	Performance Standards
PV	Photovoltaics
RE	Renewable Energy
REIPPP	Independent Power Producer Procurement. Programme
RFP	Request for Proposal
RMIPPPP	Risk Mitigation Independent Power Producer Procurement Programme
ROMPCO	Republic of Mozambique Pipeline Company
RoW	Right of Way
S&EIR	Scoping and Environmental Impact Reporting
SABS	South African Bureau of Standards

SAHRIS	South African Heritage Resources Information System
SANBI	South African National Biodiversity Institute
SANS	South African National Standards
SAWS	South African Weather Service
SCC	Species of Conservation Concern
SDMP	Spoil Disposal Management Plan
SDP	Site Development Plan
SIPS	Strategic Integrated Projects
SoC	Species of Concern
STIs	Sexually Transmitted Infections
STDs	Sexually Transmitted Diseases
SWMP	Stormwater Management Plan
TIP	Trafficking in Persons
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
WHO	World Health Organisation
WMA	Water Management Area
WML	Waste Management Licence
WULA	Water Use Licence Application
WUL	Water Use License
QRA	Quantitative Risk Assessment

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

E PROOF OF ADVERTS

F DESKTOP ECOLOGICAL INVESTIGATION REPORT

1 INTRODUCTION

1.1 PURPOSE OF THIS REPORT

This Draft Scoping Report (DSR) documents the process and findings of the scoping phase of the Scoping and Environmental Impact Reporting (S&EIR) process for the proposed development of the proposed Khensani Gas to Power Project (the "Project") in Komatipoort, South Africa.

The DSR aims to provide stakeholders with information on the proposed development including location, layout and technological alternatives, the scope of the environmental assessment, and the consultation process undertaken through the environmental impact assessment (EIA) process.

1.2 BACKGROUND INFORMATION

DNG Energy Ltd aims to create a pan-African Liquefied Natural Gas supply network. A widescale infrastructure programme will see a US$5 billion investment to bring this affordable energy alternative into the market. DNG Energy is looking at the LNG value chain from source to consumption holistically with initial development and expansion infrastructure programmes planned for South Africa, Mozambique, and Nigeria.

DNG Energy is seeking environmental authorisation (EA) for the Khensani Gas to Power project, Komatipoort. The facility design is based on approximately 24 Internal Reciprocating Combustion Engines and electrical generator units with power output capacity of approximately 18.5 MW of electrical power each, resulting in a total output of 445MW. The plant will be fed via a new natural gas pipeline between the power plant and either 1) tie-in point with the ROMPCO[1] Pipeline, or 2) tie-in point on the planned DNG Energy Ressano Garcia – Malelane pipeline.

Power will be evacuated to the national grid via a proposed double circuit 275kV overhead line running from the 132kV busbar inside the power plant boundary to the adjacent Eskom Komatipoort 275/132kV substation.

1.3 ENVIRONMENTAL ASSESSMENT PRACTITIONER

WSP Group Africa (Pty) Ltd (WSP) has been appointed in the role of Independent Environmental Assessment Practitioner (EAP) to undertake the S&EIR processes for the development of the Project. The CV of the EAP is available in **Appendix A**. The EAP declaration of interest and undertaking is included in **Appendix B**. **Table 1** details the relevant contact details of the EAP. In order to adequately identify and assess potential environmental impacts, a number of specialists will support the EAP.

Table 1 Details of the Environmental Assessment Practitioner

ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)	WSP GROUP AFRICA (PTY) LTD
Company Registration:	1999/008928/07 South Africa
Contact Person:	Nigel Seed
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[1] Republic of Mozambique Pipeline Investments Company (Pty) Ltd.

1.4 SCOPING TERMS OF REFERENCE

The 2014 Environmental Impact Assessment (EIA) Regulations (GNR 326), as amended, identifies the proposed gas to power development as an activity being subject to an S&EIR process due to the applicability of the EIA Listing Notices Government Regulation Notice GNR 325, published on 7 April 2017. In order for the project to proceed, it will require an EA from the Department of Forestry, Fisheries and Environment (DFFE)[2].

As defined in Appendix 2 of GNR 326, the objective of the scoping process is to, through a consultative process:

- Identify the relevant policies and legislation relevant to the activity;
- Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- Identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
- Identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
- Identify the key issues to be addressed in the assessment phase;
- 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 undertaken 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
- Identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

Public participation is a requirement of scoping; it consists of a series of inclusive and culturally appropriate interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the S&EIR decision-making process. Effective public participation requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the Proposed Project. The objectives of the public participation process can be summarised as follows:

- Identify relevant individuals, organisations and communities who may be interested in or affected by the Proposed Project;
- Clearly outline the scope of the proposed Project, including the scale and nature of the existing and proposed activities;
- Identify viable proposed Project alternatives that will assist the relevant authorities in making an informed decision;
- Identify shortcomings and gaps in existing information;
- Identify key concerns, raised by Stakeholders that should be addressed in the subsequent specialist studies;
- Highlight the potential for environmental impacts, whether positive or negative; and
- To inform and provide the public with information and an understanding of the Proposed Project, issues and solutions.

[2] Since 29 January 2010 to date and in terms of section 24C(2)(a) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended by section 6 of the National Environmental Management Laws Amendment Act, 2013 (Act No. 30 of 2013), the Minister of Environmental Affairs has exercised the powers as the CA in the instances where the activities had implications for international commitments or relations. The activities related to the Integrated Resources Plan (IRP) 2010 - 2030 are included in these activities

1.5 DRAFT SCOPING REPORT STRUCTURE

Table 2 cross-references the sections within the DSR with the legislated requirements as per Appendix 2 of GNR 326, published in 2017.

Table 2 Legislated Report Requirements as detailed in GNR 326

APPENDIX 2	LEGISLATED REQUIREMENTS AS PER THE NEMA GNR 982	RELEVANT REPORT SECTION
(a)	Details of	
	the EAP who compiled the report; and	Section 1.3 and **Appendix A**
	the expertise of the EAP, including a Curriculum Vitae	**Appendix A**
(b)	The location of the activity, including-	
	The 21 digit Surveyor code for each cadastral land parcel;	**Appendix C**
	Where available, the physical address and farm name	**Appendix C**
	Where the required information in terms of (i) and (ii) is not available, the coordinates of the boundary of the property.	N/a
(c)	A plan which locates the proposed activities applied for at an appropriate scale, or, if it is-	
	A linear activity, a description of the corridor in which the proposed activity or activities is to be undertaken; or	Section 2.3.1
	On land where the property has not been defined, the coordinates within which the activity is to be undertaken.	N/a
(d)	A description of the proposed activity, including-	
	All listed and specified activities triggered;	Section 3.1
	A description of the activities to be undertaken, including associated structures and infrastructure;	Section 2.3 & Section 2.4
(e)	A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	Section 3
(f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 2.1
(h)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including-	
	Details of all the alternatives considered;	Section 2.5
	Details of the public participation undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 4.5
	a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	In Final Scoping Report (FSR)

APPENDIX 2	LEGISLATED REQUIREMENTS AS PER THE NEMA GNR 982	RELEVANT REPORT SECTION
	the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 7
	the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	Section 6
	the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Section 4
	positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 6
	the possible mitigation measures that could be applied and level of residual risk;	Section 6
	the outcome of the site selection matrix;	Section 2.2
	if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and	N/a
	a concluding statement indicating the preferred alternatives, including preferred location of the activity;	Section 2.5
(i)	A plan of study for undertaking the environmental impact assessment process to be undertaken, including-	
	a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;	Section 7
	a description of the aspects to be assessed as part of the environmental impact assessment process;	Section 7
	aspects to be assessed by specialists;	Section 7
	a description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;	Section 7
	a description of the proposed method of assessing duration and significance;	Section 7
	an indication of the stages at which the competent authority will be consulted;	Section 7
	particulars of the public participation process that be conducted during the environmental impact assessment process; and	Section 7
	a description of the tasks that will be undertaken as part of the environmental impact assessment process;	Section 7
	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.	Section 6

APPENDIX 2	LEGISLATED REQUIREMENTS AS PER THE NEMA GNR 982	RELEVANT REPORT SECTION
(j)	An undertaking under oath or affirmation by the EAP in relation to-	
	the correctness of the information provided in the report;	**Appendix B**
	the inclusion of comments and inputs from stakeholders and interested and affected parties; and	To be included in FSR
	any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	N/a
(k)	An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	**Appendix B**
(l)	Where applicable, any specific information required by the competent authority; and	N/a
(m)	Any other matter required in terms of section 24(4)(a) and (b) of the Act.	N/a

1.6 ASSUMPTION AND LIMITATIONS

General assumptions and limitations:

i) The EAP hereby confirms that they have undertaken to obtain project information from the client that is deemed to be accurate and representative of the project;

ii) Site visits have been undertaken to better understand the project and ensure that the information provided by the client is correct, based on site conditions observed;

iii) The EAP hereby confirms their independence and understands the responsibility they hold in ensuring all comments received are accurately replicated and responded to within the EIA documentation;

iv) The comments received in response to the public participation process, are representative of comments from the broader community; and

v) The competent authority (CA) would not require additional specialist input, as per the proposals made in this report, in order to make a decision regarding the application.

Notwithstanding these assumptions, it is the view of WSP that this DSR provides a good description of the issues associated with the project, and a reasonable plan of study for the EIA phase.

Heritage Assessment:

i) The field survey did not include any form of subsurface inspection beyond the inspection of burrows, road cut sections, and the sections exposed by erosion or earth moving disturbances, especially by agricultural activities. Some assumptions were made as part of the study and therefore some limitations, uncertainties and gaps in information would apply. It should however, be noted that these do not invalidate the findings of this study in any significant way.

ii) Limited ground surface visibility on sections of the project area that had thick vegetation cover at the time of the study may have impeded the detection of archaeological sites. This factor is exacerbated by the fact that the study was limited to general survey without necessarily conducting any detailed inspection of specific localities that will be affected by the proposed gas plant development. The absence of confirmable and significant archaeological cultural heritage sites is not evidence in itself that such in situ sites did not exist in the project area.

2 PROJECT DESCRIPTION

2.1 NEED AND DESIRABILITY

The project is aligned with various national policy documents presenting the case for gas as a significant contributor to South Africa's future energy mix, these include *inter alia*:

1) The National Development Plan (NDP), which envisages a South African energy sector that promotes economic growth, social equality and environmental sustainability by 2030. The Department of Energy's Integrated Resource Plan outlines gas driven projects, which was further asserted by the 2012 Ministerial Determination allocation of 2,652 MW to be generated from Natural Gas between 2021 and 2025.
2) The Integrated Energy Plan, which is to the security of supply; minimise the cost of energy; increase access to energy; diversify supply sources and the primary sources of energy; minimise emissions from the energy sector; promote localisation and technology transfer and the creation of jobs.
3) The Integrated Resource Plan (IRP), which serves to determine the long-term electricity demand and detail how this demand should be met in terms of generating capacity, type, timing and cost. The accuracy of the IRP is improved by regular reviews and updates as and when things change or new information becomes available as with the current 2019 version. A determination dated 18 August 2015 (GN 732) was issued for the development of 3,126 MW of Gas (including CCGT/natural gas) and OCGT/diesel. A further determination dated 27 May 2016 was issued for an additional 600 MW.
4) The Risk Mitigation IPP Procurement Programme aimed at ensuring energy security for the generation of approximately 2000 MW from a range of energy source technologies in accordance with the short term risk mitigation capacity allocated under the heading 'Others', for the years 2019 to 2022 of the Integrated Resource Plan for Electricity 2019 to 2030.

The proposed project is also driven by the following benefits:

5) A gas- powered 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.
6) In terms of environmental impacts, a gas powered plant has approximately 40% less CO_2 emissions per unit of power than coal, due partly to greater efficiency, but mainly due to the hydrogen content. Rapid start-up, ramp-up, and ramp-down times enable gas power systems to follow variable generation patterns of renewable energy sources.
7) The power plant will be operated on a mid-merit basis, implying that power output will adjusted as demand for electricity fluctuates throughout the day. Being a load following plant, it is highly suited to balance the variability of power generated by renewable sources.

Consequently, in this scoping level assessment, the need and desirability of the project is supported based on its fit with policy, which is aimed at i) responding to the government the need for new energy generation capacity, and ii) diversifying the country's energy sources and creating a balanced and more sustainable energy mix. A more holistic need and desirability analysis taking into consideration economic, environmental and social sustainability criteria will be possible in the EIA phase of the project when additional information on the environmental effects of the project is available.

2.2 SITE SELECTION

The Khensani project is proposed to be developed on Greenfield land situated in South Africa's Mpumalanga Province, South of Kruger National Park, just outside Komatipoort and 45 km east of Malelane (**Figure 1**).

Figure 1 Proposed Site Selection

Appendix C provides the farm names and 21 digit Surveyor code for each cadastral land parcel on which the project activities will occur.

2.3 PROPOSED PROJECT DESCRIPTION

2.3.1 GAS SUPPLY CONCEPT

The gas supply to the site will be via a new 1.2km long pipeline running between the power plant and the existing Republic of Mozambique Pipeline Company (ROMPCO) natural gas pipeline servitude, which runs in an east to west direction approximately 1km south of the site boundary. The technical specifications of the new connecting pipeline are currently being finalised and will be described in the EIA Report including pipeline design factor and location class, pipeline burial depth, wall thickness design, cathodic protection, road crossing infrastructure, and maintenance features such as block valves.

Two scenarios are being considered for the gas supply for the project:

- The new 1.2km long pipeline will tie-in to the existing ROMPCO pipeline, which is a high pressure pipeline that connects the onshore gas fields in Pande and Temane in Mozambique to SASOL's operations in Secunda, South Africa.
- Either at the outset, or as a later development, the new 1.2km long pipeline will tie-in to a new natural gas pipeline that DNG is proposing to develop between Ressano Garcia in Mozambique and Malelane in Mpumalanga, South Africa – a distance of approximately 60km. This proposed pipeline would be located near to, or within the ROMPCO servitude. This would however be subject to obtaining a separate Environmental Authorisation.

2.3.2 ENGINES AND GENERATOR

The facility design is based on approximately 24 reciprocating engine and electrical generator units with power output capacity of approximately 18.5 MW of electrical power each, resulting in a total output of 445MW. The final engine manufacturer, number of engines and their configuration will be based on the selection of the preferred engine vendor as the engineering and procurement processes advance. Each engine will be fitted with a turbocharger system to improve engine efficiency by increasing the pressure of the intake gas.

Each engine has its own exhaust gas system. The exhaust gas system takes the exhaust gas from the cylinder outlets to a silencer and condensate drop-out box and then to an exhaust flue outlet. Each engine has its own flue and up to six of these flues may be clustered together on one supporting stack structure.

The environmental impact assessment will be performed on an engine vendor agnostic basis through the use of generic specifications and emissions data with environmental conservancy factors to ensure that the EIA approval remains valid irrespective of the engine supplier.

2.3.3 LUBRICATING OIL SYSTEM

The engine have a wet oil sump system that lubricates the main bearings and the cylinder liners in the engine. Oil is led through bores in the engine block, and heads to other lubrication points such as the camshaft bearings, the rocker arm bearings and the valve mechanism gear wheel bearings. The turbochargers are also connected to the engine lubricating system. Furthermore, the lubricating oil also cools the piston crowns. The project will include facilities for the storage of new and used oils.

The site will include an effluent collection system for the environmentally safe handling of low volumes of oily washing effluents associated with the cleaning and maintenance of equipment in the powerhouse; and, potentially oil contaminated runoff from lubricating oil handling areas and the on-site mechanical workshop. Management options include:

- Oil water separators: The collected oily effluent will be passed through conventional oil-water separator resulting in an oil-free water stream and oil stream. The clean water will be discharged to the local sewer subject to meeting discharge quality requirements or tankered off-site for disposal at an off-site permitted effluent treatment facility. The oil stream will be directed to the on-site oil waste storage facility.
- Oily water collection sump/tank: The oily effluent will be collected in a sump/tank without any separation. The oily water will be tankered off-site for disposal at an off-site permitted effluent treatment facility.

The final volumes, storage vessel types, pollution management systems and storage locations on site will be confirmed and evaluated in the EIA phase.

2.3.4 COOLING WATER SYSTEM

The engines will be cooled by a closed-circuit cooling water system, divided into a high temperature circuit and a low temperature circuit. The cooling water is cooled in a separate cooler in the external cooling water system where an outside fin fan cooler or radiator is used to transfer heat to the ambient air.

2.3.5 HEAT RECOVERY STEAM GENERATOR (HRSG)

A significant portion of heat energy generated through the gas combustion process goes to heat rather than power. A heat recovery steam generator (HRSG) is an energy recovery heat exchanger that recovers heat from the hot gas stream. It produces steam that can be used in a process (cogeneration) or used to drive a steam turbine (combined cycle). HRSG technology is suitable for power plants operating in baseload capacity where the operating conditions are stale; whereas the operation of a peaking and mid-merit power plant such as the Khensani project are highly variable. For this reason, HRSG or similar technology was not considered for the project.

2.3.6 GRID CONNECTION

Grid connection infrastructure at the power plant will consist of a 132kV double busbar to connect each pair of the engine generators via four 120MVA 132/11kV transformers. A double circuit 275kV overhead line will run from the 132kV busbar inside the power plant boundary to the adjacent Eskom Komatipoort 275/132kV substation.

2.3.7 SITE ACCESS

Access to the site will be possible off Hotchkiss Street. This route leads to Rissik Street, which leads to the N4 Freeway at a signalised 4-way intersection for access to the major road network. The other option will be directly from the N4. The intersection with the N4 is uncontrolled; therefore, there may be safety and capacity issues at this location. Permission will have to be obtained from SANRAL to utilise this access, especially during construction. The final access location/s and on-site circulation will only be determined when the Site Development Plan (SDP) is undertaken.

2.4 GENERAL CONSTRUCTION ACTIVITIES

The construction process will follow industry standard methods and techniques. Key activities associated with the construction process are described in **Table 3.**

Table 3 Construction Activities

ACTIVITY	DESCRIPTION
Contractor's facilities and materials lay-down areas	The contractor laydown area will be located adjacent (immediately west) to the power plant construction site on a piece of land specifically leased by DNG for this purpose. Activities within these areas are likely to include: — Temporary offices and administration facilities (e.g. containers, portable cabins). — General materials storage and laydown areas. — Construction of chemicals storage facilities (oil, grease, solvents etc.) and associated infrastructure (bunds, secured / roofed areas etc.). — Above ground fuel storage (e.g. gasoil/ petrol) – it is unlikely that volumes would be stored in quantities exceeding 9000L which is considered sufficient for normal construction site requirements. — Workshops / areas (e.g. welding, mechanical repair, electrical etc.). — Change-houses, chemical toilets and showering facilities (linked to conservancy tanks – removal of contents by exhauster vehicle and disposal at permitted facility). — Temporary waste storage areas; these shall be established and managed in accordance with EMPr requirements.
Sourcing of construction materials and equipment	Bulk materials (aggregate, cement, steel etc.) will be sourced from existing lawful commercial sources; there will be no direct mining, harvesting or extraction of natural resources. Where possible, equipment will be sourced locally based on the latest information on South African Rand / US Dollar exchange rate. Equipment will be purchased outside of South Africa where this makes commercial sense.
Site clearing	Removal of vegetation and other surface material (hard standing, illegally dumped rubble etc.) which could involve excavation below ground level. The remnant structures associated with a previously operated holiday resort/ caravan park and buildings will also be demolished and removed.
Excavation and earthworks	Subject to the determination of founding specifications, earthworks will be required. This is likely to entail:

	— Levelling and compaction using heavy machinery / earthmoving equipment – it is noted that the topography within the powerplant footprint is flat, therefore no major cut/fill or earth spoiling will be required. — Potential for excavations and trenching in order to prepare foundations and laying of below ground level equipment (cables, pipes, sumps, drainage etc.). — Piling / drilling depending on the identified construction / founding technique.
Use of general mechanical equipment	This will be undertaken within construction areas and includes the use trucks and cranes, generators, cutting and welding equipment, compressors etc.
Working Hours	It is envisaged that flexible (day and night time) working hours would be required to meet the construction programme. However, the EMP will prescribe that daytime hours would need to be adhered to for any activities involving excessively noisy activities.

2.5 ALTERNATIVES

The EIA Regulations require that the scoping and EIA process must identify and describe alternatives to the proposed activity that were considered, or motivation for not considering alternatives. Different types or categories of alternatives could be considered including different locations, technology types, and project layouts. At the scoping level the evaluation of alternatives is provided at a high level in the absence of detailed environmental comparators for each alternatives; due to the two-staged nature of the scoping and EIA process it is more suitable to identify and describe the potential alternatives on a high level basis within scoping, and to perform a more detailed analysis of alternatives (with environmental comparators) in the EIA phase of the project. As such, the Scoping and EIA will holistically assess the impacts and risks of each alternative in a comparative way, as suggested by Appendix 2 of the EIA regulations.

2.5.1 SITE ALTERNATIVES

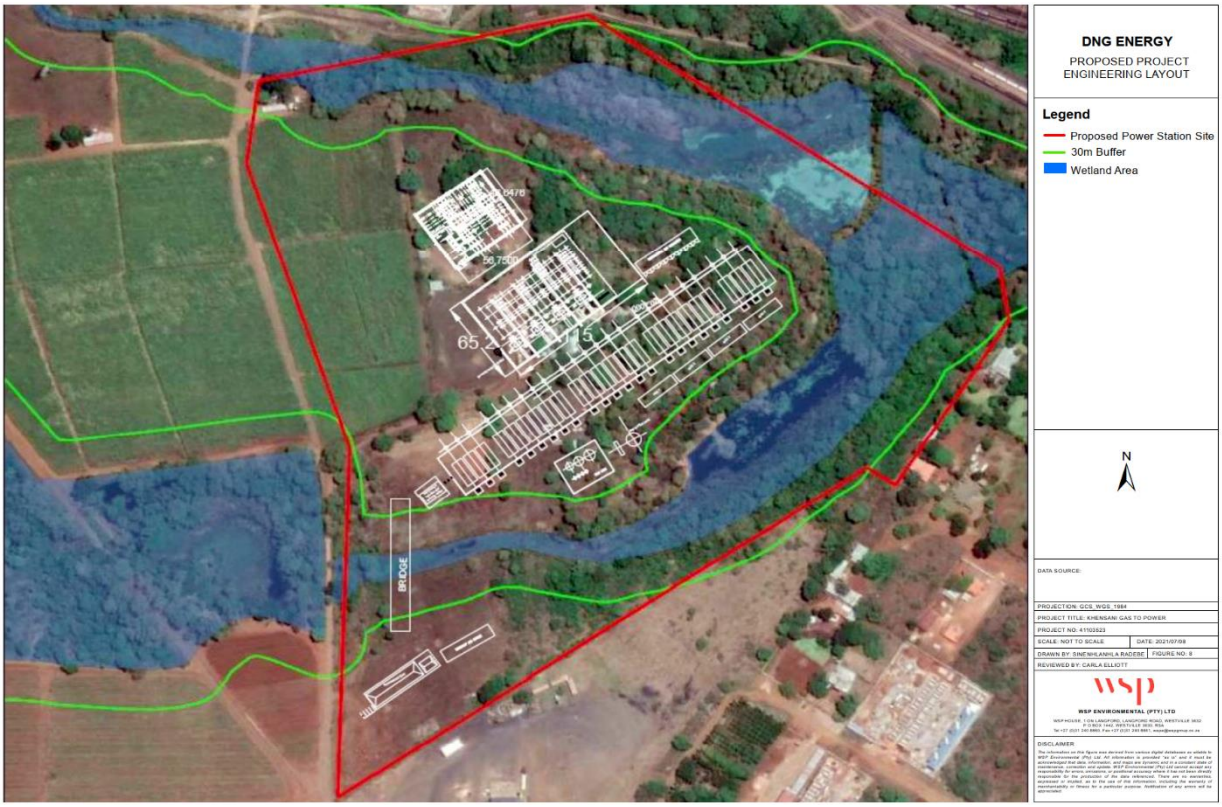
The selection of the Khensani site is the outcome of a detailed feasibility assessment by DNG, which *inter alia* served to identify site options that would be optimal for energy production and grid interconnection. The Khensani site was selected because it is strategically located due to the following factors:

1) **Proximity to the Eskom grid** – The proposed gas to power facility requires connection to the Eskom grid to transmit the generated electricity. As such, the location of the facility would benefit from being close to an existing substation. The proposed location is adjacent to the Komatipoort Eskom substation, which reduces the length of the powerline that will be constructed for connection.
2) **Land ownership** – The availability of land to purchase is a key feasibility criterion in the site selection process. The proposed location of the site was also based on the availability of the land for purchase by DNG (the sale of the land is currently in progress).
3) **Access to the gas pipeline** – The natural resource that is required for the proposed gas to power facility is the availability of the natural gas fuel feedstock. The chosen location for the facility is in close proximity to the ROMPCO gas pipeline.
4) **Road and labour pool accessibility** - Close proximity to the N4 highway and the town of Komatipoort, which will benefit construction logistics and provide a labour resource respectively.

The site is considered suitable for the reasons provided. The investigation of an alternative site is not currently proposed within this ESIA.

2.5.2 LAYOUT AND PIPELINE ALIGNMENT ALTERNATIVES

A conceptual layout for the power plant has been developed and is included in **Figure 2** showing the proposed gas pipeline, transmission line alignments, road access infrastructure, and power plant. The layout of the power plant is primarily driven by the spatial constraints on the site taking into consideration the need to include ecological buffers on the north, east and south boundaries of the site. The alignment of the gas pipeline generally follows the route of the least disturbance following existing road servitudes.



The layout and alignments are likely to be updated as the project engineering progresses and may also be influenced by environmental factors during the EIA phase studies.

2.5.3 TECHNOLOGY ALTERNATIVES

ENGINE/TURBINE SELECTION

Thermal power plants can be divided based on the type of combustion or gasification: boilers, internal reciprocating engines, and combustion turbines. In addition, combined-cycle and cogeneration systems increase efficiency by utilizing heat lost by conventional combustion systems. The type of system is chosen based on the loads, the availability of fuels, and the energy requirements of the electric power generation facility. Other ancillary processes, such as coal processing and pollution control, must also be performed to support the generation of electricity (World Bank, 2008). An overview of internal reciprocating engines and combustion turbines is provided below.

Gas Turbines

Gas turbine systems operate in a manner similar to a steam turbine, except that combustion gases are used to turn the turbine blades instead of steam. In addition to the electric generator, the turbine also drives a rotating compressor to pressurize the air, which is then mixed with either gas or liquid fuel in a combustion chamber. The greater the compression, the higher the temperature and the efficiency that can be achieved in a gas turbine. Higher temperatures, however, typically lead to increases in NOX emissions. Exhaust gases are emitted to the atmosphere from the turbine. Unlike a steam turbine system, gas turbine systems do not have boilers or a steam supply, condensers, or a waste heat disposal system. In electrical power applications, gas turbines are often used for peaking duty, where rapid startup and short runs are needed. Most installed simple gas turbines with no controls have only a 20- to 30-percent efficiency.

Internal Combustion Engines

Figure 2 Conceptual Layout

Internal combustion engines convert the chemical energy of fuels (typically diesel fuel, heavy fuel oil and gas) into mechanical energy in a design similar to a truck engine, and the mechanical energy is used to turn a generator. Two types of engines normally used: the medium-speed, four-stroke trunk piston engine and the low-speed, two-stroke crosshead engine. Both types of engine operate on the air-standard diesel thermodynamic cycle. Air is drawn or forced into a cylinder and is compressed by a piston. Fuel is injected into the cylinder and is ignited by the heat of the compression of the air. The burning mixture of fuel and air expands, pushing the piston. The products of combustion are then removed from the cylinder, completing the cycle.

The density of air at the project location was a key consideration in the section of the turbine vs. reciprocating engine technology. Combustion is affected by the ambient temperature, altitude (ambient pressure) and humidity levels. Power output on a gas turbine is dependent on the mass flow of air through the compressor. As the density of air decreases, more power is required to compress the same mass of air. A higher ambient air pressure will thus result in the gas turbine producing more power. Gas turbines are therefore much more sensitive for intake air pressure, density and temperature variations. Conversely, gas engines are robust equipment and less sensitive to ambient temperature and altitude, thus retaining their rated efficiency and power output over a broader range of ambient conditions. Most gas engines only start to become less efficient at ambient temperatures above 40°C and altitudes above 1500 m above mean sea level.

Reciprocating engines have been chosen as the preferred technology largely based on the information above, In addition, this technology is suitable for the following reasons:

1) Higher efficiency than turbines, particularly at part loads.
2) Greater operational flexibility with quicker start-ups and ramping capability
3) Advantage of more robust maintenance requirements
4) Relatively low water consumption.

From an environmental perspective, both internal combustion and turbine systems have elements that potentially impact on the environment – this is related predominantly to exhaust gas and noise emissions. Preliminary review of these systems suggests that the respective air emissions do not vary significantly; similarly absolute sound power levels emitted from turbines do not vary greatly compared with reciprocating/internal combustion engines (despite there being possibly significant differences in noise frequency ranges between these two technologies). Exhaust turbocharged reciprocating engines (as are proposed for this project) usually generate less noise on account of the turbocharger absorbing energy from the exhaust system.

COOLING TECHNOLOGY

Cooling system technologies for power plants include open evaporative cooling and closed-circuit systems that rely on air cooling. Evaporative cooling systems are more effective but are generally not required for equipment cooling. The closed-circuit cooling water system is also advantageous over evaporative water cooling systems due to the comparatively lower water requirement.

The selection of the closed-circuit cooling water system for the Khensani project is therefore based on the technical suitability of this technology and the environmental (lower water consumption) advantage.

POWERLINE ALTERNATIVES

Overhead powerline and underground cables are two technical alternatives typically considered for high voltage power transmission. An overview of the relative advantages of each option is provided below.

- Control of electrical losses and heat is critical for underground cables. As a result, cables are as much as four times the diameter and ten times the weight of equivalent overhead lines. Heat control is also a factor in the laying of the cables. The three phases of low and medium voltage cables (up to 132kV) can be placed in the same trench, while the phases for high voltage cables must be spaced apart, typically in a flat formation.
- Overhead powerlines may be affected by bush fires, lightning strikes, and bird-related faults, whereas faulting on underground cables is rare.
- When faults occur on overhead lines, they are usually re-energised by automatically reclosing the circuit-breaker within a few seconds of the fault. More serious faults, such as a damaged line may be easily found and repaired within A few days at most. Underground cables have faults that are almost exclusively

permanent, requiring inspection and correction on site. This usually requires excavating a section of the powerline. As a result, finding the location of faults is not easy unless there is clear evidence of excavation damage. The search and repair of underground cables can take several weeks severely compromising the network of the operation

- Economically, costs vary and are dependent on terrain, land use and size of the powerline. However, generally the cost of underground cabling is orders of magnitude more than overhead powerlines.
- There is not much expertise for higher voltage underground cabling in the country; thus, such expertise would have to be sourced from the international market.
- In terms of maintenance, underground cables are reported to be much more reliable, but outages are more challenging to fix as it is harder to find the faults, and therefore the outages last much longer. The lifespan for underground cables is reported to be much shorter, about half that of overhead power lines.

Based on the technical and economic criteria above the preferred option for the Khensani power project is an overhead line. The underground cable option will however be comparatively assessed within the EIA report in terms of environmental impacts – notably bird collision and electrocution risks and visual effects.

2.5.4 'NO PROJECT' ALTERNATIVE

In the no project alternative, the Khensani power project will not be developed by DNG. In this scenario, there could be a missed opportunity to address the need for new energy generation capacity with negative implications on energy security, and macro-economics at a national scale. Conversely, negative environmental impacts of the project – most prominently the emission of additional greenhouse gas – would be avoided.

It must however be qualified that there are various independent power producers with plans to develop gas to power projects in South Africa. It is therefore possible that the environmental and socio-economic pros and cons associated with the no project option would be moot, as the opportunity to develop this generation capacity could be substituted by another grid-connected project elsewhere in South Africa.

The no project alternative will be considered in the EIA phase as a baseline against which the impacts of the Khensani project will be assessed.

3 GOVERNANCE FRAMEWORK

3.1 NATIONAL ENVIRONMENTAL LEGAL FRAMEWORK

The South African regulatory framework establishes well-defined requirements and standards for environmental and social management of industrial and civil infrastructure developments. Different authorities at both national and regional levels carry out environmental protection functions. The applicable legislation and policies are shown in **Table 4**.

Table 4 Applicable National Legislation

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
The Constitution of South Africa (No. 108 of 1996)	The Constitution cannot manage environmental resources as a stand-alone piece of legislation hence additional legislation has been promulgated in order to manage the various spheres of both the social and natural environment. Each promulgated Act and associated Regulations are designed to focus on various industries or components of the environment to ensure that the objectives of the Constitution are effectively implemented and upheld in an on-going basis throughout the country. In terms of Section 7, a positive obligation is placed on the State to give effect to the environmental rights.
National Environmental Management Act (No. 107 of 1998)	In terms of Section 24(2) of the NEMA, the Minister may identify activities, which may not commence without prior authorisation. The Minister thus published GNR 327 (Listing Notice 1), 325 (Listing Notice 2) and 324 (Listing Notice 3) listing activities that may not commence prior to authorisation (7 April 2017). The regulations outlining the procedures required for authorisation are published in GNR 326 [Environmental Impact Assessment Regulations (EIA)] (7 April 2017). Listing Notice 1 identifies activities that require a Basic Assessment (BA) process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 2 identifies activities that require an S&EIR process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 3 identifies activities within specific areas that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. WSP undertook a legal review of the listed activities according to the proposed project description to conclude that the activities listed in in this section are considered applicable to the development: A S&EIR process must be followed. An EA is required and will be applied for with the DFFE.
Listing Notice 1: GNR 983	***Activity 11*** *- The development of facilities or infrastructure for the transmission and distribution of electricity (1) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.* **Description:** The project includes a 132 kV powerline to be constructed between the power plant and the existing Eskom Komatipoort Substation. This area is considered as being outside an urban area and is not an industrial area.
Listing Notice 1: GNR 983	***Activity 12*** *- The development of—* *(i) infrastructure or structures with a physical footprint of 100 square metres or more* *(a) within a watercourse* *(b) in front of a development setback; or* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.*

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
	Description: The proposed gas to power station and the gas pipeline are within / within 32m of a watercourse
Listing Notice 1: GNR 983	***Activity 24*** *- The development of a road:* *(ii) A road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres* **Description:** The proposed project will require the development of an access road to the site; the dimensions are still to be confirmed. The trigger is included as a conservative measure.
Listing Notice 1: GNR 983	***Activity 27*** *- The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—* *(i) the undertaking of a linear activity; or* *(ii) maintenance purposes undertaken in accordance with a maintenance management plan.* **Description:** The plant will involve the clearance of approx. 5 ha of Tshokwane-Hlane basalt lowveld vegetation, which is identified as being of high sensitivity by the national screening tool, and mapped as 'other natural areas/local corridor' by the Mpumalanga Biodiversity Sector Plan (MBSP). This activity will therefore be triggered.
Listing Notice 1: GNR 983	***Activity 47****- The expansion of facilities or infrastructure for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.* **Description:** The transmission line from the power plant will feed into the existing Eskom Komatipoort Substation. The final design for tie-in modifications will determine whether a footprint change will occur, therefore the trigger is included as a conservative measure.
Listing Notice 2: GNR 984	***Activity 2****- The development and related operation of facilities or infrastructure for the generation of electricity from a non-renewable resource where the electricity output is 20 megawatts or more.* **Description:** The proposed project entails the development of power generation facility with a 500MW output.
Listing Notice 2: GNR 984	***Activity 4****- The development of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.* **Description:** The proposed project may include the storage and handling of dangerous goods such as liquid hydrocarbons (lubrication and fuel). The exact volume requirements will be identified as the design progresses; therefore, the trigger is included as a conservative measure.
Listing Notice 2: GNR 984	***Activity 6*** *- The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent****.*** **Description:** The facility will require an Atmospheric Emission License (AEL) in terms of as NEM: AQA (Act 39 of 2004) – Section 21 Activities- S*ubcategory 1.5: Reciprocating Engines*

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
Listing Notice 2: GNR 984	***Activity 7-*** *The development and related operation of facilities or infrastructure for the bulk transportation of dangerous goods- in gas form, outside an industrial complex, using pipelines, exceeding 1 000 metres in length, with a throughput capacity of more than 700 tons per day***.** **Description:** The plant will be fed via a new natural gas pipeline between the power plant and either 1) tie-in point with the ROMPCO Pipeline, or 2) tie-in point on the planned DNG Energy Ressano Garcia – Malelane pipeline (separate, future EA application i.e. not currently applied for). The length of the pipeline is likely to exceed 1000m, and the throughput capacity is likely to exceed 700 tons per day. The final technical specifications will be confirmed as the design progresses.
Listing Notice 3: GNR 985	***Activity 12 (f[3])(ii) -*** *The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of Indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan / f-Mpumalanga province* *i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;* *ii. Within critical biodiversity areas identified in bioregional plans; or* *iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning or proclamation in terms of NEMPAA[4].* **Description:** The plant will involve the clearance of approx. 5 ha of Tshokwane-Hlane basalt lowveld vegetation, which is identified as being of high sensitivity by the national screening tool, and mapped as 'other natural areas/local corridor' by MBSP within a critical biodiversity area.
National Environmental Management: Waste Act (59 of 2008) (NEM:WA)	This Act provides for regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation. The Act also provides for the licensing and control of waste management activities through GNR. 921 (2013): List of Waste Management Activities that Have, or are Likely to Have, a Detrimental Effect on the Environment. The proposed project does not constitute a Listed Activity requiring a Waste Management Licence (WML) as defined in GNR 921. However, the contents of this BA Report will include reasonable measures for the prevention of pollution and good international industry practice (GIIP).
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) was promulgated in June 2004 within the framework of NEMA to provide for the management and conservation of national biodiversity. The NEMBA's primary aims are for the protection of species and ecosystems that warrant national protection, the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources. In addition, the NEMBA provides for the establishment and functions of a South African National Biodiversity Institute (SANBI). SANBI was established by the NEMBA with the primary purpose of reporting on the status of the country's biodiversity and conservation status of all listed threatened or protected species and ecosystems.

[3] Mpumalanga Province

[4] National Environmental Protected Areas Act (57 of 2003)

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
	The biodiversity assessment identifies Critical Biodiversity Area (CBAs) which represent biodiversity priority areas which should be maintained in a natural to near natural state. The CBA maps indicate the most efficient selection and classification of land portions requiring safeguarding in order to meet national biodiversity objectives. Based on the preliminary desktop assessment, the focus area is not located within a protected area, however, it is situated approximately 2 km south of the Kruger National Park. According to the Mpumalanga Biodiversity Sector Plan (MBSP, 2014) the north eastern portion of the focus area is located within an Ecological Support Area (ESA) local corridor, and a small portion of the power station and the majority of the proposed gas pipeline is located within an irreplaceable CBA. The remaining portions of the focus area is located within areas classified as either "heavily "modified" or "other natural areas". Supplementary baseline terrestrial ecology studies will be undertaken during the EIA phase to inform the assessment of impacts will therefore be on flora surveys of the power station and pipeline footprint to determine the presence of flora species of concern (SoC), and bird surveys of the powerline and power station area to define the potential risks to bird SoC. The Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA) Regulations with regards to alien and invasive species have been superseded by the National Environmental Management: Biodiversity Act, 2004 (Act no. 10 of 2004) – Alien and Invasive Species (AIS) Regulations which became law on 1 October 2014. Specific management measures for the control of alien and invasive plants will be included in the Environmental Management Programme (EMPr).
The National Water Act (No. 36 Of 1998)	The National Water Act, 1998 (Act No. 36 of 1998) (NWA) provides the framework to protect water resources against over exploitation and to ensure that there is water for social and economic development, human needs and to meet the needs of the aquatic environment. The Act defines water source to include watercourses, surface water, estuary or aquifer. A watercourse is defined in the Act as a river or spring, a natural channel in which water flows regularly or intermittently, a wetland, lake or dam into which or from which water flows, and any collection of water that the Minister may declare a watercourse. Section 21 of the Act outlines a number of categories that require a water user to apply for a Water Use License (WUL) and Section 22 requires water users to apply for a General Authorisation (GA) with the Department of Water and Sanitation (DWS) if they are under certain thresholds or meet certain criteria. The list of water uses applicable to the proposed Project include: *a) Taking water from a water resource;* *c) Impeding or diverting the flow of water in a watercourse;* *g) Disposing of waste in a manner which may detrimentally impact on a water resource;* *i) Altering the bed, banks, course or characteristics of a watercourse;* The DWS will make the final decision on water uses that are applicable to the project through a pre-application meeting after which an integrated Water Use License Application (IWULA) process will be undertaken in compliance with procedural regulations published by the DWS within General Notice 267 (GN267). These regulations specify required information per water use and the reporting structure of required supporting technical information.
The National Heritage Resources Act (No. 25 Of 1999)	The National Heritage Resource Act (Act No. 25 of 1999) (NHRA) serves to protect national and provincial heritage resources across South Africa. The NHRA provides for the protection of all archaeological and palaeontological sites, the conservation and care of cemeteries and graves by the South African Heritage Resources Agency (SAHRA), and lists activities that require any person who intends to undertake to notify the responsible heritage resources agency and furnish details regarding the location, nature, and extent of the proposed development. In terms of the Section 38 of NHRA, any person who intends to undertake a linear development exceeding 300m in length or a development that exceeds 5000m^2 must notify the heritage resources authority and undertake the necessary assessment requested by that authority.

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
	A Phase I Archaeological and Cultural-Heritage Impact Assessment (Mulaifa Development Projects cc; October 2020) (**Appendix C**) has been carried out by a suitably qualified specialist, revealing no archaeological sensitivity or sites of historical significance within the footprint of the proposed development. The legislation requires that when constructing a linear development exceeding 300m in length or developing with an area exceeding 5000 m² in extent, the developer must notify the responsible heritage authority of the proposed development and they in turn must indicate within 14 days whether an impact assessment is required. The proposed project will be loaded onto the South African Heritage Resources Information System (SAHRIS) portal for comment by the provincial Heritage Resource Agency.
The National Environmental Management: Air Quality Act (Act 39 Of 2004)	According to Section 22 of the NEM: AQA, no person may, without a provisional atmospheric emission licence or an Air Emissions Licence (AEL), conduct an activity that is - – Listed on the national list anywhere in the Republic; or – Listed on the list applicable in a province anywhere in that province. Listed activities and associated minimum emission standards (MES) were published in Government Notice 248 of 2010, Government Gazette 33064 in-line with Section 21 of NEM: AQA. An amended list of activities was published in Government Notice 893 of 2013, Government Gazette 37054, in Government Notice 551 of 2015, Government Gazette 38863 and further in Government Notice 1207 of 2018, Government Gazette 42013. According to the listed activities and associated minimum emission standards, the proposed operations will trigger the following listed activity: – Subcategory 1.5: Reciprocating Engines of the NEMAQA Section 21 Listed Activities An AEL will be applied for due to the associated triggers. WSP will compile an Air Impact Report (AIR), aligned with the National Environmental Management: Air Quality Act: Regulations: Air Dispersion Modelling (2014). Ehlanzeni District Municipality will process the application as CA.
Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)	In South Africa, environmental noise control has been in place for three decades, beginning in the 1980s with codes of practice issued by the South African National Standards (formerly the South African Bureau of Standards, SABS) to address noise pollution in various sectors of the country. Under the previous generation of environmental legislation, specifically the Environmental Conservation Act 73 of 1989 (ECA), provisions were made to control noise from a National level in the form of the Noise Control Regulations (GNR 154 of January 1992). In later years, the ECA was replaced by the National Environmental Management Act 107 of 1998 (NEMA) as amended. The National Environmental Management: Air Quality Act 39 of 2004 (NEMAQA) was published in line with NEMA and contains noise control provisions under Section 34: *(1) The minister may prescribe essential national standards –* *(a) for the control of noise, either in general or by specific machinery or activities or in specified places or areas; or* *(b) for determining –* *(i) a definition of noise; and* *(ii) the maximum levels of noise.* *(2) When controlling noise, the provincial and local spheres of government are bound by any prescribed national standards.* Under NEMAQA, the Noise Control Regulations were updated and are to be applied to all provinces in South Africa. The Noise Control Regulations give all the responsibilities of enforcement to the Local Provincial Authority, where location specific by-laws can be created and applied to the locations with approval of Provincial Government. Where province-specific regulations have not been promulgated, acoustic impact assessments must follow the Noise Control Regulations. Furthermore, NEMAQA prescribes that the Minister must publish maximum allowable noise levels for different districts and national noise standards. These have not yet been accomplished

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
	and as a result all monitoring and assessments are done in accordance with the South African National Standards (SANS) 10103:2008 and 10328:2008.
The Hazardous Substances Act (No. 15 Of 1973)	The Hazardous Substances Act (No. 15 of 1973) provides measures for the control of substances and certain electronic products that may be toxic, corrosive, irritant, strongly sensitizing or flammable in nature which may cause injury or ill-health to or death of human beings. The Act divides the substances or products into groups in relation to the degree of danger and makes provision for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products. Where substances are produced, used, handled or stored in such a form and quantity that it has the potential to cause a major accident, a Major Hazardous Installation (MHI) designation may be assigned to the facility. A Quantitative Risk Assessment (QRA) / Major Hazard installation (MHI) Assessment will be undertaken as part of the EIA phase by an Approved Inspection Authority (AIA) in order to confirm whether the facility will be an MHI.

3.2 REGIONAL POLICIES AND PLANS

Table 5 summarised key regional plans and policies as an outline of the governance framework for the project.

Table 5 Applicable Regional Policies and Plans

POLCY / PLAN	DESCRIPTION OF LEGISLATION AND APPLICABILITY
Integrated Resources Plan (IRP) (2010 – 2030) and Strategic Infrastructure Projects (SIPs)	The South African Government adopted a National Infrastructure Plan in 2012. The New Growth Path identified structural problems in the economy and pointed to opportunities in specific sectors and markets or "jobs drivers" to reach its goal of five million new jobs by 2020. In order to address these challenges and goals, Cabinet established the Presidential Infrastructure Coordinating Committee (PICC). Under its guidance, 18 strategic integrated projects (SIPS) have been developed. The SIPs cover social and economic infrastructure across all nine provinces (with an emphasis on lagging regions). The SIPs include catalytic projects that can fast-track development and growth. Work is being aligned with key cross-cutting areas, namely human settlement planning and skills development. The SIP relevant to the proposed Project: — *SIP 9: Electricity generation to support socio-economic development* Accelerate the construction of new electricity generation capacity to meet the needs of the economy and address historical imbalances. — *SIP 20: Energy* a. Emergency/Risk Mitigation Power Purchase Procurement Programme (2000MW): National b. Small IPP Power Purchase Procurement Programme (100MW): National c. Embedded Generation Investment Programme (EGIP)-400MW: National
Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP)	The Department launched a Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP) on the 23rd of August 2020. The objective of the RMIPPPP is to fill the current short-term supply gap, alleviate the existing electricity supply constraints, and reduce the extensive utilisation of diesel-based peaking electrical generators. The Determination for the RMIPPPP was gazetted on the 7th of July 2020. The Department formally invited interested parties to register prospective bids under the Risk Mitigation IPP Procurement Programme on 22 August 2020.

3.3 INTERNATIONAL ENVIRONMENTAL AND SOCIAL STANDARDS

3.3.1 IFC PERFORMANCE STANDARDS

Whilst not applicable within the South African EIA context, the S&EIA is aligned with the IFC Performance Standards (PS) on Environmental and Social Sustainability to ensure bankability of the project. Alignment with the IFC PS may also be regarded as good international industrial practice. **Table 6** provides an overview of the IFC PS and their applicability to the Project. The IFC has eight PSs providing guidance on how to identify risks and impacts, to help avoid, mitigate, and manage risks and impacts.

Table 6 IFC Performance Standards Applicability to the Project

STANDARD	OVERVIEW	APPLICABILITY
Performance Standard 1: Assessment and Management of E&S Risks and Impacts	PS1 highlights the importance of managing social and environmental performance throughout the life of a project (any business activity that is subject to assessment and management). This PS details the implementation of an environmental management system from the project's inception. This is to be carried out through the assessment of potential environmental impacts and risks, and ways of mitigating and managing these on an ongoing basis.	The Project is expected to have potential adverse social or environmental impacts that are generally beyond the site boundaries, largely reversible and can be addressed through relevant mitigation measures. The IFC PS 1 (GN 23) states that "*the breadth, depth and type of analysis included in an ESIA must be proportionate to the nature and scale of the proposed project's potential impacts as identified during the course of the assessment process*". An environmental and social impact assessment (ESIA) and Environmental and Social Management Plan (ESMP)[5] is considered the appropriate level of environmental and social risk assessment for this Project. The ESIA must focus on key environmental and social risks anticipated for the Project – these are described below under the applicability of PS 2-8.
Performance Standard 2: Labour and Working Conditions	For any business, its workforce is its most valuable asset. A sound worker-management relationship is key to the success of any enterprise. PS2 asks that companies treat their workers fairly, provide safe and healthy working conditions, avoid the use of child, or forced labour, and identify risks in their primary supply chain.	The construction activities will require contractors for completion. A safe working environment and fair contractual agreements must be in place. The operational phase will have permanent employees for day-to-day activities as well as contractors who will all need a safe working environment and fair contractual agreements. Whilst PS2 will be applicable to the Project, it is not intended to be addressed in detail at the ESIA stage. Recommendations are provided concerning development of a detailed Human Resources (HR) and Occupational Health and Safety (OHS) system by the developer and its partners (e.g. EPC Contractors) as the Project moves towards implementation. In addition, measures to address the Interim Advice for IFC Clients on Supporting

[5] The terms ESIA and ESMP used in the international context are generally synonymous with the terms EIA and EMPr used in the South African EIA legislative context.

STANDARD	OVERVIEW	APPLICABILITY
		Workers in the Context of COVID-19 are referenced. The EMPr will incorporate the requirements for compliance with local and international Labour and Working legislation and good practice on the part of the contractors.
Performance Standard 3: Resource Efficiency and Pollution Prevention	PS3 focuses on the awareness that development often leads to increased pollution of air, land and water and consumes finite resources. These impacts can affect people and the environment at all scales, local to global, and it is important that these impacts are acknowledged and managed from project inception.	Significant PS3-related impacts are not anticipated due to the nature of the project. The following topics are relevant to the Project and will be assessed in detail as part of the EIA: – Air quality and odour; – Environmental noise; and – Water (surface and groundwater) quality The management of construction waste, hazardous substances, and stormwater can be assessed qualitatively within the environmental and social assessment.
Performance Standard 4: Community Health, Safety, and Security	Business activities and infrastructure projects may expose local communities to increased risks and adverse impacts related to worksite accidents, hazardous materials, spread of diseases, or interactions with private security personnel. PS4 helps companies adopt responsible practices to reduce such risks including through emergency preparedness and response, security force management, and design safety measures.	During the construction phase there will be a significant increase in vehicular traffic along public roads, largely due to the need for importation of construction material. Pedestrian and road safety risks will be qualitatively evaluated in the ESIA and the clients' standard safety and security measures, as well as potential additional measures recommended by WSP, will be detailed in the EMP. The key PS4 impacts during the operational phase includes off-site risks associated with potential fire and explosion linked to fuel supply. These risks will be quantitatively assessed during the ESIA phase.
Performance Standard 5: Land Acquisition and Involuntary Resettlement	PS5 recognises that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons who use this land. PS5 aims to: avoid or at least minimise involuntary resettlement wherever feasible by exploring alternative project designs; mitigate adverse social and economic impacts from land acquisition by (i) providing compensation for loss of assets and (ii) ensuring that resettlement activities are implemented with appropriate consultation and disclosure; and improve or at least restore the livelihoods, standards of living and living conditions of displaced persons.	The site is contained on privately owned land; therefore, no involuntary physical or economic displacement will occur as a result of the project.
Performance Standard 6: Biodiversity Conservation and Sustainable Management of	PS6 is concerned with the protection and conservation of biodiversity, that is, the variety of life in all its forms, including genetic, species and ecosystem diversity. The key components of biodiversity include ecosystems and habitats, species and communities. This PS addresses	Relevant specialist biodiversity studies have been included in the proposed scope. These studies are in alignment with the recommendations in the Desktop Level Ecological Investigation Report (Scientific Terrestrial Services CC; October 2020) however; additional the studies during the EIA phase will meet the requirements of PS6.

STANDARD	OVERVIEW	APPLICABILITY
Living Natural Resources	how proponents can avoid or mitigate threats to biodiversity arising from their operations.	A water resources and aquatic ecology assessment will determine the Present Ecological Status (PES) of the aquatic ecosystem as well as response of various habitat features. Key biodiversity issues that must be addressed include the presence of protected species, habitat classification, and the potential for critical habitat (CH).
Performance Standard 7: Indigenous Peoples (IP)	PS7 aims to: ensure that the development process fosters full respect for Indigenous Peoples; anticipate and avoid, minimise, or compensate adverse impacts of projects on Indigenous Peoples and provide opportunities for development benefits; establish and maintain an ongoing relationship with affected Indigenous Peoples throughout the life of the project; ensure free, prior, and informed consent of Indigenous Peoples; and respect and preserve their culture, knowledge, and practices.	As per the international instruments under the United Nations (UN) Human Rights Conventions, no indigenous peoples are present within the project area. The Project does not involve displacement. PS7 will not be triggered.
IFC PS8 - Cultural Heritage	PS8 recognises the importance of cultural heritage for current and future generations. PS8 aims to: protect cultural heritage from the adverse impacts of project activities; support its preservation; and promote equitable sharing of benefits from cultural heritage.	The Phase I Archaeological and Cultural-Heritage Impact Assessment (Mulaifa Development Projects, October 2020) (**Appendix C**) for the proposed site has revealed that archaeological sites (Stone Age and Historic Archaeological), cultural heritage sites, burial grounds or isolated artifacts are unlikely to be present on the affected landscape. A Chance Find Procedure will be included in the Environmental management Programme (EMPr).

3.3.2 WORLD BANK GROUP ENVIRONMENTAL HEALTH AND SAFETY GUIDELINES

In support of the Performance Standards, the World Bank Group (WBG) has published a number of Environmental Health and Safety (EHS) Guidelines. The EHS Guidelines are technical reference documents that address IFC's expectations regarding the industrial pollution management performance of its projects. They are designed to assist managers and decision makers with relevant industry background and technical information. This information supports actions aimed at avoiding, minimising, and controlling EHS impacts during the construction, operation, and decommissioning phase of a project or facility. The EHS Guidelines serve as a technical reference source to support the implementation of the IFC Performance Standards, particularly in those aspects related to PS3: Pollution Prevention and Abatement, as well as certain aspects of occupational and community health and safety.

Where host country regulations differ from the levels and measures presented in the EHS Guidelines, projects seeking international funding may be expected to achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, a full and detailed justification for any proposed alternatives is required.

The following IFC / WBG EHS Guidelines have been generally consulted during the preparation of the EIA in order to aid the identification of EHS aspects applicable to the project:

— *Thermal Power Plants (December 2008)* - information relevant to combustion processes fuelled by gaseous, liquid and solid fossil fuels and biomass and designed to deliver electrical or mechanical power, steam, heat, or any combination of these, regardless of the fuel type (except for solid waste which is covered under a separate Guideline for Waste Management Facilities), with a total rated heat input capacity above 50

Megawatt thermal input (MWth). It applies to boilers, reciprocating engines, and combustion turbines in new and existing facilities.

- *Electric Power Transmission and Distribution (2007)* - information relevant to power transmission between a generation facility and a substation located within an electricity grid, in addition to power distribution from a substation to consumers located in residential, commercial, and industrial areas
- *General EHS Guidelines* – this includes a section on a range of environmental, occupational health and safety, community health and safety, and construction activities that would apply to the project. The guideline also contains recommended guidelines adopted form the World Health Organisation (WHO) for ambient air and water quality, which are referred to in the relevant impact assessment sections in the ESIA report.

4 SCOPING METHODOLOGY

The scoping process was initiated in accordance with Appendix 2 of GNR 326 pertaining to applications subject to an S&EIR process.

4.1 APPLICATION

The application phase consists of the completion of the appropriate application form by the EAP and the Proponent as well as the subsequent submission and registration of the application for EA with DFFE.

A request for a pre-application meeting was submitted to DFFE on 28 June 2021. DFFE responded with the allocation of an assessing officer and reference number (2021-06-0042).

4.2 S&EIR PROCESS AND PHASING

The S&EIR process consists of various phases with associated timelines as defined in GNR 326. The process can generally be divided into four main phases, namely; (i) an unregulated Pre-application Phase, (ii) an Application and Scoping Phase (current phase), (iii) an Impact Assessment Phase and (iv) Authorisation and Appeal Phase. The S&EIR process is shown in **Figure 3**.

The main objectives of the phases can be described as follows:

- Pre-Application Phase:
  - Undertake consultation meetings with the relevant authorities to confirm the required process and general approach to be undertaken;
  - Identify stakeholders, including neighbouring landowners/residents and relevant authorities;
- Application and Scoping Phase:
  - Compile and submit application forms to the CA and pay the relevant application fees;
  - Compile a Draft Scoping Report (DSR) describing the affected environment and present an analysis of the potential environmental issues and benefits arising from the proposed project that may require further investigation in the Impact Assessment Phase;
  - Develop draft terms of reference for the specialist studies to be undertaken in the Impact Assessment Phase; and
  - Inform stakeholders of the proposed project, feasible alternatives and the S&EIR process and afford them the opportunity to register and participate in the process and identify any issues and concerns associated with the proposed project.
  - Incorporate comments received from stakeholders during the DSR comment period;
  - Should significant amendments be required, release the updated DSR for a 30 day comment period to provide stakeholders with the opportunity to review the amendments as well as provide additional input if required; and
  - Submit the Final Scoping Report (FSR), following the consultation period, to the relevant authorities, in this case the DFFE, for acceptance/rejection.
- Impact Assessment Phase:
  - Continue to inform and obtain contributions from stakeholders, including relevant authorities, stakeholders, and the public and address their relevant issues and concerns;
  - Assess in detail the potential environmental and socio-economic impacts of the project as defined in the DSR;
  - Identify environmental and social mitigation measures to avoid and/or address the identified impacts;
  - Develop and/or amend environmental and social management plans based on the mitigation measures developed in the Environmental Impact Assessment Report (EIAR);
  - Submit the EIAR and the associated EMPr to the CA to undertake the decision making process;
  - Authorisation and Appeal Phase;

- The DFEE to provide written notification of the decision to either grant or refuse EA for the proposed project; and
- Notify all registered stakeholders of the decision and right to appeal.

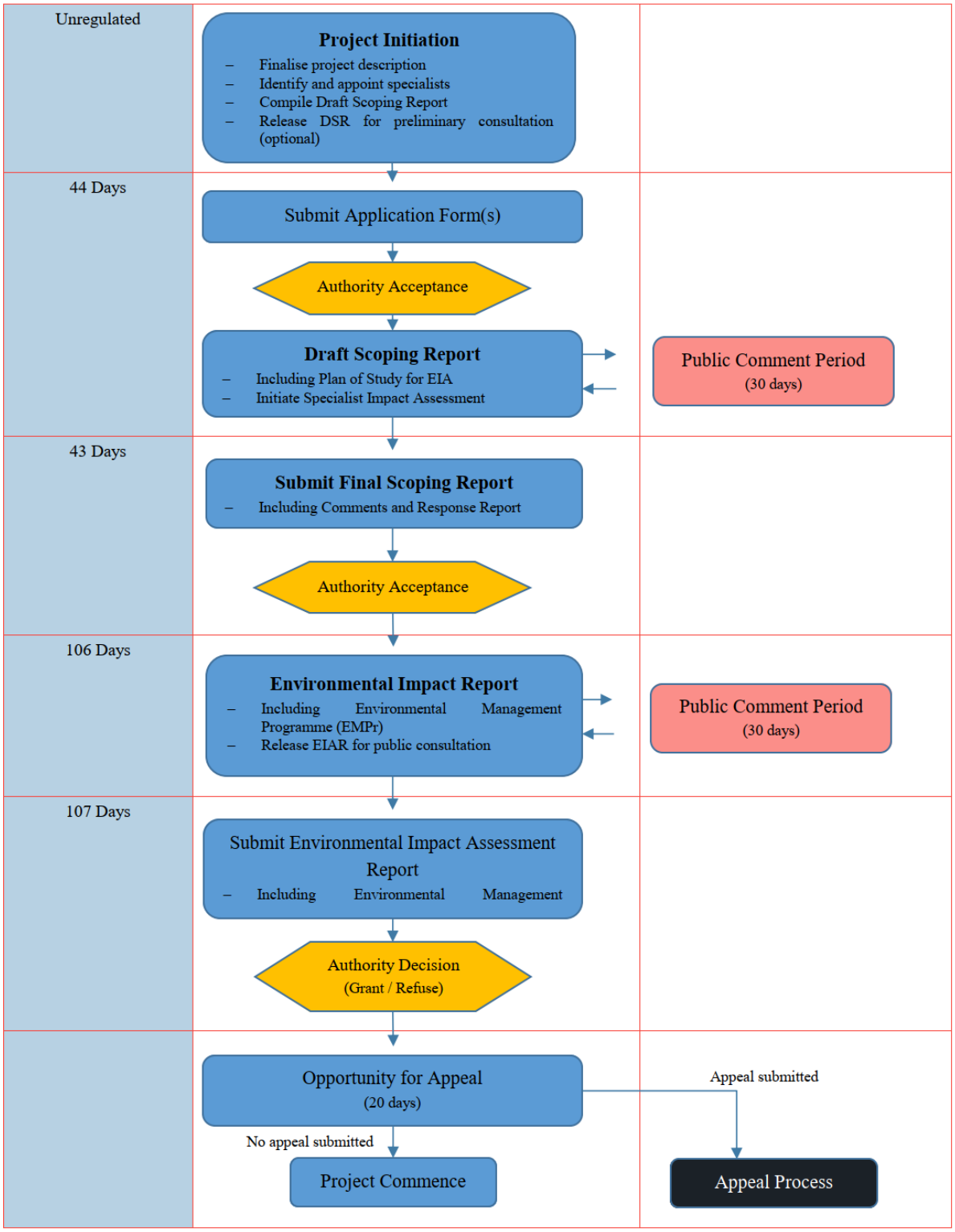


Figure 3 S&EIR Process

4.3 BASELINE ENVIRONMENTAL ASSESSMENT

The description of the baseline environment has been compiled through a combination of site investigations, desktop reviews, georeferenced data and information obtained from the specialist assessments.

An understanding of the receiving environment is critical in order to identify aspects that may be affect by the project and in turn how the surrounding environment may affect project design considerations.

4.4 IDENTIFICATION AND EVALUATION OF POTENTIALLY SIGNIFICANT IMPACTS

The potential impacts associated with the proposed development were determined at both a desktop level based on existing information, as well as the field assessment. The following methodology was used:

- Identify potential sensitive environments and receptors that may be impacted on by the proposed development;
- Identify the type of impacts that are most likely to occur (including cumulative impacts);
- Determine the nature and extent of the potential impacts during the various developmental phases, including, construction, operation and decommissioning;
- Identify potential No-Go areas (if applicable); and
- Summarise the potential impacts that will be considered further in the EIA phase through detailed specialist studies.

Appendix 2 of GNR 326 requires the identification of the significance of potential impacts during scoping. To this end, an impact screening tool has been used in the scoping phase. The screening tool is based on two criteria, namely probability; and, consequence (**Table 9**), where the latter is based on general consideration to the intensity, extent, and duration.

The scales and descriptors used for scoring probability and consequence are detailed in **Table 7** and **Table 8** respectively.

Table 7 Significance Screening Tool

		CONSEQUENCE SCALE			
PROBABILITY SCALE		**1**	**2**	**3**	**4**
	1	**Very Low**	**Very Low**	**Low**	**Medium**
	2	**Very Low**	**Low**	**Medium**	**Medium**
	3	**Low**	**Medium**	**Medium**	**High**
	4	**Medium**	**Medium**	**High**	**High**

Table 8 Probability Scores and Descriptors

SCORE	DESCRIPTOR
4	**Definite**: The impact will occur regardless of any prevention measures
3	**Highly Probable**: It is most likely that the impact will occur
2	**Probable**: There is a good possibility that the impact will occur

1	**Improbable:** The possibility of the impact occurring is very low

Table 9 Consequence Score Descriptions

SCORE	NEGATIVE	POSITIVE
4	Very severe: An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated.	Very beneficial: A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit.
3	Severe: A long term impacts on the affected system(s) or party(ies) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming or some combination of these.	Beneficial: A long term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these.
2	Moderately severe: A medium to long term impacts on the affected system(s) or party (ies) that could be mitigated.	Moderately beneficial: A medium to long term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are equally difficult, expensive and time consuming (or some combination of these), as achieving them in this way.
1	Negligible: A short to medium term impacts on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary.	Negligible: A short to medium term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.

The nature of the impact must be characterised as to whether the impact is deemed to be positive (+ve) (i.e. beneficial) or negative (-ve) (i.e. harmful) to the receiving environment/receptor. For ease of reference, a colour reference system (**Table 10**) has been applied according to the nature and significance of the identified impacts.

Table 10 Impact Significance Colour Reference System to Indicate the Nature of the Impact

Negative Impacts (-ve)	Positive Impacts (+ve)
Negligible	**Negligible**
Very Low	**Very Low**
Low	**Low**
Medium	**Medium**
High	**High**

4.5 STAKEHOLDER ENGAGEMENT

4.5.1 PURPOSE OF STAKEHOLDER ENGAGEMENT

Stakeholder engagement comprises a series of inclusive and culturally appropriate interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the S&EIR process. Effective stakeholder engagement requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the proposed project.

The objectives of the stakeholder engagement process can be summarised as follows:

- Identify relevant individuals, organisations and communities who may be interested in or affected by the proposed Project;
- Clearly outline the scope of the proposed Project, including the scale and nature of the existing and proposed activities;
- Identify viable proposed project alternatives that will assist the relevant authorities in making an informed decision;
- Identify shortcomings and gaps in existing information;
- Identify key concerns, raised by stakeholders that should be addressed in the subsequent specialist studies;
- Highlight the potential for environmental impacts, whether positive or negative; and
- To inform and provide the public with information and an understanding of the proposed project, issues and solutions.

In accordance with the NEMA, GNR 326, Chapter 6, the following activities have taken place or are proposed to take place during the DSR review period or beyond.

4.5.2 RIGHTS, ROLES AND RESPONSIBILITIES OF THE STAKEHOLDER

In terms of Chapter 6, specifically Section 43(1) of the NEMA EIA Regulations 2014, as amended, registered stakeholders have the right to bring to the attention of the CA any issues that they believe may be of significance to the consideration of the application. The rights of stakeholder are qualified by certain obligations, namely:

- Stakeholders must ensure that their comments are submitted within the timeframes that have been approved by the DFFE, or within any extension of a timeframe agreed by the Proponent, EAP or CA;
- Disclose to the EAP any direct business, financial, personal or other interest that they might have in the approval or refusal of the application;

The roles of stakeholders in a public participation process usually include one or more of the following:

- Assisting in the identification and prioritisation of issues that need to be investigated;
- Making suggestions on alternatives and means of preventing, minimising and managing negative impacts and enhancing proposed Project benefits;
- Assisting in or commenting on the development of mutually acceptable criteria for the evaluation of decision options;
- Contributing information on public needs, values and expectations;
- Contributing local and traditional knowledge; and
- Verifying that their issues have been considered.

In order to participate effectively, stakeholders should:

- Become involved in the process as early as possible;
- Register as a stakeholder;
- Advise the EAP of other stakeholders who should be consulted;
- Read the material provided and actively seek to understand the issues involved;

- Give timeous responses to correspondence;
- Be respectful and courteous towards other stakeholders;
- Refrain from making subjective, unfounded or ill-informed statements; and
- Recognise that the process is confined to issues that are directly relevant to the application.

4.5.3 STAKEHOLDER IDENTIFICATION AND NOTIFICATION

AUTHORITIES

A Public Participation Plan (PPP) and NEMA application form has been submitted t DFFE as CA for approval. Other relevant authorities (organs of state / key commenting authorities) have been automatically registered as stakeholders.

The organs of state that have jurisdiction over the activity are the DFFE, Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA), Ehlanzeni District Municipality, and Nkomazi Local Municipality. These organs of state will be provided written notification of the project via email. Other authorities to be provided with written notification are listed below:

- Department of Water and Sanitation (DWS)
- SAHRA / Mpumalanga Provincial Heritage Resource Authority (MPHRA)
- Department of Water and Sanitation (DWS)
- Department of Mineral Resources and Energy (DMRE)
- Mpumalanga Department of Public Works Road and Transport (DPWRT).

4.5.4 NOTIFICATION OF POTENTIAL STAKEHOLDERS

WRITTEN NOTIFICATION

Section 41 of the 2017 EIA Regulations states that written notices must be provided to identified stakeholders. **Table 11** details the notification / planned notification of stakeholders**.**

Table 11 NEMA Requirements for Stakeholder Written Notification

NEMA REQUIREMENT	DISCUSSION
(i) the owner or person in control of that land if the applicant is not the owner or person in control of the land	DNG Energy Pty Ltd is the landowner of the main portion of land on which the power plant will be developed (Komatipoort Townland Portion 52) and in negotiations with landowner of Komatipoort Townland Portion 48 on which the transmission line will be routed (northern portion). — The pipeline to the south may interact with the following and parcels. DNG is currently investigating contact details landowners for negotiation. — If the pipeline is routed east of dirt road, the following land parcel will be affected: Komatipoort Townland Portion 50; and Komatipoort Townland Portion 59/182 Erf 950 and 951. — If the pipeline is routed west of the dirt road the following land parcel will be affected: Komatipoort Townland Portion 72/182 Erf 10, 80 and 81. — The potential gas tie in location is situated on Komatipoort Townland Portion 14/182 and Komatipoort Townland Portion 58/182.
(ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken	The landowner/s landowners will be notified of the proposed project via a project notification letter sent via email.

(iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken	Adjacent landowners and occupier details will be collected and the landowners notified via a project notification letter sent via email and/or sms notification. The following type of surrounding landowners have been identified to date: Eskom, Transnet and private properties.
(iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area	The Ward Councillor from Ehlanzeni District Municipality and Nkomazi Local Municipality have been included on the stakeholder database.
(v) the municipality which has jurisdiction in the area	Representative from the following municipalities have been included in the stakeholder database: — Ehlanzeni District Municipality — Nkomazi Local Municipality
(vi) any organ of state having jurisdiction in respect of any aspect of the activity	The DFFE will continue to be consulted as the CA regarding the EA application.
(vii) any other party as required by the competent authority.	National, provincial, and local government representatives have been included in stakeholder database: — DFFE — DARDLEA — SAHRA / MPHRA — DWS — DMRE — Mpumalanga Department of Public Works Road and Transport

NEWSPAPER ADVERT

In accordance with GN. R 326 41(2)(c) of Chapter 6 adverts were placed between 21-23 July 2021 in the following newspapers in three languages (**Appendix D**):

— Mpumalanga News (siSwati)
— Lowvelder (English)
— Beeld (Afrikaans)

SITE NOTICES / POSTERS

The EIA Regulations require that site notices be fixed at places that are conspicuous to and accessible by the public at the boundary or on the fence or along the corridor of the site where the application will be undertaken or any alternative site. WSP will prepare eight site notices in three languages (English, SiSwati and Afrikaans) specifically targeting the site boundary, local municipality facilities, grocery stores / spaza-shops, and public transport nodes within a 5km radius of the project area.

4.5.5 REGISTRATION OF ADDITIONAL STAKEHOLDERS

In the urban outskirts of Komatipoort (west of the CBD) an informal area is present. During the placement of notices, WSP will visit this area in order to identify local leadership and obtain contact details. In addition, subject to arrangements with the local leadership, a meeting with community representatives may be agreed on.

The relevant ward committee will be also contacted to ensure that traditional leaders and community-based organisations are aware of the Project and can assist in distributing and communicating relevant Project information to community members.

Should the EAP identify an affected stakeholder, and be made aware of his/her existence by the ward councillor, efforts will be made to ensure his/her participation in the stakeholder engagement process.

Any stakeholder who submits a comment during the course of the process will automatically be registered on the stakeholder database. Comments received during the DSR review period will be included in the FSR as part of the comments and responses report (CRR) and submitted to the CA.

4.5.6 PUBLIC AND FOCUS GROUP MEETINGS

Meetings are not a requirements of the EIA Regulations however should stakeholder request be made for these, the request will be accommodated with adherence to Covid-19 related health and safety protocols.

It is anticipated that the country will return to a lower level of lockdown as the EIA process progresses. At this point, should the need for stakeholder meetings be identified, then in-person focus group meetings with small groups of people are proposed. Alternatively, virtual meetings will be held.

4.5.7 PUBLIC REVIEW OF THE DRAFT SCOPING REPORT

Section (43) / (44) of Chapter 6 requires registered stakeholders to be provided 30 days to comment on the DSR and draft EIA Report. Reports are typically made available on the WSP website (http://www.wsp-pb.com/en/WSP-Africa/What-we-do/Services/All-Services-A-Z/Technical-Reports/). Libraries are no longer permitted to receive copies for review by stakeholders due to Covid-19 risks.

All registered stakeholders and authorising/commenting state departments will be notified of the public review period as well as the locations of the DSRs via email and bulk sms. The abovementioned plan, for notification and provision of reports, will also be utilised for the review of the FSR as well as the EIAR once the EIAR Phase has commenced.

Due to the high level of infections in the country during the third wave, it is possible that recipients may not receive notices if they are: i) no longer working at offices and without adequate communications at home; ii) have been retrenched / left their position / taken forced leave; or iii) are sick and on leave due to Covid-19 or caring for others affected and therefore not in a position to engage in business matters.

All issued written notices to stakeholders will be accompanied by an email and phone call to the recipient in order to ascertain whether they are able to represent themselves and/or their constituencies, and to agree on any additional measures that may be required for this representation to be effective.

If required, additional measures will be taken, within reason, to ensure effectiveness of the engagement. This may include additional timeframes for commenting, identification of proxy-representatives etc.

4.5.8 COMMENT AND RESPONSE REPORT

Written comments received from the stakeholders will be captured in the FSR, which will outline the comments received from the stakeholders and responses provided by the applicant and EAP for consideration by EDTEA. The CRR will record the following:

- List of all issues raised;
- Record of who raised the issues;
- Record of the date on which the issue was raised; and
- Response to the issues.

5 DESCRIPTION OF BASELINE ENVIRONMENT

5.1 PHYSICAL ENVIRONMENT

5.1.1 CLIMATE AND METEOROLOGY

LOCAL METEOROLOGY OVERVIEW

Meteorological variables for the region were sourced for the South African Weather Service (SAWS) Komatidraai station and analysed for the period January 2018 – December 2020 (i.e. three calendar years as required by the Regulations Regarding Air Dispersion Modelling[6], hereafter referred to as 'the Modelling Regulations'). The Komatidraai station is located approximately 9 km to the south-southwest of Komatipoort. Station details and data recovery information for the assessed period is given in **Table 12**.

Table 12 Details of the Komatidraai meteorological station

Station Name	Latitude (ºS)	Longitude (ºE)	Altitude (m)	Data Recovery		
				Temperature	Rainfall	Wind
Komatidraai	-25.5140°	30.9100°	188	95%	100%	96%

TEMPERATURE AND RAINFALL

According to the Köppen-Geiger Classification, Komatipoort is classified as having a hot arid climate with hot summers and warm to cool, dry winters[7]. **Figure 4** presents average monthly temperature, rainfall and humidity as recorded at the Komatidraai station. This station exhibits seasonal trends typical for the eastern half of South Africa. Higher rainfall occurs during the warmer summer months (December, January and February), with drier conditions during cooler winter months (June, July and August). Summer temperatures for the region average at 25.9°C while winter temperatures average at 18.9°C. Komatipoort receives on average 575 mm of rainfall annually, with 57% received during summer (December, January and February) and 2% during winter (June, July and August).

[6] Department of Environmental Affairs (2014): Regulations Regarding Air Dispersion Modelling (No. R. 533), Government Gazette, 11 July 2014, (No. 37804).
[7] Conradie, D.C.U., (2012): *South Africa's Climatic Zones*. CSIR, Pretoria.

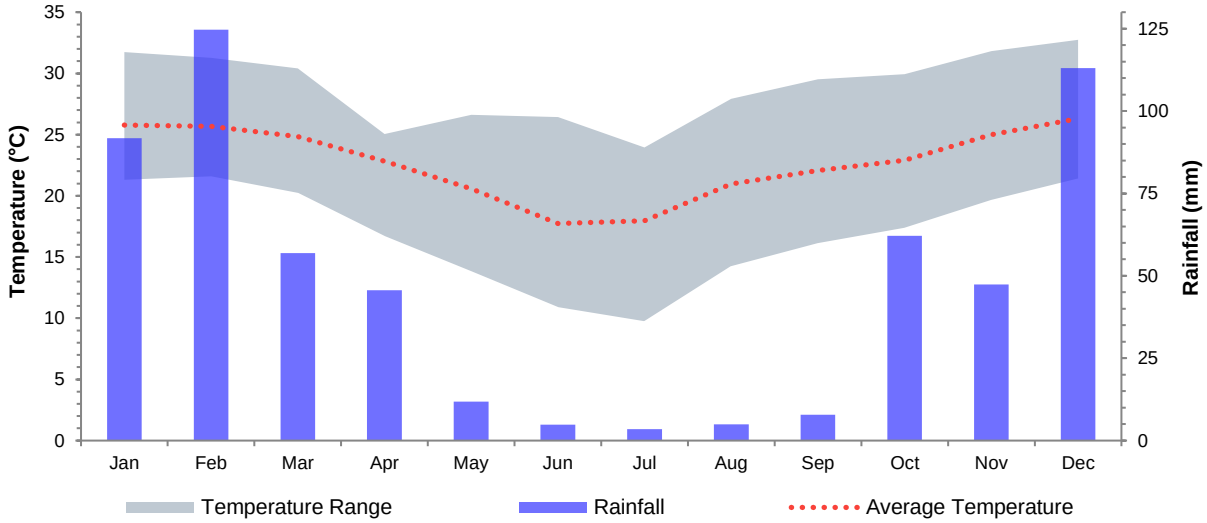


Figure 4 Meteorological summary for PMB (January 2017 - December 2019)

WIND

Wind roses summarize wind speed and directional frequency at a location. Calm conditions are defined as wind speeds less than 1.0 m/s (i.e. based on the typical sensitivity of the wind sensor installed at SAWS stations). Each directional branch on a wind rose represents wind originating from that direction. Each directional branch is divided into segments of colour, each representative of different wind speeds.

Typical wind fields are analysed for the full period (January 2018 – December 2020); diurnally for early morning (00h00–06h00), morning (06h00–12h00), afternoon (12h00–18h00) and evening (18h00–23h00); and seasonally for summer (December, January and February), autumn (March, April and May), winter (June, July and August) and Spring (September, October and November).

Wind roses for the Komatidraai meteorological station are presented in **Figure 5**.

- Calm conditions (wind speeds <1.0 m/s) occurred 25.51% of the time;
- Light to gentle southerly and northerlies prevail in the region;
- Peak (11.1 m/s) and highest average (2.8 m/s) wind speeds occurred from the south and north-northwest respectively;
- Light southerlies and south-southwesterlies prevail during the early morning hours (00h00-06h00);
- Light to moderate northerlies, southerlies and south-southwesterlies prevail in the morning (06h00-12h00);
- Light to moderate northerlies and north-northeasterlies prevail in the afternoon (12h00-18h00);
- Light to moderate southerlies and south-southeasterlies prevail during the night (18h00-00h00);
- Peak wind speeds (9.2 m/s) and highest average (2.2 m/s) wind speeds occurred during the morning and afternoon periods respectively;
- Winds from the north and south prevail throughout the year with higher directional variability occurring during summer months; and
- Peak wind speeds (9.0 m/s) and highest average wind speeds (2.1 m/s) were measured during spring. The frequency of calm conditions is highest during autumn (33.18%).

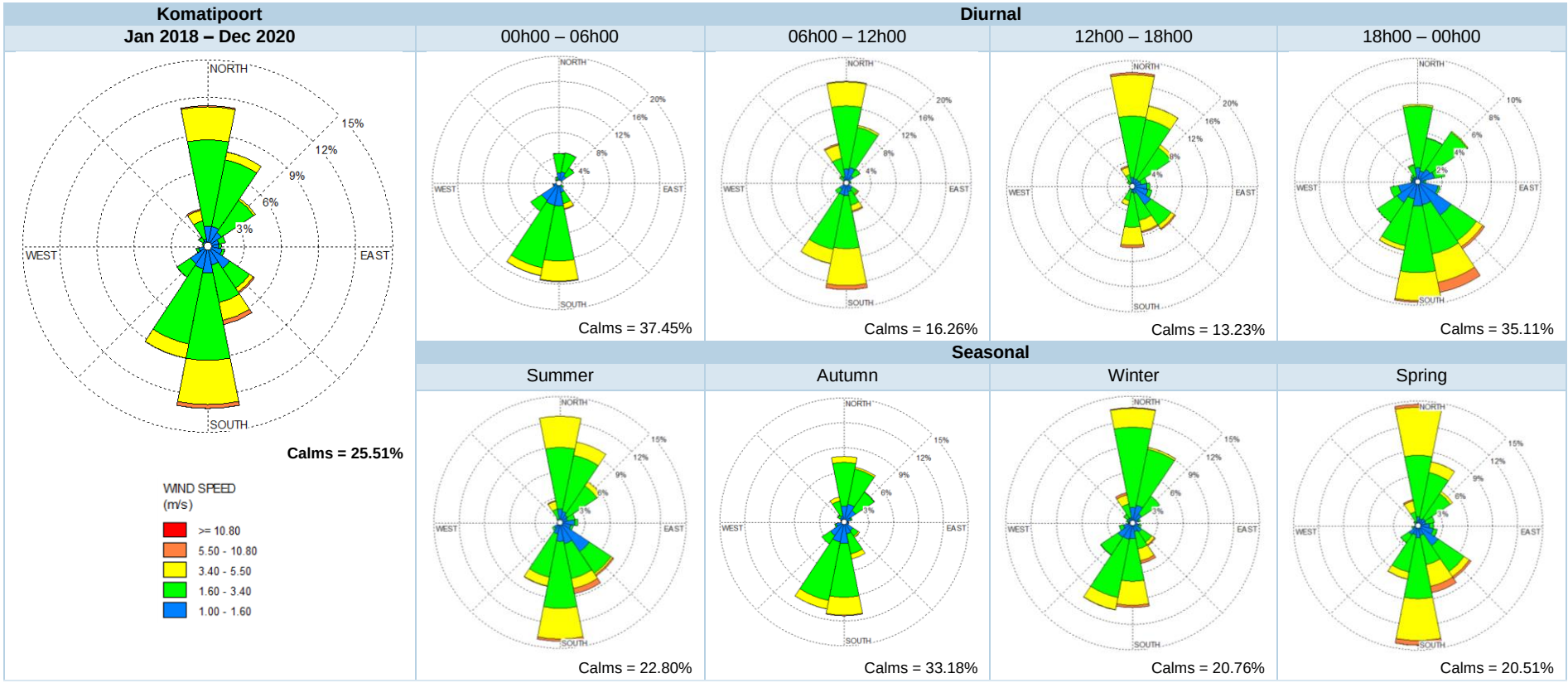


Figure 5 Local Wind Conditions for Komatipoort

5.1.2 AIR QUALITY

Air quality is defined to include noise and odour as well as 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 provide guidance on 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 the immediate and around the proposed area. The motor vehicle along the N4 may results in elevated ambient concentrations of particulates and Nitrogen Oxides (NO_2) at times.

The National Framework for Air Quality Management in the Republic of South Africa has rated the Ehlanzeni District Municipality, as having “poor” air quality. The District area has thus been identified as being in either the upper range of prevalence for one or more emission source categories or middle range in two or more categories relative to other Districts. Municipalities that are classified as having poor air quality require priority attention in terms of air quality management planning.

5.1.3 TOPOGRAPHY

The average gradient on site is less than 1.5%. with no steep slopes present .The topography slopes from east to west but due to the drainage lines a slightly undulating topography is observed from north to south (**Figure 6**). Due to the watercourse on the site, and the possible crossing of it, some earthworks will be required to provide clear and level areas for the construction of the power plant. It is not anticipated that any significant slopes will be created as part of the proposed development. There are therefore no slope stability concerns related to this site.

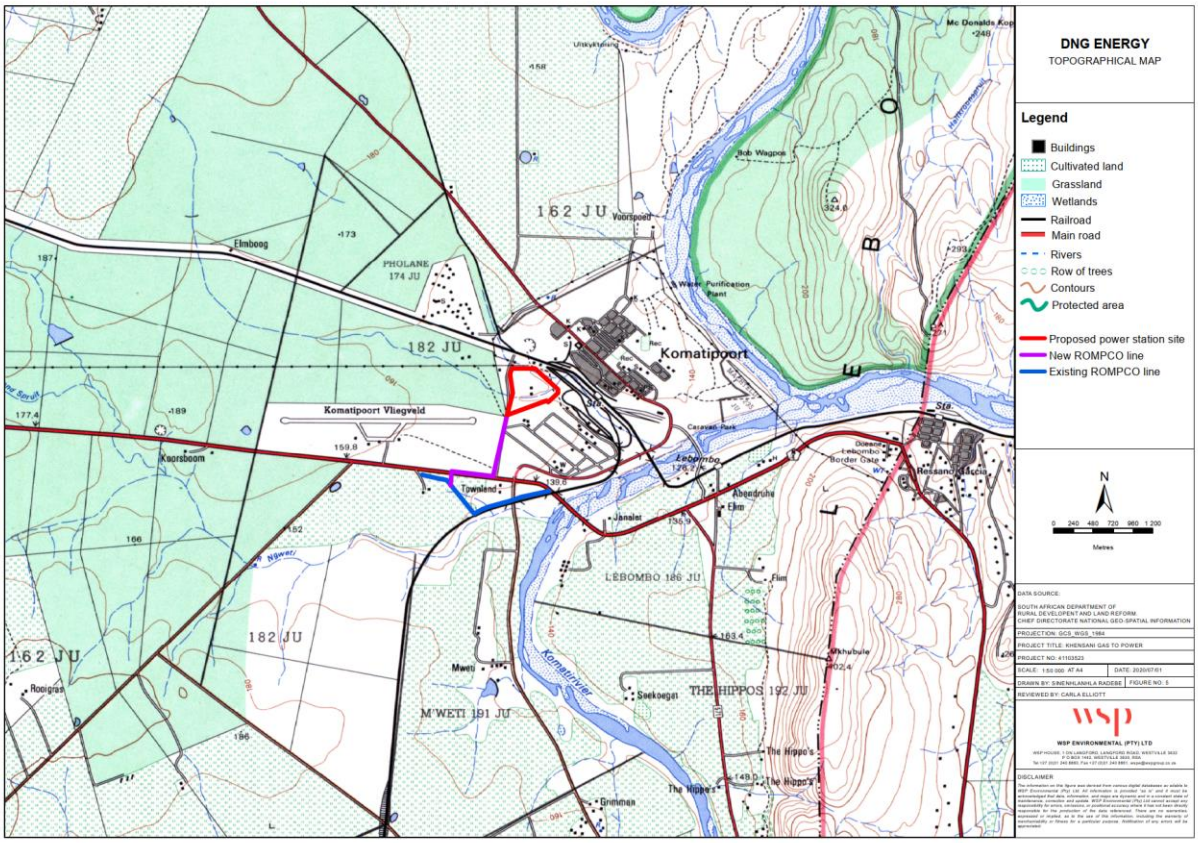


Figure 6 Topographical Map of Project Area (WSP, 2021)

5.1.4 GEOLOGY AND SOILS

A desktop review of the geology indicates the site to be underlain by the Letaba Formation of the Lebombo Group (1:250 000, 2530 Barberton). As such, the site is expected to be underlain by porphyritic mafic lavas and rhyolite. Within 1km to the east of the site, the Komatipoort Suit (Gabbro and Granophyre) is mapped but as stratigraphy dips to the east (dip angle unknown) the underlying geology is likely to be the rholitic rocks of the Letaba Formation. Based on the Land Type information, the site is located in Land Type Ea78, which, irrespective of the Terrain Type is expected to be underlain by shallow rock or saprolite with surface soils that are generally clays or sandy clays. There is also a likelihood of calcrete layers in this land type.

During a site walkover in April 2021. It was observed at numerous locations that the surface soils on site are clayey and have desiccation cracks in them. No rock outcrop was observed in the natural land surface but in some minor erosion channels and cuttings for the road along the western boundary it was noted that the superficial soils were underlain by highly weathered fine grained, felsic igneous rocks. Transported deposits of clayey soils were observed to be associated with the drainage lines and areas where the drainage has been dammed up. These are generally clayey soils that were very moist. They are not expected to reach great thicknesses and will likely be 1m thick except within the dam footprints where thicker deposits may have accumulated.

5.1.5 SURFACE WATER

HYDROLOGICAL CACHMENT

The study area falls within the Inkomati Water Management Area (WMA), which extends over several parallel river catchments which all drain in a general easterly direction, and flow together at the border with Mozambique, to form the Inkomati River which discharges into the Indian Ocean immediately north of Maputo.

Administratively, the majority of the WMA falls within Mpumalanga Province, with a portion within Limpopo Province (**Figure 7**).

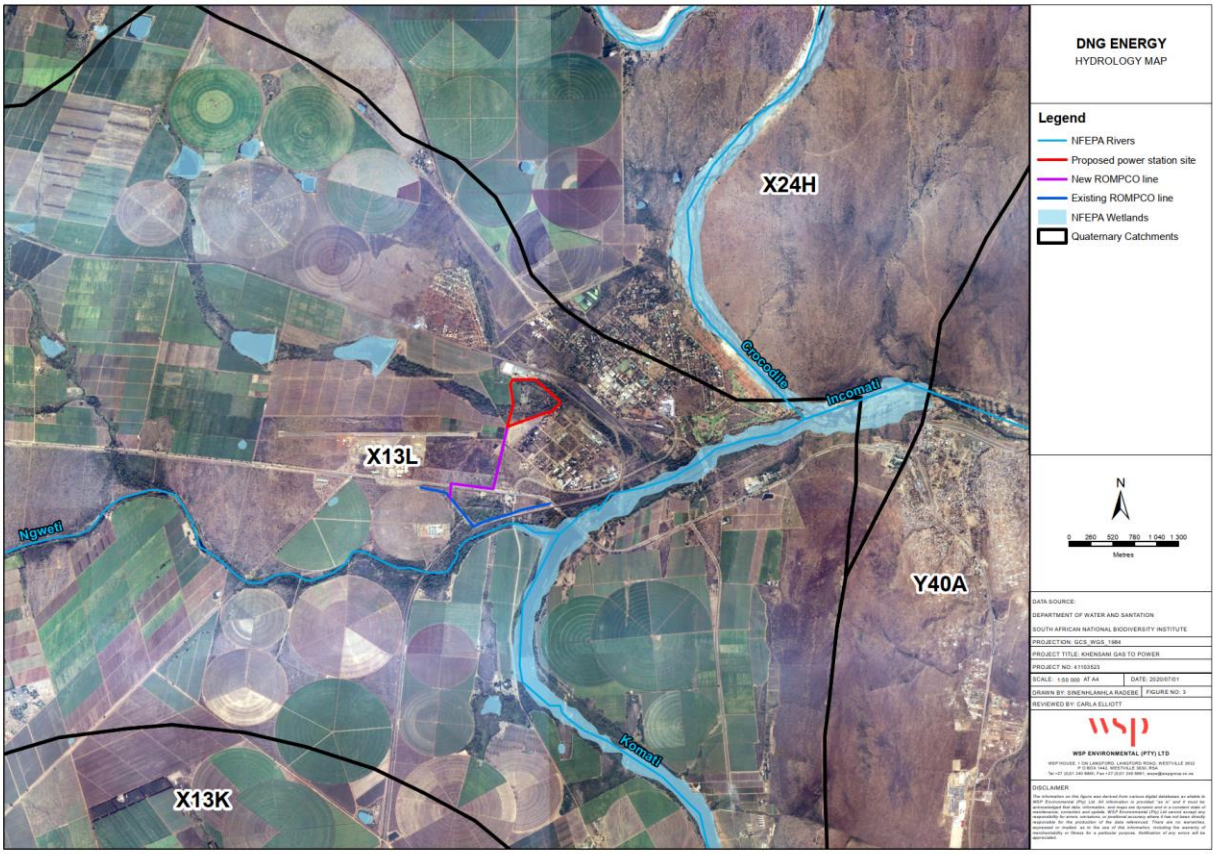


Figure 7 Hydrology Map of Project Area (WSP, 2021)

The site falls within rainfall zone X1H associated with quaternary X13L, with an MAP of 819mm. Evaporation data for the site was extracted from the WR2012 (WRC, 2019) database. The evaporation zone representative of the site is 5A with an MAE of 1484.6mm. The MAE is higher than the MAP, making this a dry area.

LOCAL WATERCOURSES AND DRAINAGE LINES

A site walkover of the Komatipoort site was undertaken in April 2021 and a photolog presented in **Figure 8 and Figure 9**. Two drainage lines, mapped as ephemeral rivers, cross the site from west to east, one is located very near to the northern site boundary while the other almost at the Southern border. Both have been dammed to some extent toward the north eastern edge of the site.

Natural drainage at the proposed site is complex due to the two drainage lines running through the site. The site has two sub-catchments draining to either drainage line, separated by a ridge.

Figure 8 Drainage line running through the northern section of the site

Figure 9 Drainage line running through the centre of the site

WETLANDS

Wetland delineation includes the confirmation of the occurrence of a wetland and the determination of the outermost edge of the wetland. As an initial step, a desktop assessment utilising aerial imagery and available datasets was conducted to determine potential wetland and riparian habitats. This desktop analysis was vital due to the extent of the area under assessment. Following the desktop assessment, an in-field assessment was

conducted in August 2020 to groundtruth and assess the desktop-identified systems, and identify any potential systems that may have been overlooked during the desktop assessment phase.

The outer boundary of the wetlands present at the site were identified and delineated according to the DWS wetland delineation manual, 'A Practical Field Procedure for Identification and Delineation of Wetland and Riparian Areas' (DWAF, 2005a). **Figure 10** depicts the 500m buffer around proposed project infrastructure for the identification of wetlands; and the delineated wetland system.

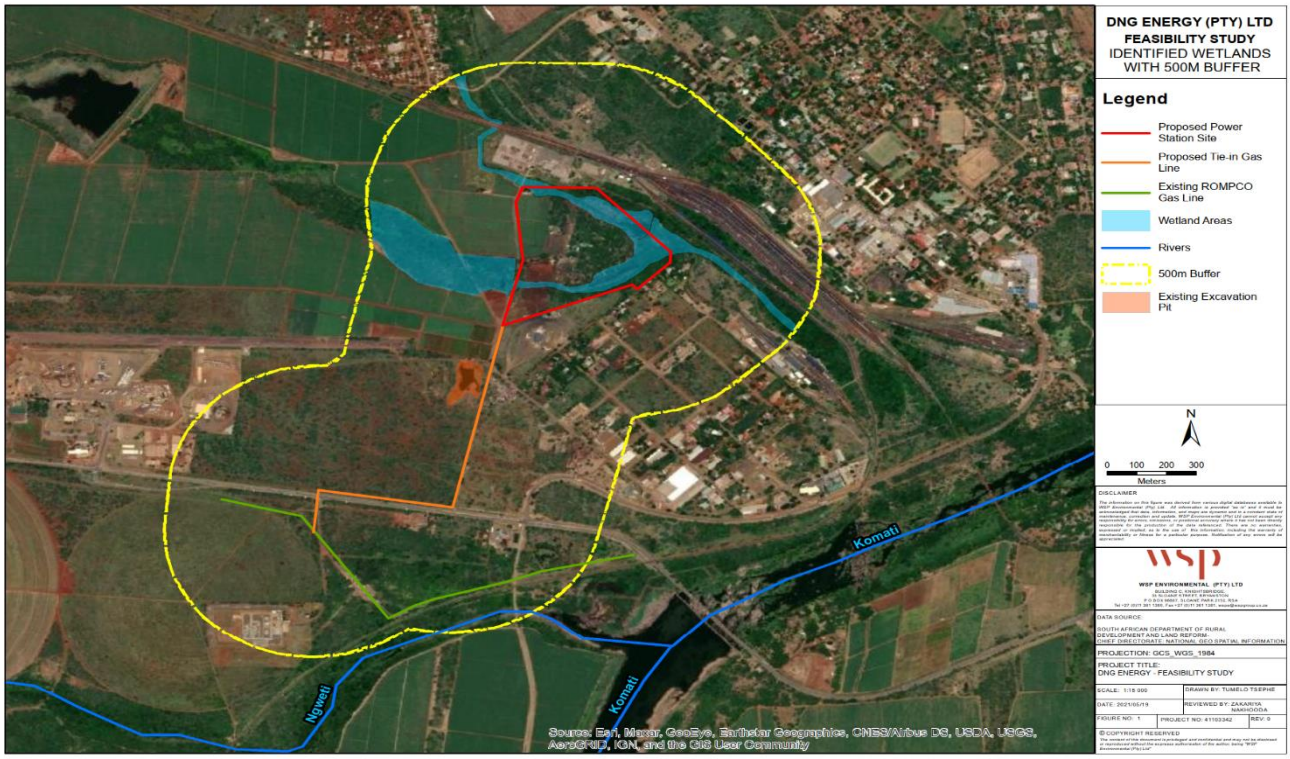


Figure 10 Delineated Wetlands within Project Footprint 500m Radius

5.1.6 GROUNDWATER

The groundwater table is expected to be seasonally variable with summer levels being shallow due to a perched superficial water table while in winter the water table is expected to be limited to pores in decomposed and partially decomposed rock and relatively shallow fractures.

No information on the on-site soil chemistry is currently available. Based on the observed soils and the expected, generally igneous bedrock setting, no aggressive soil or groundwater conditions are expected. The evidence of salt deposits in the borrow pit / existing excavation pit **(Figure 10**) do however indicate that high conductivity groundwater may be present.

The underlying natural geology is considered representative of a minor aquifer of moderate yields and variable water quality with the least vulnerability to contamination and a low susceptibility to anthropogenic activities. Groundwater is most likely contained pores in decomposed and partially decomposed rock and fractures restricted to the zone directly below the groundwater level (above the unweathered bedrock). Groundwater quality is described as Type B & D, dominated by calcium, magnesium or sodium and potassium cations and bicarbonate or chloride and sulphate anions. The total dissolved solids is expected to be 500-1000mg/l. The groundwater quality of the region is expected to have low but measureable conductivity values (70-150 mS/m).

Two registered boreholes (National Groundwater Archive) are present within 2km of the site. These are located to the northeast and southeast of the site. The northern most hole is located in the Komatipoort residential area and is registered as a monitoring well. The southern hole is located in an agricultural field on the opposite side of the Komati River and registered for domestic use. The water level was last measured in 1965 and was 5.49m below ground surface. The monitoring borehole has intermittent data records from 1997 till 2018 that indicate the electrical conductivity has been in the order of 75 mS/m despite some significant variations in the earlier recorded values.

5.2 BIOLOGICAL ENVIRONMENT

FAUNA AND FLORA

Based on the preliminary Desktop Level Ecological Investigation (Scientific Terrestrial Services, October 2020) (**Appendix E**), the focus area falls within an ecosystem of least concern, namely the Thsokwane-Hlane Basalt Lowveld. The focus area is not located within a protected area, however, it is situated approximately 2 km south of the Kruger National Park. According to the Mpumalanga Biodiversity Sector Plan (MBSP, 2014) the north eastern portion of the proposed site is located within an Ecological Support Area (ESA) local corridor, and a small portion of the proposed power plant and the majority of the proposed gas pipeline are located within an irreplaceable Critical Biodiversity Area (CBA). The remaining portions of the study area is located within areas classified as either “heavily modified” or “other natural areas” (**Figure 11**).

The southern (and a portion in the north east of the focus area) has a very high terrestrial sensitivity according to the National Web-Based Environmental Screening Tool (2020). This is attributed to the CBA 1 and ESA within the site, as well as being a focus area for land-based protected areas expansion.

The study area is considered to have a medium sensitivity for flora due to the potential presence of the sensitive species such as *Pavetta zeyheri subsp. microlancea*. In terms of fauna, the majority of the study area is considered to have a medium sensitivity due to the potential presence of sensitive species such as Sensitive Species 2 and *Aves – Circus ranivorus* (African marsh harrier) and *Sagittarius serpentarius* (Secretarybird). Scattered portions throughout the study area is considered to be of high animal sensitivity due to sensitive species such as *Aves – Ephippiorhynchus senegale* (saddle-billed stork).

According to the Plant of Southern Africa online database and the Mpumalanga State of Environment Report, there are several floral and faunal Species of Conservation Concern (SCC) on site. Should these species be present within the focus area, they will require rescuing and relocation to a similar habitat within the vicinity of the focus area before any construction activities commences. A field assessment is required to establish whether suitable habitat exists to support these species within the focus area.

Figure 11 Biodiversity Map of the Project Area (WSP, 2021)

5.3 SOCIAL ENVIRONMENT

5.3.1 LAND USE

DEVELOPMENT SITE

A visual inspection of the site was done in April 2021. Vegetation on the site consists of natural vegetation with active sugar cane agriculture (**Figure 12**) and cleared areas in the northern half of the site, and a smaller, cleared area in the south. The Site was previously used as a recreational facility consisting of a caravan park and chalets with a pool and other buildings. These are all abandoned and only remnants of these buildings and infrastructure are evident (**Figure 13**). A detailed investigation into existing infrastructure is required for before further development of this project by way of full engineering survey of all above and below ground infrastructure and services on and within agreed upon proximity to the site (**Figure 14**). There are currently two powerlines crossing the site from North to South. These lines should be moved with the approval from Eskom to enable the construction to proceed.

Figure 12 Sugarcane Plantation within Planned Power Plant Footprint

Figure 13 Abandoned Buildings on Site

Figure 14 Proposed gas pipeline route crossing N4 road to connect to an existing Rompco pipeline

SURROUNDING AREAS

The study area is located south of the railway line within the town of Komatipoort and the proposed gas pipeline runs from the proposed power station to the N4 National Highway located south of the proposed power station.

A review of Google Earth imagery from 2005 until present day indicates that area now occupied by the truck repair centre, just south of the proposed site, was previously used for agriculture until at least 2014 after which the truck centre was developed and completed by 2019. Other than the truck repair centre, the site and the surrounding area land use has not changed significantly since 2005. The borrow pit was in the early stages of development in 2005.

The site is surrounded by:

- Substation and railway siding infrastructure directly to the north
- Agricultural smallholdings to the west
- Truck repair centre to the south, and
- Agricultural lands to the west

The Komatipoort Airport is located approximately 1.3km west of the site, beyond the borrow pit. The site is approximately 3.6km to the west of the Lebombo / Mozambique border post.

5.3.2 TRANSPORT NETWORK

The local road network consists of surfaced roads within the southern suburb of Komatipoort, located between Rissik Street to the south and east and the railway yard to the north-east. The local roads take access off the R571 (Rissik Street), which connects to the N4 freeway at a side-road Stop controlled 4-way intersection.

5.3.3 HERITAGE AND CULTURAL RESOURCES

The Phase I Archaeological and Cultural-Heritage Impact Assessment (Mulaifa Development Projects, October 2020) (**Appendix C**) for the proposed site has revealed that archaeological sites (Stone Age and Historic Archaeological), cultural heritage sites, burial grounds or isolated artifacts are unlikely to be present on the affected landscape. The project receiving area is situated on previously disturbed land parcels. As such, the proposed development will be an in situ development that will be contained within existing developments in the periphery of the site of interest. Intangible impacts to the sense of a place within the project's receiving environment was assessed and deemed to be limited given the level of existing built-up areas in the project footprint area. In addition, the SAHRA database indicates that the project footprint falls within an Insignificant / Low palaeosensitivity area (**Figure 15**).

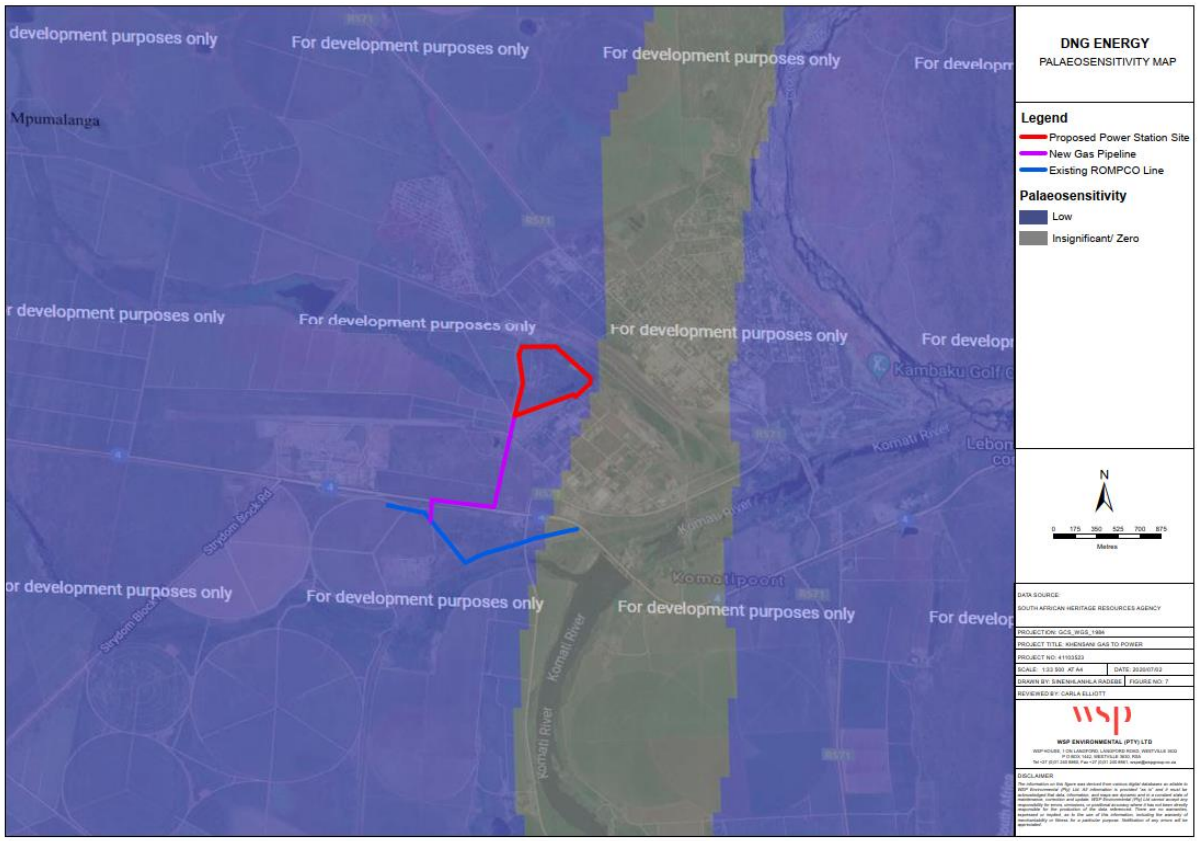


Figure 15 SAHRA Palaeosensitivity Map

5.3.4 SOCIO-ECONOMIC

GOVERNANCE

Provincial Government

Mpumalanga Province is located in the north-eastern part of South Africa. The province borders two of South Africa's neighbouring countries viz. Mozambique and Swaziland; and other South African provinces namely; Gauteng, Limpopo, KwaZulu-Natal and Free State Provinces. Mpumalanga is characterised by the high plateau grasslands of the Middleveld, which rolls eastwards for hundreds of kilometres. In the north-east, it rises towards mountain peaks and terminates in an immense escarpment (www.municipalities.co.za).

Mpumalanga province covers an area of 76 495km² and has a population of approximately 4 335 965 (IDP, 2017). The capital city of Mpumalanga is Mbombela (previously Nelspruit) and other major cities and towns include Emalahleni (previously Witbank), Standerton, eMkhondo (previously Piet Retief), Malelane, Ermelo, Barberton and Sabie. The province is divided into three district municipalities namely, Gert Sibande, Ehlanzeni and Nkangala Districts. These 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.

District Municipality

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

The municipality is also rich in terms of its biodiversity and mineral resources. Gold mines are operating at Barberton and Pilgrims Rest and chrome mines at Lydenburg. The future development of the Eastern Limb of the Bushveld Complex directly west of Lydenburg will also have an influence on the future land use patterns within the Thaba Chweu Local Municipality. The Biodiversity within Ehlanzeni also plays a significant role in terms of boosting the tourism industry with the Kruger National Park as one of the major destinations for international and domestic tourism.

Local Municipality

The proposed development is located within the Nkomazi Local Municipality which is a Category B Municipality with a total area of 4 787km² within the Ehlanzeni District Municipality. The municipality is strategically placed between Swaziland (north of Swaziland) and Mozambique (east of Mozambique). It is also bounded by Kruger National Park to the north and 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 with Mozambique by a railway line and the main national road (N4), which forms the Maputo Corridor.

The following Local Municipality description has been sourced from *Nkomazi Local Municipality Draft Integrated Development Plan (2017-2021)*.

EMPLOYMENT

Official unemployment rate was 32.3% during Quarter 2 of 2017. The unemployed youth (15-34yr) was 68.9% of the total unemployed.

POVERTY

The population below the lower bound poverty line (LBPL) was estimated at 42.6% in 2015), at R647 per person per month.

BASIC SERVICES AND INFRASTRUCTURE

Access to Water

The number of households with access to piped water in 2016 was 85.3% of households According to stats SA community profile and community, survey 2016 only 10% of piped water to homes is located in the dwelling as opposed to in the yard. Community still also rely on community stands and boreholes within the yard The Municipality anticipate to deal with the currently backlog of those not having access to clean water, and piped water inside yard by upgrading the existing infrastructure, extend reticulation, upgrade bulk and construct new reservoir to improve its level of provision in service delivery. Access to clean water is closely associated with development and community health in particular. Nkomazi has the second worst Blue Drop status and the worst Green Drop water status in the province[8].

Access to Sanitation

The share of households with access to flush/chemical toilets deteriorated between 2011 and 2016 with only 13.6 of households with flush/chemical toilets in 2016.

Access to Electricity

According to stats SA censuses 2011, only 33% of the community house olds have access to electricity. Nkomazi Local Municipality is currently servicing the 4 towns which is Malelane, Marloth park, Koomatipoort and Hectorspruit in provision of electricity. The Municipality plans to service more areas faces a challenge with revenue enhancement to allow for roll out of the service to additional areas of Nkomazi.

Refuse Removal

According to Nkomazi waste management Nkomazi is currently servicing 83 742 households and contains of 20 223 backlog of households without access to waste collection.

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[8] The concept was defined by two programmes: The Blue Drop Certification Programme for Drinking Water Quality Management Regulation and the Green Drop Wastewater Quality Management Regulation.

6 IDENTIFICATION OF POTENTIAL IMPACTS

The scoping phase of a S&EIR process is aimed to identify potential impacts that are most likely to be significant and which need to be assessed as part of the S&EIR process. The determination of anticipated impacts associated with the proposed development is a key component to the S&EIR process. This Chapter identifies the anticipated environmental and social impacts associated with the proposed project.

The issues identified stem from those aspects presented in **Section 5: Description of Baseline Environment** and the description of project components and phases as outlined in **Section 2: Project Description**. Each significant issue identified is to be investigated further during the S&EIR process. Non-significant issues will be scoped out of the study with reasonable consideration given within the Scoping Report.

6.1 AIR QUALITY

Receptors are identified as areas that may be impacted negatively due to emissions from the proposed facility. Examples of receptors include, but are not limited to, schools, shopping centres, hospitals, office blocks and residential areas. A 2km radius / area of influence proposed for the project includes the entire town of Komatipoort. Preliminary receptors identified include a school, childcare facilities, and several churches.

Construction Phase Impacts

Dust Emissions

Heavy construction is a source of dust emissions that can have a substantial temporary impact on the local air quality situation. Emissions during construction are associated with land clearing, drilling and blasting, ground excavation and cut and fill operations. Dust emissions vary substantially on a daily basis, depending on the level of activity, the specific operations and the prevailing meteorological conditions. A large portion of dust emissions results from movement of equipment and traffic over temporary roads at the construction site. The use of project-related vehicles and machinery can also result in an increase of gaseous emissions and potentially contributing to reduced ambient air quality.

Operational Phase Impacts

Combustion Emissions

The combustion of natural gas produces negligible amounts of sulphur, mercury, and particulates; however, the significant air pollutant emitted is nitrogen oxides (NOx). Release of emissions may result in decreased ambient air quality and associated nuisance and human health impacts should ambient concentrations of the pollutants exceed the limit values of the National Ambient Air Quality Standards (NAAQS) in sensitive areas (i.e. residential or non-industrial areas).

Mitigation Considerations

- Implementation of standard construction phase mitigation measures (such as wet suppression, dust emissions) to be outlined in the EMPr will assist in controlling emissions and minimising impacts.
- A Continuous Emissions Monitoring System (CEMS) will be installed consisting of one sample probe for each exhaust stack monitoring NOx, exhaust fumes / oxygen gas (O2) and carbon emissions (CO).

Recommended EIA Phase Studies

A detailed Air Quality Impact Assessment (AQIA) will be undertaken during the EIA phase to quantify potential human and environmental impacts of the emissions.

6.2 NOISE AND VIBRATIONS

Construction Phase Impacts

Noise and Vibration Emissions

The following construction-related activities are likely to generate vibrations and additional noise into the environment:

- Presence of workforce
- Land clearing
- Drilling and blasting
- Cut and fill operations
- Vehicle activities associated with transport of equipment
- Use of equipment and machinery
- Concrete mixers and cranes

Vibrations and audible increase in noise can lead to the disturbance and nuisance to sensitive receptors. A receptor is defined by the WBG (April 2007) as "any point on the premises occupied by persons where extraneous noise and/or vibration are received". Examples of receptor locations within the project area include residential households and schools within close proximity to the proposed project area.

Operational Phase Impacts

Noise Emissions

Principal sources of noise in thermal power plants include the turbine generators and auxiliaries; boilers and auxiliaries, such as reciprocating engines; fans and ductwork; pumps; compressors; condensers; precipitators, including rappers and plate vibrators; piping and valves; motors; transformers; circuit breakers; and cooling systems. The proposed power plants will be used for base load operations and will therefore operate continually - resulting in a significant source of noise in the project area (WBG, April 2007).

Mitigation Considerations

- Implementation of standard construction phase mitigation measures to be outlined in the EMPr will assist in controlling emissions and minimising impacts.
- The following measures are outlined by the IFC / WBG Thermal Power EHS Guideline (December 2008) as having potential to assist to prevent, minimize, and control noise impacts
  - Siting the proposed plant with consideration of distances from the noise sources and receptors (e.g. use of a buffer area around plant).
  - Modification of the plant configuration or use of noise barriers such as berms and vegetation to limit ambient noise at plant property lines, especially where sensitive noise receptors may be present.
  - Use of noise control techniques such as: acoustic machine enclosures; selecting structures according to their noise isolation effect; and using mufflers or silencers in intake and exhaust channels.

Recommended EIA Phase Studies

An Environmental Acoustic Impact Assessment will be undertaken during the EIA phase including the use of a noise propagation model to determine likelihood of offsite impacts to sensitive receptors and identify suitable mitigation and management options (if required).

6.3 TOPOGRAPHY, GEOLOGY AND SOILS

Construction Phase Impacts

Constructability

The site is generally categorised as flat, and lies at about 1550m above mean sea level. Major cut to fill or earth spoiling will likely not be required. Earthworks entailing the following activities will be required for the power plant and pipeline construction: levelling and compaction, excavations and trenching, piling and drilling. Establishment of the power plant will have little to no impact on the general topography of the site; and the site topography is generally regarded to be adequate to support the feasibility of the power plant. Initial geotechnical investigations indicated that the superficial soils present (varying depth) represent a generally poor construction material. The soils are also expected to be expansive. Deeper excavations will yield natural gravels from the weathered rock layers. Based on the observed felsic nature of the bedrock, these gravels will be suitable for use in layer works and pavement layers. The bedrock is, however, expected to also include mafic lavas which will likely be more weathered and the gravels from such areas may include expansive clays.

Operational Phase Impacts

N/a

Mitigation Considerations

- The removal of the unsuitable soil and loose weathered rock, and replacement with compacted suitable material across the areas for the plinths is recommended.
- A topographical survey of the site needs to be undertaken to optimise the designs of the site to accommodate the power plant and building platforms, access roads, internal roads and drainage.
- Sourcing of construction material from licenced quarries and imported to site for construction (plinths, terraces and roads).
- Detailed material assessments should be done to confirm the suitability of gravels for use in plinth foundation layers or structural pavements layers (depending on design traffic loads).
- Progressive rehabilitation will be essential to reduce the potential for soil erosion and sedimentation.

Recommended EIA Phase Studies

N/a

6.4 DRAINAGE LINES AND WATERCOURSES

Construction Phase Impacts

Physical Disturbance and Sedimentation

The construction of the project components will result in clearing of vegetation, levelling and excavation / trenching. The removal of vegetation can result in exposure of bare soil to wind and rainfall leading to an increase in erosion potential. Generation of excess excavation material will require spoiling / stockpiling which can also lead to an increased risk of soil erosion. Rainfall on unconsolidated sediment has the potential to cause an indirect impact as runoff with higher sediment load enters surrounding drainage lines leading to sedimentation of watercourses and reduced water quality (due to increased turbidity). This has the potential to result in negative secondary impacts on receiving environments and ecosystem functioning.

Operational Phase Impacts

Increased runoff, Flow Changes and Sedimentation

Natural drainage at the proposed site is complex due to the two drainage lines running through the site. The site has two sub-catchments draining to either drainage line, separated by a ridge. Compacted soils and increased hardened surfaces associated with project infrastructure has the potential to result in change in runoff profile, increased stormwater flow, sheet erosion and sedimentation of surface water resources. This has the potential to result in negative secondary impacts on receiving environments and ecosystem functioning.

Mitigation Considerations

Prevention of soil erosion and uncontrolled flow of water across the site is an essential design requirement. The project will include stormwater management infrastructure (drainage and containment) to protect project assets and control surface water flow.

Recommended EIA Phase Studies

N/a

6.5 WETLANDS

Construction Phase Impacts

Physical Disturbance and Stormwater Discharges

The desktop review and subsequent infield assessment (through soil sampling and an analysis of vegetation) identified the following wetland systems on the properties adjacent the proposed power plant:

- Two channelled valley bottom wetlands;
- An un-channelled valley bottom wetland, and
- Two hillslope seepage wetlands.

Proposed construction activities in close proximity to these wetland systems have the potential to affect resource ecosystem drivers (flow regime, water quality, geomorphological) and responses (habitat, biota) resulting in a decline of Present Ecological State (PES), wetland sensitivity and importance and ecological functioning.

Functionality could potentially be impacted upon by the proposed project; however, the wetland areas have been substantially modified. With the incorporation of the proposed mitigation measures, further degradation can be prevented.

Operational Phase Impacts

Stormwater Discharges

Stormwater discharges from the site have the potential to affect resource ecosystem drivers (flow regime, water quality, geomorphological) and responses (habitat, biota) resulting in a decline of Present Ecological State (PES), wetland sensitivity and importance and ecological functioning. Functionality could potentially be impacted upon by the proposed project; however, the wetland areas have been substantially modified. With the incorporation of the proposed mitigation measures, further degradation can be prevented.

Mitigation Considerations

- A Stormwater Management Plan (SWMP) should capture the storm water and release it in a natural pattern, taking cognisance of natural hydrological patterns and processes. The SWMP must cater diversion of “dirty” water from entering drainage lines.
- All storage areas will require licencing in terms of Section 21 of the National Water Act.
- An Indicative Flood Risk Assessment will be conducted as part of the WULA.
- Any activity that has the potential to pose a risk to the resource quality characteristics constitutes a water use in terms of Sections 21(c) and (i).
- The best practice specifications within the DWS ‘Integrated Environmental Management Series – Environmental Best Practice Specifications’: ‘Construction’

(DWAF 2005b) & 'Operation' (DWAF 2005c) Guidelines should be implemented, along with the project-specific mitigation measures that will be outlined in the EMPr and WUL.

- A 30m buffer was mapped (**Figure 16**) during wetland delineation and should be considered a key construction parameter. The buffer should be adhered to in order to avoid direct loss of wetland habitat.

Recommended EIA Phase Studies

N/a

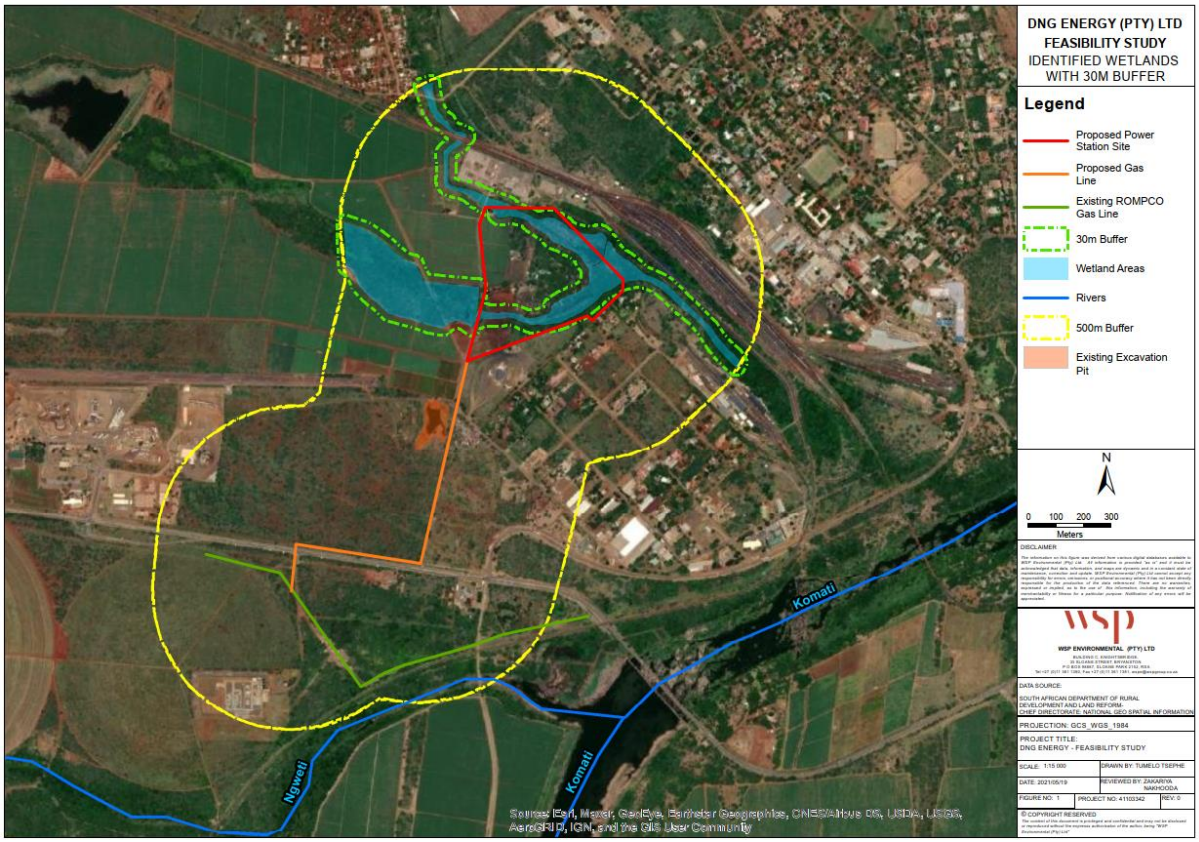

Figure 16 Wetland Delineation and 30m Buffer

6.6 GROUNDWATER

Construction Phase Impacts

Dewatering Impacts

The groundwater table is expected to be seasonally variable with summer levels being shallow due to a perched superficial water table while in winter the water table is expected to be limited to pores in decomposed and partially decomposed rock and relatively shallow fractures. A possibility exists that dewatering will be required during deeper excavations if these take place over the summer months.

Operational Phase Impacts

Conductivity / Design Requirement for Cathodic Protection

The evidence of salt deposits in the borrow pit / existing excavation pit (**Figure 10**) indicate that high conductivity groundwater may be present and as such specialist cathodic protection systems may be required for all metallic services placed underground. This will

not affect the feasibility of the proposed development; however, design needs to be informed by additional ground investigations.

Mitigation Considerations

- The dewatering and storage may only be exercised once the water use has been registered and conditions stipulated by DWS (i.e. General Authorisation likely to be required).
- Detailed soil and groundwater study should be performed during design stages to inform the required measures to prevent corrosion of underground services.

Recommended EIA Phase Studies

N/a

6.7 HAZARDOUS SUBSTANCES AND POLLUTANTS

Construction Phase Impacts

Soil, groundwater and surface water contamination

Potential exists for soil, groundwater and surface water contamination associated with potential releases of small quantities of environmental contaminants and hazardous substances. Sources of pollutants and release mechanisms include:

- Leakages of hydrocarbons (diesel and oil) from construction vehicles and heavy machinery (e.g. excavators and bulldozers).
- Loss of containment and accidental spillage associated with storage and handling of hydrocarbons, chemicals, and concrete.

Runoff creates a preferential pathway and exposure of the above contaminants into the subsurface and water resources leading to a deterioration in water quality and secondary health impacts on aquatic ecosystems and water users.

Operational Phase Impacts

Soil, groundwater and surface water contamination

Hazardous materials stored and used at combustion facilities include solid, liquid, and gaseous waste-based fuels; air, water, and wastewater treatment chemicals; and equipment and facility maintenance chemicals (e.g., paint, lubricants, cleaners, ammonia for NO_X control systems, and chlorine gas for treatment of cooling tower and boiler water).

Potential exists for soil, groundwater and surface water contamination associated with potential accidental releases due to loss of containment. This has the potential to lead to deterioration of surface water quality and secondary health impacts on downstream aquatic ecosystems and water users.

Pesticides

Wooden poles will like be used for installation of the overhead transmission lines (OHTL). Pesticides / herbicides may be used to manage and control vegetation within the OHTL RoW. Majority of wooden utility poles are treated with pesticide preservatives to protect against insects, bacteria, and fungi, and to prevent rot. According to WBG (April 2007) wood preservatives most commonly used for power poles are oil-based pesticides such as creosote and pentachlorophenol (PCP); and chromated copper arsenate (CCA). Use of these preservatives is being limited in some countries due to their toxic effects on the environment. While in use, poles may leach preservatives into soils and groundwater; however, levels are highest directly beside poles and decrease to within normal levels at approximately 30cm distance from the pole.

Mitigation Considerations

- A SWMP and system must ensure separation of clean and dirty water.
- A soil and water monitoring program should be set up prior to the proposed development being initiated in order to arrive at a comprehensive baseline dataset from which future site contamination can be judged. This should include the installation of groundwater monitoring wells at selected locations across the site and, more specifically, around the proposed development footprint. The analysis of soil samples obtained from the development of those wells should also be performed. Additional soil samples can also be obtained for analysis during any early intrusive works (e.g. design stage geotechnical investigations).
- The use of baseline contamination studies prior to development, coupled with the development of a detailed routine monitoring system after the commissioning of the plant, will be required to manage contamination from the development.
- Application of pesticides / herbicides should be managed to avoid migration into off-site land or water resources.

Recommended EIA Phase Studies

N/a

6.8 WASTE MANGAEMENT

Construction Phase Impacts

Generation of General Waste

Table 13 provides a summary of the typical general waste types that are likely to be generated on site during construction. The presence of construction workers has the potential to increase litter on site in the absence of adequate waste receptacles. This results in an unsightly working environment and possible entry into surrounding environment. Furthermore, waste materials may attract pest species / vectors into working areas leading to potential health implications for construction staff and community members.

Spoil material unsuitable for reuse as backfill and bedding material has the potential to disrupt land use and habitats if inappropriately manage or disposed illegally.

Waste generation (domestic waste, mixed industrial and metal waste) and a lack of appropriate separation, temporary storage and recycling (i.e. not aligned with the Waste Hierarchy) has the potential to result in unnecessary waste material to landfill.

Table 13 Description of Construction Phase General Waste Streams

Waste Category	*Waste Type*	*Typical Constituents*
General Waste	Domestic Waste	Paper and cardboard packaging, empty plastic and metal containers (non-hazardous original contents) etc.
	Organic Waste	Canteen, food and cooking waste
	Mixed Industrial	Wood, plastic, packaging etc.
	Metal Waste	Ferrous and non-ferrous scrap and stainless steel, metal cuttings, electrode stubs from welding.
	Spoil Material	Excavations, trenching and terracing will result in the generation of spoil material
	Building rubble	Wasted flooring material, paint containers, wall tiles, timber, piping etc.
	Biomass	Cleared vegetation

Generation of Hazardous Waste

Table 14 provides a summary of the typical hazardous waste types that are likely to be generated on site during construction. Hazardous waste generation and inappropriate management and disposal has the potential to lead to contamination of soil, groundwater and surface water.

Table 14 Description of Construction Phase Hazardous Waste Streams

Waste Category	*Waste Type*	*Typical Constituents*
Hazardous Waste	Oily Waste	Used lubricant and hydraulic oils and hydrocarbon based solvents
	Oil Contaminated Waste	Solid material (rags etc.) that has come into contact with and contains traces of oil or grease
	Hazardous Chemical Containers	From temporary storage and use of chemicals on site
	Health Care Risk Waste (HCRW)	Waste generated as workers camp medical services
	Sanitary Waste	Sewerage / faecal matter generated at the contractor's camp

Sanitation Waste

Sanitation services are required to accommodate workers on site, contractor's yard and at site camps along the route. Temporary ablution facilities (chemical toilets) are proposed to appropriately contain and treat waste for offsite disposal. The incorrect siting of chemical toilets (i.e. within 100m of a watercourse or stream) and loss of containment could lead to pollution of the receiving environment (soil, groundwater and surface water), leading to secondary health impact to ecosystems and communities (ground and surface water users).

Sanitary waste, if not correctly contained, has the potential to enter surface water via runoff and increase organic matter loading in water systems.

Operational Phase Impacts

Generation of General Waste

Table 15 provides a summary of the typical general waste types that are likely to be generated on site during operation. Waste generation (domestic waste and mixed industrial) and a lack of appropriate separation, temporary storage and recycling (i.e. not aligned with the Waste Hierarchy) has the potential to result in unnecessary waste material to landfill. However, it is noted that only small volumes of waste are anticipated to be generated by the facility during operations.

Table 15 Description of Operational Phase General Waste Streams

Waste Category	*Waste Type*	*Typical Constituents*
General Waste	Domestic Waste	Paper and cardboard packaging, empty plastic and metal containers (non-hazardous original contents) etc.
	Organic Waste	Canteen, food and cooking waste
	Mixed Industrial	Wood, plastic, packaging etc.

Generation of Hazardous Waste

Table 16 provides a summary of the typical hazardous waste types that are likely to be generated on site during construction. Hazardous waste generation and inappropriate management and disposal has the potential to lead to contamination of soil, groundwater and surface water.

Table 16 Description of Construction Phase Hazardous Waste Streams

Waste Category	*Waste Type*	*Typical Constituents*
Hazardous Waste	Oily Waste	Used lubricant and hydraulic oils and hydrocarbon based solvents / oily sludge from oil-water separators
	Spent sweetening and dehydration media	e.g. molecular sieves
	Oil Contaminated Waste	Solid material (rags etc.) that has come into contact with and contains traces of oil or grease
	HCRW	Waste generated from on-site medical services for staff
	Hazardous Chemical Containers	Large volumes of chemicals will be stored at the WTW Disinfection and Clear Water Storage

Effluent

It is noted that the closed-circuit cooling water system is planned for the power plant therefore no cooling water effluent will be generated.

The key effluent likely to be associated with the operation of the power plant is from the oily water system. Chemical additives may be added to the water to prevent internal corrosion. Discharge of this effluent into the receiving environment will lead to contamination and therefore it must be managed appropriately.

Sewage and other wastewater generated from washrooms, etc. are similar to domestic wastewater. It is anticipated that the sewage will be discharged into the municipal sewerage system.

Mitigation Considerations

- Despite the modest volumes of waste anticipated to be generated by the Project, recycling opportunities should be sought in order to reduce the volume of waste to landfill and harness commercial benefits for both the project team and local community.
- Provisions of suitable waste receptacles for temporary storage of general and hazardous waste (in compliance with Material Safety Data Sheets).
- Collection and disposal of hazardous waste at appropriately licences landfills and proof of disposal to be retained by contractors and facility operators.
- Treatment of effluent must comply with discharge standards prior to discharge.
- Any planned discharge will need to apply for and comply with a Discharge Permit.

Recommended EIA Phase Studies

N/a

6.9 BIODIVERSITY

Construction Phase Impacts

The key activities associated with development activities that may affect the ecology of the area include:

- Establishment of work camp/s;
- The utilisation of temporary tracks to the footprint areas;

- Vegetation clearing for the site establishment and site levelling;
- Alien species proliferation due to edge effects caused by vegetation clearing for access roads and site establishment;
- Trenching for the establishment of the gas pipeline, should the proposed gas pipeline be underground; and
- Digging for the pylons of the powerlines.

Loss and Fragmentation of Vegetation and Habitat

Temporary fragmentation of vegetation communities can lead to:

- Disturbance and potential loss of portion of certain vegetation types and associated floral species assemblages (habitat destruction).
- Encroachment of alien vegetation across the project development footprint, which will compete with indigenous species for water resource.

Site preparation and clearing has the potential to result in the direct loss or temporary fragmentation of vegetation communities. Permanent loss of floral Species of Conservation Concern (SCC) may occur if the proposed site footprint and construction activities takes place within sensitive habitat units.

Loss and Displacement of Fauna

The construction of project infrastructure will require the clearance of soil and vegetation (possibly providing refuge or breeding grounds to fauna). These activities will cause disturbance and displacement of local fauna (including possible threatened or protected species) due to habitat loss; and/or direct mortalities. Although it is assumed that the majority of fauna species will move to different areas because of disturbance, some protected fauna species have very specific habitat requirements, and the disturbance of sensitive habitats will result in displacement to less optimal habitats.

Secondary impacts associated include the destruction and disturbance to local breeding grounds and nesting sites; leading to potential decrease in population densities of threatened and protected species. If development takes place within the sensitive habitats permanent loss of faunal SCC carrying capacity will potentially occur.

Disturbance to Migration Routes and Temporary Displacement of Fauna

Linear development footprint associated with the pipeline and OHTL may potentially be providing a faunal migration corridor. Linear infrastructure results in a fragmentation effect and disturbance to the movement and migration of faunal species.

Operational Phase Impacts

No impacts anticipated.

Mitigation Considerations

- The preferred project layout must avoid sensitive habitats as far as possible.
- Suitable reinstatement of excavated areas.
- Pipeline routes to be aligned as far as possible with existing servitudes.
- Detailed biodiversity assessment (including avifauna) is required to determine sensitivity, quantify potential impacts to flora and fauna, and provide for recommendation of mitigation measures.
- Alien and invasive vegetation control should take place throughout the duration of the construction and operation phases.

Recommended EIA Phase Studies

N/a

6.10 VISUAL AND LANDSCAPE

Construction Phase Impacts

Change in Aesthetics

The movement of construction vehicles and machinery on untarred roads results in dust, which has the potential to lead to temporary reduced visibility within close proximity to the construction areas.

Loss of vegetation during land clearing increases the visibility of contrasting soils, resulting in changes to the colour and texture of the site. Clearing vegetation will also result in increased windblown dust, reducing visibility of both day and night skies.

Operational Phase Impacts

Change in Aesthetics

Visual impacts associated with the project typically concern the appearance of the new power plant infrastructure and its interference with the character of the surrounding landscape, particularly to nearby residential communities. Consideration should be given to the landscape character during siting and visual impacts from relevant viewing angles.

Mitigation Considerations

- Steep slopes should be avoided, erosion control measures, and revegetation procedures implemented.

Recommended EIA Phase Studies

- Consideration should be given to the landscape character during siting and visual impacts from relevant viewing angles.

6.11 HERITAGE AND CULTURAL RESOURCES

Construction Phase Impacts

Disturbance to Known Cultural Resources

Construction activities may lead to disturbance or destruction of cultural resources (archaeological and historical remains and sacred sites e.g. graves) should the development footprint encroach on identified cultural/heritage sites.

Based on the information from the SAHRA Standards of Best Practice and Minimum Standards and the NHRA (Act 25 of 1999) grading scale, key findings include:

- Field survey did not identify any cultural heritage resources, historical monuments, burial grounds or archaeological resources within the proposed project development area.
- Although the affected general landscape is associated with historical events such as white settler migration, colonial wars and the recent African people of the region, no listed specific historical sites are on the proposed development sites. The more common functions of places of cultural historical significance may include, historical building or structures older than 60 years.

Chance find of Cultural Resources

Earthworks may accidentally expose unidentified subsurface fossil remains. This will result in a lost opportunity to preserve local cultural heritage and historical records should appropriate management measures not be in place (e.g. Chance Find Procedure).

Operational Phase Impacts

No impacts anticipated.

Mitigation Considerations

- Chance Find Procedure must be included in the EMPr.

Recommended EIA Phase Studies	N/a

6.12 LOCAL ECONOMIC DEVELOPMENT AND EMPLOYMENT

Construction Phase Impacts

Employment

Construction activities will be undertaken by local contractors, as far as possible. The project will therefore contribute to employment within the contractor company(s).

In addition, it is likely that the project will result in the creation of new temporary employment opportunities with the possibility of also benefitting surrounding communities. This will result in increased income generation in marginalised communities on condition that local labour is sourced.

Local Business Opportunities

The Project will require goods and services throughout construction phase. There will therefore be opportunities for local businesses to provide these goods and services e.g. catering/food and beverages for the workers' camp, construction material, office-related supply opportunities and services such as cleaning, general consumer goods etc. As a result, existing local businesses may expand or new businesses may be established locally to meet these demands – providing indirect employment opportunities and short-term growth in the regional economy.

Operational Phase Impacts

Employment

The operation phase also presents opportunities for job creation and local income generation, as there will be a need for people to operate and maintain the power plant and associated infrastructure. Indirect benefits relate to improved electricity supply in the region to support planned industrial activity resulting in indirect increased employment opportunities.

Local Business Opportunities

The Project will require goods and services throughout the operational phase. There will therefore be opportunities for local businesses to provide these goods and services e.g. plant maintenance, catering/food and beverages for operational staff, and office-related supply opportunities and services such as cleaning, general consumer goods etc. As a result, existing local businesses may expand or new businesses may be established locally to meet these demands – providing indirect employment opportunities and short-term growth in the regional economy.

Mitigation Considerations

- The engagement and employment of local contractors and emerging sub-contractors for construction work is crucial to the success of projects in the region. Early identification and participation with locals will benefit the project and contractors and will mitigate community risks.
- Wherever possible personnel should be sourced from the local communities for unskilled, semi-skilled and skilled labour in the communities.

Recommended EIA Phase Studies	N/a

6.13 COMMUNITY HEALTH SAFETY AND SECURITY

Construction Phase Impacts

Environmental Housekeeping

Poor construction management practices may lead to adverse effects on safety, human health and well-being. A number of hazards threaten the public safety and security during the construction phase, the below are discussed in more detail in **Section 6.1** (Air Quality) and **Section 6.7** (Hazardous Substances and Pollutants).

- Air Emission: Short-term dust is primarily a nuisance factor to nearby receptors but may cause acute health issues (e.g. eye irritation, breathing problems) if acceptable standards are exceeded.
- Accidental Release of Contaminants: Improper chemical storage and handling may expose the communities to hazardous chemicals, which may affect their health.

Traffic and Transportation

The project will result in an increase of vehicles on roads in the project area to transport workers, goods, materials and machinery to and from the project site during construction. The increase in vehicles, particularly heavy haulage vehicles, increases the potential for accidents and injuries to pedestrians and other motorists.

Influx of Construction Workers in Local Communities

It is likely that a local civil contractor will be appointed for the work and it is anticipated that the majority of the workers will be sourced from the local area and will commute to work on a daily basis. Therefore, this project does not trigger any major concerns about migrant labour issues / Sexual and Gender Based Violence (SGBV), and communicable diseases.

During construction, however the workforce will be accommodated at camps and it is assumed that sub-contractors will provide a range of on-site amenities inside the camps. This will, to some extent minimise the need for the workforce to use (or rely on) local infrastructure, i.e. minimising the pressure that may be experienced by community infrastructure and services.

Operational Phase Impacts

Traffic and Transportation

The number of vehicles during operation is likely to be very low, with access required only for operational staff, maintenance and servicing. The risk of accidents and injuries to pedestrians and other motorists is low.

Fire and Explosion Risks

Fire and explosion risk with the potential to result in off-site / community impacts is limited to the gas supply pipeline. There will be no storage of gas or other large quantities of dangerous goods at the power plant. The project will be designed to ensure that the required public safety standards are achieved.

Public Exposure to Electro Magnetic Fields (EMF)

According to the WBG (April 2007) EHS Guideline: Electric Power Transmission and Distribution - although there is public and scientific concern over the potential health effects associated with exposure to EMF (not only high-voltage power lines and substations but also from everyday household uses of electricity), there is no empirical data demonstrating adverse health effects from exposure to typical EMF levels from power transmissions lines and equipment. However, while the evidence of adverse health risks is weak, this will be considered further in the EIA phase.

Mitigation Considerations

Mitigation measures will be developed in the EIA phase upon further evaluation of community health safety and security impacts.

Recommended EIA Phase Studies	– A Transportation Impact Assessment will be undertaken during the EIA phase. – A Quantitative Risk Assessment (QRA) / Major Hazard Installation (MHI) Assessment will be undertaken during the EIA phase.

6.14 PHYSICAL AND ECONOMIC DISPLACEMENT

Construction Phase Impacts	**Involuntary Economic Displacement** The site is presently used primarily for agricultural purposes grown on-site, for cash-crop purposes. Farming activities will cease and the land will be redeveloped. It is noted that the land was secured via a willing buyer willing seller process. The project will not result in involuntary economic displacement.
Operational Phase Impacts	No impacts anticipated.
Mitigation Considerations	N/a
Recommended EIA Phase Studies	N/a

6.15 OCCUPATIONAL HEALTH AND SAFETY

Construction Phase Impacts	**Exposure to Hazards** Physical hazards associated with the use of heavy equipment have the potential to cause accident, injury or illness (due to repetitive exposure to mechanical action or work activity). Single exposure to physical hazards may result in a wide range of injuries Construction activities may also result in an increase in movement of heavy vehicles for transport of materials and equipment. This represents an increased risk of traffic related accidents and injuries to workers and local communities. The use of potentially hazardous chemicals in construction may result in chemical exposure to construction workers resulting in health implications. **Potable Water Supply** Contaminated water can transmit diseases such as diarrhoea, cholera, dysentery, typhoid and polio. Adequate supply of safe potable water should be provided with a sanitary means of collecting the water for the purposes of drinking. Water supplied for consumption and food preparation should meet WHO Guidelines for Drinking-Water Quality (Fourth Edition, 2017) and WHO International Standards for Drinking-water (2011). Inadequacies in water supply can affect health adversely both directly and indirectly as it prevents good sanitation and hygiene. Continued supply to construction workers is therefore essential.
Operational Phase Impacts	The health and safety impacts arising from the following are of particular concern during operation of thermal power plants: **Non-Ionizing Radiation** Combustion facility workers may have a higher exposure to EMF than the general public due to working in proximity to electric power generators, equipment, and connecting high-voltage transmission lines. High-voltage overhead power lines typically contribute the

greatest electric field impacts at a thermal power plant site, as most other potential sources on site are shielded by metallic coatings and earthed, which isolates the electric field almost totally.

Heat

Occupational exposure to heat occurs during operation and maintenance of combustion units, pipes, and related hot equipment.

Noise

Noise sources in combustion facilities include the power generation engines, fans and ductwork, pumps; compressors, condensers, piping and valves, motors, transformers, and circuit breakers

Electrical Hazards

Energized equipment and power lines can pose electrical hazards for workers at power plants.

Mitigation Considerations

General prevention and control measures to address occupational health and safety issues will be recommended in the EIA phase.

Recommended EIA Phase Studies

- Qualitative assessment of the occupational health and safety issues will be provided in the EIA Report.
- Separate from the EIA process, the developer will be required to comply with the requirements of the Occupational Health and Safety Act 85 of 1993, including *inter alia* detailed hazard identification and risk assessment (HIRA).

6.16 CLIMATE CHANGE

Construction Phase Impacts

Greenhouse Gas Emissions

A GHG is any gaseous compound in the atmosphere that is capable of absorbing infrared radiation, thereby trapping and holding heat in the atmosphere. By increasing the heat in the atmosphere, greenhouse gases are responsible for the greenhouse effect, which ultimately leads to global warming and contributes to the negative effects of climate change.

Additional journeys will be completed during the construction phase, associated with the transportation of materials to and from the construction areas. The exhaust emissions will contribute to the presence of GHGs in the atmosphere.

Measures could be considered in respect of the construction phase i.e. attempting to implement GHG emissions reductions measures within the EPC contractor's activities. However, given the site locality, it is anticipated that typical measures (such as stipulating that the EPC contractor measure and report on their GHG emissions during construction and try to incentivise a reduction via the use of energy efficient trucks etc.) are unlikely to be practical or worth the effort (or cost).

Climate Risks and Vulnerability

Loss of topsoil and vegetation community due to soil erosion can be exacerbated by climate change as soil erosion is mostly the result of extreme but short rainfall events. Therefore, changes of precipitation intensity and frequency could exacerbate soil erosion processes.

Operational Phase Impacts

Greenhouse Gas Emissions

Carbon dioxide (CO_2) is one of the major GHGs under the UN Framework Convention on Climate Change, and a priority GHG in terms of the National Environmental Management: Air Quality Act - Declaration of Greenhouse Gases as Priority Air Pollutants (GN. R710,

2017). CO_2 is emitted from the combustion of fossil fuels including natural gas. GHG emissions of the facility will be quantified during the EIA phase.

Location Risks and Vulnerabilities

Climate change effects include a change in rainfall events resulting in impacts on increased flooding events and decrease in fresh water availability. Given the potential for an increase in extreme rainfall events across the country, the proximity to the watercourse may present an increased flood risk to the site. The level of uncertainty for the data is such that it is difficult to predict the significance of this risk, especially when such risks are heavily affected by other variables such as up-gradient land-use changes. Secondary impacts of decreased fresh water availability includes risks to operational sustainability.

Mitigation Considerations

Options for the avoidance, minimization, and offsetting emissions of carbon dioxide from the facility will be evaluated in the EIA phase.

Recommended EIA Phase Studies

A GHG emissions inventory and Climate Change Impact Assessment will be undertaken as part of the EIA phase.

6.17 SUMMARY OF IMPACT SIGNIFICANCE SCREENING

This section provides an overview of the likely significance of construction phase (**Table 17**) and operational phase (**Table 18**) impacts presenting the results of the impact screening tool based on two criteria, namely probability and consequence (outlined in **Section 4.4**). This is used as a guide to determine whether additional assessment may be required in the EIA phase.

Table 17 Construction Phase Impacts

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)	Further Assessment Required
Air Quality	Dust Emissions	Negative	1	2	**Minor**	**Yes**
Noise and Vibrations	Noise and Vibration Emissions	Negative	2	1	**Minor**	**Yes**
Topography, Geology & Soils	Constructability	Negative	3	2	**Moderate**	**No**
Drainage Lines & Watercourses	Physical Disturbance and Sedimentation	Negative	2	2	**Minor**	**No**
Wetlands	Physical Disturbance and Stormwater Discharges	Negative	3	3	**Moderate**	**Yes**
Groundwater	Dewatering Impacts	Negative	2	1	**Minor**	**No**
Hazardous Substances and Pollutants	Soil, groundwater and surface water contamination	Negative	2	2	**Minor**	**No**
Waste Generation	Generation of General Waste	Negative	2	2	**Minor**	**No**
	Generation of Hazardous Waste	Negative	2	3	**Moderate**	**No**
	Sanitation Waste	Negative	**2**	**3**	**Moderate**	**No**
Biodiversity	Loss and Fragmentation of Vegetation and Habitat	Negative	**2**	**2**	**Minor**	**Yes**
	Loss and Displacement of Fauna	Negative	**2**	**2**	**Minor**	**Yes**
	Disturbance to Migration Routes and Temporary Displacement of Fauna	Negative	**2**	**2**	**Minor**	**Yes**

Visual and Landscape	Change in Aesthetics	Negative	**2**	**1**	**Minor**	**No**
Heritage and Cultural Resources	Disturbance to known Cultural Resources	Negative	**1**	**2**	**Minor**	**No**
	Chance Find of Cultural Resources	Negative	**2**	**1**	**Minor**	**No**
Socio-Economic	Employment	Positive	**3**	**1**	**Minor**	**No**
	Local Business Opportunities	Positive	**3**	**1**	**Minor**	**No**
Community Health, Safety & Security Risks	Environmental Housekeeping	Negative	**2**	**2**	**Minor**	**No**
	Traffic and Transportation	Negative	**2**	**2**	**Minor**	**No**
	Influx of Construction Workers in Local Communities	Negative	**2**	**2**	**Minor**	**No**
Physical & Economic Displacement	Involuntary Economic Displacement	Negative	**1**	**1**	**Negligible**	**No**
Occupational Health and Safety	Exposure to Hazards	Negative	**2**	**4**	**Moderate**	**No**
	Potable Water Supply Risks & Waterborne Diseases	Negative	**1**	**3**	**Minor**	**No**
Climate Change	Greenhouse Gas Emissions	Negative	**1**	**3**	**Minor**	**Yes**
	Climate Risks & Vulnerabilities	Negative	**2**	**2**	**Minor**	**Yes**

Table 18 Operational Phase Impacts

Receptor	Description	Character	Probability	Consequence	Significance (Before Mitigation)	Further Assessment Required
Air Quality	Combustion Emissions	Negative	2	3	**N3**	**Yes**
Noise and Vibrations	Noise Emissions	Negative	2	2	**N2**	**Yes**
Drainage Lines & Watercourses	Increased runoff, Flow Changes and Sedimentation	Negative	2	2	**N2**	**No**
Wetlands	Stormwater Discharges	Negative	2	2	**N2**	**Yes**
Groundwater	Conductivity / Design Requirement for Cathodic Protection	Negative	2	3	**N3**	**No**
Hazardous Substances and Pollutants	Soil, groundwater and surface water contamination	Negative	2	3	**N3**	**No**
	Pesticides	Negative	2	2	**N2**	**No**
Waste Generation	Generation of General Waste	Negative	2	2	**N2**	**No**
	Generation of Hazardous Waste	Negative	2	3	**N3**	**No**
	Effluent	Negative	2	3	**N3**	**Yes**
Visual and Landscape	Change in Aesthetics	Negative	2	2	**N2**	**No**
Socio-Economic	Employment	Positive	2	3	**P3**	**No**
	Local Business Opportunities	Positive	2	3	**P3**	**No**

Community Health, Safety & Security	Traffic and Transportation	Negative	2	4	**N3**	**Yes**
	Fire and Explosion Risks	Negative	2	4	**N3**	**Yes**
	Public Exposure to Electro Magnetic Fields (EMF)	Negative	2	4	**N3**	**No**
Occupational Health and Safety	Exposure to Hazards	Negative	2	4	**N3**	**No**
	Heat, Noise & Electrical Hazards	Negative	1	3	**N2**	**No**
Climate Change	Reduced GHG Emissions	Positive	3	3	**P3**	**Yes**
	Location Risks & Vulnerabilities	Negative	2	3	**N3**	**Yes**

7 PLAN OF STUDY FOR EIA

7.1 PLAN OF STUDY FOR EIA TERMS OF REFERENCE

Table 19 outlines the structure of the plan of study as required in terms of Annexure 2 of GNR 326.

Table 19 Plan of Study Requirements

PLAN OF STUDY CHAPTER	INFORMATION REQUIREMENT AS PER GNR 326
Description of EIA Tasks	— A description of the tasks that will be undertaken as part of the environmental impact assessment process.
Description of Alternatives	— A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity.
Aspects to be Assessed in the EIA Process	— A description of the aspects to be assessed as part of the environmental impact assessment report process.
Specialist Studies	— Aspects to be assessed by specialists.
Impact Assessment Methodology	— A description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists. — A description of the proposed method of assessing duration and significance.
Environmental Impact Report	— Contents of EIAR as specified in GNR 326 Annexure 2
Stakeholder and Authority Engagement	— 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 environmental impact assessment process.

7.2 OVERVIEW OF THE EIAR TASKS

The EIA phase will consist of the following tasks; each of these tasks is detailed separately in the following sub-sections:

- Specialist studies
- Continuation of authority and stakeholder engagement
- Assessment of the significance of potential impacts
- Preparation of the EIA Report

7.3 DESCRIPTION OF ALTERNATIVES

The EIA process identifies two types of project alternatives:

- Concept Level Alternatives, which relate to the site, technology and process alternatives
- Detailed Level Alternatives which relate to working methods and mitigation measures

The feasibility of the higher-level concept alternatives have been considered and assessed within **Section 2.5** of the DSR. The Detailed Level Alternatives will be addressed within the EIA Report.

7.4 SPECIALIST STUDIES TO BE UNDERTAKEN

7.4.1 DFFE SCREENING TOOL RECOMMENDATIONS

Table 20 below outlines the specialist studies that were identified during the DFFE Screening Assessment. Where a specialist study is deemed not applicable, a motivation has been provided.

Table 20 Required Specialist Studies Identified by DFFE Screening Tool and Confirmation of Inclusion

SPECIALIST	APPLICABILITY	SCOPE OF WORK (IF REQUIRED)
Agricultural Impact Assessment	A visual inspection of the site was undertaken in April 2021. Vegetation on the site consists of natural vegetation with active sugar cane agriculture and cleared areas in the northern half of the site, and a smaller, cleared area in the south. The latter portion was previously used as a recreational facility consisting of a caravan park. The power plant footprint is less than 20ha. As per the DFFE Agricultural Assessment Protocol, a portion of land is for a linear activity (pipeline and OHTL) and does not require assessment. Impacts on the agricultural resource are temporary and the land can be returned to the current land capability within two years of the completion of the construction phase.	Qualitative desktop assessment to verify sensitivity and agricultural potential.
Landscape / Visual Impact Assessment	Change in land use may result in 1) change of local character; 2) Visual intrusion to sensitive receptors.	Qualitative desktop assessment to verify sensitivity and potential disturbance to sensitive receptors.
Archaeological and Cultural Heritage Impact Assessment	A Phase I Archaeological and Cultural-Heritage Impact Assessment was prepared by Mulaifa Development Projects (October 2020) (Appendix C). It indicated that archaeological sites (Stone Age and Historic Archaeological), cultural heritage sites, burial grounds or isolated artefacts are unlikely to be present on the affected landscape.	A Chance Find Procedure will be included in the Environmental management Programme (EMPr).
Palaeontology Impact Assessment	SAHRA database indicates that the project footprint falls within an Insignificant / Low Palaeosensitivity area (**Figure 15**).	Not applicable
Terrestrial Biodiversity Assessment	According to the National web based environmental screening tool, the development area has medium sensitivity for plant species and medium sensitivity for sensitive fauna species. Scattered portions of the development area are considered to be of high fauna sensitivity due to the potential presence of the endangered species saddle-billed stork (*Ephippiorhynchus senegale*). A Desktop Level Ecological Investigation Report was prepared by Scientific Terrestrial Services CC (October 2020) (**Appendix E**).	Refer to **Section 7.5** for proposed scope of work.
Aquatic Biodiversity Assessment	A Wetland Assessment has been undertaken by WSP (April 2021) to determine the PES and EIS of all the wetlands within 500m of the project site as well as delineate these systems to guide the design team as development parameters.	Refer to **Section 7.5** for proposed scope of work.

Hydrology Assessment	A desktop Hydrological Assessment has been undertaken by WSP (April 2021) which provides a description of the hydrological characteristics of the site (catchment, rainfall, evaporation, mean annual runoff etc.). Natural drainage at the proposed site is complex due to the two drainage lines running through the site. The site has two sub-catchments draining to either drainage line, separated by a ridge.	Refer to **Section 7.5** for proposed scope of work.
Noise Impact Assessment	Significant noise sources are associated with both the construction and operational phase of the project – these will therefore both be assessed.	Refer to **Section 7.5** for proposed scope of work.
Traffic Impact Assessment	The number of staff and visitors that will regularly access the site during the construction and operational phases are not known at this stage. There may be a need for additional public transport services to site during construction to support this demand. Non-motorised transport (NMT) to site is feasible; the site is located ~1 km from the Rissik/N4 intersection and 3.0km from the Komatipoort town centre. NMT may therefore utilise the local roads to walk to site from public transport drop-offs in the vicinity. No additional NMT infrastructure can be recommended at this stage.	If more than 50 vehicles per hour are expected to access the site during any peak hour to transport staff to site, a full TIA will be triggered. The TIA should include background vehicle surveys and capacity analysis of local affected road links and intersections, and if mitigating measures are required. An assessment of Public Transport and Non-motorised transport should also be undertaken.
Geotechnical Assessment	Initial geotechnical investigations completed indicated that the superficial soils present (varying depth) will not be suitable for earthworks and represent a generally poor construction material. The removal of the unsuitable soil and loose weathered rock, and replacement with compacted suitable material across the areas for the plinths is recommended. The mentioned geotechnical impediments are relatively minor and easily overcome with sound design and construction management. The proposed development is therefore feasible with respect to geotechnical conditions and the geotechnical setting is generally favourable	Design stage geotechnical investigation is planned to be undertaken by the Technical Team.
Climate Impact Assessment	A Climate Change Assessment will be undertaken as part of the EIA phase to: 1) identify GHG emissions sources; 2) identify potential impacts on core operations and vulnerability to climate change exposure; 3) identify potential impacts on upstream value chain (e.g. logistics, water accessibility, energy provision); and 4) assess climate change related impacts on the local natural environment, surrounding communities, local ambient air quality, and human health.	Refer to **Section 7.5** for proposed scope of work.
Health Impact Assessment	Health impacts are inherently assessed in other proposed specialist assessments including: Air Quality, Acoustics and QRA / MHI.	Not applicable.
Socio-Economic Assessment	The site is contained on privately owned land; therefore, no involuntary physical or economic displacement will occur as a result of the project. It is anticipated that DNG Energy will enter into amicable agreements with all landowners. It is not anticipated that social survey are required to inform the potential negative impacts and positive benefits of the project for the surrounding community. These will be addressed qualitatively in the EIA Report.	Not applicable.

Air Quality Assessment	An Air Quality Impact Assessment (AQIA) is required to quantify impacts during for the construction and operational phases and support the application for an Air Emissions Licence (AEL).	Refer to **Section 7.5** for proposed scope of work.
Plant Species Assessment	Refer to Terrestrial Biodiversity Assessment	Not applicable
Animal Species Assessment	Refer to Terrestrial Biodiversity Assessment	Not applicable

7.5 SCOPE OF SPECIALIST STUDIES

7.5.1 AIR QUALITY IMPACT ASSESSMENT

BASELINE ASSESSMENT

- Review of the receiving environment (sensitive receptors and neighbouring key sources of emissions)[9].
- Meteorological overview with data purchased from the nearest SAWS weather station
- Baseline monitoring campaign comprising:
  - Deployment of a continuous PM_{10} / $PM_{2.5}$ monitor for three months, including the monthly maintenance and download of data
  - Deployment of NO_2/SO_2 passive samplers on a monthly (one month exposure) basis for three months, coinciding with the particulate matter monitoring, with analysis being undertaken by a SANAS Accredited Laboratory.

EMISSIONS INVENTORY

- As required by subcategory 1.5, pollutants requiring assessment will comprise particulate matter (PM_{10} and $PM_{2.5}$), NO_2 and SO_2.
- During the project lifecycle, should additional pollutants require modelling; this proposal will be amended accordingly with all costs for DNG's account.
- WSP will apply the US EPA AP42 emission factors to calculate emissions associated with the construction of the facility, and operation of the reciprocating engines, as required in the South African Dispersion Modelling Regulations, and in alignment with IFC Guidelines.
- Emission concentrations will be calculated for comparison against the subcategory 1.5 minimum emission standards (MES) to ensure compliance with South African legislation, as well as for comparison against the IFC emission guidelines, which stipulate the most stringent standards must be applied (either local or IFC).

PLAN OF STUDY

- WSP will compile and submit the Plan of Study to the relevant licensing authority.

DISPERSION MODELLING

- WSP will apply the AERMOD dispersion-modelling platform, suitable for a project of this kind. Two modelling scenarios will be simulated:
  - Scenario 1: Construction phase of the gas to power plant
  - Scenario 2: Operational phase of the gas to power plant

[9] Neighbouring sources of emissions will not be included into the dispersion model.

- Dispersion predictions will be presented in graphical and isopleth formats, as per the modelling regulation requirements.
- To assess cumulative impacts, model predictions for the proposed project will be combined with the measured ambient data.

ATMOSPHERIC EMISSION LICENSE

- WSP will collect and collate all information required for input into the AEL, with an electronic AEL version being updated for review and approval by DNG.
- After DNG approval, WSP will submit the AEL onto SAAELIP, with the supporting AIR, for the licensing authority's consideration.

WSP will regularly liaise with the authority on approval status, noting the authority has 60 days to make a decision, and a further 30 days to notify the stakeholders of the decision.

7.5.2 ENVIRONMENTAL ACOUSTIC IMPACT ASSESSMENT

BASELINE ASSESSMENT

- Identification of sensitive receptors
- Baseline noise monitoring to determine
- Assessment of monitored noise levels against the relevant South Africa and IFC guideline rating levels.

ACOUSTIC INVENTORY

Guided by the IFC Environmental Health and Safety Guidelines for Thermal Power and Electric Power Transmission and Distribution.

ACOUSTIC MODELLING

- Construction noise impacts will be assessed with the use of attenuation-over-distance calculations.
- Operational phase noise levels will be determined through the use of CadnaA (Computer Aided Noise Abatement)
- Gridded outputs from the model will be input into a Geographic Information System (GIS) software platform to provide a visual representation (isopleth output) of noise levels throughout the region.

ACOUSTIC IMPACT ASSESSMENT

SANS 10328:2008 will be utilised as Methods for Environmental Noise Impact in South Africa.

7.5.3 CLIMATE CHANGE IMPACT ASSESSMENT

BASELINE ASSESSMENT

- Contextualisation of the climate change study within national climate change/GHG legislation and global commitments.
- Global context – the global atmosphere as the receiving environment. IPPC reporting on global emission trajectories and impacts.
- Local context - including climate change projections, considering expected changes in temperature and rainfall; Nationally Determined Contribution (NDC), the Integrated Resource Plan (IRP), and DEAT's Long Term Adaptation Scenarios.

IMPACT ASSESSMENT

- Clear designation of study boundaries and identification of GHG emissions sources.

- Application of emission factors to calculate GHG emissions (IPCC, 2006, South Africa's Draft Methodological Guidelines for Quantification of GHG Emissions) including Scope 1, 2 and 3[10].
- Assessment of impact of emissions on South African and global inventories.

IMPACTS OF CLIMATE CHANGE ON THE PROJECT

- Impacts on core operations – likely exposure to climate changes, sensitivity to such and vulnerability assessment.
- Impacts on upstream value chain.
- Assessment of climate change related impacts on the local natural environment, surrounding communities, local ambient air quality, and human health, and any associated implications for the project.
- Assessment of potential climate change adaptations.
- Assessment of impacts of transitional risks, e.g. proposed carbon taxes.

7.5.4 TERRESTRIAL BIODIVERSITY ASSESSMENT

In order to further characterise the terrestrial environment, and assess how it will be impacted by the proposed Project, the following approach will be undertaken:

DESKTOP REVIEW

- Relevant background information, including the provincial and national datasets, applicable legislation and systematic conservation plans.
- Supplementary baseline terrestrial ecology studies will be undertaken to inform the assessment of impacts.

MAPPING

- Natural and Modified habitat maps of the development area will be prepared, and an assessment of the potential for triggering Critical Habitat designations will be completed.

FIELD VISIT

- To assess the character of the onsite habitat in terms of general species composition, type and extent of disturbances, and habitat suitability for flora and fauna of conservation concern. This will also include identifying any sensitive and important ecological features (species and/or habitats) that may be affected by the proposed pipeline.
- Flora surveys of the power station and pipeline footprint to determine the presence of flora SoC, and bird surveys of the powerline and power station area to define the potential risks to bird SoC. Seasonal bird surveys (spring and autumn) will be undertaken to cover the breeding and migratory seasons, whilst a single flora survey undertaken during the flowering (rainy) season is considered appropriate.

IMPACT ASSESSMENT

- Assess impact of the pipeline on on-site ecosystems, and to identify potential mitigation measures to be included in an environmental management plan.

7.5.5 WETLAND IMPACT ASSESSMENT

WETLAND DELINEATION AND FUNCTIONAL ASSESSMENT

The existing Wetland Assessment Report developed by WSP (2021) will be updated to include an assessment of the proposed pipeline infrastructure. The updated assessment will include:

[10] Completion of Scope 3 emission calculations are heavily reliant on access to and availability of information. WSP cannot be held responsible for a limited Scope 3 emissions inventory due to the lack of available information. Calculation of Scope 3 emissions are only limited to the proposed gas to power facility.

- Updated wetland delineation and classification.
- A functional assessment of the identified wetlands.
- A risk assessment of the identified wetlands.
- Mitigation measures.

The existing Wetland Assessment Report will be updated in accordance with the report requirements stipulated in Annexure D, Section 6 of GN267 so that the report can be submitted as part of the basic assessment, environmental impact assessment or water use licence application processes.

WETLAND REHABILITATION

A wetland rehabilitation strategy will also be compiled, based on the outcomes of the impact assessment, and the data gathered during the field survey. The strategy will consist of the development of specific rehabilitation objectives for existing and predicted wetland impacts, and will include indicators and metrics for the implementation of the proposed mitigation measures.

7.5.6 HYDROLOGY IMPACT ASSESSMENT

ASSESSMENT

The existing desktop study will be updated to include the following and align with the requirements for an IWULA:

- Proposed pipeline infrastructure
- Three surface water quality samples and analysis
- Surface water risk assessment
- Surface water monitoring programme for the construction and operational phase.

Using the DWS Water Authorisation and Registration Management System (WARMS) database, a preliminary assessment of upstream and downstream water users will be undertaken. Furthermore, if available, information pertaining to the reserve associated with the catchment will be sourced and interrogated to define the hydrological setting.

REPORTING

The existing Hydrological Assessment report will be updated to align with the requirements for an IWULA.

7.5.7 MAJOR HAZARD INSTALLATION ASSESSMENT

Potential impacts include off-site risks associated with potential fire and explosion linked to fuel supply. It is understood that a MHI (also referred to as a QRA) will be undertaken by ISHECON for DNG. The MHI risk assessments will be carried out to comply with the requirements of the revised Major Hazard Installation Regulations of July 2001, under the South African Occupational Health and Safety Act. Scope of work will include:

INFORMATION GATHERING AND INCIDENT IDENTIFICATION

- Gather all relevant information available at this stage of the project e.g. material listings, inventories, turnovers, design drawings, P&ID's and PFD's, process conditions and flow rates, maps, weather data, key operating instructions, emergency procedures, details of process safety management systems in place, failure modes e.g. rupture, leaks, venting etc.
- A brief evaluation of the types of activities surrounding the site will be undertaken.
- Conduct discussions with operations and design staff or contractors and / or members of the Client's H&S Committee (if available) to identify hazards and agree risk assessment terms of reference.
- Identify potential major hazardous incidents associated with the installation.
- Potential knock-on effects to neighbouring facilities will also be included.

CONSEQUENCE QUANTIFICATION

- Determine the magnitude of the agreed hazardous incidents in terms of:
  - Size of the loss of containment, or internal explosion;
  - Duration of the incident.
- Perform a consequence analysis to identify the effects of applicable hazards.
- For each incident determine the consequences and estimate the severity in terms of fatalities.

LIKELIHOOD, RISK QUANTIFICATION AND REDUCTION

- Quantify the likelihood of the MHI events based on generic data derived from databases, or estimations from the experience of the operating personnel, or in the case of critical events by the compilation of fault trees. The failure data will be adjusted based on a brief evaluation of the Process Safety Management system likely to be in place at the facility.
- A societal risk estimation will be presented in the form of an F-N curve.
- Where risks are unacceptably high, identify the operations/equipment that is leading to the high risk and suggest possible risk reduction measures.
- Review the on-site emergency plans and where necessary provide brief ideas on any possible improvements in the light of the risk assessment results as well as the requirements of SANS1514:2018 MHI Emergency Response Planning.

TECHNICAL REPORT

- For the final proposed installation compile all the information, analysis, assessments and conclusions.

SITE VISIT

- Visit the proposed location of the facilities to view the surrounding areas, the topography etc.
- Issue a Final MHI for Notifications.

MHI NOTIFICATIONS

- Prepare and deliver notification package for the relevant authorities.
- Prepare and deliver public advertisement, notices and notification letters.

7.5.8 WATER USE LISENCE SPECIALIST STUDIES

The proposed project activities trigger the NWA Section 21 activities. Hence a WULA is required. The below studies are required to support the WULA and will supplement assessment during the EIA phase:

- Indicative Flood Risk Assessment
- Stormwater Management Plan
- Geohydrological Assessment
- Hydropedological Assessment

7.6 IMPACT ASSESSMENT METHODOLOGY

The EIA Report will use a methodological framework developed by WSP to meet the combined requirements of international best practice and NEMA, Environmental Impact Assessment Regulations, 2014, as amended (GN No. 326) (the “EIA Regulations”).

As required by the EIA Regulations (2014) as amended, the determination and assessment of impacts will be based on the following criteria:

- Nature of the Impact;
- Significance of the Impact;

- Consequence of the Impact;
- Extent of the impact;
- Duration of the Impact;
- Probability if the impact;
- Degree to which the impact:
  - can be reversed;
  - may cause irreplaceable loss of resources; and
  - can be avoided, managed or mitigated.

Following international best practice, additional criteria have been included to determine the significant effects. These include the consideration of the following:

- Magnitude: to what extent environmental resources are going to be affected;
- Sensitivity of the resource or receptor (rated as high, medium and low) by considering the importance of the receiving environment (international, national, regional, district and local), rarity of the receiving environment, benefits or services provided by the environmental resources and perception of the resource or receptor); and
- Severity of the impact, measured by the importance of the consequences of change (high, medium, low, negligible) by considering inter alia magnitude, duration, intensity, likelihood, frequency and reversibility of the change.

It should be noted that the definitions given are for guidance only, and not all the definitions will apply to all of the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.

7.6.1 METHODOLOGY

Impacts are assessed in terms of the following criteria:

a) The nature; a description of what causes the effect, what will be affected and how it will be affected.

Table 21 Nature or Type of Impact

NATURE OR TYPE OF IMPACT	DEFINITION
Beneficial / Positive	An impact that is considered to represent an improvement on the baseline or introduces a positive change.
Adverse / Negative	An impact that is considered to represent an adverse change from the baseline, or introduces a new undesirable factor.
Direct	Impacts that arise directly from activities that form an integral part of the Project (e.g. new infrastructure).
Indirect	Impacts that arise indirectly from activities not explicitly forming part of the Project (e.g. noise changes due to changes in road or rail traffic resulting from the operation of Project).
Secondary	Secondary or induced impacts caused by a change in the Project environment (e.g. employment opportunities created by the supply chain requirements).
Cumulative	Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.

b) The physical extent.

Table 22 Physical Extent Rating of Impact

SCORE	DESCRIPTION
1	the impact will be limited to the site;
2	the impact will be limited to the local area;
3	the impact will be limited to the region;
4	the impact will be national; or
5	the impact will be international;

c) The duration, wherein it is indicated whether the lifetime of the impact will be:

Table 23 Duration Rating of Impact

SCORE	**DESCRIPTION**
1	of a very short duration (0 to 1 years)
2	of a short duration (2 to 5 years)
3	medium term (5–15 years)
4	long term (> 15 years)
5	permanent

d) Reversibility: An impact is either reversible or irreversible. How long before impacts on receptors cease to be evident.

Table 24 Reversibility of Impact

SCORE	**DESCRIPTION**
1	The impact is immediately reversible.
3	The impact is reversible within 2 years after the cause or stress is removed; or
5	The activity will lead to an impact that is in all practical terms permanent.

e) The magnitude of impact on ecological processes, quantified on a scale from 0-10, where a score is assigned.

Table 25 Magnitude Rating of Impact

SCORE	**DESCRIPTION**
0	small and will have no effect on the environment.
1	minor and will not result in an impact on processes.
2	low and will cause a slight impact on processes.
3	moderate and will result in processes continuing but in a modified way.

4	high (processes are altered to the extent that they temporarily cease).
5	very high and results in complete destruction of patterns and permanent cessation of processes.

f) The probability of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale where:

Table 26 Probability Rating of Impact

SCORE	DESCRIPTION
1	very improbable (probably will not happen.
2	improbable (some possibility, but low likelihood).
3	probable (distinct possibility).
4	highly probable (most likely).
5	definite (impact will occur regardless of any prevention measures).

g) The significance, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high;

h) The status, which is described as either positive, negative or neutral;

i) The degree to which the impact can be reversed;

j) The degree to which the impact may cause irreplaceable loss of resources; and

k) The degree to which the impact can be mitigated.

The significance is determined by combining the above criteria in the following formula:

Significance = (Extent + Duration + Reversibility + Magnitude) x Probability

[S= (E+D+R+M) ×P]

Where the symbols are as follows:

SYMBOL	CRITERIA	DESCRIPTION
S	Significance Weighting	
E	Extent	Refer to Table 23
D	Duration	Refer to Table 24
M	Magnitude	Refer to Table 25
P	Probability	Refer to Table 26

The significance weightings for each potential impact are as follows:

OVERALL SCORE	SIGNIFICANCE RATING (NEGATIVE)	SIGNIFICANCE RATING (POSITIVE)	DESCRIPTION
< 30 points	Low	Low	where this impact would not have a direct influence on the decision to develop in the area

31 - 60 points	Medium	Medium	where the impact could influence the decision to develop in the area unless it is effectively mitigated
> 60 points	High	High	where the impact must have an influence on the decision process to develop in the area

The impact significance without mitigation measures will be assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the proposed development's actual extent of impact, and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains following the application of mitigation and management measures, and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during Project implementation to verify that actual impacts are the same as those predicted in this EIA Report.

7.7 ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Once the DSR has been submitted to the proposed project will proceed into detailed EIA phase, which involves the detailed specialist investigations. WSP will produce a Draft EIAR after the completion of the required specialist studies. The Draft EIAR will provide an assessment of all the identified key issues and associated impacts from the Scoping phase. All requirements as contemplated in the GNR 326 EIA Regulations will be included in the Draft EIAR. The Draft EIAR will contain, inter alia, the following:

- Details of the EAP who prepared the report and the expertise of the EAP to carry out the S&EIR process, including a curriculum vitae;
- The location of the activity, including the 21 digit Surveyor General code of each cadastral land parcel, where available, the physical address and farm name; and the coordinates of the boundary of the property or properties;
- A plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale;
- A description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for; and a description of the associated structures and infrastructure related to the proposed project;
- A description of the policy and legislative context within which the 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 full description of the process followed to reach the proposed development footprint within the approved site;
- Details of the public participation process undertaken;
- A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;
- The environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
- The impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts;
- The methodology used in determining and ranking of potential environmental impacts and risks;
- Positive and negative impacts;
- An assessment of each identified potentially significant impact and risk;
- The possible mitigation measures that could be applied;
- An environmental impact statement;
- A description of any assumptions, uncertainties and gaps in knowledge;

- A reasoned opinion as to whether the proposed activity should or should not be authorised;
- An undertaking under oath or affirmation by the EAP; and
- An EMPr.

7.8 STAKEHOLDER AND AUTHORITY ENGAGEMENT

Public participation during the EIA phase revolves around the review of the environmental impact assessment findings, which will be presented in the Draft EIA Report. All stakeholders will be notified of the progress to date and availability of the Draft EIA Report, via mail, email and/or SMS. A legislated period of 30 consecutive days will be allowed for public comment. Reports will be made available in the following way:

- Distribution for comment at central public places, which were used during the Scoping phase (subject to Covid 19 status quo);
- The document will be made available to download from the WSP website; and
- Copies of CDs will be made available on request.

It is anticipated that the country will return to a lower level of lockdown as the EIA process progresses. At this point, should the need for stakeholder meetings be identified, then in-person focus group meetings with small groups of people are proposed. Alternatively, virtual meetings will be held. The purpose of the meetings would be to present the findings of the impact assessment and address issues of concern raised during the Scoping phase.

The EIA phase will provide the following information to I&APs:

- Initial Site Plan;
- Alternatives;
- A description of activities and operations to be undertaken;
- Baseline information;
- Specialist studies;
- Impact assessment;
- Management measures;
- Monitoring and measuring plan; and
- Closure details.

The information outlined above will be presented in one or more of the following:

- Notifications;
- Scoping Report;
- EIA Report; and
- EMPr.

All comments received during the EIA phase will be recorded in the comments and response report (CRR), which will be included in the draft and final EIA Reports. The final EIA Report will incorporate public comment received on the Draft EIA Report and will be made available for public review with hard copies distributed mainly to the authorities and key stakeholders.

All stakeholders will receive a letter notifying them of the authority's decision

8 WAY FORWARD

This DSR contains:

- A description of the existing and proposed activities;
- A description of the alternatives considered to date;
- An outline of the proposed process to be followed;
- Information on the EAP and stakeholders who have chosen to participate in the project;
- An outline of the environment in which the project falls;
- Information on the potential environmental impacts to be studied in more detail during the EIAR phase of the project; and
- Information on the proposed specialist studies to be undertaken.

A number of environmental impacts have been identified as requiring some more in-depth investigation and the identification of detailed mitigation measures. Therefore, a detailed EIA is required to be undertaken in order to provide an assessment of these potential impacts and recommend appropriate mitigation measures.

The recommendation of this report is that detailed specialist studies as outlined in **Section 7.4** are undertaken.

This DSR is available for review from **23 July 2021 to 23 August 2021**. All issues and comments submitted to WSP will be incorporated in the CRR of the FSR.

The DSR will be submitted to the delegated competent authorities responsible for authorising this project.

If you have any further enquiries, please feel free to contact:

WSP Group Africa

Attention: Carla Elliott

Tel: 031 2408874

Fax: 031 2408861

E-mail: carla.elliott@wsp.com

BIBLIOGRAPHY

- Department of Water Affairs and Forestry (2005a) A practical field procedure for identification and delineation of wetland and riparian areas. Edition 1, September 2005. DWAF, Pretoria.
- Department of Water Affairs and Forestry (2005b) Environmental Best Practice Specifications: Construction. Integrated Environmental Management: Sub-Series No. IEMS 1.6. Third Edition. Pretoria.
- Department of Water Affairs and Forestry (2005c) Environmental Best Practice Specifications: Operation. Integrated Environmental Management: Sub-Series No. IEMS 1.6. Third Edition. Pretoria.
- International Finance Corporation (IFC) / World Bank Group (WBG) (2008) Thermal Power Plants Environment Health and Safety (EHS) Guideline.
- International Finance Corporation (IFC) / World Bank Group (WBG) (2007) Electric Power Transmission and Distribution Environment Health and Safety (EHS) Guideline.
- Jo Burges (2016) South African Green Drop Certification for Excellence in Wastewater Treatment Plant Operation, Water Research Commission of South Africa).

APPENDIX

A EAP CV

NIGEL SEED, B.Soc.Sc. EAP

Director (Environmental Science), Environment & Energy

Years with the firm

19

Years of experience

19

Areas of expertise

Environmental and Social Impact Assessment (ESIA)

Environmental and Social Due Diligence (ESIA)
Environmental and Social Management Systems (ESMS)

ENV-ID Assessment of Industrial Processes

Environmental Legal Compliance (South Africa)

CAREER SUMMARY

Nigel has 19 years' environmental and social consulting experience. He is a Technical Director as well as the Africa lead for the environmental and social impact assessment (ESIA) service and Power in Africa.

Nigel has led complex ESIA and transaction related due diligence assessments across a range of sectors including aerospace, agro-processing, chemicals, healthcare, infrastructure (ports, roads, waste management), manufacturing, mining and beneficiation, oil & gas, pulp & paper power generation (thermal & renewables), and property development.

Nigel has extensive experience working with national and international regulations and procedures, including Equator Principles III, the IFC Performance Standards on Environmental and Social Sustainability (2012) and related policies, and the World Bank Group EHS and Industry Sector guidelines.

Nigel has experience in Angola, Cameroon, Ghana, Kenya, Lesotho, Madagascar, Mozambique, Nigeria, Somalia (Somaliland), South Africa, Swaziland and Zambia.

EDUCATION

Bachelor of Social Science, Environmental Management & Geography, University of Natal, Durban, South Africa	2000

ADDITIONAL TRAINING

Nuclear Engineering Short Course (Reactor Technology), South African Network for Nuclear Education, Science and Technology (SAN-NEST).	2017
Resettlement as Part of Impact Assessment, Intersocial Consulting Ltd. c/o IAIA	2017
ISO 9001:2015 Awareness workshop, DQS Training Academy	2016
Understanding International Project Finance, International Project Finance Association	2016
Hazard Identification and Risk Assessment Training, EOH Legal Services	2015
Diploma in AutoCAD	2000

PROFESSIONAL MEMBERSHIPS

Certified Environmental Assessment Practioner	EAP
Institute for Waste Management South Africa	IWMSA
International Association for Impact Assessment	IAIA

PROFESSIONAL EXPERIENCE

Environmental Impact Assessment Process

Crude Oil Refining

— Tetra Ethyl Lead Facilities Decommissioning Projects, South Africa (2012 - 2015): Project Director. Environmental risk assessment, ESMP and oversight of all environmental monitoring associated with the decommissioning of TEL handling and waste storage facilities at the SAPREF Refinery and Island View. South Africa. Client: SAPREF.

- Hydrogen Manufacturing Unit (HMU), South Africa (2019) – ESIA Specialist. ESIA for the development of a hydrogen to extract sulphur from fuel. The HMU will address a shortfall of hydrogen produced at the refinery in the near to medium term created largely by the market move to lower sulphur diesel fuels. Client: SAPREF
- Tetra Ethyl Lead Facilities Decommissioning Projects, South Africa (2012 - 2015): Project Director. Environmental risk assessment, ESMP and oversight of all environmental monitoring associated with the decommissioning of TEL handling and waste storage facilities at the SAPREF Refinery and Island View. South Africa. Client: SAPREF.
- Environmental Due Diligence (EDD) for the proposed acquisition of a bulk petrochemical depot (2015). South Africa. Desktop review, facility assessment, legal assessment, determination of EHS liability associated with the properties due to current or historic operations; recommendation of EHS financial provisions in site purchase agreement. Client: Confidential Black Economically Empowered Private Equity Investor
- Engen Refinery Environmental Risk and Integrity Assessment, South Africa (2014). Technical Lead. Determination of potential for Section 30 emergency incidents, appraisal of preventative and migratory measures, development of action plan, authority liaison and facilitation. Client: Engen Limited.
- ESIA for the Expansion of the 90 000 bpd SAPREF Crude Oil Refinery to achieve EURO 5 Fuel Specifications, South Africa, (2013): Environmental impact assessment specialist. Technical / impact assessment of proposed upgrades to *inter alia* Crude Distillation Units, Hydrogen Generation Units, Desulphurisation Units, Benzene Hydrogenation Units, and Refinery Fuel Gas boilers. ESIA methodology aligned to Shell global Health, Security, Safety, the Environment and Social Performance Standards. South Africa. Client: SAPREF.
- Environmental Legal Appraisal of Refinery Projects, South Africa (2012-2014). Technical Lead. Environmental and legal appraisal of projects viz. vertical deep well anode bed pipeline protection (2015), LL Extraction Column for BTEX reduction in CD2/3 de-salter effluent (2014), Sour Water Stripper and SRU-3 Coalescer replacement Projects (2012). KZN, South Africa. Client: SAPREF.
- Waste Act Legal Review of SASOL Synfuels Refinery, South Africa (2013-2014). Legal Specialist. Process block assessment of pre-identified unit processes and process streams at the SASOL Synfuels Refinery, development and application of criteria for the identification of legally defined wastes and activities requiring waste licenses. Client: SASTECH.
- Industry Waste Management Plan for the South African Used Lubrication Oils Sector, South Africa (2015). Project Director. Preparation of an industry waste management plan as part of the ROSE Foundation extender producer responsibility (EPR) programme for the South African Lubrication Oil manufacturing sector. Client: ROSE Foundation.

Mining, Beneficiation and Processing

- Lenders Environmental and Social Due Diligence for proposed term loan finding of the Vanchem Assets (2016). South Africa. Lead Auditor. Proposed purchase of Vanchem Vanadium Products assets including the Vanchem Plant, Waste Disposal Facilities, and ferrovanadium plants. Client: Nedbank Limited.
- Site Screening and Environmental and Social Impact Assessment for the establishment of calcium carbonate calcining facilities (2017). The scope of the activities on the selected site included raw materials handling, initial beneficiation (flotation) and calcining, and establishment of a tailings disposal facility. Key environmental aspects investigated in the study include hydrogeological impacts (associated with tailings facility), impacts on biodiversity (incl. wetlands), and atmospheric emissions. Client: Grasland Ondernemings.

- Lenders Environmental and Social Due Diligence for the Accra Cement Grinding Facility (2016). Accra, Ghana. Review of ESIA, Environmental and Social Management Plan (ESMP), Environmental Authorisations. Determination of compliance against relevant EP III criteria; IFC Performance Standards on Environmental and Social Sustainability, and applicable World Bank Group Environmental, Health and Safety (EHS) Guidelines. Compliance scoring. Preparation of ESIA DD Report including Environmental and Social Action Plan (ESAP). Client: DEG
- Underground Chrome Mine, South Africa (2011): Project Director. ESIA for the establishment of an underground chrome mine targeting the Middle Group and Lower Group Reefs covering 28 500 hectares on the Farm Turfontein 462 JQ. Client: Samancor Chrome Ltd.
- South Uranium Plant SX Circuit Replacement, South Africa (2011): Project Manager. EIA process for proposed solvent extraction plant replacement at Vaal River Operations. The SX process employs atmospheric acid leaching, counter current decantation and ion exchange systems to concentrate uranium leach liquor, which is then further upgraded and purified and reacted to produce ammonium di-uranate. Client: AngloGold Ashanti (Pty) Ltd.
- Smelter SO_2 Abatement Projects, Polokwane / Rustenburg, Limpopo / North West Province, South Africa (2012): Technical Support. Technical support to the EIA process for proposed SO_2 abatement equipment initiatives at the Polokwane and Mortimer Smelters. Client: Anglo American Platinum Ltd.
- Desulpherisation Unit, Newcastle, KwaZulu-Natal, South Africa (2006): Project Manager. EIA process for proposed upgrade of the desulphurisation unit and dust abatement system associated with the steel plant furnaces. Client: Arcelor Mittal South Africa Ltd.
- 60 MVA Ferrosilicon Smelter, South Africa (2003): Project Manager. EIA Process for the proposed establishment of a 60 MVA ferrosilicon smelter. Client: Silicon Technology (Pty) Ltd.
- Richards Bay Bulk Materials Handling Facility ESIA, South Africa (2003): Project Manager. Development of a Bulk Materials Handling Facility associated with the Port dry bulk terminal Import/export facilities. Client: Richards Bay Coal Distributors.

Effluent and Waste Management

- ESIA of the Zrenjanin Wastewater Treatment Plant, Zrenjanin Serbia (2021). Project Manager. ESIA in accordance with the IFC Performance Standards and EU Laws of a proposed 25ML/day urban wastewater treatment plant. Client: Metito Utilities Limited and Die Oesterreichische Entwicklungsbank AG (OeEB).
- Waste management plan for all Total South Africa manufacturing, commercial, retail and administration facilities located in South Africa, Namibia, Botswana and Swaziland (2016): Project Lead. Waste management database, hazard characterisation and coding, development of waste management and waste traceability and reporting SOP's. Client: Total South Africa Limited.
- Waste management plan for all PPC cement manufacturing and quarry sites in South Africa (2016): Project Lead. Waste management database, hazard characterisation, GHS waste classification, development of safety data sheets, legal compliance assessment and recommendations. Client: PPC Limited.
- Waste management plan for all Transnet Port Terminal sites in South Africa (2015): Project Lead. Waste management database, hazard characterisation, GHS waste classification, development of safety data sheets, legal compliance assessment and recommendations. Client: Transnet Port Terminals.
- Netcare National Waste Management Strategy, South Africa (2015): Project Lead (Waste). Baseline waste management assessment of 70 of Netcare's healthcare

facilities including clinics and hospitals. Development of a national integrated waste management system and strategy. Client: Netcare Limited.

- Healthcare Risk Waste Treatment Facilities, Pietermaritzburg, KwaZulu-Natal, South Africa (2006-2009): Project Manager. EIA Process and Waste Management License for proposed static and mobile microwave disinfection units for the treatment of healthcare risk waste. Client: Ecocycle (Pty) Ltd.
- Electron Road Regional Waste Transfer Station, South Africa (2005-2006): Project Manager. EIA process and waste management licensing for a 2400 ton per day regional waste transfer station. Client: Durban Solid Waste.
- KwaDukuza waste disposal site, South Africa (2010): Project Manager. EIA process peer review associated with the proposed high hazard (H:H) permitting of the Kwadukusa waste disposal site. Client: Metamorphosis Environmental Consultants.
- Illovo South Africa Waste Legislation Compliance Review and Strategy, South Africa (2010): Project Manager. Provision of technical waste management support to a legal (including Waste Act) assessment with Garlicke & Bousfield. The study included six Illovo Sugar facilities within KwaZulu-Natal including distilleries and mills. Client: Illovo Sugar South Africa Limited.
- Waste Disposal Site Prefeasibility, South Africa (2010): Project Manager. Waste disposal site prefeasibility for ferrosilicon smelting operations. The determination of waste type, landfill class and associated CAPEX and OPEX was based on relevant DEA standards Client: Silicon Technology (Pty) Ltd.
- Newcastle Works Effluent Buffering, South Africa (2009): Project Manager. EIA process associated with the implementation of effluent buffering capacity in order to address ammonia toxicity to the biological effluent treatment process. The project proposal entailed the use of an existing leachate dam associated with an existing high hazard (H:H) waste disposal site situated on the complex. Client: Arcelor Mittal South Africa Ltd.
- AngloGold Waste Management Strategy, Vaal River, Gauteng, South Africa (2008): Project Manager. Development of a comprehensive waste management strategy for 27 business (mines, metallurgical plants, commercial services) units in the Vaal River and West Wits area (2003). In 2008 the strategy was updated to include the development of a comprehensive action plan for the management of hazardous waste. Client: AngloGold Ashanti (Pty) Ltd.
- Lebowa Mining Complex Waste Management Strategy, South Africa (2008): Project Manager. Waste management baseline assessments, waste management strategies, and to develop detailed waste management procedures for the Lebowa Platinum Mine complex and the Polokwane Smelter. Client: Anglo American Platinum Ltd.
- Umbogintwini Industrial Complex Effluent Balance, South Africa (2007-2008): Project Manager. Effluent balance and feasibility studies for additional marine effluent disposal capacity & associated water and energy recovery. Client: Heartland Leasing (Pty) Ltd.
- Resource Recovery Facility – Uitenhage, Eastern Cape, South Africa (2007-2008): Waste Management License / EIA process for the development of a resource recovery facility for the handling and treatment of hydrocarbon and organic effluents, various general and hazardous solid wastes. Client: Veolia Environmental Services (Pty) Ltd.
- Effluent Treatment Facilities, South Africa (2007/8): Project Manager. ESIA/ESMP for effluent treatment facilities intended to address increasingly stringent sulphide limitations at the Southern Wastewater Treatment Works. Client: SAPREF.

- Study on Priority Hazardous Waste Streams in the Western Cape, South Africa (2007): Project Manager. Development of the Best Practicable Environmental Options for priority hazardous waste streams in the Western Cape. Client: Department of Environmental Affairs and Development Planning.
- Hazardous Waste Transfer Facility, Richards Bay, KwaZulu-Natal, South Africa (2006): Project Manager. EIA Process for the proposed establishment of a hazardous waste transfer facility at the Richards Bay Dry Bulk Terminal. Client: Transnet Port Terminals.
- Logmed® Medical Waste Facilities, South Africa (2002): Project Manager. Assessment of four alternative Medical Waste Treatment Facility sites within the eThekwini Municipality as part of an EIA process. Client: WasteMan (Pty) Ltd.

Power

- E&S Advisor to DNG Energy Gas to Power Projects, South Africa (2021): E&S Advisor as part of the Owners Engineer Team for large-scale gas to power projects (>500MW) located in Mossel Bay, Coega, Komatipoort, and Malelane. Client: DNG Energy
- DNG Energy 500MW Khensani Gas to Power Project, South Africa (2021): EIA Projets Manger. EIA process in accordance with local legislation and IFC Standards for the development of a 500MW power plant based on reciprocating engine technology. Client: DNG Energy
- E&S Due Diligence of the Malicounda 132MW Duel Fuel Project, Senegal (2021). Project Director (Scope limited to AfDB OS 1 and 5, and IFC PS 1 and 2). Analysis of the local standards ESIA against the he AfDB's Integrated Safeguards System (ISS) and associated Operational Safeguards (OSs) / development of the Corrective Action Plan. Client: African Development Bank.
- QMM Hybrid Wind, Solar and BESS Power Project, Madagascar (2020): Project Director: IFC complaint ESIA for the 8MW solar photovoltaic (PV) and 10MW wind + BESS project in Port Dauphin, Madagascar. The project is located in the Ehoala port concession which QIT Madagascar Minerals (QMM) has secured from the Government of Madagascar. Key ESIA focal areas include evaluation of legacy resettlement issues, verification of critical habitat triggers, and collision risks associated with bats and pelagic avifauna. Client: CrossBoundary Energy
- ESIA Gap Analysis of the Homa Bay Biogas Project, Kenya (2020). Project Director. Analysis of the local standards ESIA for the proposed development of a 12 MW biogas plant in Kobala, Homa Bay County. The project feedstock includes water hyacinth from Lake Victoria, Kenya, and bagasse. The project will generate electricity as well as organic fertilizer, ammonium carbonate fibre, and liquid CO_2 by-products.
- E&S Red Flags Due Diligence for Multi-regional Renewable Energy Portfolio, South Africa (2020). Red flags analysis associated with investment in 21 solar renewable energy projects in South Africa. The ESDD reference framework included host country legislation and the IFC PS. Client: Confidential International Investor.
- E&S Red Flags Due Diligence for a portfolio of three Hybrid (Wind, Solar and BESS) Dispatchable Energy Projects South Africa (2020). Lenders Red flags analysis associated with bid submissions in terms of the South African Risk Mitigation Power Procurement Process. The ESDD reference framework included host country legislation, Equator Principles and IFC PS. Client: Nedbank, RMB, ABSA
- E&S Red Flags Due Diligence for the 400MW Richards Bay Gas II (RBG2) Project. South Africa (2020). Lenders Red flags analysis associated with bid submissions in terms of the South African Risk Mitigation Power Procurement Process. The ESDD reference framework included host country legislation,

Equator Principles and IFC PS. Key Focal areas included cumulative air quality impacts and major accidental hazard risks associated with LPG handling. Client: Nedbank c/o Fieldstone

- Integrated battery energy storage facility (BESS), South Africa (2020): Project Manager. Environmental and social scoping for a proposed 800MWh grid integrated BESS based on Tesla ® lithium-ion battery technology. Client: Gridflex Energy.
- Garneton Solar PV Projects, Zambia (2020): Project Manager. Environmental and social due diligence of two 20MW solar PV projects under the GETFiT Programme. The principle reference framework of the study was the African Development Bank (AfDB) Operational Safeguards. Client: AfDB.
- Environmental advisory services in relation to IFC requirements for a 550MW Open Cycle Gas Turbine (OCGT) Power Plant project in Ondo State, Nigeria (2019). Client: Kingline Development Nigeria.
- Environmental and social review of the Ndeke Solar PV development site extension area, Zambia (2018): E&S Specialist. The development site is proposed as part of the Zambia Scaling Solar Project (Round 2) comprising three solar PV power plants of up to a combined 200MWp. The review focussed on issues associated with community services impacts (PS6) and involuntary resettlement (PS5). Client: IFC
- Environmental and social screening of prospective solar PV and thermal (gas) power generation sites, Nacala, Mozambique (2018): Project Director. Environmental screening in terms of the IFC sustainability framework and host country legislation. Client: Confidential
- Lenders ESDD for the Aggeneys and Konkoonsies Solar Renewable Energy Projects (2016). South Africa. Review of ESIA, Environmental and Social Management Plan (ESMP), Environmental Authorisations. Determination of compliance against relevant EP III criteria; IFC Performance Standards on Environmental and Social Sustainability, and applicable World Bank Group Environmental, Health and Safety (EHS) Guidelines. Compliance scoring. Preparation of ESIA DD Report including Environmental and Social Action Plan (ESAP). Client: Nedbank Ltd.
- ESIA for the 120MW combined cycle gas turbine power project and associated Light Crude Oil and Natural Gas pipelines and storage facilities in the Tema Free Zone Enclave in Ghana (2016): Impact Assessment with key reference to the World Bank Group General and Industry Sector guidelines (Thermal Power). ESIA Project Manager. Client: Atlantic Electric Company / LMI Holdings.
- ESIA for Photovoltaic and Concentrated Solar (trough) Power Generation Facilities in Northern Cape Province, South Africa (2015): Project Director and technical specialist. The project consists of two development sites *viz.* Letsoai concentrated solar site (300MW) and Enamandla Solar PV (375MW) including 60km water supply pipeline (CSP site) and associated powerline grid connections. Client: Biotherm Energy.
- ESIA for Wind Power Generation Facilities in Western Cape Province, South Africa (2015): Project Director and technical specialist. The project consists of two development sites *viz.* Maralla Wind (280MW) and Esizayo Wind (140MW) including associated powerline grid connections. Client: Biotherm Energy.
- Gledhow Mill 11-18MW Biomass Energy Project, South Africa (2012): Project Manager. EIA processes for a renewable energy power project within the Gledhow Sugar Mill Complex. The project will comprise the installation of a biomass boiler and electricity generation plant with a capacity ranging from 11MW to 18MW which will be exported to the national grid. Client: Illovo Sugar Ltd.
- Solar Photovoltaic (PV) Generation Facility, South Africa (2011): Project Director. Basic Assessment (BA) process for the proposed construction of a Solar

Photovoltaic (PV) Generation Facility. Client: eThekwini Municipality Energy Office.

- National Landfill Gas to Electricity Projects, South Africa (2009-2010): Project Manager. EIA process and waste management licensing of 17 landfill Gas to Electricity Clean Development Mechanism Projects. Client: CEF (Pty) Ltd.
- Durban Solid Waste Landfill Gas to Electricity Projects, South Africa (2003-2004): Project Manager. EIA process and waste management licensing of landfill Gas to Electricity Clean Development Mechanism Projects at Bisasar Road, Mariannhill, and La Mercy landfill sites. Client: Durban Solid Waste.
- ESIA for the 140 – 170 MW Mozambique Gas Engine Power Project (2011), Mozambique. ESIA aligned to the IFC Performance Standards for the proposed Mozambique Gas Engine Power Plant (MGEPP) 140 – 170 Megawatt (MW) electricity generation facility in Ressano Garcia, Mozambique (2011). Environmental impact assessment specialist / waste management specialist. Technology environmental performance appraisal with key reference to the European Union (EU) Integrated Pollution Prevention and Control Reference Document on Best Available Techniques for Large Combustion Plants (July 2006). Physical Environment Impact Assessment (air, water, waste) and ESIA and E&S Management Plan with key reference to the World Bank EHS guidelines.
- Sasolburg 180-200MW Combined Cycle Gas Engine Power Project, South Africa (2011): BAT Review and Waste Management Specialist. Open cycle power plant with an output capacity of approximately 180MW; future conversion to a combined cycle (heat recovery) which will generate an additional 20MW. Client: SASOL New Energy Holdings.
- Sappi Saiccor 20MW Multi-Fuel Boiler, South Africa (2011): Project Director. EIA processes for the a) establishment of a high pressure 20MW coal and biomass boiler and associated infrastructure at the Sappi Saiccor Mill and upgrade of chemical recovery boiler in order to derive energy and chemical recovery benefits. Client: Sappi Southern Africa Limited.
- Sappi Tugela 40MW CCGT Project, South Africa (2011): Project Director. EIA processes for a 40MW combined cycle gas-powered combustion turbine. Client: Sappi Southern Africa Limited.
- Power Line Construction and Upgrading projects, South Africa (2001-2004): Project Manager. Various 132KV & 275KV electrical transmission line construction and upgrading projects in the eThekwini Municipality. Client: eThekwini Electricity Department.

Food and Agriculture

- Ubombo Mill Furfural project, Swaziland (2015): ESIA (Scoping) Project Lead. ESIA process in terms of Swaziland legislative requirements and GIIP for the establishment of a greenfield furfural manufacturing plant associated with the Ubombo Sugar Mill. Key study aspects included materials handling facilities, reaction and distillation processes, high efficiency biomass heat and power generation, increased water consumption, effluent generation, airborne emissions, changes in waste physico-chemical characteristics Client: Illovo Southern Africa.
- ESIA Screening and TOR for Tea Manufacturing Facility, Kenya (2011): Project Manager. The proposed development area is located in the Kericho agricultural region, western Kenya. The scope of the project included relocation of tea manufacturing facilities including materials and product storage, manufacturing, and utilities (biomass heat and power generation, water treatment, industrial and sanitary effluent treatment). The project was undertaken in conjunction with local regulatory specialists. Client: Unilever Limited.
- Yeast Plant Environmental Prefeasibility, South Africa and Swaziland (2011): Environmental and Social Specialist. Site selection and ESIA pre-screening and

TOR for the proposed establishment of a yeast manufacturing facility within the Southern African region. Client: AB Mauri Technology & Development Ltd.

- Waste Management Licensing, Stanger, KwaZulu-Natal, South Africa (2010): Project Manager. Waste Management License application and Scoping and EIA process for waste management activities at the Stanger Mill. Client: Sappi Stanger (Pty) Ltd.

Manufacturing Sector

- LignoTech Acquisition E&S Due Diligence, South Africa (2010): E&S due diligence for the proposed transfer of ownership of the Lignotech Lignosulphonate production facilities. Client: LignoTech SA
- Mondi Richards Bay Chemical Plant Upgrade Project (2019). The upgrade of the chemical plant is also required to ensure that the plant is capable of producing chlorate and Hydrochloric Acid (HCL) to enable Chlorine Dioxide (CLO_2) production on an optimised cost basis. Client: Mondi Limited.
- Mondi Richards Bay Mill Expansion Project (2017). The expansion includes the establishment of a multi-fuel (coal and biomass) boiler, new hard and soft wood digestion lines, chemical recovery boiler, and increase in electrical generation capacity. Key environmental aspects investigated in the study included atmospheric emissions, traffic generation, and impacts on biodiversity in the adjacent sensitive areas. Client: Mondi Limited.
- Environmental, Health and Safety Due Diligence for the acquisition of domestic and industrial geyser manufacturing firm (2016). Scope of audit included one primary manufacturing facility and 3 regional warehouses. Study aspects included historical asbestos, inorganic and hydrocarbon chemical usage, occupational air quality, noise and illumination risks. Client: Confidential Scandinavian Investor.
- Anhydrous Hydrofluoric Acid Plant, South Africa (2012): Project Director. EIA Process associated with product diversification projects to optimize the internal use of intermediate products, and minimize site pollutants; entailing production of anhydrous hydrogen fluoride and aluminium trifluoride. Client: Foskor (Pty) Ltd. Lead Auditor.
- MSMA Production, South Africa (2009): Project Manager. Technical, environmental and legal assessment of proposed mono sodium methyl arsenate (MSMA) at the CleanTech (Berlin) industrial facility. Client: Mzanzi Chemicals (Pty) Ltd.
- PET Plant Debottlenecking - South Africa (2007-2008): Project Manager. Environmental duty of care assessment and integrated permitting (Scheduled Trade) procedure for PET production debottlenecking. Client: HOSAF (Pty.) Ltd.
- Biodiesel Manufacturing, Berlin, Eastern Cape, South Africa (2007): Project Manager. EIA Process for proposed conversion of industrial facilities for the production of Biodiesel at the CleanTech (Berlin) industrial facility. Client. CleanTech Africa.
- Industry Waste Management Plan, Western Cape, South Africa (2007): Project Manager. Provision of technical support to the development of an Industrial Waste Management Plan for the Consumer Formulated Chemicals Sector. Client: Western Cape Department of Environmental Affairs.
- Ferromanganese Storage, Durban, KwaZulu-Natal, South Africa (2006): Project Manager. EIA Process for the proposed relocation of ferromanganese handling facilities within the Port of Durban. Client: Transnet National Ports Authority.
- Acrylic Emulsion Plant Debottlenecking, South Africa (2006): Project Manager. Proposed de-bottlenecking project involving several initiatives aimed at improving process efficiency related to water based acrylic and co-acrylic

emulsions (Styrene Acrylic Emulsions) production. Client: Rohm and Haas (Pty) Ltd.

- Solid State Polymerisation (SSP) plant upgrade, Durban, KwaZulu-Natal, South Africa (2004): Project Manager. EMP and post construction audit for the construction of a Solid State Polymerisation (SSP) plant upgrade. Client: HOSAF (Pty.) Ltd.
- Di Methyl Phthalate Plant Adaptation, South Africa (2003): Project Manager. Environmental appraisal of proposed Di Methyl Phthalate Plant adaptation project. Client: Orchem (Pty) Ltd.
- Lignosulphonate Plant Construction Project. South Africa (2003): Environmental Control Officer. EMP, environmental monitoring and training for a greenfield lignosulphonate plant expansion project. Client: Lignotech (Pty) Ltd.

Municipal Infrastructure

- Esidweni Low Cost Housing, South Africa (2003): Project Manager. Environmental prefeasibility and EIA Process for proposed development of the Esidweni low cost housing development at Umlazi. Client: eThekwini Housing Department.
- Le Domaine Sewage Scheme, South Africa (2003): Project Manager. EIA for sewage treatment options for the Le Domaine retirement estate, Hillcrest, KwaZulu-Natal. Client: Le Domaine (Pty) Ltd.
- Mpumalanga Eastern Trunk Sewer, South Africa (2002): Environmental Control Officer. EMP, environmental monitoring, training, and rehabilitation project management for the construction of the 4km Mpumalanga eastern trunk sewer. Client: eThekwini Wastewater Department / Stewart Scott Engineers.
- Sewage Treatment Facilities, Durban, KwaZulu-Natal, South Africa (2001): Project Manager. EIA Process for sewage treatment facilities associated with the redevelopment of the Rob Roy Hotel Site. Client: Alliance Property Group.

Large Scale Infrastructure

- ESIA of the 485MW Kpep Hydropower Project, Cameroon Northwest Region (2019) - ESIA to IFC Standards of a hydropower project on the Katsina Ala River. The project is currently estimated to have an installed capacity of approximately 285MW if developed as a baseload plant, or approximately 340MW if developed as a peaking plant, which will make it one of the most significant power plants in Cameroon. Client: Joule Africa
- Nondovo Dam, Swaziland (eSwatini) (2019): Project Director. ESIA and Resettlement Action Plan (RAP) for development of a multipurpose dam (the Mbabane-Manzini Corridor Dam (Nondvo Dam)). The dam reservoir will have a total storage capacity of 15 Mm^3 with an inundation area of approximately 2.1 km^2. The ESIA was undertaken principally within the reference framework of the African Development Bank Integrated Safeguards System (ISS) and associated Operational Safeguards (OSs). Client: Government of eSwatini
- Lesotho Highlands Water Project Phase 2, Lesotho (2019): Due Diligence E&S Transaction Advisor for project co-finding by two international development finance institutions. The project includes the 2.3 km^3 Polihali dam, 38 km Polihali–Katse water transfer tunnel and associated infrastructure. The Due Diligence was undertaken principally within the reference framework of the African Development Bank Integrated Safeguards System (ISS) and associated Operational Safeguards (OSs). Client: Confidential.
- Berbera Port Phase 1 Expansion Project. Somalia (2018) ESIA Project Manager for the 442 million Berbera port expansion Project. The port will be developed in two phases commencing with the construction of a 430-meter berth and 25-hectare yard. The ESIA is being carried out to the IFC performance standards and relevant World Bank Group EHS Guidelines. Client: DP World

- Bakassi Deep Water Port, Cross River State, Nigeria (2018): Lead E&S transaction advisor to Cross River State for the proposed development of the Bakassi Deep Water Port. The current phase of the project entails gap analysis of the ESIA against the IFC performance standards and relevant World Bank Group EHS Guidelines and the development of an Environmental and Social Action Plan (ESAP). Client: Cross River State.
- Pemba Oil and Gas Port and Logistics Centre, South Africa (2014): ESIA specialist. Environmental Screening and Site Selection, ESIA/ESMP Technical and Environmental Appraisal of an onshore 12000 hectare greenfield oil and gas logistics support base to the Rovuma offshore concession areas. Impact assessment performed with key reference to the World Bank General EHS Industry Sector guidelines: Ports, Harbours, and Terminals (2007) and selected IFC Performance Standards (1, 3, and 5) and application of the World Bank General EHS guidelines (general and for ports). Client: Sonils/ENH.
- South Sudan Feeder Roads Environmental Review (2017): Project Director. Environmental Review of the routes proposed for development, including Lot 1 (Kangi Bar Urud), Lot 2 (Achol Pagong-Ayen-Panilete) and Lot 3 (Gok Machar-Mayom Angok). Along with the Environmental Review Report, an Environmental Management Plan was developed to inform the site establishment, construction and operational phases of the project. Client: United Nations Office for Project Services
- Outer West Roads Upgrades, South Africa (2005): Project Manager. EIA Process for strategic upgrading of key transportation routes in the eThekwini Municipality Outer West area. Client: eThekwini Roads Department.
- ESIA and ESMP for the upgrade of the Ingquza Hill to Mangwanini Access Road, Matheko to Msikaba Access Road and the Mpophomeni Access Roads, South Africa (2011): Project Director. The upgrade project forms part of the South African National Roads Agency Limited Community Development Programme. The ESIA was conducted according to South African Environmental legislation, informed by international best practice guidance for linear project developments.
- Transnet Rail Engineering Waste Management Strategies, South Africa (2011): Project Director. Development of an Industry Waste Management Plan for Durban and Koedoespoort Regions. Client: Transnet Rail Engineering.
- Richards Bay Port Dry Bulk Terminal Waste Management Strategy, South Africa (2006): Project Manager. Development of waste management baseline assessment and development of a bulk material waste minimisation strategy for the Richards Bay Dry Bulk Terminal. Client: Transnet Port Terminals.
- Richards Bay Port Dry Bulk Terminal Waste Transfer Station, South Africa (2006): Project Manager. EIA Process for the proposed establishment of a hazardous waste transfer facility at the Richards Bay Dry Bulk Terminal. Client: Transnet Port Terminals.
- Durban Port Upgrades of Island View Berths 5 and 6. South Africa (2005): Environmental Control Officer. EMP and environmental auditing for the reconstruction of Island View Berths 5 and 6, Port of Durban. Client: Transnet Port Terminals.
- Richards Bay Port Waste Management Strategy, South Africa (2004): Project Manager. Development of a waste management baseline assessment, waste management strategy, and strategy implementation guidelines for the Port of Richards Bay. Client: Transnet Port Terminals.
- Durban Port Ore and Ferrochrome Facility EMS, South Africa (2007): Project Manager. Environmental management system for the Durban container, bulk ore and ferrochrome handling facilities. Client: Bridge Ports (Pty) Ltd.

General

- SAAB Gripen Legal Review, Durban, KwaZulu-Natal, South Africa (2006): Project Manager. Activities associated with the introduction of the Gripen Aircraft into South Africa. Client: SAAB (c/o SAAB Sweden).
- South African Police Services EMS. St. Lucia Wetland Park, KwaZulu-Natal, South Africa (2007): Project Manager. Environmental management system for SAPS training facilities. Client: South African Police Services.

APPENDIX

B EAP DECLARATION

APPENDIX 10
DECLARATION OF THE EAP

I, __Nigel Robert Seed_____, declare that –

- I act as the independent environmental assessment practitioner in this application;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I will take into account, to the extent possible, the matters listed in Regulation 13 of the Regulations when preparing the application and any report relating to the application;
- I undertake to disclose to the applicant and the Competent Authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the Competent Authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the Competent Authority, unless access to that information is protected by law, in which case it will be indicated that such information exists and will be provided to the Competent Authority;
- I will perform all obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I am aware of what constitutes an offence in terms of Regulation 48 and that a person convicted of an offence in terms of Regulation 48(1) is liable to the penalties as contemplated in Section 49B of the Act.

Disclosure of Vested Interest (delete whichever is not applicable)

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;

- ~~I have a vested interest in the proposed activity proceeding, such vested interest being:~~

_____

_____

_____

_____

_____
Signature of the environmental assessment practitioner

WSP Group Africa (Pty.) Ltd
Name of company:

23 June 2021
Date

APPENDIX

C FARM NAMES AND 21 DIGIT SURVEYOR CODES

APPENDIX

PROJECT COMPONENT	FARM NAME	FARM NUMBER	PORTION NUMBER	SG CODE
Power Plant area to be leased	Komatipoort Townland 182 FP	182	48	T0JU00000000018200048
Power Plant area purchased by DNG	Komatipoort Townland 182 FP	182	52	T0JU00000000018200052
Location of the existing Komatipoort Substation where listed activity upgrades may be required.	Komatipoort Townland 182 FP	182	RE	T0JU00000000018200000
Gas Pipeline Route Option	Komatipoort Townland 182 FP	182	72	T0JU00000000018200072
Gas Pipeline Route Option	Komatipoort Townland 182 FP	182	59	T0JU00000000018200059
Gas Pipeline Route Option within road servitude	Komatipoort Townland 182 FP	182	62	T0JU00000000018200062
Gas Pipeline Route Option South of Road Servitude where ROMPCO Tie in occurs	Komatipoort Townland 182 FP	182	58	T0JU00000000018200058
Gas Pipeline Route Option South of Road Servitude where ROMPCO Tie in occurs	Komatipoort Townland 182 FP	182	14	T0JU00000000018200014

APPENDIX

D PHASE 1 ARCHEOLGICAL AND CULTURAL HERITAGE ASSESSMENT

Nsovo Environmental Consulting

Archaeological and Heritage Impact Assessment Report for Proposed establishment of Tau Gas Plant and its associated Infrastructure in Komatipoort, Nkomazi Local Municipality in the Mpumalanga Province, South Africa

October 2020

PREPARED BY

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REPORT DETAILS

PROJECT NAME:	Proposed establishment of Tau Gas-station in Komatipoort**,** Mpumalanga Province.
REPORT TITLE:	Archaeological and Heritage Impact Assessment Report for Proposed establishment of Tau Gas station and its associated infrastructure to feed Eskom Komatipoort Power-Station within Nkomazi Local Municipality in the Mpumalanga Province**.**
AUTHOR:	Mr. Mabuda MM.
REFFERENCE NO.:	2020.GP.HIA.PRO.0003
STATUS OF REPORT:	Final
FINAL ISSUE:	Date: October 2020
STUDY LEADER	M. Mabuda ***Qualifications***: (**Honours.** [Archaeology]. 2003, University of Venda**, Masters of development studies,** 2016, Univ. Of Limpopo**, Post graduate Certificate in Senior Executive Management, 2017,** Univ. of Limpopo (Turfloop Graduate School of Leadership) ***Contacts:*** Mobile Phone: +2783 414 1130
FIELD STUDY TEAM	: **Archaeologist:** Mr. M. Mabuda (BA & BA Hons. Univen. 2002 & 2003)
PROFESSIONAL SERVICE PROVIDER (PSP)	MULAIFA DEVELOPMENT PROJECTS CC

Report

Archaeological and Heritage Impact Assessment Study (A/HIA) for proposed establishment of Tau Gas Plant and its associated infrastructure in the Komatipoort Town of Nkomazi Local Municipality, Mpumalanga Province, SA.

Caveat

Mr M Mabuda of Mulaifa Development Projects has prepared this HIA Report, for Nsovo Environmental Consulting for the expressed purpose of fulfilling the requirements of the National Heritage Resources Act, Act 25 of 1999 and SAHRA regulations in terms of Sec. 38 of the Act.

Geographic Co-ordinate Information: Geographic co-ordinates in this report were obtained using a hand-held Garmin Global Positioning System device. The manufacturer states that these devices are accurate to within +/- 5 m.

Maps: Nsovo Environmental Consulting provided Maps included in this report.

Disclaimer: The Author is not responsible for omissions and inconsistencies that may result from information not available at the time this report was prepared.

This Archaeological and Heritage Impact Assessment Study was carried out within the context of tangible and intangible cultural heritage resources as defined by the SAHRA Regulations and Guidelines for the authorization for proposed establishment of Tau Gas plant and its associated infrastructure.

Signed by:

M Mabuda, October 2020.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Background

DNG Energy (PTY) Ltd appointed Nsovo Environmental Consulting (Nsovo) to conduct an Environmental Impact Assessment (EIA) study for the proposed establishment of Tau gas plant and its associated infrastructure. In turn, Nsovo commissioned Mulaifa Development Projects to conduct a Phase 1 Archaeological and Heritage Impact Assessment (AIA/HIA) Study for the proposed Gas development project within the Komatipoort town in Nkomazi Local Municipality of Mpumalanga Province. The purpose of the study was to provide AIA/HIA professional opinion to the applicant (DNG) in relation to possible impacts associated to the proposed development in the study area.

Method Statement

The findings of this report have been informed by desktop data review, field survey and impact assessment reporting which include recommendations to guide heritage authorities in making decisions with regards to the proposed project. This study was conducted as part of the specialist input to the Environmental Impact Assessment conducted by Nsovo. The study and this report, follow the South African Heritage Resources Agency (SAHRA) and Mpumalanga Provincial Heritage Resources Authority (MPHRA) Guidelines for Phase one (1) AIA/HIA.

Nature of Proposed Development

This study is part of an EIA triggered by proposed development of Tau Gas station and its associated Infrastructure to feed to Eskom Komatipoort Substation. DNG Energy intends to build a new gas station which will connect to Rompco Compressor station pipeline. The proposed project site is located within a heavily degraded and built up area by means of sugarcane agricultural activities and internal streets.

Project Area

The proposed development is situated in the Komatipoort township area within the Nkomazi Local Municipality in the Mpumalanga Province. The entire project area is surrounded by Eskom transmission and distribution powerline from Komatipoort Substation, existing gas pipeline, sugarcane agricultural activities, internal streets and railway line.

The Heritage Impact Assessment Process

This HIA study report is segmented into sections as follows:

1. Executive Summary,
2. Project Background,
3. HIA on the Project Receiving Cultural Landscape project area in line with the NHRA *(Act 25 Section 38)*, and
4. Heritage Management Recommendations for immediate project receiving area covering the development, operation to closure phases of the project.

The impact assessment study also includes detailed recommendations on how to mitigate and manage potential negative impacts of the proposed development while enhancing positive effects on the project area.

The Legal Framework and Guidelines

This HIA study is a specialist study to the EIA process and it is guided by the:

- National Heritage Resources Act, *(Section 38 of Act 25 of 1999).*
- SAHRA AMP HIA Guideline.
- Terms of Reference provided.

All South African heritage assets are protected by the National Heritage Resources Act (NHRA 25 of 1999), which makes it an offence to destroy heritage resources without permission from the relevant authority. In terms of the provisions of the NHRA Act of 1999, individual sites within the project area enjoy the varying levels of protection.

Results of the Study

Analysis of the archaeological, cultural heritage, environmental and historic contexts of the study area predicted that archaeological sites (Stone Age and Historic Archaeological), cultural heritage sites, burial grounds or isolated artifacts are unlikely to be present on the affected landscape. The field survey was conducted to test this hypothesis and verify this prediction within the proposed gas

station and gas pipeline project and its associated infrastructure site. The project receiving area is situated on previously disturbed land parcels. As such, the proposed development will be an in situ development that will be contained within existing developments in the periphery of the site of interest. Intangible impacts to the sense of a place within the project's receiving environment was assessed and deemed to be limited given the level of existing built-up areas in the project footprint area.

Recommendations

The project footprint area was assessed and rated as having low to medium cultural heritage significance. The following recommendations are made in this report:

- The project area has considerable existing built-up areas and as such no significant impacts are anticipated on the built environment given the existence of contemporary built-infrastructure or structures already in the project area.
- Low visibility emanating from the proposed project development is anticipated, particularly during the post-construction phase. Furthermore, the project area is characterized by Agricultural land with contemporary infrastructures in place like Komatipoort Eskom sub-station, which will absorb the proposed developments in situ once the project becomes operational. Therefore the visual impacts of the proposed development are considered to be very low across the receiving contemporary cultural landscape.
- Overall impacts to heritage resources are not considered to be adverse to warrant abandonment of the proposed project. It is thus concluded that the project must be cleared to proceed as planned subject to the Heritage Authority ensuring that a detailed heritage monitoring procedures are included in the project EMP, for the construction phase. These should include chance archaeological finds mitigation procedure in the project EMP, specifically to cover subsurface construction activities.
    - The chance finds process will be implemented when necessary, especially when archaeological materials and burials are encountered during subsurface construction activities.
    - If archaeological materials are uncovered, work should cease immediately and the Mpumalanga Provincial Heritage Resource Authority (MPHRA) or SAHRA be notified and activity should not resume until appropriate management provisions are in place.

- In the event that previously unknown human remains are accidentally uncovered during development, then work on affected section and the immediate vicinity should be halted and the finds protected and reported to SAHRA.
- The findings of this report, with approval of the MPHRA, may be classified as acceptable to any Interested and Affected Parties within the limits of the laws.
- It is further recommended that, from both heritage and economic considerations, the proposed development should be approved.

ABBREVIATIONS

AIA Archaeological Impact Assessment

BID Background Information Document

C Contractor

CARA Conservation of Agricultural Resources Act, 1983 (Act No 43

CECO Construction Environmental Conservation Officer

DAFF Department of Agriculture, Forestry and Fisheries

DEA Department of Environmental Affairs

DSR Draft Scoping Report

DWA Department of Water Affairs

EAP Environmental Assessment Practitioner

ECA Environmental Conservation Act

ECO Environmental Conservation Officer

EIA Environmental Impact Assessment

EIAR Environmental Impact Assessment Report

EM Environmental Manager

EMP Environmental Management Plan

EMPr Environmental Management Programme

EMPR Environmental Management Programme Report

EMS Environmental Management System

FC Farming Community

GN General Notice

GNR General Notice Regulation

Ha Hectares

HIA Heritage Impact Assessment

HMP Heritage Management Plan

I&AP's Interested and Affected Parties

IDP Integrated Development Plan

IRR Issues and Responses Report

LIA Late Iron Age

LFC Late Farming Community

LSA Late Stone Age

MIA Middle Iron Age

MSA Middle Stone Age

NEMA National Environmental Management Act 107 of 1998

NEMAQA National Environmental Management: Air Quality Act 39 of 2004

NEMPAA National Environmental Management Protected Areas Act

NEMWA National Environmental Management: Waste Act 59 of 2008

NGO Non-Government Organisation

NHRA Nation Heritage Resources Act, Act 25 of 1999

PM Project Manager

SAHRA South African Heritage Resources Agency

SM Site Manager

ToR Terms of Reference

DEFINITIONS

The following terms used in this Archaeological /Heritage Impact Assessment are defined in the National Heritage Resources Act [NHRA], Act Nr. 25 of 1999, South African Heritage Resources Agency [SAHRA] Policies as well as the Australia ICOMOS Charter *(Burra Charter)*:

Archaeological Material remains resulting from human activities, which are in a state of disuse and are in, or on, land and which are older than 100 years, including artifacts, human and hominid remains, and artificial features and structures.

Chance Finds means Archaeological artefacts, features, structures or historical cultural remains such as human burials that are found accidentally in context previously not identified during cultural heritage scoping, screening and assessment studies. Such finds are usually found during earth moving activities such as water pipeline trench excavations.

Compatible use means a use, which respects the cultural significance of a place. Such a use involves no, or minimal, impact on cultural significance.

Conservation means all the processes of looking after a place so as to retain its cultural significance.

Cultural Heritage Resources Same as ***Heritage Resources*** as defined and used in the National Heritage Resources Act *(Act No. 25 of 1999*). Refer to physical cultural properties such as archaeological and palaeolontological sites; historic and prehistoric places, buildings, structures and material remains; cultural sites such as places of ritual or religious importance and their associated materials; burial sites or graves and their associated materials; geological or natural features of cultural importance or scientific significance. ***Cultural Heritage Resources*** also include ***intangible resources*** such as religion practices, ritual ceremonies, oral histories, memories and indigenous knowledge.

Cultural significance means aesthetic, historic, scientific, social or spiritual value for past, present or future generations.

Cultural Significance also encompasses the complexities of what makes a place, materials or intangible resources of value to society or part of, customarily assessed in terms of aesthetic, historical, scientific/research and social values.

Environment The surroundings within which humans exist and that are made up of: i. the land, water and atmosphere of the earth;

ii. micro-organisms, plant and animal life;

iii. any part or combination of (i) and (ii) and the interrelationships among and between them; and,

iv. the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being. This includes the economic, social, cultural, historical and political circumstances, conditions and objects that affect the existence and development of an individual, organism or group.

Environmental impact assessment An Environmental Impact Assessment (EIA) refers to the process of identifying, predicting and assessing the potential positive and negative social, economic and biophysical impacts of any proposed project, plan, programme or policy which requires authorisation of permission by law and which may significantly affect the environment. The EIA includes an evaluation of alternatives. As well as recommendations for appropriate mitigation measures for minimising or avoiding negative impacts, measures enhancing the positive aspects of the proposal and environmental management and monitoring measures.

Expansion means the modification, extension, alteration or upgrading of a facility, structure or infrastructure at which an activity takes place in such a manner that the capacity of the facility or the footprint of the activity is increased;

Fabric means all the physical material of the place including components, fixtures, contents and objects.

Grave A place of interment *(variably referred to as burial)*, including the contents, headstone or other marker of such a place, and any other structure on or associated with such place. A grave may occur in isolation or in association with others where upon it is referred to as being situated in a cemetery *(contemporary)* or **Burial Ground** *(historic).*

Heritage impact assessment (HIA) refers to the process of identifying, predicting and assessing the potential positive and negative cultural, social, economic and biophysical impacts of any proposed project, plan, programme or policy which requires authorisation of permission by law and which may significantly affect the cultural and natural heritage resources. The HIA includes recommendations for appropriate mitigation measures for minimising or avoiding negative impacts, measures enhancing the positive aspects of the proposal and heritage management and monitoring measures.

Historic Material remains resulting from human activities, which are younger than 100 years, but no longer in use, including artefacts, human remains and artificial features and structures.

Impact The positive or negative effects on human well-being and / or on the environment.

In Situ material culture and surrounding deposits in their original location and context, for example an archaeological site that has not been disturbed by farming.

Interested and affected parties Individuals, communities or groups, other than the proponent or the authorities, whose interests may be positively or negatively affected by the proposal or activity and/ or who are concerned with a proposal or activity and its consequences.

Interpretation means all the ways of presenting the cultural significance of a place.

Late Iron Age this period is associated with the development of complex societies and state systems in southern Africa.

Material culture means buildings, structure, features, tools and other artefacts that constitute the remains from past societies.

Mitigate The implementation of practical measures to reduce adverse impacts or enhance beneficial impacts of an action.

Place means site, area, land, landscape, building or other work, group of buildings or other works, and may include components, contents, spaces and views.

Protected area means those protected areas contemplated in section 9 of the NEMPAA and the core area of a biosphere reserve and shall include their buffers;

Public participation process A process of involving the public in order to identify issues and concerns, and obtain feedback on options and impacts associated with a proposed project, programme or development. Public Participation Process in terms of NEMA refers to: a process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to specific matters

Setting means the area around a place, which may include the visual catchment.

Significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change *(i.e. intensity, duration and likelihood).* Impact significance is the value placed on the change by different affected parties *(i.e. level of significance and acceptability).* It is an anthropocentric concept, which makes use of value judgments and science-based criteria *(i.e. biophysical, physical cultural, social and economic).*

Site A distinct spatial cluster of artefacts, structures, organic and environmental remains, as residues of past human activity.

Use means the functions of a place, as well as the activities and practices that may occur at the place.

1. INTRODUCTION

Nsovo Environmental Consulting (Nsovo) commissioned Mulaifa Development Projects cc led by Mr. M. Mabuda and Mr. R. Munyai to conduct an Archaeological and Heritage Impact Assessment (AIA/HIA) study of the area that will be affected by the proposed development of new Tau gas station. This report focuses on the proposed establishment of Tau gas station and its associated infrastructure to feed Komatipoort Eskom substation at Komatipoort Township, Nkomazi Local Municipality in Mpumalanga Province. This report outlines the desktop study, review of previous heritage assessment studies in the general area, field study and present results of the study as well as discussion on the anticipated impacts of the proposed development as is required by the National Heritage Resources Act, (Act 25 of 1999). The study focuses on identifying and assessing potential impacts on archaeological, as well as on other physical cultural properties including historical heritage and intangible resources in relation to the proposed development.

An accredited archaeologist and heritage management specialist, undertook the assessments, research and consultations required for the preparation of the report for the purpose of ensuring that the cultural values are taken into consideration and reported into the EIA authorisations and EMP' processes spanning the proposed life span of the proposed gas station and gas pipeline development.

The study was designed to ensure that any significant cultural, physical property or sites and related intangible heritage resources are located and recorded, and site significance is evaluated to assess the nature and extent of expected impacts from the proposed development. The assessment includes recommendations to manage the expected impact of the development site. The report includes recommendations to guide heritage authorities in making appropriate decision with regards to Heritage Management Planning.

The specialist conducted the assessment; research and consultations required for the preparation of this HIA report in a manner consistent with its obligations set in the NHRA as well as the environmental management legislations. In line with MPHRA/SAHRA guidelines, this section of the report, not necessarily in that order, provides:

1) Management summary
2) Methodology
3) Information with reference to the desktop study
4) Map and relevant geodetic images and data

5) GPS co-ordinates
6) Directions to the site
7) Site description and interpretation of the cultural area where the project will take place
8) Management details, description of affected cultural environment, photographic records of the project area
9) Recommendations regarding the significance of the site and recommendations regarding further monitoring of the site
10) Conclusion.

2. NATURE OF PROPOSED DEVELOPMENT

The study concerns the proposed establishment of a new Tau gas plant. This will includes two identical plants next to each other with a foot print of 60m x 100m at a height of 25m. The associated infrastructure is inclusive of an estimated 1km pipeline which will connect from an existing Rompco gas pipeline to the power plant.

3. STATUTORY REQUIREMENTS

This HIA report addresses the requirements as is stipulated in the NHRA Act 25 of 1999 Section 38 as well as EIA Terms of Reference in relation to the assessment of impacts of the proposed gas plant, pipeline and its associated infrastructure development on the cultural and heritage resources associated with the receiving environment. The statutory mandate of heritage impact assessment studies is to encourage and facilitate the protection and conservation of archaeological and cultural heritage sites, in accordance with the provisions of the National Heritage Resources Act, Act 25 of 1999 and auxiliary regulations. Therefore, in pre-development context, heritage impact assessment study is conducted to fulfil the requirements of Section 38 (1) of the National Heritage Resources Act, (No 25 of 1999).

The legislations requires that when constructing a linear development exceeding 300m in length or developing with an area exceeding 5000 m² in extent, the developer must notify the responsible heritage authority of the proposed development and they in turn must indicate within 14 days whether an impact assessment is required. The NHR Act notes, "Any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.

Both the national legislations and provincial provisions provide protection for the following categories of heritage resources:

Landscapes, cultural or natural;

- Buildings or structures older than 60 years;
- Archaeological Sites, palaeontological material and meteorites;
- Burial grounds and graves;
- Public monuments and memorials;
- Living heritage (defined as including cultural tradition, oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems and the holistic approach to nature, society and social relationships).

Furthermore, the proposed development is guided and governed by legislative acts and regulations including environmental, spatial planning, land use and heritage management laws and regulations. The following acts have particular relevance to the management of heritage sites wherever they are found in the Republic:

- Environmental Conservation Act, No.73 of 1989.
- National Environment Management Act (NEMA), No.107 of 1998.

4. HIA STUDY TERMS OF REFERENCE

This HIA study was commissioned under the guidance of the requirements of Section 38*(3)* of the NHRA. As outlined in the introduction section, the activities would include:

1. Hypothesising and Conducting a detailed desk-top level investigation to identify all archaeological, cultural and historic sites in the proposed gas plant and pipeline project receiving areas;
2. Conduct appropriate physical cultural properties field work and survey to verify results of desktop investigation;
3. During the field survey, document *(GPS coordinates and map)* all archaeological and heritage sites, objects and structures and physical cultural properties identified within the project's receiving environment;

4. Compile a Heritage Impact Assessment report which would include:
    a. Identification of archaeological, cultural and historic sites within the affected development areas;
    b. Assess the sensitivity and significance of archaeological remains within the affected development areas;
    c. Estimation and evaluation of the potential impacts of the proposed construction, operation and maintenance of the proposed development on archaeological, cultural and historic sites in the proposed project receiving areas;
    d. Measure the impacts in terms of the scale of impact
    e. Provide appropriate Recommendation of mitigation measures that may add positive impacts while reducing the identified negative impacts on archaeological, cultural and historic sites in the proposed project receiving areas;
    f. The recommendations should be applicable enough to effectively guide the compliance authorities in issuing a decision regarding the authorisation of the proposed development.
    g. Consideration of relevant MPHRA and SAHRA as well and international best practices guidelines; and,
    h. Development Heritage Management Planning guideline: "Guideline for involving heritage stakeholders in the processes".

In essence, both the national heritage and environmental legislations provide protection for the following categories of heritage resources:

- Landscapes, cultural or natural;
- Buildings or structures older than 60 years;
- Archaeological Sites, palaeontological material and meteorites;
- Burial grounds and graves;
- Public monuments and memorials;

- Living heritage (defined as including cultural tradition, oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems and the holistic approach to nature, society and social relationships).

5. LOCATION OF ACTIVITY AREA AND IMPACT AREA

The project area is located approximately 105 km east of Mbombela Town, along the N4 towards Mozambique border, in Komatipoort Town of Mpumalanga Province. These activities would also have impacted negatively on any visible evidence of heritage resources. Refer to the EIA report for geographical, environmental and demographic issues.

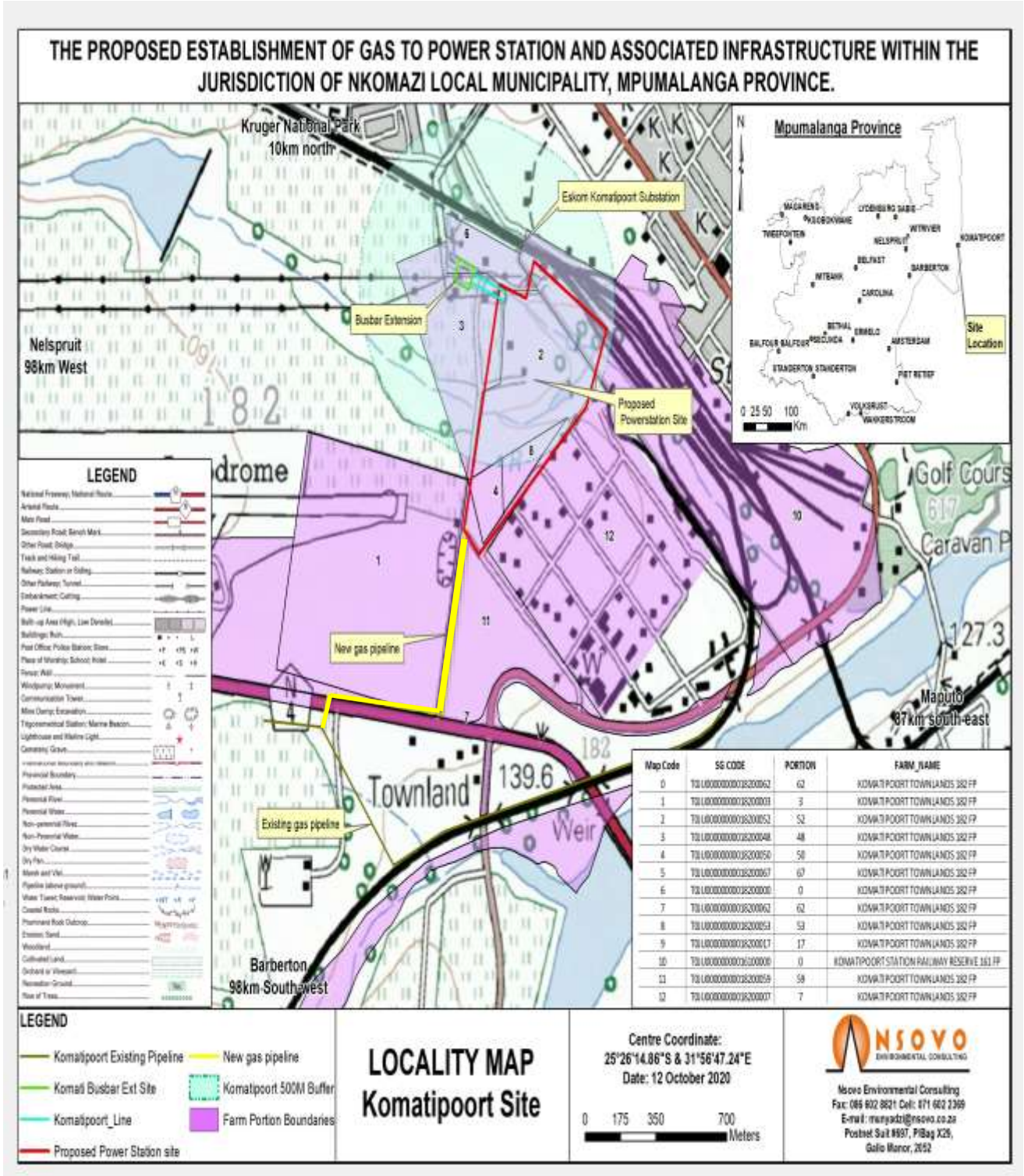

Plate 1. Project locality Map, courtesy of Nsovo Environmental Consulting, 2020

6. METHODOLOGY

The proposed project development requires clearance and authorisation from government compliance agencies including the heritage authority of MPHRA and or SAHRA. Key HIA objectives for this section of the study are to fulfil the statutory requirements of the National Heritage Resources Act, Act 25 of 1999. In order to meet the objectives of the HIA Phase 1 study, the following tasks were conducted: *1)* site file search, *2)* literature review, *3)* consultations with key stakeholders, *4)* completion of a field survey and assessment and *5)* analysis of the acquired data and report production.

The following tasks were undertaken:

- Preparation of a predictive model for archaeological heritage resources in the study area.
- A review and gap analysis of archaeological, historical and cultural background information, including possible previous heritage consultant reports specific to the affected project area, the context of the study area and previous land use history as well as a site search;
- Field survey.
- Physical cultural property recording of any identified sites or cultural heritage places;
- Identification of heritage significance; and
- Preparation of HIA report with recommendation, planning constraints and opportunities associated with the proposed development.

The project area is part of an existing and previously developed and disturbed landscape with access roads servitudes; Gas pipelines, both transmission and distribution powerlines and other auxiliary infrastructures dominate the affected project area. The proposed site is most predominated by sugarcane plantation.

Geographic coordinates were obtained with a handheld Garmin GPS global positioning unit. Photographs were taken as part of the documentation process during field study.

7. Assumptions and Limitations

The field survey did not include any form of subsurface inspection beyond the inspection of burrows, road cut sections, and the sections exposed by erosion or earth moving disturbances, especially by agricultural activities. Some assumptions were made as part of the study and therefore some

limitations, uncertainties and gaps in information would apply. It should however, be noted that these do not invalidate the findings of this study in any significant way:

1. The proposed gas plant development will be limited to specific right of way sites and laydown areas as detailed in development layout.
2. The construction teams at the development and service sites will use the existing access roads and there will be no major deviations into undisturbed sections.
3. Given the extensive degraded nature on most affected project area, the area have low to medium potential to yield highly significant in situ archaeological or physical cultural properties.
4. No excavations or sampling was undertaken, since a permit from heritage authorities is required to disturb a heritage resource. As such the results herein discussed are based on surface indicators. However, these surface observations concentrated on areas accessible.
5. No Palaeontological study was conducted as part of this HIA.
6. This study did not include any ethnographic and oral interviews. The existing studies from current and historic researches are accepted as adequate for the purposes of this HIA.

8. Consultation

No oral consultation was done as part of this study. However, the EIA Public Participation Process will invite comments from affected communities and other interested parties on any matter related to the proposed development including heritage concerns that may arise as a result of the proposed development.

9. FIELDWORK RESULTS

Plate 1. Reflect the sugarcane plantation which will be affected by the proposed Tau gas plant at S25°26'15,54" E31°56'39,25"

Plate 2: Photo 2 shows the point whereby the proposed new gas pipeline will connect to the existing towards the proposed plant (Author 2020). S25°26'28,98" E31°56'36,33" (T-off of Hotchkiss Street).

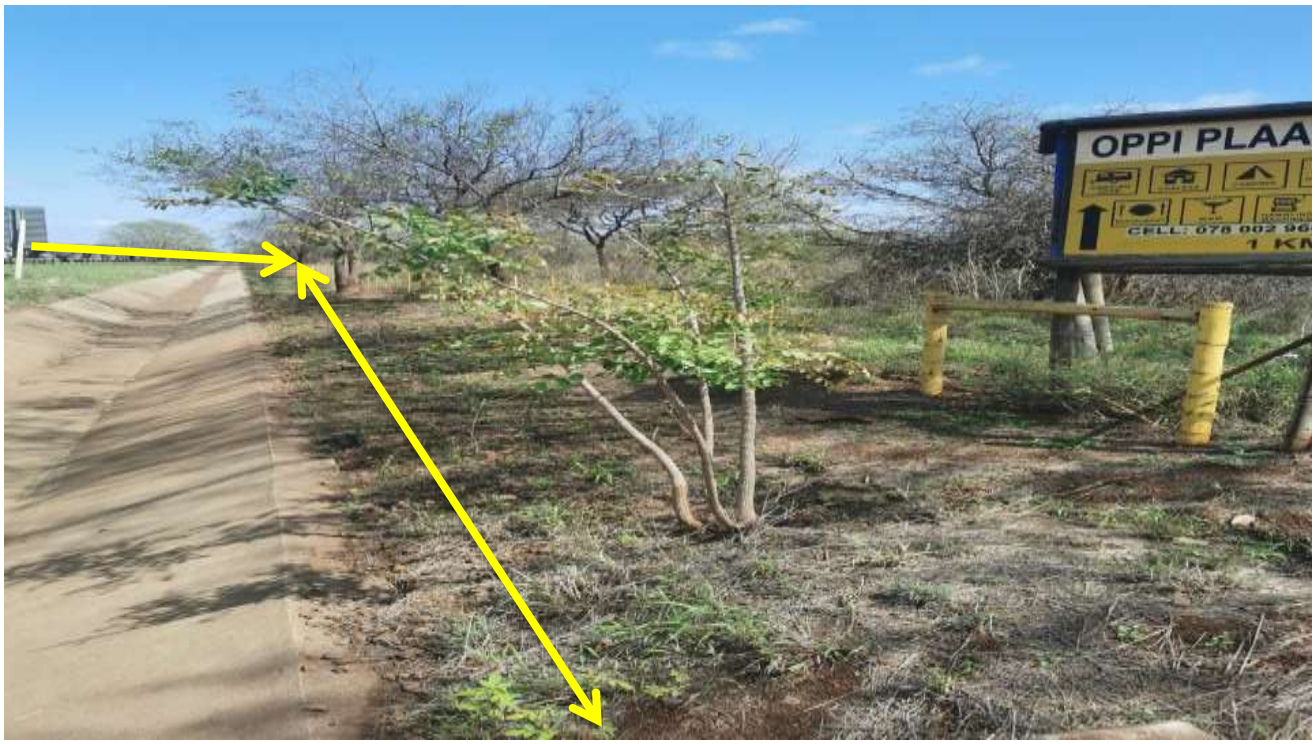

Plate 3: Photo 3 shows a T-off point of the proposed gas pipeline to run parallel the N4 towards the Rompco Compressor station. (Author 2020). S25°26'46,8 E31°56'32,56" (Parallel N4).

Plate 4: Photo 4 shows the point in which the proposed gas pipeline will cross N4 road to connect to an existing Rompco pipeline (Author 2020). S25°26'46'15" E31°56'17,35" (T-off N4 towards Rompco compressor station).

9.1 Archaeological finds

Although some sections of the site earmarked for the gas plant development are degraded from previous and current land uses such as access road, existing Rompco gas pipeline, both Eskom transmission and distribution powerline and agricultural activities in sugar cane farming, there is no evidence suggesting any potential of recovering archaeological remains during excavation for proposed gas plant foundations and its associated infrastructure. There is an established associated infrastructure development, illegal dumping site, roads and other infrastructures across the entire project receiving area and as such, the proposed gas station establishment and its associated infrastructure development will be additional to in situ developments already on the project area. The field survey did not identify any cultural heritage resources, burial grounds or archaeological resources within the proposed area earmarked for the proposed project development.

9.2 Historical and Built Environment

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 period sites and features associated with the, African communities, settler and commercial farming communities are on record in the project area environment. Although the affected general landscape is associated with historical events such as white settler migration, colonial wars and the recent African people of the region, no listed specific historical sites are on the proposed development sites. The more common functions of places of cultural historical significance may include:
Historical building or structures older than 60 years.

9.3 Burial grounds and graves

Whether burial sites are known or not on record, from a heritage perspective, burial grounds and gravesites are accorded the highest social significance threshold (see Appendix 1). They have both historical and social significance and are considered sacred. Wherever they exist they may not be tempered with or interfered with during any proposed development. It is important to note that the possibility of encountering human remains during subsurface earth moving works anywhere on the landscape is ever present. Although the possibility of encountering previously unidentified burial sites is low along the proposed earmarked site, should such sites

be identified during subsurface construction work, they are still protected by applicable legislations and they should be protected.

9.4 Historical Monuments

There are currently no places within or in the vicinity of the proposed site that are listed on the National Heritage List.

9.5 Cultural landscapes

The project area is part of an established rural settlement with associated infrastructure. As such the entire gas plant site is part of a broader cultural landscape.

10. DISCUSSION

Literature review does not revealed the existence of archaeological sites that may occur within the general project area. As such there is no need for construction teams members to be inducted on the potential of encountering subsurface cultural heritage resources during construction. The following observations are worthy emphasizing in this discussion prior to making final recommendations:

- Limited ground surface visibility on sections of the project area that had thick vegetation cover at the time of the study may have impeded the detection of archaeological sites. This factor is exacerbated by the fact that the study was limited to general survey without necessarily conducting any detailed inspection of specific localities that will be affected by the proposed gas plant development. The absence of confirmable and significant archaeological cultural heritage sites is not evidence in itself that such in situ sites did not exist in the project area.

11. CULTURAL HERITAGE SITE ASSESSMENT OF SIGNIFICANCE

The appropriate management of cultural heritage resources is usually determined on the basis of their assessed significance as well as the likely impacts of any proposed developments. Cultural significance is defined in the Burra Charter as meaning aesthetic, historic, scientific or social value for past, present and future generations (Article 1.2). Social, religious, cultural and public significance are currently identified as baseline elements of this assessment, and it is through the combination of these elements that the overall cultural heritage values of the site of interest, associated place or area are resolved. Not all sites are equally significant and not all are worthy of

equal consideration and management. The significance of a place is not fixed for all time, and what is considered of significance at the time of assessment may change as similar items are located, more research is undertaken and community values change.

The above observation does not lessen the value of the heritage approach, but enriches both the process and the long-term outcomes for future generations as the nature of what is conserved and why, also changes over time (Pearson and Sullivan 1995:7).

African indigenous cultural heritage significance is not limited to items, places or landscapes associated with pre-European contact. Indigenous cultural heritage significance is understood to encompass more than ancient archaeological sites and deposits, broad landscapes and environments. It also refers to sacred places and story sites, as well as historic sites, including mission sites, memorials, and contact sites. This can also refer to modern sites with particular resonance to the indigenous community. The site of interest considered in this project falls within this realm of broad significance.

12. Assessment Criteria

The SAHRA Guidelines and the Burra Charter define the following criterion for the assessment of cultural significance:

12.1 Aesthetic Value

Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and material of the fabric; sense of place, the smells and sounds associated with the place and its use.

12.2 Historic Value

Historic value encompasses the history of aesthetics, science and society, and therefore to a large extent underlies all of the terms set out in this section. The overall Mpumalanga Province region as a place has historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives in situ, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.

12.3 Scientific value

The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality or representativeness, and on the degree to which the place may contribute further substantial information. Scientific value is also enshrined in natural resources that have significant social value. For example, pockets of forests and bushvelds have high ethnobotany value.

12.4 Social Value

Social value embraces the qualities for which a place has become a focus of spiritual, religious, political, local, national or other cultural sentiment to a majority or minority group. Social value also extend to natural resources such as bushes, trees and herbs that are collected and harvested from nature for herbal and medicinal purposes.

12.5 Evaluation of Heritage Resource

Based on the information from the SAHRA standards of best practice and minimum standards, data capture forms were used to collect information from the field through site condition surveys and observations. After data was gathered from the field, it was combined with information from other sources deemed essential to establish the value and significance of individual sites as well as to identify any threats to the heritage. The NHRA (Act 25 of 1999) grading scale was used to assess significance.

Table 1: Significance assessment of heritage resources based on ICOMOS and NHRA criteria.

ICOMOS Ranking	South African Legislation (National Heritage Resources Act Ranking
• **Very high (World Heritage Sites)**	National Heritage Sites (Grade 1)
• **High (Nationally significant sites**	National Heritage Sites (Grade 1), Grade 2 (Provincial Heritage Sites), burials
• **Medium (regionally significant sites)**	Grade 3a
• **Low (locally significant sites)**	Grade 3b
• **Negligible**	Grade 3c
• **Unknown**	Grade 3a

13. STATEMENT OF SIGNIFICANCE

13.1Aesthetic Value

The visual and physical relationship between HIA study area and the surrounding cultural Landscape demonstrates the connection of place to the local and oral historical stories of the African communities who populated this region going back into prehistory.

Table 2: Assessment of impacts to Aesthetic Values related to the scenic routes and sense of place

	Before Mitigation	After Mitigation
Magnitude	Low	NA
Extent Local -	Local	NA
Duration Long term -	Long term	NA
Significance	Low -	NA
Probability	Definite -	NA
Status	Negative -	NA

13.2 Historic Value

Although the entire project area is comprised of various infrastructure development, no historical aspect of cultural significance were recorded on the direct path of powerline servitude or substation

footprint, however, such history goes back to the pre-colonial period, through the colonial era, the colonial wars and subsequent colonial rule up to modern day.

Table 3: Assessment of impacts to Historic Values related to the project area.

	Before Mitigation	After Mitigation
Magnitude	Low	Low
Extent Local -	Specific Site	Specific Site
Duration Long term	Long term	Long term
Significance	Low -	Low -
Probability	Definite -	Probable
Status	Negative -	Negative -
Cumulative	No historic sites may be affected by this development.	

13.3 Scientific value

Previous construction activities and associated roads, and other auxiliary infrastructure developments and disturbance within the HIA study area associated with the proposed substation development have resulted in limited intact significant cultural landscapes with the potential to retain intact large scale or highly significant open archaeological site deposits. However, should intact archaeological sites be recorded within the proposed substation site and immediate surrounding areas, they may retain scientific evidence that may add value to the local and regional history.

Table 4: Assessment of impacts to Archaeological Scientific Values related to the project area.

	Before Mitigation	After Mitigation
Magnitude		
	Low	NA
Extent Local -		
	Specific Site	NA
Duration Long term -		
	Long term	NA
Significance		
	Low -	NA
Probability		
	Definite -	NA

Status		
	Negative -	NA
Reversible		
	Yes (with rehabilitation after plant is decommissioned)	NA
Cumulative		
	There are no archaeological resources falling within the project area. Given the destructive nature of the proposed project area, there is no cumulative impacts that are of concern on this site. Monitoring may not be necessary during construction phase of the development.	

13.4 Social Value

Under normal circumstances, any site possesses some certain status of social significance at a particular time in a society. The overall area has social value for the local community, as is the case with any populated landscape. The land provides the canvas upon which daily socio-cultural activities are created. All these factors put together confirm the social significance of the project area. However, this social significance is not going to be adversely impacted by the proposed Tau gas plant and pipeline development especially given the fact that the development will add value to the human settlements and activities already taking place. In addition the area is already affected by development and this project is an addition to already existing infrastructure such as roads, and other infrastructure developments.

14. RECOMMENDATIONS

1. From a heritage perspective supported by the findings of this study, the proposed gas plant and its associated pipeline development is feasible. However, the proposed development should be approved to proceed as planned under observation that the plant dimension do not extend beyond the proposed site. The foot print impact of the proposed gas plant development and associated infrastructure should be kept to minimal to limit the possibility of encountering chance finds.
2. There are no burial site or graves identified during the field investigation of gas pipeline corridor and gas plant development earmarked site. However, should graves and burial sites are discovered during the cause of construction activities, all construction activities should cease and site must be barricaded and SAHRA/MPHRA or the professional archaeologist must be informed.

3. Should any unmarked burials are exposed during construction affected families must be trekked and consulted, relevant rescue/ relocation permits must be obtained from SAHRA/MPHRA before any grave relocation can take place. Furthermore a professional archaeologist must be retained to oversee the relocation process in accordance with the National Heritage Resources Act 25 of 1999.
4. When the removal of topsoil and subsoil on the site earmarked development sites commences, caution must be exercised.
5. Should chance archaeological materials or human burials remains be exposed during subsurface, construction work on any section of the gas plant 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.
6. Subject to the recommendations herein made and the implementation of the mitigation measures and adoption of the project EMP, there are no significant cultural heritage resources barriers to the proposed Tau gas plant and its associated infrastructure development. The Heritage authority may approve the proposed development to proceed as planned with special implementing the recommendations here in made.

15. Management & Policy Recommendations

15.1 Community Advisory

Should community consultations being held through the project EIA PPP refer to any cultural issues associated with the project area, such matters should be addressed adequately. The proposed developmental project is associated with existing communities in the landscape and their heritage or cultural aspirations that may potentially be affected by the development should be acknowledged in the event that they are identified during the course of the implementation of the proposed development. To date, the PPP consultation process has not identified cultural heritage contestation to the project.

15.2 Public Participation

The Project Public Participation Process should ensure that any cultural heritage related matter for this project is given due attention whenever it arises and is communicated to MPHRA throughout the proposed project development. This form of extended community involvement would pre-empty any potential disruptions that may arise from previously unknown cultural heritage matter that may have escaped the attention of this study.

15.3 Interpretation & Active Management Recommendations

In most cases, the local communities have a long and significant connection with project area. Like any other generational society, there are several other cultural activities that take place within the affected settlement areas associated with the particular site.

16. Recommendation

Although the possibility of conflict between the community and the proposed development related to cultural heritage is unlikely, MPHRA should acknowledge on behalf of the community, that the project area is situated in a culturally significant landscape associated with local history and cultural activities. MPHRA may also acknowledge that such significance is not tied to physical sites or archaeological sites only, but to intangible heritage such as popular memories, oral history, ancestral remembrance, religious rituals, aesthetic appreciations, living experiences and folklores. As such, the community retains the right to have their constitutionally guaranteed cultural heritage rights respected and protected without being limited to existence of physical evidence such as archaeological sites. Should such issues arise in association with this proposed development, they will have to be adequately addressed by MPHRA and community.

16. CONCLUDING REMARKS

The literature review, field research and subsequent impact assessment confirmed that the project area is situated within a historical and contemporary cultural landscape dotted with settlements that have long local history. Field survey was conducted during which it was established that the entire project site is degraded by existing and previous land use activities and developments. This report concludes that the proposed Tau gas plant and and its estimated 1km gas pipeline development be approved by Heritage Authority to proceed as planned subject conditional inclusion of heritage monitoring measures in the project EMP (also see Appendices) and chance finds procedures for the construction phase.

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APPENDIX 1: HUMAN REMAINS AND BURIALS IN DEVELOPMENT CONTEXT

Developers, land use planners and professional specialist service providers often encounter difficult situations with regards to burial grounds, cemeteries and graves that may be encountered in development contexts. This may be before or during a development project. There are different procedures that need to be followed when a development is considered on an area that will impact upon or destroy existing burial grounds, cemeteries or individual graves. In contexts where human remains are accidentally found during development work such as road construction or building construction, there are different sets of intervention regulations that should be instigated. This brief

is an attempt to highlight the relevant regulations with emphasis on procedures to be followed when burial grounds, cemeteries and graves are found in development planning and development work contexts. The applicable regulations operate within the national heritage and local government legislations and ordinances passed in this regard. These guidelines assist you to follow the legal pathway.

1. First, establish the context of the burial:

A. Are the remains less than 60 years old? If so, they may be subject to provisions of the Human Tissue Act, Cemeteries Ordinance(s) and to local, regional, or municipal regulations, which vary from place to place. The finding of such remains must be reported to the police but are not automatically protected by the National Heritage Resources Act (Act 25 of 1999).

B. Is this the grave of a victim of conflict? If so, it is protected by the National Heritage Resources Act (Section 36(3a)). (Relevant extracts from the Act and Regulations are included below).

C. Is it a grave or burial ground older than 60 years which is situated outside a formal substation administered by a local authority? If so, it is protected by the National Heritage Resources Act (Section 36(3b)).

D. Are the human or hominid remains older than 100 years? If so, they are protected by the National Heritage Resources Act (Section 35(4), see also definition of "archaeological" in Section 2).

2. Second, refer to the terms of the National Heritage Resources Act most appropriate to the situation, or to other Acts and Ordinances:

   A. Human remains that are NOT protected in terms of the National Heritage Resources Act (i.e. less than 60 years old and not a grave of a victim of conflict or of cultural significance) are subject to provisions of the Human Tissue Act and to local and regional regulations, for example Cemeteries Ordinances applicable in different Provincial and local Authorities.

   B). All finds of human remains must be reported to the nearest police station to ascertain whether or not a crime has been committed.

   C). If there is no evidence for a crime having been committed, and if the person cannot be identified so that their relatives can be contacted, the remains may be kept in an institution where certain conditions are fulfilled. These conditions are laid down in the Human Tissue Act (Act No. 65 of 1983). In contexts where the local traditional authorities given their consent to the unknown

remains to be re-buried in their area, such re-interment may be conducted under the same regulations as would apply for known human remains.

3. In the event that a graveyard is to be moved or developed for another purpose, it is incumbent on the local authority to publish a list of the names of all the persons buried in the graveyard if there are gravestones or simply a notification that graves in the relevant graveyard are to be disturbed. Such a list would have to be compiled from the names on the gravestones or from parish or other records. The published list would call on the relatives of the deceased to react within a certain period to claim the remains for re-interment. If the relatives do not react to the advertisement, the remains may be re-interred at the discretion of the local authority.

A. However, it is the responsibility of the developer to ensure that none of the affected graves within the development site are is burials of victims of conflict. The applicant is also required in line with the heritage legislation to verify that the graves have no social significance to the local communities.

B. It is illegal in terms of the Human Tissue Act for individuals to keep human remains, even if they have a permit, and even if the material was found on their own land.

4. The Exhumations Ordinance (Ordinance No. 12 of 1980 and as amended) is also relevant. Its purpose is "To prohibit the desecration, destruction and damaging of graves in cemeteries and receptacles containing bodies; to regulate the exhumation, disturbance, removal and re-interment of bodies, and to provide for matters incidental thereto". This ordinance is supplemented and support by local authorities regulations, municipality by-laws and ordinances.

DEFINITIONS AND APPLICABLE REGULATIONS

1). A "Municipality" is defined as any land, whether public or private, containing one or more graves.

2). A "grave" includes "(a) any place, whether wholly or partly above or below the level of ground and whether public or private, in which a body is permanently interred or intended to be permanently interred, whether in a coffin or other receptacle or not, and (b) any monument,

tombstone, cross, inscription, rail, fence, chain, erection or other structure of whatsoever nature forming part of or appurtenant to a grave.

3). No person shall desecrate, destroy or damage any grave in a cemetery, or any coffin or urn without written approval of the Administrator.

4). No person shall exhume, disturb, remove or re-inter anybody in a cemetery, or any coffin or urn without written approval of the Administrator.

5). Application must be made for such approval in writing, together with:

a). A statement of where the body is to be re-interred.

b). Why it is to be exhumed.

c). The methods proposed for exhumation.

d). Written permission from local authorities, nearest available relatives and their religious body owning or managing the cemetery, and where all such permission cannot be obtained, the application must give reasons why not.

6). The Administrator has the power to vary any conditions and to impose additional conditions.

7). Anyone found guilty and convicted is liable for a maximum fine of R200 and maximum prison sentence of six months.

5. Human remains from the graves of victims of conflict, or any burial ground or part thereof which contains such graves and any other graves that are deemed to be of cultural significance may not be destroyed, damaged, altered, exhumed or removed from their original positions without a permit from the National Heritage Resources Agency. They are administered by the Graves of Conflict Division at the SAHRA offices in Johannesburg.

"Victims of Conflict" are:

a). Those who died in this country as a result of any war or conflict but excluding those covered by the Commonwealth War Graves Act, 1992 (Act No. 8 of 1992).

b). Members of the forces of Great Britain and the former British Empire who died in active service before 4 August 1914.

c). Those who, during the Anglo Boer War (1899-1902) were removed from South Africa as prisoners and died outside South Africa, and,

d). Those people, as defined in the regulations, who died in the "liberation struggle" both within and outside South Africa.

6. Any burial that is older than 60 years, which is outside a formal cemetery administered by a local authority, is protected in terms of Section 36(3b) of the National Heritage Resources Act. No person shall destroy damage, alter, exhume or remove from its original position, remove from its original site or export from the Republic any such grave without a permit from the SAHRA.

   There are some important new considerations applicable to B & C (above).

   SAHRA may, for various reasons, issue a permit to disturb a burial that is known to be a grave of conflict or older than 65 years, or to use, at a burial ground, equipment for excavation or the detection or the recovery of metals.

   (Permit applications must be made on the official form Application for Permit: Burial Grounds and Graves available from SAHRA or provincial heritage resources authorities.) Before doing so, however, SAHRA must be satisfied that the applicant:

   a). Has made satisfactory arrangements for the exhumation and re- interment of the contents of such a grave at the cost of the applicant.

   b). Has made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such a grave and,

   c). Has reached an agreement with these communities and individuals regarding the future of such a grave or burial ground.

PROCEDURE FOR CONSULTATION

The regulations in the schedule describe the procedure of consultation regarding the burial grounds and graves. These apply to anyone who intends to apply for a permit to destroy damage, alter, remove from its original position or otherwise disturb any grave or burial ground older than 60 years that is situated outside a formal cemetery administered by a local authority. The applicant must make a concerted effort to identify the descendants and family members of the persons buried in and/or any other person or community by tradition concerned with such grave or burial ground by:

1). Archival and documentary research regarding the origin of the grave or burial ground;

2). Direct consultation with local community organizations and/or members;

3). The erection for at least 60 days of a notice at the grave or burial ground, displaying in all the official languages of the province concerned, information about the proposals affecting the site, the telephone number and address at which the applicant can be contacted by any interested person and the date by which contact must be made, which must be at least 7 days after the end of the period of erection of the notice; and

4). Advertising in the local press.

The applicant must keep records of the actions undertaken, including the names and contact details of all persons and organizations contacted and their response, and a copy of such records must be submitted to the provincial heritage resources authority with the application.

Unless otherwise agreed by the interested parties, the applicant is responsible for the cost of any remedial action required.

If the consultation fails to reach in agreement, the applicant must submit records of the consultation and the comments of all interested parties as part of the application to the provincial heritage resources authority.

In the case of a burial discovered by accident, the regulations state that when a grave is discovered accidentally in the course of development or other activity:

a). SAHRA or the provincial heritage resources authority (or delegated representative) must, in co-operation with the Police, inspect the grave and decide whether it is likely to be older than 60 years or otherwise protected in terms of the Act; and whether any further graves exist in the vicinity.

b). If the grave is likely to be so protected, no activity may be resumed in the immediate vicinity of the grave, without due investigation approved by SAHRA or the provincial heritage resources authority; and

c). SAHRA or the provincial heritage resources authority may at its discretion modify these provisions in order to expedite the satisfactory resolution of the matter.

d. Archaeological material, which includes human and hominid remains that are older than 100 years (see definition in section 2 of the Act), is protected by the National Heritage Resources Act (Section 35(4)), which states that no person may, without a permit issued by the responsible heritage resources authority - destroy, damage, excavate, alter or remove from its original site any archaeological or palaeontological material.

The implications are that anyone who has removed human remains of this description from the original site must have a permit to do so. If they do not have a permit, and if they are convicted of an offence in terms of the National Heritage Resources Act as a result, they must be liable to a maximum fine of R100 000 or five years imprisonment, or both.

TREAT HUMAN REMAINS WITH RESPECT

a). Every attempt should be made to conserve graves in situ. Graves should not be moved unless this is the only means of ensuring their conservation.

b). The removal of any grave or graveyard or the exhumation of any remains should be preceded by an historical and archaeological report and a complete recording of original location, layout, appearance and inscriptions by means of measured drawings and photographs. The report and recording should be placed in a permanent archive.

c). Where the site is to be re-used, it is essential that all human and other remains be properly exhumed and the site left completely clear.

d). Exhumations should be done under the supervision of an archaeologist, who would assist with the identification, classification, recording and preservation of the remains.

e). No buried artifacts should be removed from any protected grave or graveyard without the prior approval of SAHRA. All artifacts should be re-buried with the remains with which they are associated. If this is not possible, proper arrangements should be made for the storage of such relics with the approval of SAHRA.

f). The remains from each grave should be placed in individual caskets or other suitable containers, permanently marked for identification.

g). The site, layout and design of the area for re-interment should take into account the history and culture associated with, and the design of, the original grave or graveyard.

h). Re-burials in mass graves and the use of common vaults are not recommended.

i). Remains from each grave should be re-buried individually and marked with the original grave markers and surrounds.

j). Grouping of graves, e.g. in families, should be retained in the new layout.

k). Material from the original grave or graveyard such as chains, kerbstones, railing and should be re-used at the new site wherever possible.

l). A plaque recording the origin of the graves should be erected at the site of re-burial.

m). Individuals or groups related to the deceased who claim the return of human remains in museums and other institutions should be assisted to obtain documentary proof of their ancestral linkages.

APPENDIX 2: LEGAL BACK GROUND AND PRINCIPLES OF HERITAGE RESOURCES MANAGEMENT IN SOUTH AFRICA

Extracts relevant to this report from the National Heritage Resources Act No. 25 of 1999, (Sections 5, 36 and 47)

General principles for heritage resources management

5. (1) All authorities, bodies and persons performing functions and exercising powers in terms of this Act for the management of heritage resources must recognize the following principles:

(a) Heritage resources have lasting value in their own right and provide evidence of the origins of South African society and as they are valuable, finite, non-renewable and irreplaceable they must be carefully managed to ensure their survival;

(b) every generation has a moral responsibility to act as trustee of the national heritage for succeeding generations and the State has an obligation to manage heritage resources in the interests of all South Africans;

(c) heritage resources have the capacity to promote reconciliation, understanding and respect, and contribute to the development of a unifying South African identity; and

(d) heritage resources management must guard against the use of heritage for sectarian purposes or political gain.

(2) To ensure that heritage resources are effectively managed—

(a) the skills and capacities of persons and communities involved in heritage resources management must be developed; and

(b) provision must be made for the ongoing education and training of existing and new heritage resources management workers.

(3) Laws, procedures and administrative practices must—

(a) be clear and generally available to those affected thereby;

(b) in addition to serving as regulatory measures, also provide guidance and information to those affected thereby; and

(c) give further content to the fundamental rights set out in the Constitution.

(4) Heritage resources form an important part of the history and beliefs of communities and must be managed in a way that acknowledges the right of affected communities to be consulted and to participate in their management.

(5) Heritage resources contribute significantly to research, education and tourism and they must be developed and presented for these purposes in a way that ensures dignity and respect for cultural values.

(6) Policy, administrative practice and legislation must promote the integration of heritage resources conservation in urban and rural planning and social and economic development.

(7) The identification, assessment and management of the heritage resources of South Africa must—

(a) take account of all relevant cultural values and indigenous knowledge systems;

(b) take account of material or cultural heritage value and involve the least possible alteration or loss of it;

(c) promote the use and enjoyment of and access to heritage resources, in a way consistent with their cultural significance and conservation needs;

(d) contribute to social and economic development;

(e) safeguard the options of present and future generations; and

(f) be fully researched, documented and recorded.

Burial grounds and graves

36. (1) Where it is not the responsibility of any other authority, SAHRA must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit.

(2) SAHRA must identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with the grave referred to in subsection (1), and must maintain such memorials.

(3) (a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority—

(a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;

(b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or

(c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

(4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources
authority.

(5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection (3)(b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority—

(a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and

(b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.

(6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority—

(a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and

(b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-interment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.

(7) (a) SAHRA must, over a period of five years from the commencement of this Act, submit to the Minister for his or her approval lists of graves and burial grounds of persons connected with the liberation struggle and who died in exile or as a result of the action of State security forces or agents provocateur and which, after a process of public consultation, it believes should be included among those protected under this section.

(b) The Minister must publish such lists as he or she approves in the Gazette.

(8) Subject to section 56(2), SAHRA has the power, with respect to the graves of victims of conflict outside the Republic, to perform any function of a provincial heritage resources authority in terms of this section.

(9) SAHRA must assist other State Departments in identifying graves in a foreign country of victims of conflict connected with the liberation struggle and, following negotiations with the next of kin, or relevant authorities, it may re-inter the remains of that person in a prominent place in the capital of the Republic.

General policy

47. (1) SAHRA and a provincial heritage resources authority—

(a) must, within three years after the commencement of this Act, adopt statements of general policy for the management of all heritage resources owned or controlled by it or vested in it; and

(b) may from time to time amend such statements so that they are adapted to changing circumstances or in accordance with increased knowledge; and

(c) must review any such statement within 10 years after its adoption.

(2) Each heritage resources authority must adopt for any place which is protected in terms of this Act and is owned or controlled by it or vested in it, a plan for the management of such place in accordance with the best environmental, heritage conservation, scientific and educational principles that can reasonably be applied taking into account the location, size and nature of the place and the resources of the authority concerned, and may from time to time review any such plan.

(3) A conservation management plan may at the discretion of the heritage resources authority concerned and for a period not exceeding 10 years, be operated either solely by the heritage resources authority or in conjunction with an environmental or tourism authority or under contractual arrangements, on such terms and conditions as the heritage resources authority may determine.

(4) Regulations by the heritage resources authority concerned must provide for a process whereby, prior to the adoption or amendment of any statement of general policy or any conservation management plan, the public and interested organisations are notified of the availability of a draft statement or plan for inspection, and comment is invited and considered by the heritage resources authority concerned.

(5) A heritage resources authority may not act in any manner inconsistent with any statement of general policy or conservation management plan.

(6) All current statements of general policy and conservation management plans adopted by a heritage resources authority must be available for public inspection on request.

APPENDIX

E PROOF OF ADVERTS

0915 SALES IN EXECUTION

NOTICE
AUCTION
IN THE HIGH COURT OF SOUTH AFRICA
MPUMALANGA DIVISION
MBOMBELA (MAIN SEAT)
Case Number: 1557/2017
In the matter between:
FIRSTRAND BANK LIMITED (REGISTRATION NUMBER: 1929/001225/06)
- PLAINTIFF
and
LOUIS NTETHE MAPHANGA (IDENTITY NUMBER: 650202 5706 085)
- DEFENDANT
NOTICE OF SALE IN EXECUTION
In execution of a judgment of the High Court of South Africa, Mpumalanga, Mbombela, abovementioned suit, a sale with a reserve price of
R158 487.41, will be held by the **SHERIFF OF THE HIGH COURT, PHALABORWA IN FRONT OF THE MAGISTRATE`S COURT THULAMAHASHE on THURSDAY the 5th of AUGUST 2021 at 10:00** of the undermentioned property of the defendant subject to the conditions of sale which are available for inspection at the offices of the SHERIFF, PHALABORWA during office hours.
CERTAIN:
SITE NO A381
IN EXTENT: 480 (FOUR HUNDRED AND EIGHTY) SQUARE METRES
AS SHOWN ON GENERAL PLAN/DIAGRAM NO PB689 /1987
SITUATED IN THE TOWNSHIP OF MAVILJAN DISTRICT MAPULANENG
HELD BY DEED OF GRANT NO T827/96 DATED 19 AUGUST 1996
ALSO KNOWN AS: STAND 381, MAVILJAN ZONE A, BUSHBUCKRIDGE
The following information is furnished regarding improvements on the property although nothing in this respect is guaranteed:
HOUSE CONSISTING OF BRICKS AND TILED ROOF WITH LOUNGE, BATHROOM, TOILET, KITCHEN,
3 BEDROOMS, GARAGE.
The property is zoned residential.
The sale shall be subject to the terms and conditions of the High Court and the rules made thereunder and the Purchaser (other than the Execution Creditor) shall pay a deposit of 10% (ten per centum) of the purchase price by bank guaranteed cheque or by way of an electronic funds transfer on the fall of the hammer at the sale. The full Conditions of Sale and rules of auction shall be inspected at the offices of the **SHERIFF PHALABORWA, 13 NABOOM STREET, PHALABORWA** 24 (twenty four) hours prior to the auction.
Take further notice that:
1. This sale is a sale in execution pursuant to a judgment obtained in the above Court.
2. The rules of this auction is available 24 (twenty four) hours before the auction at the office of the **SHERIFF PHALABORWA.**
3. Registration as a buyer is a pre-requisite subject to the conditions, inter alia:
(a) Directive of the Consumer Protection Act 68 of 2008 (URL http://www.info.gov.za/view/DownloadFileAction?id=99961).
(b) FICA-legislation in respect of proof of identity and address particulars;
(c) Payment of a registration fee of R15 000.00 (Fifteen Thousand Rand) (refundable) in cash;
(d) Registration conditions.
(e) Advertising costs at current publication rates and sale costs according to Court rules, apply.
DATED AT PRETORIA ON THIS 14th DAY OF JUNE 2021.
PLAINTIFF`S ATTORNEYS
VEZI DE BEER INCORPORATED
319 Alpine Road
Lynnwood
P O BOX 13461
HATFIELD, 0028
Tel: 012-361-5640
REF: R ISMAIL/WG/MAT46261
E-mail: Louisa @vezidebeer.co.za
——————TA010851

NOTICE
IN THE MAGISTRATE`S COURT FOR THE DISTRICT OF MBOMBELA
HELD AT MBOMBELA
Case NO: 629/2020 & 2573/2019
In the matter between:
KARINO LIFESTYLE ESTATE HOA
- PLAINTIFF
and
THABO TREASURE MOTUBATSE
- DEFENDANT
NOTICE OF SALE IN EXECUTION
PURSUANT to a judgment by the Magistrate`s Court MBOMBELA on 25 JUNE 2020 the under mentioned goods will be sold at **09H00 on 6 AUGUST 2021** by public auction to be held at **SHERIFF NELSPRUIT OFFICE, 99 JACARANDA STREET, WEST ACRES, MBOMBELA** by the Sheriff of the Magistrate`s Court, Nelspruit to the highest bidder for cash:
1 x Lounge suite
DATED at MBOMBELA on this the 8th day of JULY 2021
SWANEPOEL & PARTNERS INC
ATTORNEY FOR PLAINTIFF
SUITE 601, THE PINNACLE
1 PARKIN STREET
NELSPRUIT
Tel: 013-753-2401
Docex: DOCEX 6
Ref: MR SIEBRITS/ Jacquline /DEB13892
——————TA010815

0916 TITLE DEEDS

NOTICE
`FORM JJJ
LOST OR DESTROYED DEED
Notice is hereby given in terms of regulation 68 of the Deeds Registries Act, 1937 of the intention to apply for the issue of a certified copy Deed of Transfer T825/2007 passed by ESTATE LATE MARTHA MESI MABUZA and PAUL MABUZA in favour of FRASER LUSAPHO GIDI and NCUMISA GIDI in respect of ERF 2717 EMJINDINI TOWNSHIP, REGISTRATION DIVISION J.U, PROVINCE OF MPUMALANGA which has been lost or destroyed.
All interested person having objection to the issue of such copy are hereby required to lodge the same in the writing with the Registrar of Deeds Mpumalanga at 25 Bell Street, Nelspruit within two weeks from the date of the publication of this notice.
Dated at Nelspruit on this 14th day of July 2021.
CONVEYANCER
WILLIAM PETRUS MEINTJES
MEINTJIES AND KHOZA ATTORNEYS
8TH FLOOR MID-CITY BUILDING
37 BROWN STREET
NELSPRUIT
TEL: 013-752-5449
——————TA010839

NOTICE
(Form of publication in terms of Regulation 68 of the Deeds Registries Act, 1937, (No. 47 of 1937))
LOST OR DESTROYED DEED
Notice is hereby given in terms of regulation 68 of the Deeds Registries Act, 1937, of the intention to apply for the issue of a certified copy of Deed of Transfer T6557/2012 passed by:
JOHANNES LODEWIKUS BOTHA
Identity Number
431130 5046 085
Married out of community of property
In favour of:
BERYL LORRAINE BOTHA (PREVIOUSLY HORN)
Identity Number
510809 0190 089
Married out of community of property
In respect of certain:
½ (ONE HALF) Undivided share of:
PORTION 61 OF ERF 1957 WEST ACRES EXTENSION 13 TOWNSHIP
REGISTRATION DIVISION J.T. PROVINCE OF MPUMALANGA
Which has been lost or destroyed.
All interested persons having objection to the issue of such copy are hereby required to lodge the same in writing with the Registrar of Deeds Mpumalanga at Nelspruit, situated at 25 Bell Street, Nelspruit, within two weeks from the date of the publication of this notice.
Dated at NELSPRUIT on this 13th of July 2021
Signature of Applicant
ANNEMARIE SWANEPOEL
ATTORNEYS
CORNERHOUSE, CNR
RUSSEL & NEL STREETS
PO BOX 4550, NELSPRUIT, 1200
TEL: 013-752-4908
FAX: 013-752-4911
Email: maritha @aswanepoel.co.za
REF: ST5113/MAT485
——————TA010834

NOTICE
LOST DEED
Notice is hereby given in terms of regulation 68 of the Deeds Registries Act, 1937, of the intention to apply for the issue of a certified copy of Deed of Transfer **T77593/2002** passed by **MBOMBELA LOCAL MUNICIPALITY,** in favour of, **MADONSELA NTOMBI LIZZETH** ID Number **660524 0403 089**, in respect of certain, **ERF 1211 TEKWANE SOUTH EXT 1 TOWNSHIP, Registration Division J.U, PROVINCE OF MPUMALANGA Measuring 182 (One Hundred and Eighty Two) Square metres Held by Deed of Transfer Number T77593/2002.**
All interested persons having objection to the issue of such copy are hereby required to lodge the same in writing with the Registrar of Deeds at **32 Bell Street old BMW building Nelspruit** within two weeks from the date of publication of notice.
Dated at Mbombela on this 14th day of June 2021.
Applicant: Address,
TP SITHOLE INC.
44 MARLOTH STREET,
E-mail address: deeds @tpsithole.co.za,
Contact: 013-591-7153
NONTOKOZO ROZAN MADONSELA
(Representative)
——————TA010780

NOTICE
LOST or DESTROYED FORM JJJ
Notice is hereby given that the provisions of regulation 68 of the Deeds Registries Act, 1937, of the intention to apply for the issue of a certified copy of Deed of Transfer
ST142808/2007
passed by
MEADOW BROOK PROPERTIES 120 CC
REGISTRATION NUMBER: 2005/159169/23
in favour of
KOPKRAP BELEGGINGS 2 PROPRIETARY LIMITED
REGISTRATION NUMBER: 1998/023203/07
in respect of
1. A unit consisting of
(a) Section Number 18 as shown and more fully described on Sectional Plan Number SS1147 /2007, in the scheme known as BOUGAINVILLA PLACE in respect of the land and building or buildings situate at ERF 434 SONHEUWEL TOWNSHIP, City of Mbombela, of which section the floor area, according to the said Sectional Plan, is 79 (SEVENTY NINE) square metres in extent; and
(b) An undivided share in the common property in the scheme apportioned to the said section in accordance with the participation quota as endorsed on the said sectional plan.
which has been lost or destroyed.
All interested persons having objection to the issue of such copy are hereby required to lodge the same in writing with the Registrar of Deeds, Mpumalanga at Nelspruit within two weeks from the date of the publication of this notice.
Dated at NELSPRUIT on
12 July 2021
APPLICANT
KRUGER AND PARTNERS INC
5 VAN RENSBURG STREET, NELSPRUIT
lkieser@kmprok.co.za
013-745-5300
——————TA010835

NOTICE
LOST OR DESTROYED DEED
Notice is hereby given in terms of Regulation 68 of the Deeds Registries Act, 1937 of the intention to apply for the issue of a certified copy of
T41253/1986 (VA4/1996)
registered on
9 September 1986 by
E/L JOHANNES PETRUS JORDAAN JOUBERT
NO 1978/83 in favour of
MARELY VAN DER WESTHUIZEN
ID no 410920 0028 004 in respect of PORTION 28 (PTN OF PTN 1) OF THE FARM ALKMAAR 286 JT, which has been lost or destroyed. All interested persons having objection to the issue of such copy are hereby required to lodge same in writing with the Registrar of deeds Mpumalanga at Bell Street, Nelspruit within two weeks from date of the publication of this notice.
DATED AT NELSPRUIT ON THIS 20 DAY OF MAY 2021.
ATTORNEY/CONVEYANCER
TONNY KGOTHATSO SEGODI
TK SEGODI ATTORNEYS
OFFICE 2H BUILDING 10
9 FAURIE STREET, SONPARK
NELSPRUIT
1200
——————TA010762

NOTICE
LOST OR DESTROYED DEED
Notice is hereby given in terms of regulation 68 of the Deeds Registries Act, 1937, of the intention to apply for the issue of a certified copy of
T41253/1986 (VA4/1996)
registered on
9 September 1986 by
E/L JOHANNES PETRUS JORDAAN JOUBERT
NO 1978/83 in favour of
MARELY VAN DER WESTHUIZEN
ID no 410920 0028 004 in respect of PORTION 28 (PTN OF PTN 1) OF THE FARM ALKMAAR 286 JT, which has been lost or destroyed. All interested persons having objection to the issue of such copy are hereby required to lodge same in writing with the Registrar of deeds Mpumalanga at Bell Street, Nelspruit within two weeks from date of the publication of this notice.
Viljoen Wagner Attorneys
41 Ehmke Street Nelspruit 1200
attorney@ehmkelaw.co.za
013-755-2540
——————TA010845

0925 ESTATES

NOTICE
In the Estate of the Late:
THANDEKA PRUDENCE MATUKANE
Date of birth: 13 OCTOBER 1984
Identity number: 841013 0183 083
Marital Status: UNMARRIED
Of: MSOGWABA TRUST, MPUMALANGA
Estate number: 2347/2021
Date of death: 16 SEPTEMBER 2020
CREDITORS AND DEBTORS in the abovementioned Estate are hereby requested to submit their claims and pay their debts within 30 (Thirty) days from date of this publication
EXECUTORS
GERHARD LOURENS INC
P.O. BOX 268, NELSPRUIT, 1200
REF: MR PG LOURENS/SIBU
TEL: 013-755-2080
——————TA010811

0935 TOWN PLANNING

KENNISGEWING
VAN GROND ONTWIKKELINGSAANSOEKE
Ons, Umsebe Development Planners BK, het die volgende grond ontwikkelingsaansoeke by die Stad van Mbombela Plaaslike Munisipaliteit ingedien ingevolge die Mbombela Grondgebruikskema, 2019 en die Mbombela Bywet op Ruimtelike Beplanning en Grondgebruiksbestuur, 2019:
1) RT/21/00007 vir die opheffing van `n beperkende titelvoorwaarde en serwituut wat geregistreer is teen die titel van die grond van Gedeelte 3 van Hoewe 186 van die Witrivier Landgoed (Oostelike Afdeling) Landbouhoewes, geleë langs die Jatingaweg in die Plaston-omgewing. Die aansoek poog om die reg-van-weg-serwituut (RoW) ten gunste van Gedeelte 1 van Hoewe 186 te verwyder, sodat die voorgestelde nuwe institusionele fasiliteit oor die posisie van die serwituut gebou kan word. `n Notariële verbindingsooreenkoms sal toegang verseker tot Gedeeltes 2 en 4 (Gedeeltes van Gedeelte 1) van Hoewe 186, sonder die vereiste van `n RoW-serwituut, aangesien dit as een eiendom in die aktekantoor in Mpumalanga geregistreer sal word.
2) CO/21/00015, SD/21/00022 & AM/21/00052 vir die konsolidasie, onderverdeling en hersonering van Erf 1961 tot 2112, 2115 en 2122, Stonehenge Uitbreiding 14, geleë in die vakante area tussen die Hermansburgweg en Belladonnastraat, om die konsolidasie van alle erwe toe te laat, met die daaropvolgende heronderverdeling om kleiner residensiële gedeeltes te skep en dienooreenkomstig te hersoneer.
`n Afskrif van die twee (2) aansoeke en stawende dokumentasie is verkrygbaar gedurende gewone kantoorure by die Kantoor van die Senior Bestuurder: Grondgebruiksbestuur, Kantoor 205, Burgersentrum, Nelstraat 1, Mbombela, 1201, wie gekontak kan word op die volgende kontaknommer: 013-759-2185.
Geskrewe kommentaar of besware tesame met die redes daarvoor moet ingedien word in die voorgeskrewe formaat aan die Munisipale Bestuurder, Posbus 45, Mbombela, 1200 of by die Registrasie afdeling van Rekords, Eerste verdieping, Burgersentrum, Nelstraat 1, Mbombela; of gefaks word na 013-759-2070; of per e- pos aan: registry@mbombela.gov.za teen nie later as 21 Augustus 2021 nie.
Die formaat vir kommentaar of besware is beskikbaar by die Kantoor van die Senior Bestuurder: Grondgebruiksbestuur, by die bogemelde adres of op die Munisipaliteit se webwerf (www.mbombela.gov.za).
Enige persoon wat nie kan lees of skryf nie mag enige personeellid van die Kantoor van die Senior Bestuurder: Grondgebruiksbestuur Afdeling, gedurende kantoorure raadpleeg en bystand sal aan sodanige persoon verleen word om die beswaar of kommentaar saam te stel.
Aansoeker se Kontakbesonderhede:
Naam: Umsebe Development Planners BK
Fisiese Adres: Ehmkestraat 39, Suite 2, Lidwala House
Telefoonnommer: 013-752-4710
E- posadres: jandri @umsebe.co.za & lerina@umsebe.co.za
——————TA010853

SCOPING AND ENVIRONMENTAL REPORTING (S&EIR) PROCESS

NOTICE OF THE PROPOSED CONSTRUCTION AND OPERATION OF THE PROPOSED KHENSANI GAS TO POWER PLANT, MPUMALANGA PROVINCE

Notice is given in terms of Regulation 41(2) of GNR 982 (7 April 2017) published under section 24 and 24D of the National Environmental Management Act (No. 107 of 1998) (NEMA) for submission of application for environmental authorisation (EA) in respect of activities identified in terms of GNR 983, 984 and 985 (7 April 2017)
and
Notice is given in terms of Section 38(3) of the National Environmental Management: Air Quality Act (No. 39 of 2004) (NEM:AQA) for the submission of an application for an atmospheric emission license (AEL) in respect of listed activities identified in terms of GNR 893 - Subcategory 1.5: Reciprocating Engines.

BACKGROUND AND LOCATION
DNG Energy (Pty) Ltd is seeking environmental authorisation (EA) for the Khensani Gas to Power project, Komatipoort.
The project involves the development of liquified natural gas converted to natural gas to supply the fired power plant. The generation technology will consist of Internal Reciprocating Combustion Engines (IRCE) with an output of 445MW. The gas supply to the site will be via a new c 1.2km long pipeline running between the power plant and the existing Republic of Mozambique Pipeline Company (ROMPCO) natural gas pipeline. The EIA process is also considering alternate gas supply and pipeline routing options. Power will be evacuated to the national grid via a c.0.5km x 275kV transmission powerline connected to the existing Komati substation.

REGISTRATION
WSP Group Africa (Pty) Ltd (WSP) has been appointed as the independent Environmental Assessment Practitioner (EAP), to manage the S&EIR process. Parties wishing to formally register as stakeholders in order to offer their comment on the proposed project are requested to forward their full contact details to the EAP at the details provided below. Registered stakeholders will be forwarded all future correspondence, and notified of additional opportunities to participate in the process.

The contact details of the EAP are:
Name: Carla Elliott
Tel: 011 240 8874
E-mail: carla.elliott@wsp.com

LEGALS

0910 PUBLIC / LEGAL NOTICES

NOTICE
INVITATION FOR PUBLIC COMMENTS IN APPLYING FOR A LIQUOR LICENCE IN TERMS OF SECTION 35(2)(a) OF THE MPUMALANGA LIQUOR LICENCING ACT, 2006
PERSONAL DETAILS
I, ZULU MAKHOSETIVE, ID: 841004 5360 081, an adult male, hereby invite written public comments concerning my application for a liquor licence to the Mpumalanga Liquor Authority to trade under the name of PRIME LIQUORS. I make this application for myself.
LICENCE TYPE
The retail sale of liquor for consumption on and off the premises where the liquor is sold.
BUSINESS PREMISES
Physical address: 53 BROWN STREET, MBOMBELA, 1200, being an address in the Republic of South Africa and situated within the Boundaries of Mpumalanga Province.
Postal address: 53 BROWN STREET, MBOMBELA, 1200
Cell: 079-577-2975
ADDRESSES TO WHICH COMMENTS MUST BE SUBMITTED
Comments should be made in writing and be addressed to the municipality concerned and a copy to the applicant, to reach the said addresses within thirty (30) days of this publication.
District: EHLANZENI
Municipality`s address: MBOMBELA LOCAL MUNICIPALITY
PO Box 45, Mbombela, 1200
Applicant`s address:
1 NEL STREET, MBOMBELA CIVIC CENTRE, MBOMBELA, 1200
Advertiser Name: ZULU MAKHOSETIVE
Advertiser Address: 53 BROWN STREET, MBOMBELA, 1200
Advertiser Email: makhosizulu @yahoo.com
———————TA010837

NOTICE
Urgently looking for **Sibuye Nurse** with Identity number 820816 0391 083 with regards to Estate late **Sibuye, Ngabani Simeon** with Identity number 490120 5417 087. Contact **Sinah Sibuye** on 078-281-4963 082-631-8591
———————TA010849

0916 TITLE DEEDS

NOTICE
LOST OR DESTROYED DEED
Notice is hereby given in terms of regulation 68 of the Deeds Registries Act, 1937 of the intention to apply for the issue of a certified copy Deed of Transfer **T000012399/2017** passed by HAZEL NONHLANHLA THELEDI, Identity Number: 640831 0280 085 in favour of THE TRUSTEES FOR THE TIME BEING OF THE FARM HOUSE TRUST, Registration Number: IT3811/2015 (G) and in respect of PORTION 331 (A PORTIONOF PORTION 113) OF FARM WHITE RIVER 64 REGISTRATION DIVISION JU, PROVINCE OF MPUMALANGA which has been lost or destroyed. All interested person having objection to the issue of such copy are hereby required to lodge the same in the writing with the Registrar of Deeds Mpumalanga at 25 Bell Street, Nelspruit within two weeks from the date of the publication of this notice.
Dated at MBOMBELA on this 14th day of JULY 2021.
Transferring Attorneys
Mxolisi Zwane
ZWANE SAMBO INCORPORATED
R40 CNR Hazyview & Numbi Road
Casterbridge Lifestyle Centre
White River
1240
lawchambers @zwanesamboinc.co.za
———————TA010838

0935 TOWN PLANNING

KENNISGEWING
AANSOEK OM HERSONERING
Kennis word hiermee gegee ingevolge die Mbombela Grondgebruikskema van 2019, dat ons, Grifton Development Planners, van voormeen is om by die City of Mbombela Munisipaliteit aansoek to doen om hersonering om Erf 213 en Erf 215, Stonehenge Uitbruiding 1, vanaf `n grondgebruiksone van "Residensieel"met `n digtheid van 1 wooneenheid per Erf tot `n grondgebruiksone van "Residensieel"met studenteakkommodasie as primêre grondgebruik. Volledige besonderhede is verkrygbaar by die onderstaande adres. Enigeen wat beswaar teen die voorgestelde gebruik wil aanteken moet sodanig beswaar, tesame met die redes daarvoor, skriftelik by die Mbombela Plaaslike Munisipaliteit, Burgersentrum, Nelspruit en by die ondergetekende, nie later as agt-en twintig (28) dae vanaf die kennisgewingsdag van die verskyning van hierdie advertensie indien, naamlik: 19 Augustus 2021.
Naam van applicant:
Grifton Development Planners, P.O Box 309
Kanyamazane, 1214,1342
Cell no: 072-874-4867
———————TA010846

NOTICE
APPLICATION FOR REZONING
Notice is hereby given in terms of the Mbombela Land Use Scheme, 2019, that we. Grifton Development Planners, have applied at the City of Mbombela Municipality for the rezoning of Erf 213 and Erf 215, Stonehenge Extension 1 from and land use zone of "Residential"with a density of 1 dwelling unit per Erf to a land use zone of "Residential"with student accommodation as the primary land use. Full of Particulars in connection with the application is available at the address given below.Any person having an objection to the proposed use, must lodge such objection, together with the grounds thereof, in wriing to the City ofMbombela Municipality, Civic Centre, Nelspruit and with the undersigned not later than twenty eight (28) days after the day of publication of this notice, which is: 19 August 2021.
Name of applicant: Grifton Development Planners
P.O Box 309
Kanyamazane, 1214
Cell no: 072-874-4867
———————TA010844

INCHUBO YEKUCWANINGA NEKUBIKA NGESIMONDZAWO (S&EIR)

SATISO NGEKWAKHA LOKUHLONGOTWAKO NEKUSEBENTA KWENDZAWO LEKHICITA IGESI IKHENSANI, ESIFUNDZENI SASEMPUMALANGA

Satiso siniketwa ngekuhambisana neMtsetfosimiso 41(2) we-GNR 982 (7 Inkhwekhweti 2017) loshicilelwe ngaphansi kwesigaba 24 na 24D se-National Environmental Management Act (Nom. 107 wanga 1998) (iNEMA) kufaka ticelo tekugunyata simondzawo (EA) ngalokuphatselene nemisebenti lekhonjwe ngekwe-GNR 983, 984 ne 985 (7 Inkhwekhweti 2017)
ne
Satiso lesiniketwa ngekuhambisana neSigaba 38(3) se-National Environmental Management: Air Quality Act (Nom. 39 sangakufaka sicelo sekusebentisa i-atmospheric emission license (AEL) ngekuhambisana nemisebenti leselulhweni lebonwe ngekuhambisana ne-GNR 893 - incenye yesigaba 1.5: tinjini lejikeletako.

LINGEMUVA NEKUTFOLAKALA
I-DNG Energy (Pty) Ltd ifuna ligunya letesimondzawo (EA) yemklamo yeKhensani Gas to Power, eKomatipoort.
Lomklamo ufaka ekhatsi lokutfutfukiswa kwagesi loyimvelo losamanti lotawuguculwa ube ngugesi wemvelo kute kuphakelwe indzawo yemandla lenemlilo. Letheknolojhi yekuphehla itawufaka ekhatsi ema-Internal Reciprocating Combustion Engines (IRCE) kube nalokutfolakalako lokungu-445MW. Logesi lophakelwa kulendzawo ngekusebentisa liphayiphi lelisha lelidze lelingu c 1.2km lelihamba emkhatsini waletindzawo talamandla Kanye nalenKapani leseyivele ikhona ye-Republic of Mozambique Pipeline Company (ROMPCO) lekuliphayiphi lagesi wemvelo. Inchubo ye-EIA nayo ibuketa kusebentisa kuphakelwa gesi ngalenye indlela naletinye tindlela tekuhambisa emaphayiphi. Emandla atawususa kulegridi yavelonkhe ngekusebentisa indlela yekuhambisa emandla lekuyi a c.0.5km x 275kV leyihlanganiswe kwanyalo nesiteshi lesikhona saseKomati.

KUBHALISA
Licembu le-WSP e-Afrika (Pty) Ltd (WSP) licashe Njengesisebenti Lesitimele Sekuhlola Simondzawo (EAP), kute lilawule lenchubo ye-S&EIR. Tinhlangano letifisa kubhalisa njengalabatsintsekako kute kutsi banikete kuphawula kwabo kulomklamo lophakanyisiwe tiyacelwa kutsi titfumele imininingwane yekutsintsana legcwele ku-EAP kulemininingwane leniketwe ngentasi. Labatsintsekako lababhalisile batawutfunyelelwa konkhe lekuchunywana ngako ngalokutako, babuye batiswe ngekutsintsana ngalokutako, babuye batiswe ngalamanye ematfuba langetiwe kute bangenelele

Lemininingwane yekutsintsana ne-EAP ngulena:
Ligama: Carla Elliott
Lucingo: 011 240 8874
I-imeyili: carla.elliott@wsp.com

‘Rustige’ boer Petré soek ’n opregte vrou

Ané van Zyl

Boer Petré (25) van Vierfontein in die Vrystaat sal mooi na die briewe en video’s kyk wat vroue vir hom instuur op *Boer soek ’n vrou* om seker te maak hy kies iemand opreg.

“Ek dink ek kan goed oordeel,” sê Petré, die vierde geslag op die familieplaas.

“Ek raam omtrent 60% tot 70% van meisies wat inskryf, sal dit dalk vir die publisiteit doen.”

Petré is een van tien hubare boere wat vanjaar liefde op die TV-program op kykNET soek.

Dié program het oor die jare heen so gewild geword dat deelnemers en hul pasmaats derduisende volgelinge op sosiale media kry en sommige in die kollig leef.

Petré sê hy gaan mooi kyk na die video’s wat vir hom ingestuur word. Al is dit net 30 sekondes lank, sal hy ’n opregte vrou uitken.

Sommige meen moontlik hy is bra jonk om liefde op ’n TV-program te soek, maar hy reken dit is die regte tyd.

“Ek het nog altyd gedink ek wil graag trou op 28 of 29. En ek wil darem ’n jaar of twee in ’n verhouding wees, ’n paar maande verloof wees en dan eers trou.

“Ek was twee jaar in Suid-Dakota, Amerika, en vier jaar op die Puk (Noordwes-Universiteit in Potchefstroom). Ek is sedert November permanent op die plaas en het by my eie huis ingetrek. Die tyd is nou reg.”

Petré boer met sonneblomme, beeste en skape.

Sy droomvrou is vry om haar eie pad te volg – sy kan op die plaas woeker en saam boer, miskien met groente, maar sy is ook welkom om in die dorp ’n loopbaan te volg.

Hy wil nie al die besluite in die verhouding neem nie en ook nie ’n vrou hê wat “ja en amen” sê op wat hy wil hê nie.

“Een ding wat ek graag sal wil hê, is dat sy eendag wanneer ons kinders het en as dit moontlik is, ophou werk om haar volle aandag aan hulle te gee terwyl hulle klein is. Dit maak ’n groot verskil in ’n kind se opvoeding.”

Petré beskou dit as sy plig om die familienaam voort te dra en sal nie sommer oorweeg om van die plaas weg te trek nie.

Hy en sy pa boer saam en ander familielede soos neefs en niggies woon in die omtrek. Daarom is dit vir hom redelik belangrik dat die vrou wat hy kies, hul goedkeuring wegdra.

Hy sê hy bekommer hom nie te veel oor dinge nie en geniet dit om saam met die *Boer soek ’n vrou*-span te werk. “Dit voel of ek drama swot,” spot hy.

Wie is vir hom die mooiste vrou ter wêreld? Rolene Strauss, voormalige Mej. Wêreld, sê hy. Hy het haar sowat drie jaar gelede in Hartenbos raakgeloop. Sy is nederig en vriendelik.

■ Diegene wat vir boer Petré wil inskryf, moet ouer as 21 wees en ongetroud, geskei of ’n weduwee wees. Inskrywings moet voor middernag op 29 Julie ingedien word.

Vroue kan inskryf op kykNET se webwerf, kyknet.tv, of 079 335 5137 skakel of e-pos stuur na boer@marche.media (let wel .media en nie .co.za nie).

Boer Petré saam met Rolene Strauss, voormalige Mej. Wêreld.

Duif-eskader

Duiwe vlieg oor Groentemarkplein in Kaapstad. Foto: JACO MARAIS

‘Kraal sal veilige hawe wees vir kultuurskatte’

’n Vrystaatse boer wat onlangs Covid-19 oorleef het, het nege hoekpale van sandsteen aan die Federasie van Afrikaanse Kultuurvereniginge (FAK) geskenk.

Lede van die FAK se kultuurnetwerke in die Vaaldriehoek en die Vrystaat, die Genealogiese Genootskap van Suid-Afrika (GGSA) en die Suid-Afrikaanse Weermagvereniging (SAWV) het toe die naweek hul moue opgerol om die hoekpale by die Vredesmonument in Vereeniging in die vorm van ’n “kraal” te plant.

Doringdraad met populiersparre is tussenin as ’n heining gespan.

Deon van der Watt, ’n boer van Tweeling in die Vrystaat, het ook nog drie sulke “pale” geskenk wat as sitplek ingerig gaan word.

Hy sê die pale is uit sandsteenrotsklipbanke op sy plaas, Verkykerskop, gebreek. Vroeër jare is huise en kerke in veral die Oos-Vrystaat met dié sandsteen gebou. Die klippe is uit die klipbanke gekap.

Hoekpale van sandsteen wat ’n Vrystaatse boer aan die FAK geskenk het, word by die Vredesmonument in Vereeniging geplant.

“Die afvalpunte is gebruik om pale te vorm wat die oumense veral gebruik het as grenslyne op hul plase in die Oos-Vrystaat.”

Op sy plaas staan nog ’n lyndraad van meer as 3 km lank waar so ’n klippaal elke 15 m ingeplant is.

“Tussendeur die klippale is populiersparre gebruik. Die geheim van die populierspar is dat niks hom eet nie. Al die houtbalke van die ou huise van meer as 80 jaar oud in dié gebied is van populierbome gemaak.

“Die spesifieke klippale is uitgehaal (op sy plaas) waar ons lande groter gemaak het, want ek probeer om waar moontlik die oorspronklike pale op die grenslyne van die plaas daar te hou vir die geskiedenis daarvan.”

Jan-Danie Malan, projekorganiseerder van FAK-kultuurnetwerke in die Vrystaat, sê die samewerking van kultuurnetwerkvrywilligers oor provinsiale grense heen in ’n tyd van nood herinner ’n mens weer aan die tye in die geskiedenis waar daar in groot nood saamgestaan is en selfdoen die hoeksteen van vooruitgang geword het.

Malan sê die “kraal” sal as veilige hawe dien om kultuurskatte, waaronder granietreplikas van die Voortrekkermonument, genl. Christiaan de Wet en genl. Koos de la Rey se standbeelde en ander in uit te stal. Dié skatte sal binnekort daar uitgestal word en sal agter slot en grendel gehou word. Die publiek kan dan per afspraak daarna kom kyk. **– Saamgestel deur Cherêne Pienaar**

FORUM WYS WAT GEDOEN KAN WORD

Senekal se helde gaan in Alex help

‘Vrede sal net hou as mense saamwerk’

Cherêne Pienaar

Die forum wat gehelp het om Senekal in die Oos-Vrystaat te vernuwe, gaan môre in Alexandra wys wat gedoen kan word.

Dié township het verlede week erg onder plundertogte deurgeloop.

Die Senekal-Matwabeng-gemeenskapsforum meen wat in Senekal gebeur het, bewys dat vrede slegs volhoubaar is as ’n gemeenskap om dieselfde doel verenig, soos met die huidige opruimingswerk in die geplunderde dele van die land.

Die forum het verlede jaar by Senekal ingespring nadat rassespanning in Oktober daar op die spits gedryf is in die nadraai van die plaasmoord op Brendin Horner (22).

Talle lede van die forum gaan môre in die geplunderde Alexandra help opruim.

Barend la Grange, voormalige bedryfshoof van die organisasie South Africa Day wat ook by die forum betrokke is, sê Senekal is ’n goeie voorbeeld van ’n gemeenskap wat ná trauma kan saamstaan en ’n dorp vernuwe.

Hy hoop Senekal stap Sondag met die louere weg as Dorp van die Jaar.

Hy sê die groot verskil het gekom toe mense daadwerklik begin saamwerk het en dit nie net by vredespraatjies gebly het nie.

“Elkeen kom met ’n agenda na ’n vredesonderhandeling. Wanneer mense se agendas begin ooreenstem, dán is vrede volhoubaar.”

Die feit dat hulle behoeftes aangepak het wat ryk en arm raak, het daartoe gelei dat mense wíl saamwerk.

“Die dorp is skoon, dis mooi met meer as 5 000 slaggate wat herstel is.

“Die tuine is mooigemaak, ryk en arm het water en daar is ’n memorandum van verstandhouding met die munisipaliteit.”

Benewens dat ’n gemeenskap ’n gemeenskaplike doel moet vind, moet mense gemobiliseer word vir ’n projek wat almal raak.

Past. John Mathuhle van Senekal dien ook in die forum. Hy sê inwoners van ’n dorp het soms juis ’n skok nodig om te vernuwe. Toe wit en swart inwoners ná die gebeure op 16 Oktober vergader, was daar botsende belange. Die oplossing sou net kom deur kompromisse.

“Die verandering het gekom toe ons aan mekaar begin sê: ‘Ek hoor jou pyn en ek is bereid om te luister.’ ”

Mense was aanvanklik emosioneel en dan neig hulle om “terug te trek in hul vel”.

“Wanneer hulle bedreig word, klim hulle terug in hul eie kultuur. God en die behoeftes van die gemeenskap was die dryfkrag van eenheid.”

Die ommeswaai in Senekal was danksy die feit dat hulle proaktief was om verdere konflik te voorkom.

“Nou het ons ’n nuwe energie. Ten minste het hier ’n positiewe ding uitgekom waar mense besef hulle kan nie meer op die regering wag nie.

“En dieselfde geld vir gebiede soos Alexandra.”

Nkele Galedzana, jong gemeenskapsleier in Alexandra wat die CleanAlex-opruiming verlede Saterdag gereël het, en Barend la Grange, voormalige bedryfshoof van South Africa Day. Galedzana is betrokke by die organisering van Senekallers se hulp môre in die township.

Wat sê jý? Gee jou mening. Ons luister.

Stuur ’n SMS na 32515 of skryf ’n brief aan briewe@beeld.com SMS’e kos R1.00

Sue Pyler raak verloof: ‘Ek ruil hom vir niks’

Ané van Zyl

“Ek ruil hom vir niks,” sê Sue Pyler, die radio- en TV-aanbieder wat verlede week op die idilliese Zanzibar aan Franco Slabbert verloof geraak het.

Sy giggel wanneer sy praat oor al sy wonderlike eienskappe: Hy is eerlik, reguit, georganiseerd, onselfsugtig, ’n raakvatter, staatmaker en ook ’n gentleman, sê Pyler.

Sy het verlede Woensdag die senuagtige Slabbert die jawoord in ’n amfiteater op die eiland gegee net nadat hulle ’n heerlike aandete in ’n restaurant geniet het.

“Ek het hom nog nooit op sy senuwees gesien nie,” sê sy. “Hy sê hy was bang ek sê nee! Ek weet nie hoekom nie. Maar ek het ja gesê en van daar af kan ek hom my verloofde noem.”

Hy het vooraf haar ouers gevra.

Pyler sê sy en Slabbert, wat in die konstruksiebedryf werk, het mekaar in Januarie ontmoet en dit was nie lank nie of hulle het geweet hulle wil vir ewig saam wees.

Sy het geweet die groot vraag is op pad, want hulle het die ring saam ontwerp en sy het selfs saam met hom gegaan toe hy die ring gaan haal het.

“Ek is mal daaroor,” sê sy.

“Ek verkies dit so eerder as om met ’n ring te sit wat meer sy smaak as myne is. Franco het ook my bynaampie vir hom aan die binnekant laat graveer.”

Sue Pyler en haar verloofde, Franco Slabbert.

Slabbert is oorspronklik van die Wes-Kaap, maar het tot onlangs toe in die Noord-Kaap gewoon. In daardie tyd was ’n langafstandverhouding uitdagend vir hulle.

Maar hy het twee maande gelede Johannesburg toe getrek en kan haar nou met allerhande loswerkies in die huis help. “Ek en my hondjie is handig, maar ek noem Franco nou sommer my *handyman*. Hy kan regtig enigiets regmaak,” sê sy.

Die paartjie het Sondag teruggekeer na Suid-Afrika ná ’n week in Zanzibar, wat eintlik vir haar verjaardag verlede Dinsdag bedoel was.

Sy beskryf die eiland as ’n paradys en sê hul tyd daar was fenomenaal. “Ons het die onluste in Suid-Afrika vrygespring en dit was ’n verligting om weg te gaan na ’n ander land waar die reëls (oor Covid-19) nie so streng is nie.

“Almal het daarheen gegaan met ’n negatiewe Covid-19-toets, so ’n mens kon grootliks sonder ’n masker vakansie hou. Ja, ons het ons hande ontsmet, maar nie so erg soos in Suid-Afrika nie.”

Die paartjie verklap nog nie veel oor hul komende huweliksdag nie, maar sê hulle het al begin beplan. Vir nou neem hulle dinge dag vir dag.

“Ons hoop daar is meer goeie as slegte tye in die toekoms.

“Ons gaan voort om liefde, respek en eerlikheid te toon en goed te kommunikeer.”

APPENDIX

F DESKTOP ECOLOGICAL INVESTIGATION REPORT

SCIENTIFIC TERRESTRIAL SERVICES

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DESKTOP LEVEL ECOLOGICAL INVESTIGATION AS PART OF THE ENVIRONMENTAL AUTHORISATION PROCESS FOR THE PROPOSED POWER STATION, POWERLINE AND GAS PIPELINE IN KOMATIPOORT, MPUMLANGA PROVINCE.

Prepared for

Nsovo Environmental Consulting

October 2020

Prepared by: Scientific Terrestrial Services CC
Report author: S. Erwee
Report reviewer: N. Cloete (Pr. Sci. Nat)
Report reference: STS 200058

EXECUTIVE SUMMARY

Scientific Terrestrial Services (STS) was appointed to conduct a desktop terrestrial biodiversity assessment as part of the Environmental Impact and Authorisation process for the proposed development of a Busbar extension, power station, associated powerline and a gas pipeline, in Komatipoort, Mpumalanga Province (hereafter collectively referred to as “focus area”).

Based on the preliminary desktop assessment, the focus area is not located within a protected area, however, it is situated approximately 2 km south of the Kruger National Park. According to the Mpumalanga Biodiversity Sector Plan (MBSP, 2014) the north eastern portion of the focus area is located within an Ecological Support Area (ESA) local corridor, and a small portion of the power station and the majority of the proposed gas pipeline is located within an irreplaceable Critical Biodiversity Area (CBA). The remaining portions of the focus area is located within areas classified as either “heavily modified” or “other natural areas”.

During the desktop analysis, it was established that the southern and a portion in the north east of the focus area has a very high terrestrial sensitivity according to the National Web-based Environmental Screening Tool (2020). This is attributed to the CBA 1 and ESA within the focus area, as well as being a focus area for land-based protected areas expansion. The focus area is considered to have a medium sensitivity for plant species due to the potential presence of the sensitive species such as *Pavetta zeyheri subsp. microlancea*. For the Animal Species theme, the majority of the focus area is considered to have a medium sensitivity due to the potential presence of sensitive species such as Sensitive species 2 and Aves – *Circus ranivorus* (African marsh harrier) and *Sagittarius serpentarius* (Secretarybird). Scattered portions throughout the focus area is considered to be of high animal sensitivity due to sensitive species such as Aves – *Ephippiorhynchus senegale* (saddle-billed stork). A field assessment will have to be undertaken to verify the current sensitivity of the habitat as well as the presence of the floral and faunal species within the focus area.

During the desktop analysis, several floral and faunal Species of Conservation Concern (SCC), were identified as having the potential to be observed within the focus area, according to the Plant of Southern Africa online database and the Mpumalanga State of Environment Report. As these species are provincially important, should they be present within the focus area, they will require rescuing and relocation to a similar habitat within the vicinity of the focus area before any construction activities commences. Thus, a field assessment would be required to establish whether suitable habitat exists to support these species within the focus area.

Following the desktop analysis of the biodiversity associated with the focus area, it is determined that a full biodiversity assessment will need to be undertaken to determine the sensitivity and the potential impacts to the focus area should the proposed development receive Environmental Authorisation.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

GLOSSARY OF TERMS

Most definitions are based on terms and concepts elaborated by Richardson *et al*. (2011), Hui and Richardson (2017) and Wilson *et al*. (2017), with consideration to their applicability in the South African context, especially South African legislation [notably the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), and the associated Alien and Invasive Species Regulations, 2014].

Alien species (syn. exotic species; non-native species)	A species that is present in a region outside its natural range due to human actions (intentional or accidental) that have enabled it to overcome biogeographic barriers.
Biome - as per Mucina and Rutherford (2006); after Low and Rebelo (1998).	A broad ecological spatial unit representing major life zones of large natural areas – defined mainly by vegetation structure, climate and major large-scale disturbance factors (such as fires).
Bioregion (as per the definition in NEMBA)	A geographic region which has in terms of section 40(1) been determined as a bioregion for the purposes of this Act;
CBA (Critical Biodiversity Area)	A CBA is an area considered important for the survival of threatened species and includes valuable ecosystems such as wetlands, untransformed vegetation and ridges.
Corridor	A dispersal route or a physical connection of suitable habitats linking previously unconnected regions.
Ecoregion	An ecoregion is a "recurring pattern of ecosystems associated with characteristic combinations of soil and landform that characterise that region".
Endangered	Organisms in danger of extinction if causal factors continue to operate.
Endemic species	Species that are only found within a pre-defined area. There can therefore be sub-continental (e.g. southern Africa), national (South Africa), provincial, regional or even within a particular mountain range.
ESA (Ecological Support Area)	An ESA provides connectivity and important ecological processes between CBAs and is therefore important in terms of habitat conservation.
Habitat (as per the definition in NEMBA)	A place where a species or ecological community naturally occurs.
IBA (Important Bird and Biodiversity Area)	The IBA Programme identifies and works to conserve a network of sites critical for the long-term survival of bird species that: are globally threatened, have a restricted range, are restricted to specific biomes/vegetation types or sites that have significant populations.
Indigenous vegetation (as per the definition in NEMA)	Vegetation occurring naturally within a defined area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.
Listed alien species	All alien species that are regulated in South Africa under the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004), Alien and Invasive Species Regulations, 2014.
Least Threatened	Least threatened ecosystems are still largely intact.
RDL (Red Data listed) species	According to the Red List of South African plants (http://redlist.sanbi.org/) and the International Union for Conservation of Nature (IUCN), organisms that fall into the Extinct in the Wild (EW), critically endangered (CR), Endangered (EN), Vulnerable (VU) categories of ecological status.
SCC (Species of Conservation Concern)	The term SCC in the context of this report refers to all RDL (Red Data) and IUCN (International Union for the Conservation of Nature) listed threatened species as well as protected species of relevance to the project.

LIST OF ACRONYMS

AIP	Alien and Invasive Plant
BGIS	Biodiversity Geographic Information Systems
CARA	Conservation of Agricultural Resources Act, 1983 [Act No. 43 of 1983]
CBA	Critical Biodiversity Area
CR	Critically Endangered
DEFF	Department of Environment, Forestry and Fisheries
E-GIS	Environmental Geographical Information Systems
EIA	Environmental Impact Assessment
EMPR	Environmental Management Programmes
EN	Endangered
ESA	Ecological Support Areas
FEPA	Freshwater Ecosystem Priority Areas
IBAs	Important Bird and Biodiversity Areas
IUCN	International Union for Conservation of Nature
LC	Least Concern
MTPA	Mpumalanga Tourism and Parks Agency
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act, 1998 [Act 107 of 1998]
NEMBA	National Environmental Management: Biodiversity Act, 2004 [Act 10 of 2004]
NPAES	National Protected Areas Expansion Strategy
PP	Poorly Protected
QDS	Quarter Degree Square
SACAD	South African Conservation Areas Database
SANBI	South African National Biodiversity Institute
SAPAD	South African Protected Areas Database
STS	Scientific Terrestrial Services
SWSAs	Strategic Water Source Areas
VU	Vulnerable
WP	Well Protected

1 INTRODUCTION

Scientific Terrestrial Services (STS) was appointed to conduct a desktop terrestrial biodiversity assessment as part of the environmental assessment and authorisation process for the proposed development of a Busbar extension, power station, associated powerline and a gas pipeline, in Komatipoort, Mpumalanga Province (hereafter collectively referred to as “focus area”).

The focus area falls within the Nkomazi Local Municipality and is located directly south and east of the existing power station. The focus area is located south of the railway line within the town of Komatipoort and the proposed gas pipeline runs from the proposed power station to the N4 National Highway located south of the proposed power station (Figures 1 and 2). The focus area is situated approximately 3.6 km to the west of the Lebombo border post going into Mozambique. The immediate surroundings to the west comprises mainly agricultural lands with a watercourse traversing the focus area, urban development to the north and east and disturbed lowveld to the south.

This report, after consideration and description of the ecological integrity of the focus area, must guide the Environmental Assessment Practitioner (EAP) and relevant authorities, as to the viability and acceptability of the proposed development.

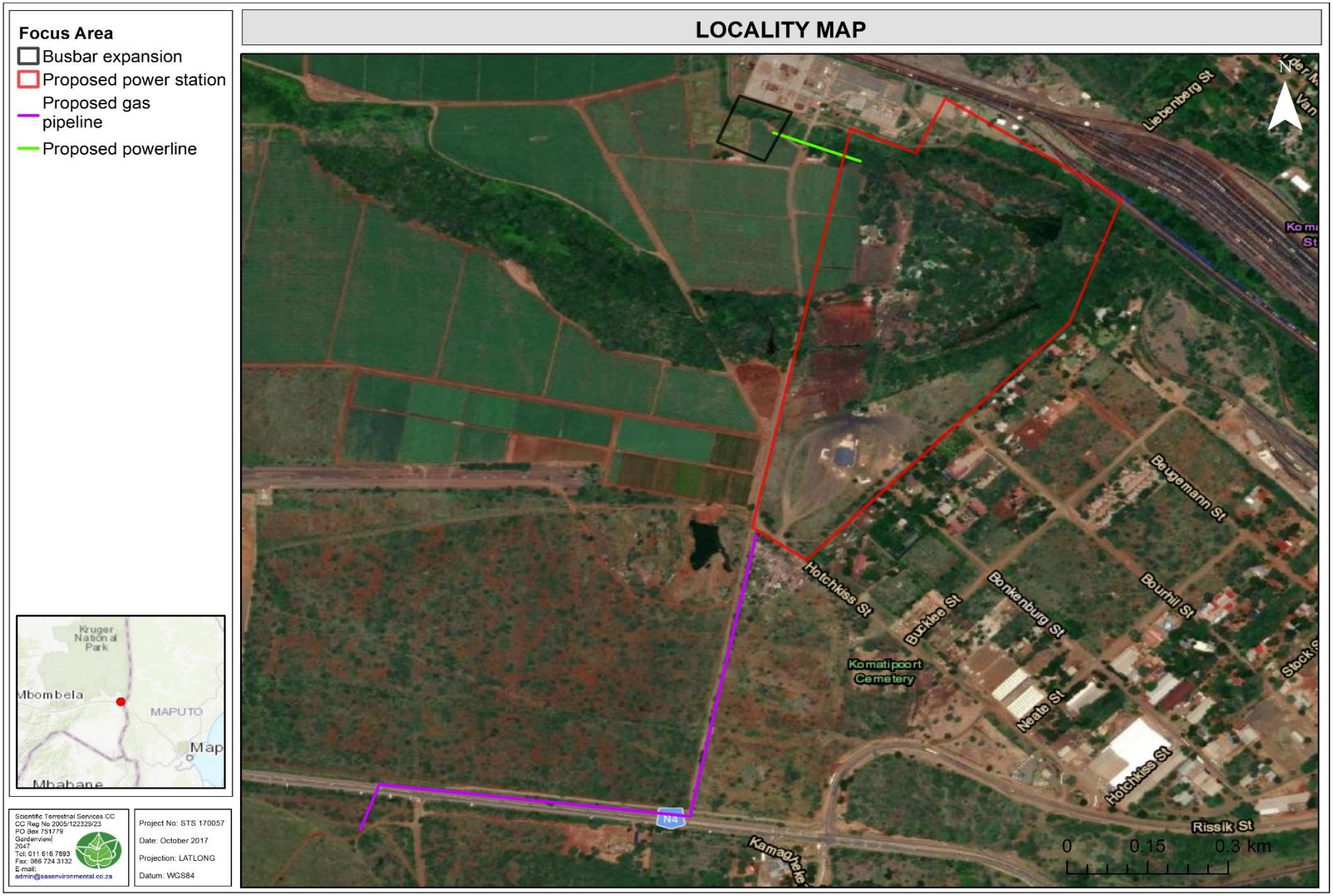

Figure 1: Digital satellite image depicting the focus area in relation to surrounding areas.

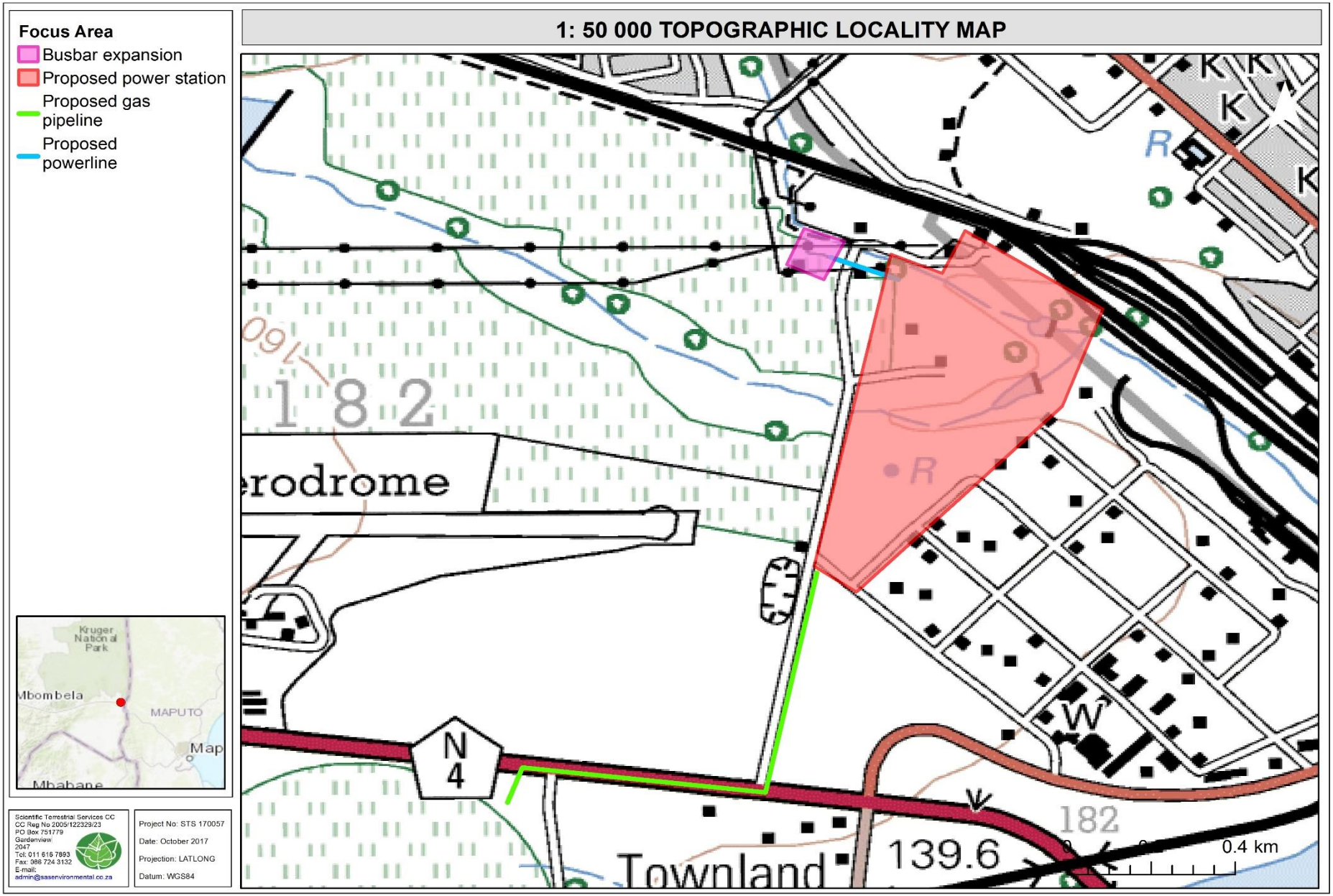

Figure 2: The focus area depicted on a 1:50 000 topographical map in relation to the surrounding area.

1.1 Scope of Work

Specific outcomes in terms of the report are as follows:

- Compile a desktop assessment with all relevant information as presented by South African National Biodiversity Institute's (SANBI) Biodiversity Geographic Information Systems (BGIS) website (http://bgis.sanbi.org) and the Department of Environment, Forestry and Fisheries (DEFF) Environmental Geographical Information Systems (E-GIS) website (https://egis.environment.gov.za/). The desktop assessment aims to gain background information on the physical habitat and potential floral and faunal ecology associated with the focus area;
- To state the indemnity and terms of use of this report (Appendix A) as well as to provide the details of the specialists who prepared the reports (Appendix E);
- To outline the legislative requirements that were considered for the assessment (Appendix B of this report); and
- To provide the methodologies followed relating to the impact assessment and development of the mitigation measures (Appendix C) that was applied.

1.2 Assumptions and Limitations

The following assumptions and limitations are applicable to this report:

- The biodiversity desktop assessment is confined to the focus area and does not include detailed results of the adjacent properties, although the sensitivity of surrounding areas has been included on the relevant maps, based on the relevant national and provincial databases; and
- It is important to note that although all data sources used provide useful and often verifiable, high-quality data, the various databases used do not always provide an entirely accurate indication of the actual site characteristics within the focus area at the scale required to inform an environmental process. However, this information is useful as background information to the study and, based on the desktop results; sufficient decision making can take place with regards to the proposed development.

1.3 Legislative Requirements

The following legislative requirements were considered during the assessment:

- The Constitution of the Republic of South Africa, 1996[1];
- The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA);
- The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA);
- Government Notice R598 Alien and Invasive Species Regulations as published in the Government Gazette 37885 dated 1 September 2014 as it relates to the National Environmental Management Biodiversity Act, 1998 (Act No. 107 of 1998);
- The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (CARA);
- Government Gazette Notice 635 List of Protected Tree Species as published in the Government Gazette 42887 dated 6 December 2019 as it relates to the National Forest Act, 1998 (Act No. 84 of 1998); and
- The Mpumalanga Nature Conservation Act, 1998 (Act No. 10 of 1998) (MNCA).

The details of each of the above, as they pertain to this study, are provided in Appendix B of this report.

2 ASSESSMENT APPROACH

2.1 Literature and Database Review

A desktop study was compiled with all relevant information as presented by the relevant databases and SANBI's Biodiversity Geographic Information Systems (BGIS) website (http://bgis.sanbi.org). Relevant databases and documentation that were considered during the assessment of the focus area included [2]:

- The National Protected Areas Expansion Strategy (NPAES) focus areas for Protected Area Expansion, 2009 (Formally and Informally Protected Areas):
- The South African Conservation Areas Database, Quarter 4 (SACAD, 2019);
- The South African Protected Areas Database, Quarter 4 (SAPAD, 2019);
- Mpumalanga Biodiversity Sector Plan (MBSP, 2014);

[1] Since 1996, the Constitution has been amended by seventeen amendments acts. The Constitution is formally entitled the 'Constitution of the Republic of South Africa, 1996". It was previously also numbered as if it were an Act of Parliament – Act No. 108 of 1996 – but since the passage of the Citation of Constitutional Laws Act, neither it not the acts amending it are allocated act numbers.

[2] Datasets obtained from:

- SANBI BGIS (2019). The South African National Biodiversity Institute - Biodiversity GIS (BGIS) [online]. URL: http://bgis.sanbi.org as retrieved in 2019; and
- Department of Environmental Affairs (DEA) Environmental Geographical Information Systems (E-GIS) website. URL: https://egis.environment.gov.za/

- Mucina and Rutherford, 2012 and 2018:
    - Biomes, Bioregions and Vegetation Type(s);
- The National Threatened Ecosystems (2011);
- The National Biodiversity Assessment (NBA, 2018);
- Important Bird and Biodiversity Areas (IBAs) (2015), in conjunction with the South African Bird Atlas Project (SABAP2); and
- The International Union for Conservation of Nature (IUCN).

2.2 Floral and faunal Species of Conservational Concern (SCC)

All relevant databases were utilised to record the floral and faunal SCC that are expected to occur within the focus area. Should the proponent require complete inventories of faunal and floral species that would occur within the focus area, a field assessment must take place.

3 RESULTS OF THE DESKTOP ANALYSIS

3.1 Conservation Characteristics of the Focus Area based on National and Provincial Datasets

The following section contains data accessed as part of the desktop assessment and are presented as a “dashboard” report below (Table 1). The dashboard report aims to present concise summaries of the data on as few pages as possible in order to allow for improved assimilation of results by the reader to take place. Where required, further discussion and interpretation are provided.

Table 1: Summary of the biodiversity characteristics associated with the focus area [Quarter Degree Square (QDS) 2531BD].

<table>
<tr><th colspan="2">DETAILS OF THE FOCUS AREA IN TERMS OF MUCINA & RUTHERFORD (2018)</th><th colspan="7">DESCRIPTION OF THE TSHOKWANE-HLANE BASALT LOWVELD (SVI5) VEGETATION TYPE RELEVANT TO THE FOCUS AREA (MUCINA & RUTHERFORD 2006)</th></tr>
<tr><td>Biome</td><td>The focus area is situated within the Savanna Biome.</td><td>Distribution</td><td colspan="6">Mpumalanga Province and Swaziland</td></tr>
<tr><td>Bioregion</td><td>The focus area is located within the Lowveld Bioregion</td><td rowspan="3">Climate</td><td colspan="6">Summer rainfall with dry winters.</td></tr>
<tr><td>Vegetation Type</td><td>The focus area is situated within the Tshokwane-Hlane Basalt Lowveld vegetation type.</td><td>MAP (mm)</td><td>MAT (°C)</td><td>MFD (days)</td><td>MAPE (mm)</td><td>MASMS (%)</td></tr>
<tr><td colspan="2">CONSERVATION DETAILS PERTAINING TO THE FOCUS AREA (VARIOUS DATABASES)</td><td>572</td><td>21.7</td><td>0</td><td>1939</td><td>79</td></tr>
<tr><td rowspan="2">National Threatened Ecosystems [3] (2011)</td><td rowspan="2">The focus area is within an ecosystem of Least Concern. The sensitivity of the ecosystem associated with the focus 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 structure, function, and composition of threatened ecosystems. The purpose of listing protected ecosystems is primarily to preserve witness sites of exceptionally high conservation value.</td><td>Altitude (m)</td><td colspan="6">180 – 400 m</td></tr>
<tr><td>Conservation</td><td colspan="6">Least threatened.
Target 19%. About 64% statutorily conserved</td></tr>
<tr><td rowspan="3">National Biodiversity Assessment (2018) (Figure 3)</td><td rowspan="3">The focus area falls within an least concerned vegetation type (Thsokwane-Hlane Basalt Lowveld) that is currently well protected (WP). The majority of focus area falls within the remaining extent of Tshokwane-Hlane Basalt Lowveld.

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.</td><td>Geology & Soils</td><td colspan="6">The Letaba Formation basalts of the Karoo Supergroup in this area give rise to black, brown or red clayey soils, usually not more the 1 m deep. Vertisols, such as the Arcadia soil form, occur in low-lying areas and concave plains. Land types mainly Ea with some Dc.</td></tr>
<tr><td>Vegetation & landscape features (Dominant Floral Taxa in Appendix D)</td><td colspan="6">Usually fairly flat plains with open tree savanna, often dominated by tall Sclerocarya birrea and Acacia nigrescens with a moderately developed shrub layer and a dense herbaceous layer. On some sloping areas with shallower soils, trees are stunted (e.g. A. nigrescens).</td></tr>
<tr><td colspan="2">NATIONAL WEB BASED ENVIRONMENTAL SCREENING TOOL (2020)</td><td colspan="6">The Screening Tool is intended to allow for pre-screening of sensitivities in the landscape to be assessed within the EA process. This assists with implementing the mitigation hierarchy by allowing developers to adjust their proposed development footprint to avoid sensitive areas.</td></tr>
<tr><td colspan="2"></td><td>Terrestrial Sensitivity (Figure 5)</td><td colspan="6">The Terrestrial Sensitivity for the southern and north eastern portions of the focus area is considered to have a Very High Sensitivity. This is mainly attributed to the CBA1 and ESA associated with the focus area. Additionally, the focus area is within a focus area for land-based protected areas expansion. The remaining portion of the focus area is of low sensitivity.</td></tr>
<tr><td colspan="2"></td><td>Plant Species</td><td colspan="6">For the Plant Species theme, the focus area is considered to have a Medium Sensitivity due to the potential presence of the sensitive species such as Pavetta zeyheri subsp. microlancea</td></tr>
</table>

[3] For Environmental Impact Assessments (EIAs), the 2011 National list of Threatened Ecosystems remains the trigger for a Basic Assessment in terms of Listing Notice 3 of the EIA Regulations 2014, as amended published under the National Environmental Management Act, 1998 (Act No. 107 of 1998). However, the updated 2018 ecosystem threat status have also been considered in the assessment of impact significance in EIAs.

	The ecosystem protection level status is assigned using the following criteria: i. 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; ii. When less than 100% of the biodiversity target is met in formal A or B protected areas it is classified it as Moderately Protected; iii. If less than 50% of the biodiversity target is met, it is classified it as Poorly Protected; and If less than 5% it is Hardly Protected.
SAPAD (2019, Q4); SACAD (2019, Q4); NPAES (2009) **(Figure 4)**	The SAPAD[4] (2019, Q4) and NPAES (2009) database indicate that the **Kruger National Park** is situated ± 2 km north of the focus area. No other protected areas are located within 10 km of the focus area.
IBA (2015)	The **Kruger National Park** is identified as an IBA as well. **IBA trigger species** **Globally threatened** species are Cape Vulture (*Gyps coprotheres*), Hooded Vulture (*Necrosyrtes monachus*), White-backed Vulture (*Gyps africanus*), Lappet-faced Vulture (*Torgos tracheliotos*), Southern Ground-Hornbill (*Bucorvus leadbeateri*), White-headed Vulture (*Trigonoceps occipitalis*), Kori Bustard (*Ardeotis kori*), Crowned Eagle *(Stephanoaetus coronatus)*, Bateleur (*Terathopius ecaudatus*), Secretarybird (*Sagittarius serpentarius)* and Martial Eagle (*Polemaetus bellicosus*). **Regionally threatened** species are White-backed Night Heron (*Gorsachius leuconotus*), Saddlebilled Stork (*Ephippiorhynchus senegalensis*), Tawny Eagle (*Aquila rapax*), African Finfoot (*Podica senegalensis*), African Grass Owl (*Tyto capensis*), Pel's Fishing Owl (*Scotopelia peli*), Black Stork (*Ciconia nigra)*, Marabou Stork (*Leptoptilos crumenifer*), African Pygmy Goose (*Nettapus auratus)*,

Animal Species (Figure 6)	For the Animal Species theme, the majority of the focus area is considered to have a **medium sensitivity** due to the potential presence of sensitive species such as Aves – *Circus ranivorus* (African marsh harrier) and *Sagittarius serpentarius* (Secretarybird). Scattered portions throughout the focus area is considered to be of **high sensitivity** due to sensitive species such as Aves – *Ephippiorhynchus senegale* (saddle-billed stork).
STRATEGIC WATER SOURCE AREAS FOR SURFACE WATER (2017)	
Surface water Strategic Water Source Areas (SWSAs) are defined as areas of land that supply a disproportionate (i.e. relatively large) quantity of mean annual surface water runoff in relation to their size. They include transboundary areas that extend into Lesotho and Swaziland. The sub-national Water Source Areas (WSAs) are not nationally strategic as defined in the report but were included to provide a complete coverage.	
Name and Criteria	The focus area is not located within 10 km of a SWSA.
MPUMALANGA BIODIVERSITY SECTOR PLAN (MBSP, 2014) (FIGURE 7)	
Ecological Support Area: Local Corridor	The north eastern portion of the focus area is located within an ESA: Local corridor. These are finer-scale alternative pathways that build resilience into the corridor network by ensuring connectivity between climate change focal areas, reducing reliance on single landscape-scale corridors.
Critical Biodiversity Area: Irreplaceable	A small portion of the proposed power station and the majority of the proposed gas pipeline is located within an area classified as a CBA Irreplaceable area. This category includes: (1) Areas required to meet targets and with irreplaceability values of more than 80%; (2) Critical linkages or pinch-points in the landscape that must remain natural; (3) Critically Endangered Ecosystems.
Heavily Modified	The remaining portions of the focus area are classified as areas that are "Heavily Modified". These are areas currently modified to such an extent that any valuable biodiversity and ecological functions have been lost.

[4] **SAPAD (2019):** The definition of protected areas follows the definition of a protected area as defined in the National Environmental Management: Protected Areas Act, (Act 57 of 2003). Chapter 2 of the National Environmental Management: Protected Areas Act, 2003 sets out the "System of Protected Areas", which consists of the following kinds of protected areas - 1. Special nature reserves; 2. National parks; 3. Nature reserves; 4. Protected environments (1-4 declared in terms of the National Environmental Management: Protected Areas Act, 2003); 5. World heritage sites declared in terms of the World Heritage Convention Act; 6. Marine protected areas declared in terms of the Marine Living Resources Act; 7. Specially protected forest areas, forest nature reserves, and forest wilderness areas declared in terms of the National Forests Act, 1998 (Act No. 84 of 1998); and 8. Mountain catchment areas declared in terms of the Mountain Catchment Areas Act, 1970 (Act No. 63 of 1970).

	Bat Hawk (*Macheiramphus alcinus*), Lanner Falcon (*Falco biarmicus*), Greater Painted-snipe (*Rostratula benghalensis*), Half-collared Kingfisher (*Alcedo semitorquata*) and Lemon-breasted Canary (*Serinus citrinipectus*). **Restricted-range and biome-restricted species** include Arnot's Chat (*Pentholaea arnotti*) (restricted to the north of the park) and the uncommon Stierling's Wren-Warbler (*Calamonastes stierlingi*), Gorgeous Bush-Shrike (*Telophorus quadricolor*), Meves's Starling (*Lamprotornis mevesii*) and Lemon-breasted Canary (*Serinus citrinipectus*). Burchell's Starling (*L. australis*) and White-throated Robin-Chat (*Cossypha humeralis*) are fairly common, while Kurrichane Thrush (*Turdus libonyanus*), White-bellied Sunbird (*Cinnyris talatala*) and Brown-headed Parrot (*Poicephalus cryptoxanthus*) are common.	**Other Natural Areas (ONAs)**	The remaining portions of the focus area are classified as "Other Natural Areas". These areas have not been identified as priority in the current systematic biodiversity plan but retain most of their natural character and perform a range of biodiversity and ecological infrastructural functions.

ESA = Ecological Support Area; NBA = National Biodiversity Assessment; SAPAD = South African Protected Areas Database; SACAD = South African Conservation Areas Database; ONA = Other Natural Area; NPAES = National Protected Areas Expansion Strategy; IBA = Important Bird Area; MAP = Mean annual precipitation; MAT = Mean annual temperature; MAPE = Mean annual potential evaporation; MFD = Mean Frost Days; MASMS = Mean annual soil moisture stress (% of days when evaporative demand was more than double the soil moisture supply); PA = Protected Area.

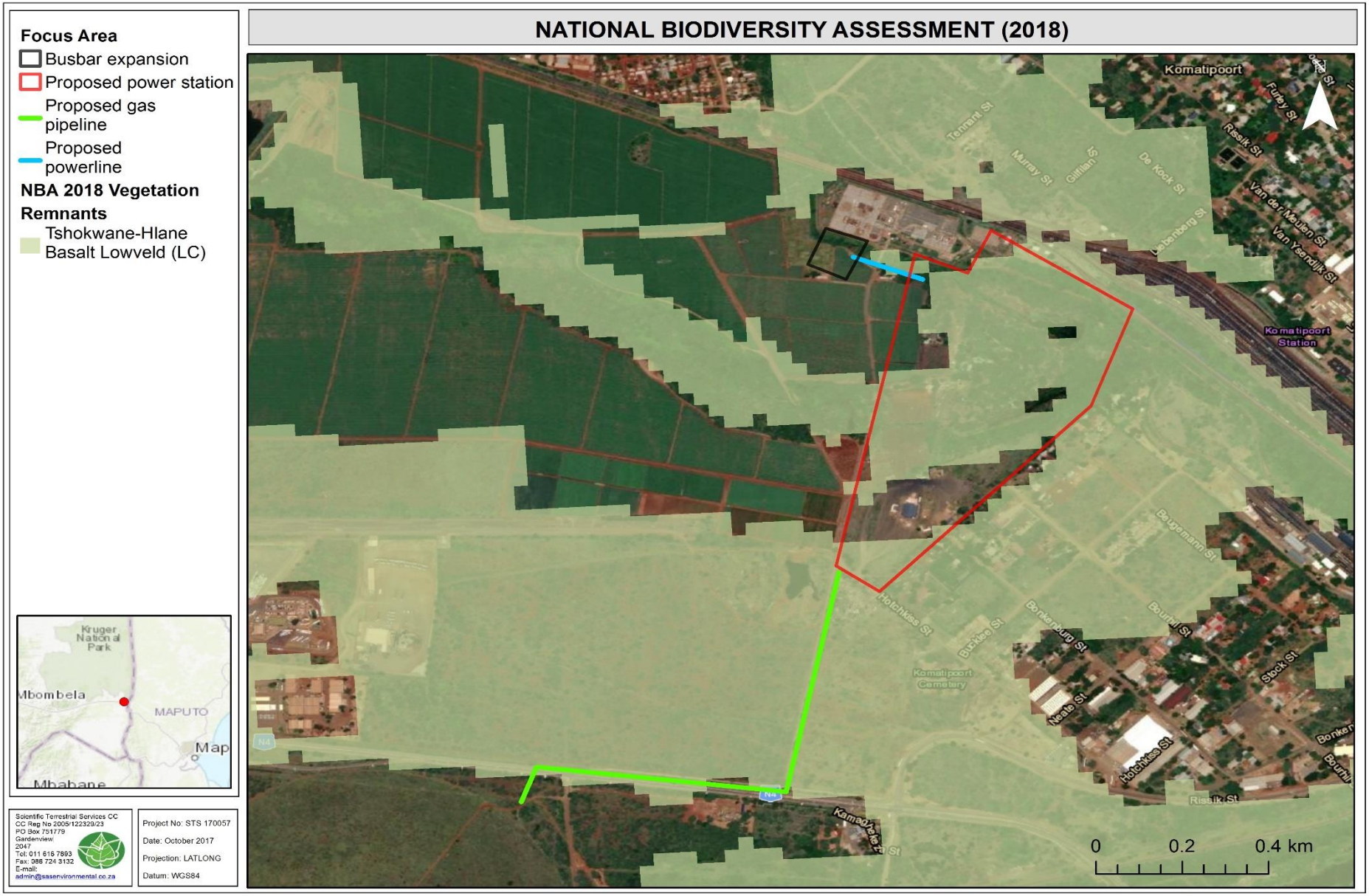

Figure 3: The remaining extent of the least concerned and well protected Tshokwane-Hlane Basalt Lowveld, according to the National Biodiversity Assessment (NBA, 2018).

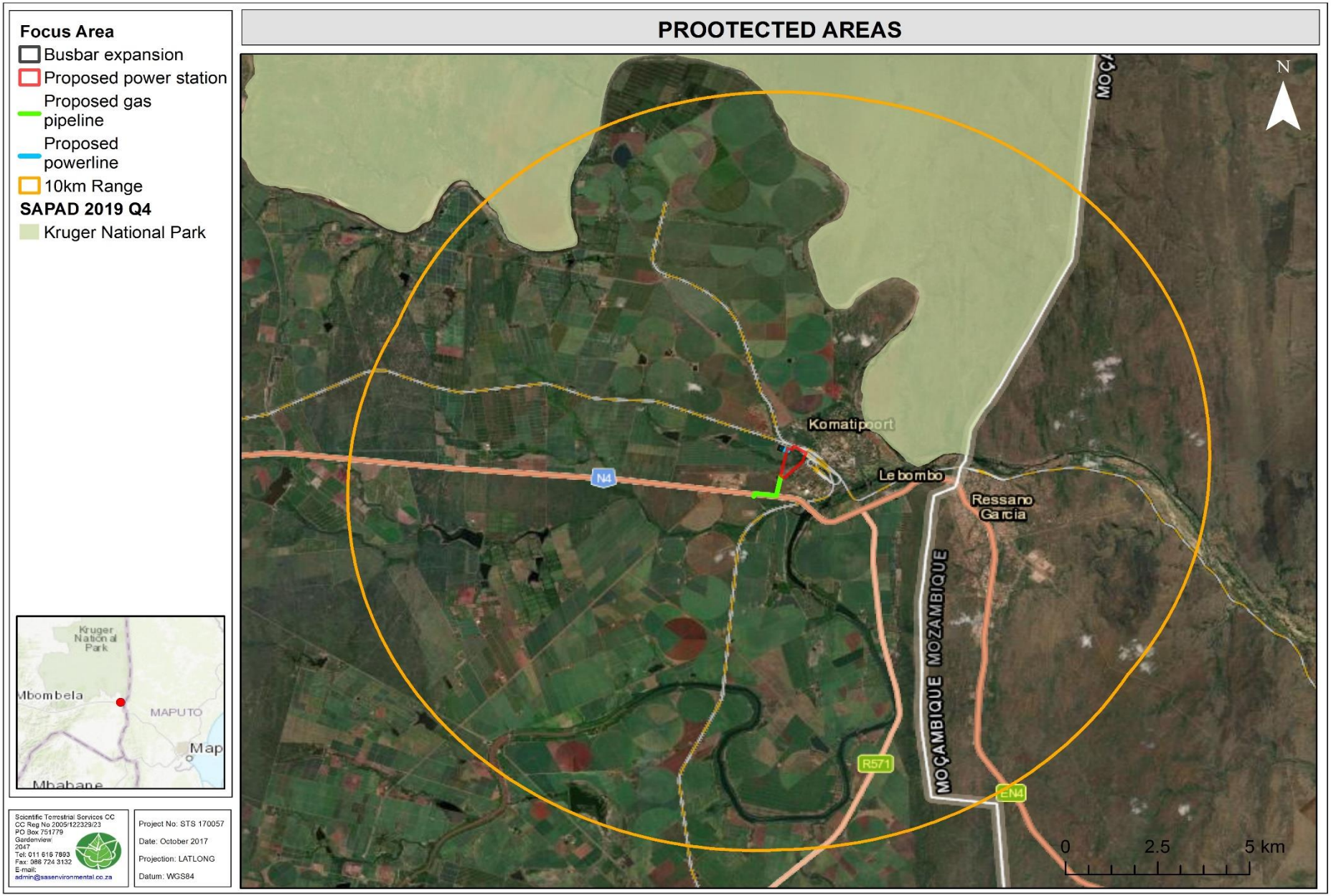

Figure 4: Nationally protected area associated with the focus area (various databases).

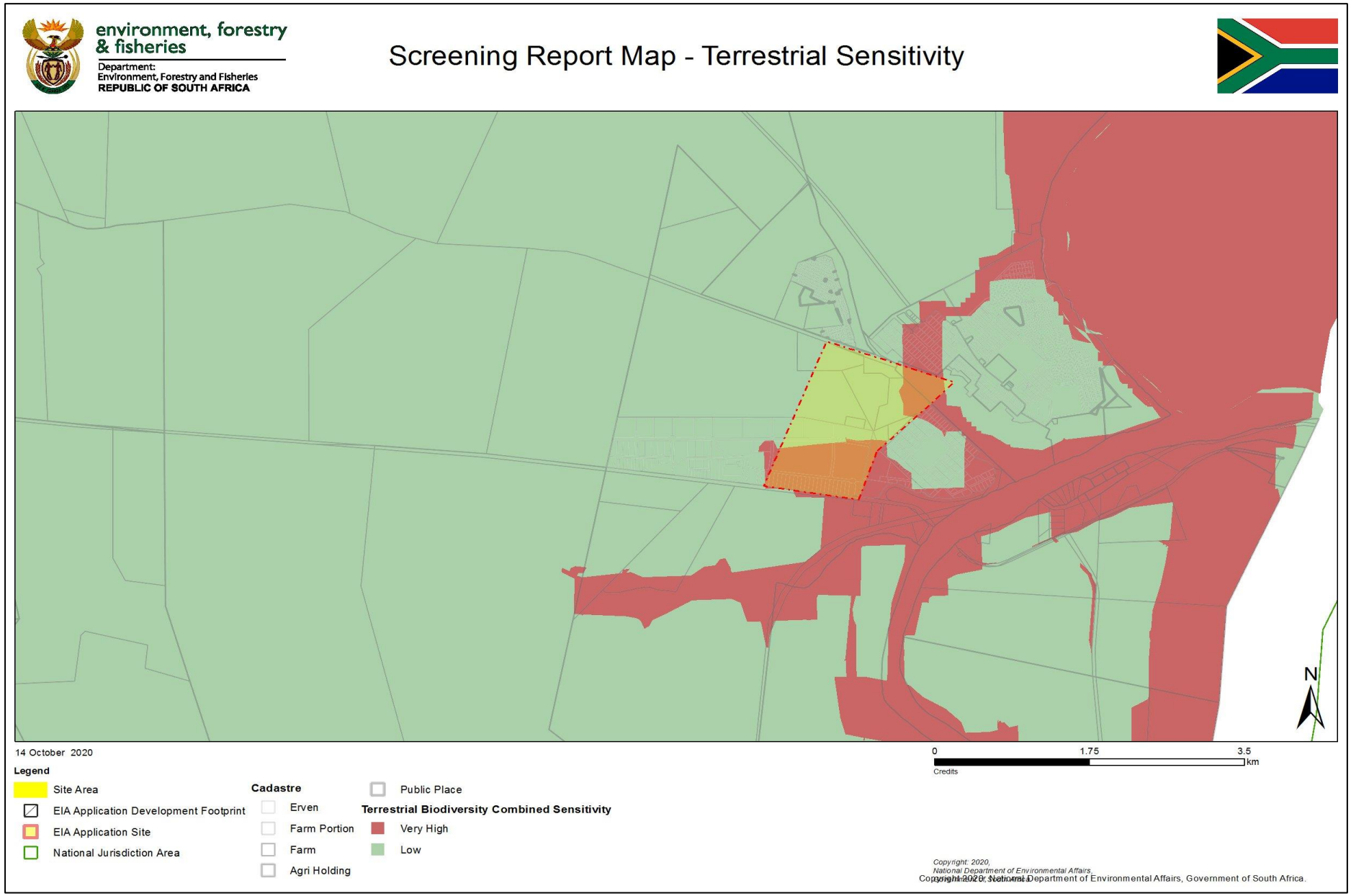

Figure 5: Terrestrial sensitivity map of the focus area as obtained from the National Web Based Environmental Screening Tool (2020).

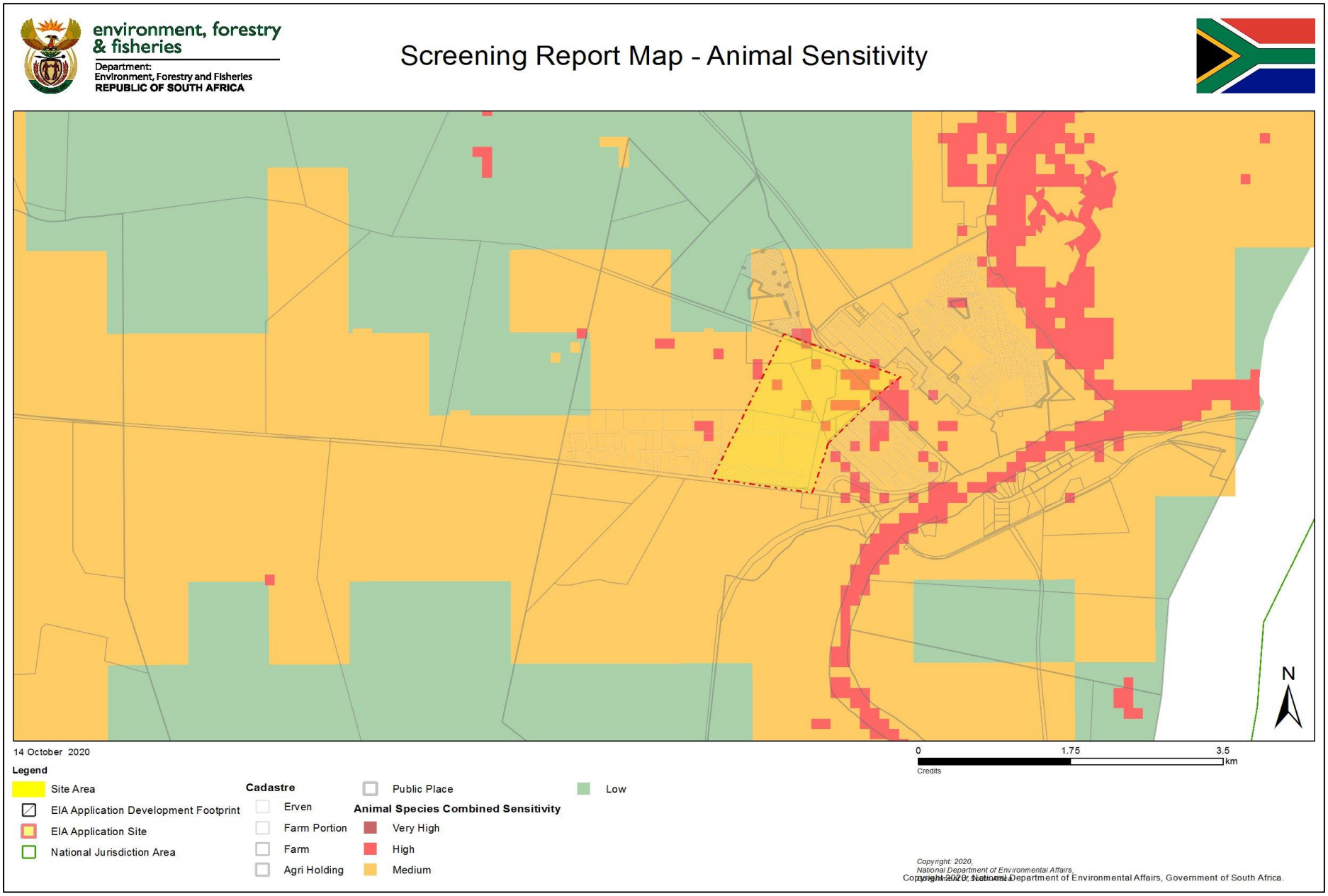

Figure 6: Animal Species sensitivity map for the focus area as obtained from the National Web Based Environmental Screening Tool (2020).

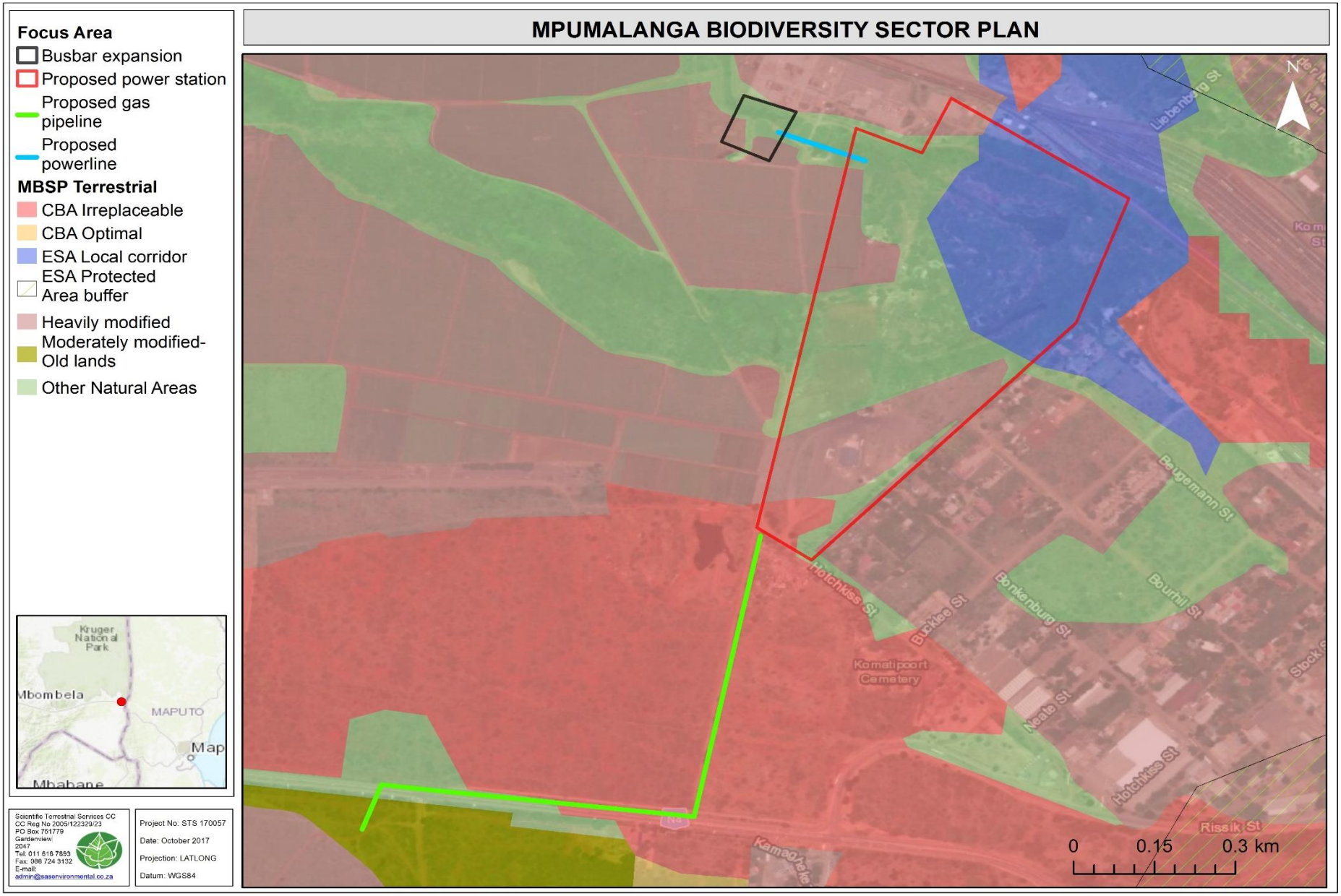

Figure 7: Critical Biodiversity Area (CBA) and Ecological Support Areas (ESA) relating to the focus area, according to MBSP (2014).

3.2 Floral and faunal Species of Conservation Concern (SCC)

3.2.1 Floral SCC

Threatened/protected species are species that are facing a high risk of extinction. Any species classified in the IUCN categories Critically Endangered (CR), Endangered (EN) or Vulnerable (VU) is a threatened species. Furthermore, SCC are species that have a high conservation importance in terms of preserving South Africa's high floristic diversity and include not only threatened species, but also those classified in the categories Extinct in the Wild (EW), Regionally Extinct (RE), Near Threatened (NT), Critically Rare, Rare and Declining. A person may not carry out a restricted activity involving a specimen of a listed threatened or protected species without a permit issued in terms of Chapter 7 of the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) (NEMBA). A record of floral SCC and their habitat requirements was acquired from these primary sources:

- Southern African plant names and floristic details from SANBI, i.e. the new Plant of Southern Africa online database (POSA) (http://posa.sanbi.org/);
  - This website provides access to South African plant names (taxa), specimens (herbarium sheets) and observations of plants made in the field (botanical records). Data is obtained from the Botanical Database of Southern Africa (BODATSA), which contains records from the National Herbarium in Pretoria (PRE), the Compton Herbarium in Cape Town (NBG & SAM) and the KwaZulu-Natal Herbarium in Durban (NH).
  - Information on habitat requirements etc. is obtained from the SANBI Red List of South African Plants website (http://redlist.sanbi.org/).
  - Typically, data is extracted for the Quarter Degree Square (QDS) in which the focus area is situated but where it is deemed appropriate, a larger area can be included.
- NEMBA TOPS (2015) listed for Mpumalanga Province.
- The list of Schedule 11 Protected Plants [Section 69 (1)(a)] and Schedule 12 Specially Protected Plants [Section 69 (1)(b)] under the Mpumalanga Nature Conservation Act, 1998 (Act 10 of 1998).
- Data obtained from the Mpumalanga Tourism and Parks Agency for the Komatipoort region.
- A List of Protected Tree Species under Section 12 of the National Forest Act, 1998 (Act No. 84 of 1998).

South Africa uses the internationally endorsed IUCN Red List Categories and Criteria in the Red List of South African plants. This scientific system is designed to measure species' risk

of extinction. The purpose of this system is to highlight those species that are most urgently in need of conservation action. Due to its strong focus on determining risk of extinction, the IUCN system does not highlight species that are at low risk of extinction but may nonetheless be of high conservation importance. Because the Red List of South African plants is used widely in South African conservation practices such as systematic conservation planning or protected area expansion, we use an amended system of categories designed to highlight those species that are at low risk of extinction but of conservation concern.

Definitions of the national Red List categories

Categories marked with **N** are non-IUCN, national Red List categories for species not in danger of extinction but considered of conservation concern. The IUCN equivalent of these categories is Least Concern (LC).

- **Extinct (EX)** A species is Extinct when there is no reasonable doubt that the last individual has died. Species should be classified as Extinct only once exhaustive surveys throughout the species' known range have failed to record an individual.
- **Extinct in the Wild (EW)** A species is Extinct in the Wild when it is known to survive only in cultivation or as a naturalized population (or populations) well outside the past range.
- **Regionally Extinct (RE)** A species is Regionally Extinct when it is extinct within the region assessed (in this case South Africa), but wild populations can still be found in areas outside the region.
- **Critically Endangered, Possibly Extinct (CR PE)** Possibly Extinct is a special tag associated with the category Critically Endangered, indicating species that are highly likely to be extinct, but the exhaustive surveys required for classifying the species as Extinct has not yet been completed. A small chance remains that such species may still be rediscovered.
- **Critically Endangered (CR)** A species is Critically Endangered when the best available evidence indicates that it meets at least one of the five IUCN criteria for Critically Endangered, indicating that the species is facing an extremely high risk of extinction.
- **Endangered (EN)** A species is Endangered when the best available evidence indicates that it meets at least one of the five IUCN criteria for Endangered, indicating that the species is facing a very high risk of extinction.
- **Vulnerable (VU)** A species is Vulnerable when the best available evidence indicates that it meets at least one of the five IUCN criteria for Vulnerable, indicating that the species is facing a high risk of extinction.
- **Near Threatened (NT)** A species is Near Threatened when available evidence indicates that it nearly meets any of the IUCN criteria for Vulnerable and is therefore likely to become at risk of extinction in the near future.
- [N]**Critically Rare** A species is Critically Rare when it is known to occur at a single site but is not exposed to any direct or plausible potential threat and does not otherwise qualify for a category of threat according to one of the five IUCN criteria.
- [N]**Rare** A species is Rare when it meets at least one of four South African criteria for rarity but is not exposed to any direct or plausible potential threat and does not qualify for a category of threat according to one of the five IUCN criteria. The four criteria are as follows:
    - Restricted range: Extent of Occurrence (EOO) <500 km2, OR
    - Habitat specialist: Species is restricted to a specialized microhabitat so that it has a very small Area of Occupancy (AOO), typically smaller than 20 km2, OR
    - Low densities of individuals: Species always occurs as single individuals or very small subpopulations (typically fewer than 50 mature individuals) scattered over a wide area, OR
    - Small global population: Less than 10 000 mature individuals.
- **Least Concern** A species is Least Concern when it has been evaluated against the IUCN criteria and does not qualify for any of the above categories. Species classified as Least Concern are considered at low risk of extinction. Widespread and abundant species are typically classified in this category.
- **Data Deficient - Insufficient Information (DDD)** A species is DDD when there is inadequate information to make an assessment of its risk of extinction, but the species is well defined. Listing of species in this category indicates that more information is required, and that future research could show that a threatened classification is appropriate.
- **Data Deficient - Taxonomically Problematic (DDT)** A species is DDT when taxonomic problems hinder the distribution range and habitat from being well defined, so that an assessment of risk of extinction is not possible.
- **Not Evaluated (NE)** A species is Not Evaluated when it has not been evaluated against the criteria. The national Red List of South African plants is a comprehensive assessment of all South African indigenous plants, and therefore all species are assessed and given a national Red List status. However, some species

included in Plants of southern Africa: an online checklist are species that do not qualify for national listing because they are naturalized exotics, hybrids (natural or cultivated), or synonyms. These species are given the status Not Evaluated and the reasons why they have not been assessed are included in the assessment justification.

According to the MTPA and POSA numerous floral SCC are expected to occur within the QDS (2531BD) (Table 3).

Table 2: POSA plant list for the QDS (2531BD) (SANBI, http://posa.sanbi.org/sanbi/Explore).

Family	Species	IUCN	Growth Form
Asphodelaceae	*Aloe komatiensis*	EN	Succulent, herb
Rubiaceae	*Pavetta zeyheri*	EN	Dwarf shrub

EN = Endangered

Table 3: MTPA plant list for the Komatipport area.

Family	Scientific Name	Conservation RSA	MTPA	Endemic
Apocynaceae	*Adenium swazicum*	CR	CR	FSA
Rubiaceae	*Pavetta zeyheri subsp. microlancea*	Rare	Rare	
Acanthaceae	*Barleria oxyphylla*	Rare	Rare	FSA
Brassicaceae	*Cleome schlechteri*	DDD	DDD	SA
Apocynaceae	*Orbea paradoxa*	LC	VU	Not
Orchidaceae	*Ansellia africana*	Declining	Declining	Not
Hyacinthaceae	*Drimia intricata*	LC	Muthi	Not
Amaryllidaceae	*Crinum stuhlmannii*	Declining	Declining	Not

CR = Critically Endangered; FSA = LC = Least Concern; SA = South Africa

Table 4: Schedule 11 - PROTECTED PLANTS (SECTION 69 (1) (a))

Common Name	Scientific Name
all species of trees ferns, excluding the bracken fern	All species of the Genus: *Cyathea capensis and Cyathea dregei*
all species of cycards in Republic of South Africa and the seedling of the species of cycards referred to in schedule 12	All species of the family Zamiaceae occurring in the Republic of South Africa and the seedlings of the species of Encephalartos referred to in Schedule 12
all species of yellow wood	*Podocarpus spp.*
all species of arum lilies	*Zantedeschia spp.*
"volstruiskom"	*Schizobasis intricate*
"knolklimop"	*Bowiea volubilis*
All species of red-hot pokers	*Kniphofia spp.*
All species of aloes, excluding: (a) All species not occurring in Mpumalanga and (b) The following species: all species of haworthias all species of agapanthus all species of squill	Aloe spp., excluding: (a) All species not occurring in Mpumalanga (b) The following species: *Haworthia spp.* *Agapanthus spp.* *Scilla spp.*
all species of pineapple flower	*Eucomis spp.*
all species of dracaena	*Dracaena spp.*
all species of paint brush	*Haemanthus spp. and Scadoxis spp.*
Cape poison bulb	*Boophane disticha*
all species of clivia	*Clivia spp.*
all species of brunsvigia	*Brunsvigia spp.*
all species of crinum	*Crinum spp.*
ground lily	*Ammocharis coranica*
all species of fire lily	*Cyrtanthus spp.*
river lily	*Hesperantha coccinea*
all species of watsonia	*Watsonia spp.*

all species of gladioli	*Gladiolus spp.*
wild ginger	*Siphonochilus aethiopicus*
all species of orchids	All species of the family Orchidacaea
all species of the family proteaceae	All species of the family Proteacea
all species of black stinkwood	*Ocotea spp.*
kiaat	*Pterocarpus angolensis*
tamboti	*Spirostachys africana*
the following species of euphorbias: Euphorbia bernardii and Euphorbia grandialata	The following species of euphorbias: *Euphorbia bernardii and Euphorbia grandialata*
common bersama	*Bersama tysoniana*
red ivory	*Berchemia zeyheri*
Pepperbark tree	*Warburgia salutaris*
all species of adenia	*Adenia spp.*
bastard onion wood	*Cassipourea gerrrdii*
assegai tree	*Curtisia dentata*
all species of olive trees	all species of the Genus Olea
all species of impala lilies	all species of the Genus Adenium
kudu lily	*Pachypodium saundersii*
all species of brachystelma	*Brachystelma spp.*
all species of ceropegia	*Ceropegia spp.*
all species of huerniopsis and huernia	*Huernipsis and Huernia spp.*
all species of duvalia	*Duvalia spp.*
all species of stapeliads	*Stapelia spp.*
all species of orbeanthus	*Orbeanthus spp.*
all species of orbeas	*Orbea spp.*
all species of orbeopsis	*Orbeopsis soo.*

Table 5: Schedule 12 - SPECIALLY PROTECTED PLANTS (SECTION 69 (1) (b))

Common Name	Scientific Name
(a) all plants, excluding seedlings, of the following species of cycads: *dolomiticus, dyer, middleburg, eugene marais, heenan, inopinus, laevifolius, lanatus, lebombo, ngoyanus, paucidentatus, modjadje and villosus*	(a) all plants, excluding seedlings, of the following species of the Genus *Encephalartos: E. dolomiticus, E. dyerianus, E. middleburgensis, E. eugene maraissii, E. heenanii, E. inopinus, E. laevifolius, E. lanatus, E. transvenosus and E. villosus and* many species derived from the above species
(b) all plants of the following. species of *cycards: cupidus and humilus*	*(b)* all plants of the following species of the Genus *Encephalartos: E. cupids and E. humilus*
(c) all species of cycadsin their natural habitat	(c) all plants of the Genus *Encephalartos* in their natural habitat

Table 6: List of protected tree species under the National Forest Act (NFA, 2019).

Scientific Name	Common Name
Vachellia erioloba	Camel thorn
Vachellia haematoxylon	Grey Camel Thorn
Adansonia digitata	Baobab
Afzelia quanzensis	Pod mahogany
Balanites subsp. maughamii	Torchwood
Barringtonia racemosa	Powder-puff tree
Boscia albitrunca	Shepherd's tree
Brachystegia spiciformis	Msasa
Breonadia salicina	Matumi
Bruguiera gymnorrhiza	Black mangrove
Cassipourea swaziensis	Swazi onionwood
Catha edulis	Bushman's tea

Scientific Name	Common Name
Ceriops tagal	Indian mangrove
Cleistanthus schlechteri var. schlechteri	False tamboti
Colubrina nicholsonii	Pondo weeping thorn
Combretum imberbe	Leadwood
Curtisia dentata	Assegai
Elaeodendron transvaalensis	Bushveld saffron
Erythrophysa transvaalensis	Bushveld red balloon
Euclea pseudebenus	Ebony guarri
Ficus trichopoda	Swamp fig
Leucadendron argenteum	Silver tree
Lumnitzera racemose var. racemosa	Tonga mangrove
Lydenburgia abbottii	Pondo bushman's tea
Lydenburgia cassinoides	Sekhukhuni bushman's tea
Mimusops caffra	Coastal red milkwood
Newtonia hildebrandtii var. hildebrandtii	Lebombo wattle
Ocotea bullata	Stinkwood
Ozoroa namaquensis	Gariep resin tree
Philenoptera violacea	Apple-leaf
Pittosporum viridiflorum	Cheesewood
Podocarpus elongatus	Breede River yellowwood
Podocarpus falcatus (Afrocarpus falcatus)	Outeniqua yellowwood
Podocarpus henkelii	Henkel's yellowwood
Podocarpus latifolius	Real yellowwood
Protea comptonii	Saddleback sugarbush
Protea curvata	Serpentine sugarbush
Prunus africana	Red stinkwood
Pterocarpus angolensis	Wild teak
Rhizophora mucronata	Red mangrove
Sclerocarya birrea subsp. caffra	Marula
Securidaca longepedunculata	Violet tree
Sideroxylon inerme subsp. inerme	White milkwood
Tephrosia pondoensis	Pondo poison pea
Warburgia salutaris	Pepper-bark tree
Widdringtonia cedarbergensis	Clanwilliam cedar
Widdringtonia schwarzii	Willowmore cedar

Should any floral SCC be encountered within the focus area during any development activities, these species should be marked and avoided. A person may not carry out a restricted activity involving a specimen of a listed threatened or protected species without a permit issued in terms of Chapter 7 of the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) (NEMBA). If it is not possible to avoid all individual species, a permit application to remove or relocate the protected species must be submitted and approval should be granted prior to any activities taking place. Rescue and relocation of tall trees is not considered feasible, and it is therefore recommended that the proposed layout be designed in such a way to avoid all tall protected tree species (>3 m).

3.2.2 Faunal SCC

The tables below indicate the faunal SCC that are expected to occur within the focus area, obtained from the MTPA, the Mpumalanga State of the Environment Report (2003) and

Species listed as protected under the Mpumalanga Nature Conservation Act, 1998 (Act No. 10 of 1998):

Table 7: List of bird species likely to be observed within the Komatipoort region (MTPA).

Common Name	Scientific Name	Conservation RSA	MTPA	Endemic
African Finfoot	*Podica senegalensis*	VU	VU	
Bateleur	*Terathopius ecaudatus*	EN	EN	-
White-backed Vulture	*Gyps africanus*	CR	CR	-

CR = Critically Endangered; EN = Endangered

Table 8: List of mammal species and IUCN Red List Category (Cohen & Camacho, 2002a) as listed in the Mpumalanga State of the Environment Report (2003).

Common Name	Scientific Name	MP 2003 Status
Cape mole rat	*Georychus capensis*	EN
Sclater's golden mole	*Chlorotalpa sclateri montana*	CR
Highveld golden mole	*Amblysomus septentrionalis*	VU
Rough-haired golden mole	*Chrysospalax villosus rufopallidus*	CR
Juliana's golden mole	*Neamblysomus julianae*	EN
Robust golden mole	*Amblysomus robustus*	VU
Meester's golden mole	*Amblysomus hottentotus meesteri*	VU
Laminate vlei rat	*Otomys laminatus*	VU
Peak-saddle horseshoe bat	*Rhinolophus blasii empusa*	EN
Lesser long-fingered bat	*Miniopterus fraterculus*	VU
Welwitsch's hairy bat	*Myotis welwitschii*	EN
Short-eared trident bat	*Cloeotis percivali australis*	EN
Aardvark	*Orycteropus afer*	NE
Oribi	*Ourebia ourebi*	VU
African striped weasel	*Poecilogale albinucha*	LC
Wild dog	*Lycaon pictus*	EN
Pangolin	*Manis temminckii*	VU
Aardwolf	*Proteles cristatus*	NE
African Leopard	Panthera pardus	NE
Natal red rock rabbit	Pronolagus crassicaudatus ruddi	NE

EN= Endangered; CR= Critically Endangered; VU= Vulnerable; NE=Not Evaluated

Table 9: List of bird species and IUCN Red List Category (Cohen & Camacho, 2002b) as listed in the Mpumalanga State of the Environment Report (2003).

Common Name	Scientific Name	Status
White winged Flufftail	*Sarothrura ayresi*	CR
Rudd's Lark	*Heteromirafra ruddi*	CR
Yellow breasted Pipit	*Hemimacronyx chloris*	VU
Bald Ibis	*Geronticus calvus*	VU
Botha's Lark	*Spizocorys fringillaris*	EN
Wattled Crane	*Bugeranus carunculatus*	CR
Blue Crane	*Anthropoides paradiseus*	VU
Grey Crowned Crane	*Balearica reguloru,*	VU
Blue Swallow	*Hirundo atrocaerulea*	CR
Pink throated Twinspot	*Hypargos margaritatus*	NT
Chestnut banded Plover	*Charadrius pallidus*	NT
Striped Flufftail	*Sarothrura affinis*	VU
Southern Ground Hornbill	*Bucorvus leadbeateri*	VU
Black-rumped Buttonquail	*Turnix hottentotta nana*	EN
Blue Korhaan	*Eupodotis caerulescens*	VU
Stanley's Bustard	*Neotis denhami*	VU
African Marsh Harrier	*Circus ranivorus*	VU
Grass Owl	*Tyto capensis*	VU
Lesser Flamingo	*Phoeniconaias minor*	NT

Greater Flamingo	*Phoeniconaias roseus*	NT
White bellied Korhaan	*Eupodotis senegalensis*	VU
Saddle billed Stork	*Ephippiorhynchus senegalensis*	CR
Lappet faced Vulture	*Torgos tracheliotos*	EN
White headed Vulture	*Trigonoceps occipitalis*	EN
Bateleur	*Terathopius ecaudatus*	VU
Cape Vulture	*Gyps coprotheres*	VU
Martial Eagle	*Polemaetus bellicosus*	VU
Peregrine Falcon	*Falco peregrinus minor*	VU
Taita Falcon	*Falco fasciinucha*	NT

EN= Endangered; CR= Critically Endangered; VU= Vulnerable; NT= Near Threatened

Table 10: List of reptile species and their IUCN Red List Category (Williamson & Theron, 2002) as listed in the Mpumalanga State of the Environment Report (2003).

Common Name	Scientific Name	Status
Haacke's flat gecko	*Afroedura haackei*	EN
Abel Erasmus Pass flat gecko	*Afroedura sp.*	EN
Mariepskop flat gecko	*Afroedura sp.*	EN
Rondavels flat gecko	*Afroedura sp.*	EN
Forest/Natal purple-glossed snake	*Amblyodipsas concolor*	VU
Lowveld shieldnosed snake	*Aspidelaps scutatus intermedius*	VU
Dwarf chameleon	*Bradypodion transvaalense*	VU
Sungazer/ Giant girdled lizard	*Cordylus giganteus*	VU
Barberton girdled lizard	*Cordylus warreni barbertonensis*	VU
Lebombo girdled lizard	*Cordylus warreni*	VU
Swazi rock snake	*Lamprophis swazicus*	VU
Transvaal flat lizard	*Platysaurus orientalis*	NT
Wilhelm's flat lizard	*Platysaurus wilhelmi*	VU
Montane burrowing skink	*Scelotes mirus*	LC
Breyer's longtailed seps	*Tetradactylus breyeri*	VU
Copper Grass Lizard	*Chamaesaura aenea*	NT

EN= Endangered; VU= Vulnerable; NT= Near Threatened; LC= Least Concern

Table 11: List of amphibian species and their IUCN Red List Category (Williamson & Theron, 2002) as listed in the Mpumalanga State of the Environment Report (2003).

Common Name	Scientific Name	Status
Karoo Toad	*Bufo gariepensis nubicolus*	VU
Natal Ghost Frog	*Heleophryne natalensis*	VU
Spotted Shovel-Nosed Frog	*Hemisus guttatus*	VU
Yellow Striped Reed Frog	*Hyperolius semidiscus*	VU
Plain Stream Frog	*Strongylopus wageri*	VU
Giant Bullfrog	*Pyxicephalus adspersus*	VU
Greater Leaf-Folding Frog	*Afrixalus fornasini*	VU
Whistling Rain Frog	*Breviceps sopranus*	VU

VU= Vulnerable

Table 12: List of invertebrate species and their IUCN Red List Category (De Wet, 2002) as listed in the Mpumalanga State of the Environment Report (2003).

Common Name	Scientific Name	Status
Rossouw's Copper	*Aloeides rossouwi*	EN
Barbara's Copper	*Aloeides barbarae*	EN
Swanepoel's Blue	*Lepidochrysops swanepoeli*	EN
Jeffery's Blue	*Lepidochrysops jefferyi*	EN
Stoffberg Widow	*Dingana fraterna*	EN
Marsh Sylph*	*Metisella meninx*	VU
Cloud Copper	*Aloeides nubilus*	VU
Catshead Sprite - Coenagrionidae	*Pseudagrion coeleste*	CR
Balinsky's Sprite - Coenagrionidae	*Pseudagrion inopinatum*	VU

Newton's Sprite - Coenagrionidae	*Pseudagrion newtoni*	VU
Sjostedt's Sprite - Coenagrionidae	*Pseudagrion sjoestedti pseudojoestedti*	CR
Elliot's Hawker-Aeshnidae	*Aeshna ellioti usambarica*	VU
Unicorn Cruiser - Corduliidae	*Phyllomacromia monoceros*	CR

EN= Endangered; CR= Critically Endangered; VU= Vulnerable; P = Protected

Table 13: Avifaunal Species for the pentad 2525_3130, and 2530_3130 within the QDS 2531BC & 2531DA.

PENTADS	LINK TO PENTAD SUMMARY ON THE SOUTH AFRICAN BIRD ATLAS PROJECT 2 WEB PAGE
2525_3130	http://sabap2.adu.org.za/coverage/pentad/2525_3130
2530_3130	http://sabap2.adu.org.za/coverage/pentad/2530_3130

Table 14: Schedule 1 - SPECIALLY PROTECTED GAME (SECTION 4 (1) (a)) (MNCA)

Common name	Scientific name
Elephant	*Loxodonta africana*
All species of rhinoceros	all species of the Family Rhinocerotidae

Table 15: Schedule 2 - PROTECTED GAME (SECTION 4 (1) (b)) (MNCA)

Common name	Scientific name
AMPHIBIANS, REPTILES AND MAMMALS	
Bullfrog	Pyxicephalus adspersus
All species of reptiles excluding the water leguan, rock leguan and all species of snakes	All species of the Class Reptilia excluding *Varanus niloticus*, *Varanus exanthematicus* and all species of the Sub Order Serpentes
Riverine Rabbit	*Bungolagus monticularis*
Hedgehog	*Atelerix frontalis*
Samango Monkey	*Cercophithecus mitis*
Bushbaby	*Otolemur crassicaudatus*
Lesser Bushbaby	*Galago moholi*
Honey-Badger	*Mellivora capensis*
Pangolin	*Manis temminckii*
Aardwolf	*Proteles cristatus*
Cape Hunting Dog	*Lycaon pictus*
Brown Hyaena	*Hyaena brunnea*
Antbear	*Orycteropus afer*
Mountain Zebra	*Equus zebra*
Hartmann's Zebra	*Equus zebra hartmannae*
Hippopotamus	*Hippopotamus amphibius*
Giraffe	*Giraffa camelopardalis*
Nyala	*Tragelaphus angasi*
Red Duiker	*Cephalophus natalensis*
Blue Duiker	*Philantomba monticola*
Reedbuck	*Redunca arundinum*
Mountain Reedbuck	*Redunca fulvorufula*
Sable Antelope	*Hippotragus niger*
Roan Antelope	*Hippotragus equinus*
Black Wildebeest	*Connochaetes gnou*
Tsessebe	*Damaliscus lunatus*
Lichtenstein's Hartebeest	*Alcelaphus lichtensteinii*
Klipspringer	*Oreotragus oreotragus*
Oribi	*Ourebia ourebi*
Steenbok	*Raphicerus campestris*
Sharpe's Grysbok	*Raphicerus sharper*
Suni	*Neotragus moschatus*
Grey Rhebok	*Pelea capreolus*

Common name	Scientific name
Eland	*Taurotragus oryx*
Waterbuck	*Kobus ellipsiprymnus*
Cape Clawless Otter	*Aonyx capensis*
Spotted Necked Otter	*Lutra maculicollis*
BIRDS	
Any bird which is a wild animal, excluding a bird referred to in Schedule 3, and the -	
White Breasted Cormorant	*Phalacrocorax lucidus*
Reed Cormorant	*Phalacrocorax africanus*
Red-Eyed Turtle Dove	*Streptopelia semitorquata*
Cape Turtle Dove	*Streptopelia capicola*
Laughing Dove	*Streptopelia senegalensis*
all species of mousebirds	all species of the Family Colidae
Pied Crow	*Corvus albus*
Black Crow	*Corvus capensis*
Red-Eyed Bulbul	*Pycnonotus nigricans*
Black-Eyed Bulbul	*Pycnonotus barbatus*
Red-Winged Starling	*Onychognathus morio*
Cape Sparrow	*Passer melanurus*
Spotted-Backed Weaver	*Ploceus cucullatus*
Cape Weaver	*Ploceus capensis*
Masked Weaver	*Ploceus velatus*
Red-Billed Quelea	*Quelea quelea*
Red Bishop	*Euplectes orix*

Table 16: Schedule 4 - PROTECTED WILD ANIMALS (SECTION 4 (1) (d)) (MNCA)

Common name	Scientific name
Spotted hyaena	*Crocuta crocuta*
Cheetah	*Acinonyx jubatus*
Leopard	*Panthera pardus*
Lion	*Panthera Leo*
African buffalo	*Syncerus caffer*

Table 17: Schedule 5 - WILD ANIMALS TO WHICH THE PROVISIONS OF SECTION 33 APPLY (MNCA)

Common name	Scientific name
Water Monitor Lizard	*Varanus niloticus*
White throated rock monitor lizard	*Varanus exanthematicus*
All species of snakes	all species of the Sub Order Serpentes
Any bird which is a wild animal but which is not game, excluding the ostrich	*Struthio camelus*
Chacma Baboon	*Papio ursinus*
Vervet Monkey	*Cercophitecus mitis*
All Dassies	Family: Procaviidae
All Mongooses	Family: Viverridae
Tree Squirrel	*Paraxerus cepapi*
Warthog	*Phacochoerus aethiopicus*
Serval	*Felis serval*
Civet	*Civettictis civetta*
Cape Fox	*Vulpes chama*
Side Striped Jackal	*Canis adustus*
All Genets	*Genetia* spp.
Springhare	*Pedetes capensis*
African Wild Cat	*Felis lybica*

Table 18: Schedule 7 - INVERTEBRATES (SECTION 35 (1)) (MNCA)

Common name	Scientific name
All species of baboon spiders belonging to the genera referred to hereby	*Ceratogyrus* spp., *Harpactira* spp. and *Pterinochilus* spp.

Numerous faunal SCC are expected to occur within the Mpumalanga Province. Based on digital signatures it is evident that a watercourse is present within the focus area. This watercourse could be identified as sensitive and of increased importance providing more foraging and breeding opportunity for faunal species common and SCC. A site visit will have to be undertaken to determine whether any faunal SCC will occur within the focus area, especially within the watercourse habitat, or within close proximity to the focus area. Should any development activities take place care should be taken to avoid collision with these species (SSC listed as threatened by the IUCN and Mpumalanga Nature Conservation Act are of particular concern). Hunting and trapping of faunal species (common and SCC) are prohibited and if any faunal species are encountered within the focus area it should be rescued and relocated to similar suitable habitat within the vicinity of the focus area. With the Kruger National Park located within 2 km of the focus area the likelihood of avifaunal SCC migrating between the KNP and surrounding areas, including the focus area, or utilising the surrounding areas for foraging is high. This will however have to be confirmed with a site visit from a suitably qualified specialist.

4 IMPACT ASSESSMENT

The tables below serve to summarise the significance of potential impacts on terrestrial habitat that may result due to proposed development activities from a desktop basis. In addition, it also indicates the required mitigatory and management measures required to minimise potential ecological impacts and presents an assessment of the significance of the impacts taking into consideration the available mitigatory measures, assuming that they are fully implemented.

The following essential mitigation measures are considered to be standard best practice measures applicable to activities of this nature, in conjunction with those stipulated in the individual tables in the following sections, which define the mitigatory measures specific to the minimisation of impacts on natural resources within the focus area.

Project footprint

- It is highly recommended that any development activities near natural undisturbed areas, if present within the focus area, or within the watercourse located within the focus area, should be avoided or minimised as far as possible as they are potentially regarded to be of ecological importance. Edge effects from any activities occurring in areas surrounding these habitat units must be effectively mitigated in order to prevent impacts on the areas;

- It is recommended that no development occurs within the watercourse or its regulated zone, should this not be feasible, a water use licence application process can be applied for to allow development within the regulated zone. A watercourse assessment will need to be conducted to determine the extent of the watercourse, thereafter determining the potential development constraints and required authorisations;
- All footprint areas should remain as small as possible and should not encroach onto surrounding areas beyond the necessary areas. It must be ensured that watercourses, if any, beyond the approved development footprint are off-limits to vehicles and personnel;
- The boundaries of footprint areas are to be clearly defined and it should be ensured that all activities remain within defined footprint areas. Edge effects will need to be extremely carefully controlled if the project is to proceed;
- Planning of temporary roads and access routes should avoid natural areas and be restricted to existing gravel roads where possible;
- Appropriate sanitary facilities must be provided for the life of the proposed construction activities and all waste removed to an appropriate waste facility; and
- No fires should be permitted in or near the focus area.

Alien floral species

- Alien and invasive vegetation control should take place throughout the duration of the development activities;
- Proliferation of alien and invasive species is expected within any disturbed area. These species should be eradicated and controlled to prevent their spread beyond the footprint. Alien plant seed dispersal within the top layers of the soil within footprint areas, that will have an impact on future rehabilitation, has to be controlled; and
- Removal of the alien and weed species encountered within the footprint area must take place in order to comply with existing legislation (amendments to the regulations under the Conservation of Agricultural Resources Act, 1983 and Section 28 of the National Environmental Management Act, 1998).

SCC and Protected floral and faunal species

- Prohibit the collection of plant material for firewood or medicinal uses;
- Should any SCC or other protected floral and faunal species be encountered within the focus area, the following should be ensured:
  - If any threatened species will be disturbed, ensure effective relocation of individuals to suitable offset areas;

- Permit applications should be obtained from the relevant authorities where applicable; and
- A suitably qualified specialist should oversee all rescue and relocation plans;

➢ No trapping or hunting of fauna is to take place.

Vehicle maintenance

➢ All vehicles must be regularly inspected for leaks. Re-fuelling must take place on a sealed surface area to prevent ingress of hydrocarbons into topsoil;

➢ In the event of a vehicle breakdown, maintenance of vehicles must take place with care and the recollection of spillage should be practiced near the surface area to prevent ingress of hydrocarbons into topsoil and subsequent habitat loss; and

➢ All spills should be immediately cleaned up and treated accordingly.

Watercourses

➢ If any activity is to take place within the proximity of the watercourse and associated regulated zone, the extent of encroachment will need to be extremely well controlled and limited. Appropriate mitigation and well managed systems will need to be implemented to prevent potential impact on water quality and quantity within and adjacent to the watercourse areas. Overall however, activities within watercourses should be avoided as far as possible; and

➢ Should any activities be proposed within the watercourses and associated regulated zones, including rehabilitation, this must be authorised by the Department of Water and Sanitation (DWS) in terms of Section 21 (c) & (i) of the National Water Act (Act 36 of 1998).

Soils

➢ Sheet runoff from access roads should be slowed down by the strategic placement of berms;

➢ Should any active erosion be observed, measures to rehabilitate such areas should be implemented; and

Rehabilitation

➢ Rehabilitate all disturbed areas that may be impacted by the proposed development activities to ensure that the ecology and functionality of these areas are re-instated. Rehabilitation should also ensure the prevention of any potential latent impacts on the area;

➢ As much vegetation growth as possible should be retained around the focus area in order to protect soils; and

All alien vegetation in the vicinity of the focus area should be removed regularly throughout the life of the activities and reseeded with a climate appropriate veld reclamation mix.

4.1 Impact 1: Impact on Floral Species of Conservation Concern

For the purpose of this study, the key activities associated with development activities that may affect the ecology of the area include:

- The utilisation of temporary tracks to the footprint areas;
- Vegetation clearing for the site establishment;
- Alien species proliferation due to edge effects caused by vegetation clearing for access roads and site establishment;
- Site levelling;
- Trenching for the establishment of the gas pipeline, should the proposed gas pipeline be underground; and
- Digging for the pylons of the powerlines.

Management	Probability of Impact	Sensitivity of receiving environment	Severity	Spatial scale	Duration of impact	Likelihood	Consequence	Significance
Unmanaged	4	4	3	2	3	8	8	64 (Medium-low)

Essential mitigation measures:

- A walkdown/active search for Floral SCC must be conducted within the focus area prior to any activities taking place.
- Floral SCC encountered within the footprint, are to be either protected *in situ* or relocated as appropriate. This specifically relates to species which can potentially be successfully rescued and relocated, provided that permit application for the disturbance of these protected species is approved;
- Keep the proposed development footprint as small as possible;
- As far as possible development within sensitive habitat units must be avoided;
- All disturbed areas must be concurrently rehabilitated during construction of access roads and vegetation clearing for temporary contractors laydown areas;
- The existing integrity of flora surrounding the focus area should be upheld and no activities should occur outside the footprint area; and
- Edge effect control needs to be implemented to avoid further habitat degradation outside of the proposed footprint area.

Recommended mitigation measures:

- All sensitive areas are to be demarcated and access into these areas should minimised as far as possible.

Management	Probability of Impact	Sensitivity of receiving environment	Severity	Spatial scale	Duration of impact	Likelihood	Consequence	Significance
Managed	3	4	2	2	2	7	6	42 (Low)

Probable latent impacts:

- If inadequately controlled activities takes place within any sensitive habitat units permanent loss of floral SCC will potentially occur; and
- Permanent loss of SCC habitat and SCC individuals.

4.2 Impact 2: Impact on Faunal Species of Conservation Concern

For the purpose of this study, the key activities associated with the proposed development activities that may affect the ecology of the focus area include:

- The utilisation of temporary tracks to the footprint areas;
- Vegetation clearing for the site establishment;
- Alien species proliferation due to edge effects caused by vegetation clearing for access roads and site establishment;
- Site levelling;
- Trenching for the establishment of the gas pipeline, should the proposed gas pipeline be underground; and
- Digging for the pylons of the powerlines.

Management	Probability of Impact	Sensitivity of receiving environment	Severity	Spatial scale	Duration of impact	Likelihood	Consequence	Significance
Unmanaged	4	4	3	2	3	8	8	64 (Low)

Essential mitigation measures:

- The proposed development footprint areas should remain as small as possible and where possible be confined to already disturbed areas;
- As far as possible development within sensitive habitat units must be avoided;
- 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;
- All disturbed areas must be concurrently rehabilitated;
- All informal fires in the vicinity of the development footprint should be prohibited; and
- No trapping or hunting of fauna is to take place.

Recommended mitigation measures:

- It is recommended that a speed limit of 40km/h be implemented on all roads running through the focus area in order to minimise risk to SCC and other fauna from vehicles.

Management	Probability of Impact	Sensitivity of receiving environment	Severity	Spatial scale	Duration of impact	Likelihood	Consequence	Significance
Managed	3	4	2	2	2	7	6	42 (Low)

Probable latent impacts

- If development takes place within the sensitive Habitat Units permanent loss of faunal SCC carrying capacity will potentially occur.

4.3 Impact Assessment Conclusion

Based on the above impact assessment it is evident that there are two possible key impacts associated with the proposed development activity from a biodiversity and freshwater resource management point of view. The tables below summarise the findings, indicating the significance of the impacts before management takes place and the likely impact if management and mitigation takes place. From the tables it is evident that the development activities will have Medium-low impacts on the faunal and floral ecology prior to mitigation. With mitigation measures fully implemented and managed, the impacts can be reduced to Low.

Table 19: A summary of the results obtained from the assessment of watercourse, floral and faunal ecological impacts arising from development activities.

Impact	Unmanaged	Managed
1: Impact of floral species of conservational concern	Medium-low	Low
2: Impact of faunal species of conservational concern	Medium-low	Low

5 CONCLUSION

Scientific Terrestrial Services (STS) was appointed to conduct a desktop terrestrial biodiversity assessment as part of the environmental assessment and authorisation process for the proposed development of a Busbar extension, power station, associated powerline and a gas pipeline, in Komatipoort, Mpumalanga Province (hereafter collectively referred to as “focus area”).

Based on the preliminary desktop assessment, the focus area falls within an ecosystem of least concern, namely the Thsokwane-Hlane Basalt Lowveld. The focus area is not located within a protected area, however, it is situated approximately 2 km south of the Kruger National Park. According to the Mpumalanga Biodiversity Sector Plan (MBSP, 2014) the north eastern portion of the focus area is located within an ESA local corridor, and a small portion of the power station and the majority of the proposed gas pipeline is located within an irreplaceable CBA. The remaining portions of the focus area is located within areas classified as either “heavily modified” or “other natural areas”.

According to the National web based environmental screening tool (2020), the southern and a portion in the north east of the focus area has a very high terrestrial sensitivity. The focus area is considered to have a medium sensitivity for plant species due to the potential presence of the *Pavetta zeyheri subsp. microlancea*. For the Animal Species theme, the majority of the focus area is considered to have a medium sensitivity due to the potential presence of sensitive species such as Aves – *Circus ranivorus* (African marsh harrier) and *Sagittarius serpentarius* (Secretarybird). Scattered portions throughout the focus area is considered to be of high animal sensitivity due to sensitive species such as Aves – *Ephippiorhynchus senegale* (saddle-billed stork). A field assessment will have to be undertaken to verify the current sensitivity of the habitat as well as the presence of the floral and faunal species within the focus area.

Following the desktop analysis of the biodiversity associated with the focus area, it is determined that a full biodiversity assessment will need to be undertaken to determine the sensitivity and the potential impacts to the focus area should the proposed development receive Environmental Authorisation.

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APPENDIX A: Indemnity and Terms of Use of this Report

The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information. The report is based on survey and assessment techniques which are limited by seasonality, time and budgetary constraints relevant to the type and level of investigation undertaken as well as the project program and STS CC and its staff, at their sole discretion, reserve the right to modify aspects of the report including the recommendations if and when new information may become available from ongoing research or further work in this field or pertaining to this investigation.

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APPENDIX B: Legislative Requirements

The Constitution of the Republic of South Africa, 1996

The environment and the health and well-being of people are safeguarded under the Constitution of the Republic of South Africa, 1996 by way of Section 24. Section 24(a) guarantees a right to an environment that is not harmful to human health or well-being and to environmental protection for the benefit of present and future generations. Section 24(b) directs the state to take reasonable legislative and other measures to prevent pollution, promote conservation, and secure the ecologically sustainable development and use of natural resources (including water and mineral resources) while promoting justifiable economic and social development. Section 27 guarantees every person the right of access to sufficient water, and the state is obliged to take reasonable legislative and other measures within its available resources to achieve the progressive realisation of this right. Section 27 is defined as a socio-economic right and not an environmental right. However, read with Section 24 it requires of the state to ensure that water is conserved and protected and that sufficient access to the resource is provided. Water regulation in South Africa places a great emphasis on protecting the resource and on providing access to water for everyone.

The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)

The National Environmental Management Act, 1998 (Act No.107 of 1998) (NEMA) and the associated Environmental Impact Assessment (EIA) Regulations (GN R326 as amended in 2017 and well as listing notices 1, 2 and 3 (GN R327, R325 and R324 of 2017), state that prior to any development taking place which triggers any activity as listed within the abovementioned regulations, an environmental authorisation process needs to be followed and environmental authorisation obtained. This could follow either the Basic Assessment process or the Environmental Impact Assessment process depending on the nature of the activity and scale of the anticipated impacts

The National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA)

The objectives of this act are (within the framework of NEMA) to provide for:

- The management and conservation of biological diversity within the Republic of South Africa and of the components of such diversity;
- The use of indigenous biological resources in a sustainable manner;
- The fair and equitable sharing among stakeholders of the benefits arising from bio prospecting involving indigenous biological resources;
- To give effect to ratify international agreements relating to biodiversity which are binding to the Republic;
- To provide for cooperative governance in biodiversity management and conservation; and
- To provide for a South African National Biodiversity Institute to assist in achieving the objectives of this Act.

This act alludes to the fact that management of biodiversity must take place to ensure that the biodiversity of the surrounding areas are not negatively impacted upon, by any activity being undertaken, in order to ensure the fair and equitable sharing among stakeholders of the benefits arising from indigenous biological resources.

Furthermore, a person may not carry out a restricted activity involving either:

a) A specimen of a listed threatened or protected species;
b) Specimens of an alien species; or
c) A specimen of a listed invasive species without a permit.

Government Notice 598 Alien and Invasive Species Regulations (2014), including the Government Notice No. 1003 Alien Invasive Species List as published in the Government Gazette 43726 of 2020, as it relates to the NEMBA

NEMBA is administered by the Department of Environmental Affairs and aims to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA. This act in terms of alien and invasive species aims to:

- Prevent the unauthorised introduction and spread of alien and invasive species to ecosystems and habitats where they do not naturally occur;
- Manage and control alien and invasive species, to prevent or minimize harm to the environment and biodiversity; and
- Eradicate alien species and invasive species from ecosystems and habitats where they may harm such ecosystems or habitats.

Alien species are defined, in terms of the NEMBA as:

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

Categories according to NEMBA (Alien and Invasive Species Regulations, 2014):

- **Category 1a:** Invasive species that require compulsory control;
- **Category 1b:** Invasive species that require control by means of an invasive species management programme;
- **Category 2:** Commercially used plants that may be grown in demarcated areas, provided that there is a permit and that steps are taken to prevent their spread; and
- **Category 3:** Ornamentally used plants that may no longer be planted.

The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (CARA)

Removal of the alien and weed species encountered in the application area must take place in order to comply with existing legislation (amendments to the regulations under the CARA, 1983 and Section 28 of the NEMA, 1998). Removal of AIP and weed species should take place throughout the construction and operation, phases in line with an approved AIP Management Plan.

The Mpumalanga Nature Conservation Act, 1998 (Act No. 10 of 1998) (MNCA)

The Mpumalanga Nature Conservation Act (MNCA; Act 10 of 1998) provides for the protection of indigenous plants. Subject to the provisions of this Act, no person shall:

- Pick, be in possession of, sell, purchase, donate, receive as a gift, import into, export or remove from the Province, or convey:
  - A specially protected plant; or
  - A protected plant.
- Pick any indigenous plant:
  - On a public road;
  - On land next to a public road within 100m measured from the centre of the road;
  - Within an area bordering any natural watercourse, whether wet or dry, up to and within a distance of 50m from the high watermark on either side of the natural watercourse; or
  - In a Provincial Park, a site of Ecological Importance or a Protected Natural Environment.

The below schedules were applicable for the floral and faunal assessments (Part B and C):

- Schedule 1: Specifically Protected Game (Section 4 (1) (a));
- Schedule 2: Protected Game (Section 4 (1) (b));
- Schedule 4: Protected Wild Animals (Section 4 (1) (d));
- Schedule 7: Invertebrates (Section 35 (1));
- Schedule 11: Protected Plants (Section 69 (1) (a)); and
- Schedule 12: Specifically Protected Plants (Section 69 (1) (b)).

APPENDIX C: Ecological Impact Assessment Methodology

In order for the EAP to allow for sufficient consideration of all environmental impacts, impacts were assessed using a common, defensible method of assessing significance that will enable comparisons to be made between risks/impacts and will enable authorities, stakeholders and the client to understand the process and rationale upon which risks/impacts have been assessed. The method to be used for assessing risks/impacts is outlined in the sections below.

The first stage of risk/impact assessment is the identification of environmental activities, aspects and impacts. This is supported by the identification of receptors and resources, which allows for an understanding of the impact pathway and an assessment of the sensitivity to change. The definitions used in the impact assessment are presented below.

- An **activity** is a distinct process or task undertaken by an organisation for which a responsibility can be assigned. Activities also include facilities or infrastructure that are possessed by an organisation.
- An **environmental aspect** is an 'element of an organizations activities, products and services which can interact with the environment'[5]. The interaction of an aspect with the environment may result in an impact.
- **Environmental risks/impacts** are the consequences of these aspects on environmental resources or receptors of particular value or sensitivity, for example, disturbance due to noise and health effects due to poorer air quality. In the case where the impact is on human health or well-being, this should be stated. Similarly, where the receptor is not anthropogenic, then it should, where possible, be stipulated what the receptor is.
- **Receptors** can comprise, but are not limited to, people or human-made systems, such as local residents, communities and social infrastructure, as well as components of the biophysical environment such as wetlands, flora and riverine systems.
- **Resources** include components of the biophysical environment.
- **Frequency of activity** refers to how often the proposed activity will take place.
- **Frequency of impact** refers to the frequency with which a stressor (aspect) will impact on the receptor.
- **Severity** refers to the degree of change to the receptor status in terms of the reversibility of the impact; sensitivity of receptor to stressor; duration of impact (increasing or decreasing with time); controversy potential and precedent setting; threat to environmental and health standards.
- **Spatial extent** refers to the geographical scale of the impact.
- **Duration** refers to the length of time over which the stressor will cause a change in the resource or receptor.

The significance of the impact is then assessed by rating each variable numerically according to the defined criteria. Refer to the table below. The purpose of the rating is to develop a clear understanding of influences and processes associated with each impact. The severity, spatial scope and duration of the impact together comprise the consequence of the impact and when summed can obtain a maximum value of 15. The frequency of the activity and the frequency of the impact together comprise the likelihood of the impact occurring and can obtain a maximum value of 10. The values for likelihood and consequence of the impact are then read off a significance rating matrix and are used to determine whether mitigation is necessary[6].

The assessment of significance is undertaken twice. Initial, significance is based on only natural and existing mitigation measures (including built-in engineering designs). The subsequent assessment takes into account the recommended management measures required to mitigate the impacts. Measures such as demolishing infrastructure, and reinstatement and rehabilitation of land, are considered post-mitigation.

The model outcome of the impacts was then assessed in terms of impact certainty and consideration of available information. The Precautionary Principle is applied in line with South Africa's National Environmental Management Act (No. 108 of 1997) in instances of uncertainty or lack of information, by

[5] The definition has been aligned with that used in the ISO 14001 Standard.

[6] Some risks/impacts that have low significance will however still require mitigation

increasing assigned ratings or adjusting final model outcomes. In certain instances where a variable or outcome requires rational adjustment due to model limitations, the model outcomes have been adjusted.

Table C1: Criteria for assessing significance of impacts.

LIKELIHOOD DESCRIPTORS

Probability of impact	RATING
Highly unlikely	1
Possible	2
Likely	3
Highly likely	4
Definite	5
Sensitivity of receiving environment	**RATING**
Ecology not sensitive/important	1
Ecology with limited sensitivity/importance	2
Ecology moderately sensitive/ /important	3
Ecology highly sensitive /important	4
Ecology critically sensitive /important	5

CONSEQUENCE DESCRIPTORS

Severity of impact	RATING
Insignificant / ecosystem structure and function unchanged	1
Small / ecosystem structure and function largely unchanged	2
Significant / ecosystem structure and function moderately altered	3
Great / harmful / ecosystem structure and function largely altered	4
Disastrous / ecosystem structure and function seriously to critically altered	5
Spatial scope of impact	**RATING**
Activity specific / < 5 ha impacted / Linear features affected < 100m	1
Development specific / within the site boundary / < 100ha impacted / Linear features affected < 1000m	2
Local area / within 1 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	3
Regional within 5 km of the site boundary / < 5000ha impacted / Linear features affected < 10 000m	4
Entire habitat unit / Entire system / > 5000ha impacted / Linear features affected > 10 000m	5
Duration of impact	**RATING**
One day to one month	1
One month to one year	2
One year to five years	3
Life of operation or less than 20 years	4
Permanent	5

Table C2: Significance rating matrix.

	CONSEQUENCE (Severity + Spatial Scope + Duration)														
LIKELIHOOD (Frequency of activity + Frequency of impact)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150

Table C3: Positive/Negative Mitigation Ratings.

Significance Rating	Value	Negative Impact management recommendation	Positive Impact management recommendation
Very High	126 - 150	Consider the viability of the project. Very strict measures to be implemented to mitigate impacts according to the impact mitigation hierarchy	Actively promote the project
High	101 - 125	Consider alternatives in terms of project execution and location. Ensure designs take environmental sensitivities into account and Ensure management and housekeeping is maintained and attention to impact minimisation is paid according to the impact mitigation hierarchy	Promote the project and monitor ecological performance
Medium High	76 – 100	Consider alternatives in terms of project execution and Ensure management and housekeeping is maintained and attention to impact minimisation is paid according to the impact mitigation hierarchy	Implement measures to enhance the ecologically positive aspects of the project while managing any negative impacts
Medium Low	51 - 75	Ensure management and housekeeping is maintained and attention to impact minimisation is paid	Implement measures to enhance the ecologically positive aspects of the project while actively managing any negative impacts
Low	26 - 50	Promote the project and ensure management and housekeeping is maintained	Monitor ecological performance and pay extensive attention to minimising potential negative environmental impacts
Low Very	1 - 25	Promote the project	Actively seek measures to implement impact minimisation according to the impact mitigation hierarchy and identify positive ecological aspects to be promoted

The following points were considered when undertaking the assessment:

- Risks and impacts were analysed in the context of the *project's area of influence* encompassing:
  - Primary project site and related facilities that the client and its contractors develop or controls;
  - Areas potentially impacted by cumulative impacts for further planned development of the project, any existing project or condition and other project-related developments; and

  - Areas potentially affected by impacts from unplanned but predictable developments caused by the project that may occur later or at a different location.
- Risks/Impacts were assessed for all stages of the project cycle including:
  - Infill activities
  - Rehabilitation
- If applicable, transboundary or global effects were assessed;
- Individuals or groups who may be differentially or disproportionately affected by the project because of their *disadvantaged* or *vulnerable* status were assessed.
- Particular attention was paid to describing any residual impacts that will occur after rehabilitation.

APPENDIX D: Vegetation Type

Tshokwane-Hlane Basalt Lowveld (SVI5)

Figure D1: SVI 5 Tshokwane-Hlane Basalt Lowveld: Deciduous closed woodland occurring on clay flats with *Acacia gerrardii, A. tortilis, Combretum hereroense* and *C. imberbe* looking over the Nwanetsi River, Kruger National Park (Mucina & Rutherford, 2006, Figure 9.48)

Table D1: Dominant & typical floristic species of the Granite Lowveld (Mucina & Rutherford, 2012)

Group	Species
WOODY SPECIES	
Tall trees	*Acacia nigrescens (d), Sclerocarya birrea subsp. caffra (d), Philenoptera violacea*
Small trees	*Acacia borleae, A. gerrardii, A. nilotica, A. tortilis subsp. heteracantha, Albizia harveyi, Combretum hereroense, C. imberbe, Lannea schweinfurthii var. stuhlmannii, Peltophorum africanum, Pterocarpus rotundifolius*
Tall shrubs	*Dichrostachys cinerea, Grewia bicolor, Gymnosporia maranguensis, Rhus gueinzii.*
Low shrubs	*Acalypha segetalis, Dicoma tomentosa, Hermannia glanduligera, Justicia flava, J. protracta subsp. protracta, Seddera suffruticosa, Tragia dioica, Boscia foetida subsp. minima* (endemic)
HERBACEOUS SPECIES	
Herbaceous climber	*Commicarpus plumbagineus*
Herb	*Chamaecrista mimosoides, Gisekia africana, Thunbergia dregeana*
Succulent herbs	*Aloe zebrina, Orbea paradoxa, O. rogersii.*
GRAMINOID SPECIES	
Graminoids	*Bothriochloa radicans (d), Digitaria eriantha subsp. eriantha (d), Panicum coloratum (d), P. maximum (d), Themeda triandra (d), Urochloa mosambicensis (d), Aristida congesta, Cenchrus ciliaris, Eragrostis superba, Heteropogon contortus.*

***(d) – Dominant species for the vegetation type**

APPENDIX E: Details, Expertise And Curriculum Vitae of Specialists

1. (a) (i) Details of the specialist who prepared the report

Sanja Erwee	BSc Zoology (University of Pretoria)
Nelanie Cloete	MSc Botany and Environmental Management (University of Johannesburg)

1. (A). (ii) The expertise of that specialist to compile a specialist report including a curriculum vitae

Company of Specialist:	Scientific Terrestrial Services		
Name / Contact person:	Nelanie Cloete		
Postal address:	PO. Box 751779, Gardenview		
Postal code:	2047	Cell:	084 311 4878
Telephone:	011 616 7893	Fax:	086 724 3132
E-mail:	Nelanie@sasenvgroup.co.za		
Qualifications	MSc Environmental Management (University of Johannesburg) MSc Botany (University of Johannesburg) BSc (Hons) Botany (University of Johannesburg) BSc (Botany and Zoology) (Rand Afrikaans University)		
Registration / Associations	Professional member of the South African Council for Natural Scientific Professions (SACNASP) Member of the South African Association of Botanists (SAAB) Member of the International Affiliation for Impact Assessments (IAIAsa) South Africa group Member of the Grassland Society of South Africa (GSSA)		

1. (b) a declaration that the specialist is independent in a form as may be specified by the competent authority

I, Sanja Erwee, declare that -

- I act as the **independent specialist** in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct

Signature of the Specialist

I, Nelanie Cloete (reviewer), declare that -

- I act as the **independent specialist (reviewer)** in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct

Signature of the Specialist

SAS ENVIRONMENTAL GROUP OF COMPANIES – SPECIALIST CONSULTANT INFORMATION

CURRICULUM VITAE OF NELANIE CLOETE

PERSONAL DETAILS

Position in Company	Senior Scientist, Member Botanical Science and Terrestrial Ecology
Joined SAS Environmental Group of Companies	2011

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Professional member of the South African Council for Natural Scientific Professions (SACNASP – Reg No. 400503/14)
Member of the South African Association of Botanists (SAAB)
Member of the International Affiliation for Impact Assessments (IAIAsa) South Africa group
Member of the Grassland Society of South Africa (GSSA)
Member of the Botanical Society of South Africa (BotSoc)
Member of the Gauteng Wetland Forum (GWF)

EDUCATION

Qualifications

MSc Environmental Management (University of Johannesburg)	2013
MSc Botany (University of Johannesburg)	2007
BSc (Hons) Botany (University of Johannesburg)	2005
BSc (Botany and Zoology) (Rand Afrikaans University)	2004

Short Courses

Certificate – Department of Environmental Science in Legal context of Environmental Management, Compliance and Enforcement (UNISA)	2009
Introduction to Project Management - Online course by the University of Adelaide	2016
Integrated Water Resource Management, the National Water Act, and Water Use Authorisations, focusing on WULAs and IWWMPs	2017

AREAS OF WORK EXPERIENCE

South Africa – Gauteng, Mpumalanga, North West, Limpopo, KwaZulu-Natal, Northern Cape, Eastern Cape, Free State
Africa - Democratic Republic of the Congo (DRC)

KEY SPECIALIST DISCIPLINES

Biodiversity Assessments

- Floral Assessments
- Biodiversity Actions Plan (BAP)
- Biodiversity Management Plan (BMP)
- Alien and Invasive Control Plan (AICP)
- Ecological Scan
- Terrestrial Monitoring
- Protected Tree and Floral Marking and Reporting
- Biodiversity Offset Plan

Freshwater Assessments

- Desktop Freshwater Delineation
- Freshwater Verification Assessment
- Freshwater (wetland / riparian) Delineation and Assessment
- Freshwater Eco Service and Status Determination
- Rehabilitation Assessment / Planning
- Plant species and Landscape Plan

Legislative Requirements, Processes and Assessments

- Water Use Applications (Water Use Licence Applications / General Authorisations)
- Environmental and Water Use Audits
- Freshwater Resource Management and Monitoring as part of EMPR and WUL conditions

SAS ENVIRONMENTAL GROUP OF COMPANIES – SPECIALIST CONSULTANT INFORMATION CURRICULUM VITAE OF SANJA ERWEE

PERSONAL DETAILS

Position in Company	GIS Technician and Visual Specialist
Joined SAS Environmental Group of Companies	2014

EDUCATION

Qualifications

BSC Zoology (University of Pretoria)	2013

Short Courses

Global Mapper	2015
SANBI BGIS Course	2017
Global Mapper Lidar Course	2017
ESRI MOOC ARCGIS Cartography	2018

AREAS OF WORK EXPERIENCE

South Africa – Gauteng, Mpumalanga, North West, Limpopo, KwaZulu-Natal, Northern Cape, Western Cape Free State

KEY SPECIALIST DISCIPLINES

Freshwater Assessments

- Desktop Freshwater Delineation
- Plant species and Landscape Plan

Visual Impact Assessment

- Visual Baseline and Impact Assessments
- Visual Impact Peer Review Assessments
- View Shed Analyses
- Visual Modelling

GIS

- Mapping and GIS for various sectors and various disciplines (biodiversity, freshwater, aquatic, soil and land capability).