

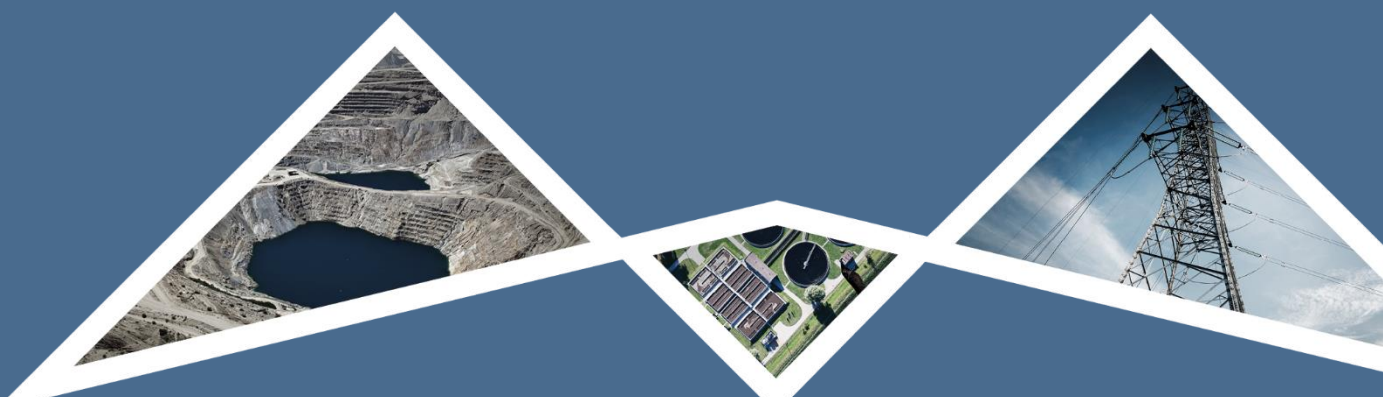


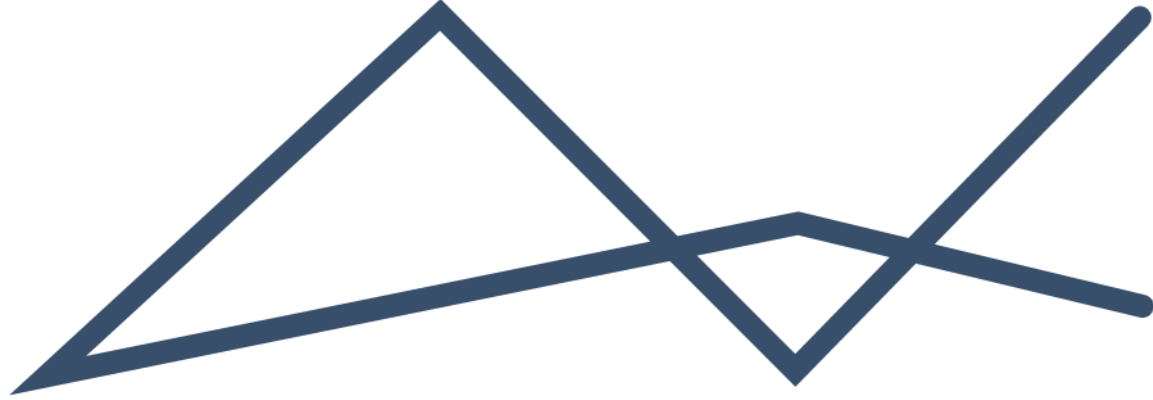
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SCOPING REPORT FOR PUBLIC REVIEW

KELVIN POWER PLANT COMBINED CYCLE GAS TURBINE PROJECT





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List of Abbreviations & Acronyms

ACSA	Airports Company South Africa
AEL	Air Emissions License
AIDS	Acquired immunodeficiency syndrome
AIP	Alien Invasive Plants
APPA	Air Pollution Prevention Act
AQA	Air Quality Act
AQMS	Air Quality Monitoring Station
ASAPA	Association of Southern African Professional Archaeologists
ASTM	American Standard Testing Methodology
ATNS	Air Traffic and Navigation Service
BPG	Best Practice Guideline
CA	Competent Authority
CBA	Critical Biodiversity Area
CBD	Central Business District
CCGE	Combined Cycle Gas Engine
CCGT	Combined Cycle Gas Turbine
CCS	Carbon Capture and Storage
CoE	City of Ekurhuleni
CRM	Cultural Resource Management
CV	Curriculum Vitae
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DFFE	Department of Forestry, Fisheries and Environment
DMRE	Department of Mineral Resources and Energy
DPWR	Department of Public Works, Roads and Transport
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act
EHV	Extra High Voltage
EIA	Environmental Impact Assessment
EIMS	Environmental Impact Management Service (Pty) Ltd
EMPr	Environmental Management Programme
ESA	Ecological Support Area
ESMS	Environmental and Social Management System
FOLU	Forestry and Other Land Use
FPIC	Free, Prior, and Informed Consent
FPL	Food Poverty Line
GDARDE	Gauteng Department of Agriculture, Rural Development and the Environment
GHG	Green House Gas
GIS	Geographical Information Systems
GPMEF	Gauteng Province Environmental Management Framework
GWP	Global Warming Potential
HIA	Heritage Impact Assessment
HRSO	Heat Recovery Steam Generator
I&APs	Interested and Affected Parties



ICE	Internal Combustion Engine
ICP	Informed Consultation and Participation
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
IFC	International Finance Corporation
IOGP	International Association for Oil & Gas Producers
IPCC	Intergovernmental Panel on Climate Change
IPP	Independent Power Producer
IRP	Integrated Resource Plan
IUA	Integrated Unit of Analysis
KPI	Key Performance Indicator
KPS	Kelvin Power Station
LED	Local Economic Development
LM	Local Municipality
LUCF	Land-Use Change and Forestry
mamsl	Meters above mean sea level
MHI	Major Hazardous Installation
MM	Metropolitan Municipality
MPRDA	Mineral and Petroleum Resources Development Act
MW	Megawatts
NAAQS	National Ambient Air Quality Standards
NCCRP	National Climate Change Response Policy
NCEP	National Centres for Environmental Prediction
NDP	National Development Plan
NEMA	National Environmental Management Act
NEMAQA	National Environmental Management: Air Quality Act
NEMBA	National Environmental Management Biodiversity Act
NEMWA	National Environmental Management Waste Act
NERSA	National Energy Regulator of South Africa
NFA	National Forests Act
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act
NOAA	National Oceanic and Atmospheric Administration
NPAES	National Protected Areas Expansion Strategy
NWA	National Water Act
OCGT	Open Cycle Gas Turbine
OHSA	Occupational Health and Safety Act
PAJA	Promotion of Administrative Justice Act
PM	Particulate Matter
PPA	Power Purchase Agreement
PPE	Personal Protective Equipment
PPP	Public Participation Process
PPR	Public Participation Report
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SANS	South African National Standard
SAWS	South African Weather Service
SDF	Spatial Development Framework



SEMA	Specific Environmental Management Act
SPLUMA	Spatial Planning and Land Use Management Act
SSVR	Site Sensitivity Verification Report
SWMP	Stormwater Management Plan
UIF	Unemployment Insurance Fund
UNFCC	United Nations Framework Convention on Climate Change
WHO	World Health Organisation
WUL	Water Use License
WULA	Water Use Licence Application



EXECUTIVE SUMMARY

Kelvin Power (Pty) Ltd (hereafter referred to as Kelvin) has appointed Environmental Impact Management Services (Pty) Ltd (EIMS) as the Environmental Assessment Practitioners (EAPs) to assist with undertaking the necessary application processes (including the statutory public participation) and to compile and submit the required documentation in support of their proposed development of a Combined Cycle Gas Turbine (CCGT) Power Plant at the Kelvin Power Station located in Kempton Park, City of Ekurhuleni Metropolitan Municipality.

Kelvin, the Applicant, proposes to develop a CCGT Power Plant with a net output of up to 600 megawatts. The proposed CCGT Power Plant will comprise of one gas turbine, a heat recovery boiler and a steam turbine. The main structures comprising the plant include a gas turbine building, steam turbine building, water treatment plant, heat recovery steam generator, mechanical draft cooling tower, Extra High Voltage (EHV) substation, exhaust stack, auxiliary buildings and administration buildings. Other possible infrastructure includes additional water and treated sewage wastewater reticulation pipelines, as well as electricity transmission lines to the City Power Sebenza substation adjacent to the power station. The proposed CCGT plant will be located at the previous A-station location, currently undergoing a decommissioning process. Kindly refer to Figure 1 for the locality map showing the proposed development location.

Kelvin plans to receive Natural Gas to the CCGT plant via Sasol's existing gas pipeline system. A pipeline connection will be required to connect to the existing gas pipeline, however, Kelvin will not be responsible for the construction and maintenance of this pipeline. It is noteworthy that various gas suppliers are currently being engaged for the supply of gas to the CCGT plant via the existing Sasol gas pipeline system.

The proposed development triggers various listed activities in terms of the National Environmental Management Act (Act 107 of 1998 – NEMA) Listing Notices 1, 2 and 3 and a full Scoping and Environmental Impact Assessment process is being undertaken. The relevant Water Use Licence (WUL) and Air Emissions Licence (AEL) applications will be submitted for the triggers under the National Water Act (Act 36 of 1998 – NWA) and National Environmental Management Air Quality Act (Act No. 39 of 2004 as amended – NEMAQA) respectively.

This report aims to comply with the requirements of Appendix 2 of the Environmental Impact Assessment Regulations, 2014, promulgated under the National Environmental Management Act (NEMA- Act 107 of 1998) and fulfils the requirements of a Scoping Phase Report.

PURPOSE OF THE SCOPING REPORT

The purpose of the scoping process is to:

- Identify the policies and legislation that are relevant to the activity;
- To motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- To identify and confirm the preferred activity and technology alternatives through an impact and risk assessment and ranking;
- Where appropriate, to identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process including 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;
- To identify the key issues to be addressed in the assessment phase;
- To 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



- To 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 PROCESS

The Public Participation Process (PPP) for the proposed project has been undertaken in accordance with the requirements the NEMA in line with the principles of Integrated Environmental Management. The PPP commenced on the 14th of February 2024 with an initial call to register notification. The comments received from I&APs during the initial call to register and commenting period to date have been captured in the Public Participation Report in Appendix C.

Comments received during this Scoping Report review period will also be collated and added to the Public Participation Report and updated accordingly for inclusion in the finalised Scoping Report to be submitted to the Competent Authority (CA). Should the CA accept the Scoping Report, an EIA Report including an Environmental Management Programme (EMPr) will then be compiled and presented for public comment as part of this EIA process during which time further stakeholder engagement will take place.

This Scoping Report will be made available for public review and comment for a period of 30 days from 15 March 2024 – 16 April 2024. Contact details are provided below:

- Environmental Impact Management Services (Pty) Ltd (EIMS)
- P.O. Box 2083 Pinegowrie 2123
- Phone: 011 789 7170 / Fax: 086 571 9047
- Contact: Jolene Webber
- Email: Kelvin@eims.co.za

PROJECT ALTERNATIVES AND ENVIRONMENTAL IMPACT ASSESSMENT

A scoping assessment was undertaken to identify all the potential risks and impacts associated with each phase of the proposed CCGT project as well as potentially feasible alternatives. Each of the identified risks and impacts at the various project phases were assessed. The assessment criteria (see Section 10.1 for the EIMS Impact Assessment Methodology) include the nature, extent, duration, magnitude / intensity, reversibility, probability, cumulative impact, and irreplaceable loss of resources.

After considering the broad range of alternative types that exist (i.e. location, process, technology, and activity options), layout alternatives were the only reasonable options identified. Layout information is still being finalized and potential layout alternatives will be assessed in the EIA phase once these become available.

Various impacts have been identified in relation to the proposed project and these have been subjected to a scoping level impact assessment. No negative impacts were determined to have a high final significance at this stage. The following preliminary impacts were determined to have a potentially moderate positive / negative final significance (see Section 10.2 for full list of identified impacts and the significance of each):

- Negative Impacts:
 - Operational Noise Impacts;
 - Operational Climate Change Impacts; and
 - Job Losses (Decommissioning Phase).
- Positive Impacts:
 - Employment Creation (Construction and Operational Phases)
 - Generation of electricity and energy security

The identified potential impacts of moderate to high significance will be further assessed during the EIA phase of the project. Potential mitigation measures have been identified and will be refined based on input from the



Environmental Assessment Practitioner (EAP), public consultation, and specialist assessments during the EIA phase of the project. The associated EMPr will identify appropriate mitigation mechanisms for avoidance, minimisation and / or management of the negative impacts and enhancement of the positive impacts.



1 INTRODUCTION

Kelvin Power (Pty) Ltd (hereafter referred to as Kelvin) has appointed Environmental Impact Management Services (Pty) Ltd (EIMS) as the Environmental Assessment Practitioners (EAPs) to assist with undertaking the necessary application processes (including the statutory public participation) and to compile and submit the required documentation in support of their proposed development of a Combined Cycle Gas Turbine (CCGT) Power Plant at the Kelvin Power Station located in Kempton Park, City of Ekurhuleni Metropolitan Municipality.

Kelvin, the Applicant, proposes to develop a CCGT Power Plant with a net output of up to 600 megawatts (MW) to be supplied to the Eskom grid through the IPP system. The proposed CCGT Power Plant will comprise of one gas turbine, a heat recovery boiler and a steam turbine. The main structures comprising the plant include a gas turbine building, steam turbine building, water treatment plant, heat recovery steam generator, mechanical draft cooling tower, Extra High Voltage (EHV) substation, exhaust stack, auxiliary buildings and administration buildings. Other possible infrastructure includes additional water and treated sewage wastewater reticulation pipelines, as well as electricity transmission lines to the City Power Sebenza substation adjacent to the power station. The proposed CCGT plant will be located at the previous A-station location, which has been decommissioned. Kindly refer to Figure 1 for the locality map showing the proposed development location.

Kelvin plans to receive Natural Gas to the CCGT plant via Sasol's existing gas pipeline system. A short pipeline connection will be required to connect to the existing gas pipeline, however, Kelvin will not be responsible for the construction and maintenance of this pipeline. It is noteworthy that various gas suppliers are currently being engaged for the supply of gas to the CCGT plant via the existing Sasol gas pipeline system.

The proposed development triggers various listed activities in terms of the National Environmental Management Act (Act 107 of 1998 – NEMA) Listing Notices 1, 2 and 3 and a full Scoping and Environmental Impact Assessment process is being undertaken. The relevant Water Use Licence (WUL) and Air Emissions Licence (AEL) applications will be submitted for the triggers under the National Water Act (Act 36 of 1998 – NWA) and National Environmental Management Air Quality Act (Act No. 39 of 2004 as amended – NEMAQA) respectively.

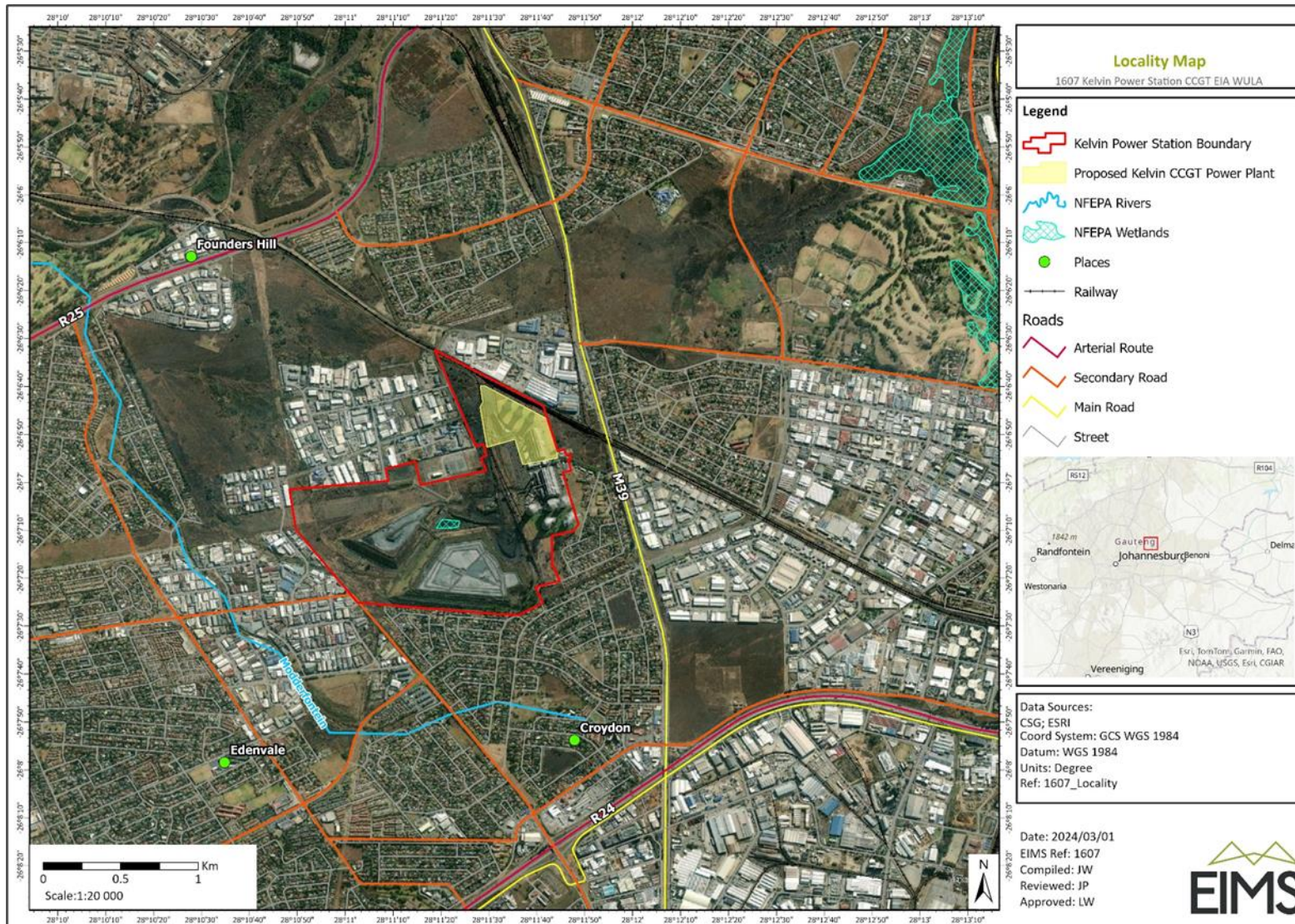


Figure 1: Map showing the proposed development area (yellow outline) and the Kelvin Power Station boundary (red outline).



1.1 REPORT STRUCTURE

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

Table 1: Report structure.

Environmental Regulation	Description – NEMA Regulation 982 (2014) as amended	Section in Report
Appendix 2(1)(a):	Details of – <ol style="list-style-type: none"> i. The Environmental Assessment Practitioner (EAP) who prepared the report; and ii. The expertise of the EAP, including a curriculum vitae; 	Section 1.2 – CV included as Appendix A
Appendix 2(1)(b):	The location of the activity. Including – <ol style="list-style-type: none"> i. The 21-digit Surveyor General code of each cadastral land parcel; ii. Where available, the physical address and farm name; iii. Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties; 	Section 2 Table 4
Appendix 2(1)(c):	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is – <ol style="list-style-type: none"> i. A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or ii. On a land where the property has not been defined, the coordinates within which the activity is to be undertaken; 	Figure 2 and Figure 3
Appendix 2(1)(d):	A description of the scope of the proposed activity, including – <ol style="list-style-type: none"> i. All listed and specified activities triggered; ii. A description of the activities to be undertaken, including associated structures and infrastructure; 	Section 3
Appendix 2(1)(e):	A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	Section 5



Appendix 2(1)(f):	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 6
Appendix 2(1)(g):	<p>A full description of the process followed to reach the proposed preferred activity, site and location within the site, including –</p> <ul style="list-style-type: none"> i. Details of all alternatives considered; ii. Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; iii. A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; iv. The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; v. The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts – <ul style="list-style-type: none"> a. Can be reversed; b. May cause irreplaceable loss or resources; and c. Can be avoided, managed or mitigated; vi. The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; vii. Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; viii. The possible mitigation measures that could be applied and level of residual risk; ix. The outcome of the site selection matrix; x. If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and xi. A concluding statement indicating the preferred alternatives, including preferred location of the activity; 	<p>Section 7</p> <p>Section 8 Section 8.6</p> <p>Section 9</p> <p>Section 10.2</p> <p>Section 10.1</p> <p>Section 10.2 Section 10.2</p> <p>Section 07.1</p> <p>Section 7 Section 12.1</p>
Appendix 2(1)(h):	<p>A plan of study for undertaking the environmental impact assessment process to be undertaken, including –</p> <ul style="list-style-type: none"> i. A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity; ii. A description of the aspects to be assessed as part of the environmental impact assessment process; iii. Aspects to be assessed by specialists; 	Section 12



	<ul style="list-style-type: none"> iv. A description of the proposed method of assessing the environmental aspects, including a description of the proposed method assessing the environmental aspects to be assessed by specialists; v. A description of the proposed method of assessing duration and significance; vi. An indication of the stages at which the competent authority will be consulted; vii. Particulars of the public participation process that will be conducted during the environmental impact assessment process; and viii. A description of the tasks that will be undertaken as part of the environmental impact assessment process; ix. Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored; 	
Appendix 2(2)(i)	<p>An undertaking under oath or affirmation by the EAP in relation to –</p> <ul style="list-style-type: none"> i. The correctness of the information provided in the report; ii. The inclusion of comments and inputs from stakeholders and interested and affected parties; and iii. Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties; 	Section 14
Appendix 2(2)(j):	An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	Section 15
Appendix 2(2)(k):	Where applicable, any specific information required by the competent authority; and	No additional requirements have been received from the Competent Authority to date.
Appendix 2(2)(l):	Any other matter required in terms of section 24(4)(a) and (b) of the Act.	None.



1.2 DETAILS OF THE EAP

Environmental Impact Management Services (Pty) Ltd (EIMS) has been appointed by Kelvin to assist in preparing and submitting the relevant environmental applications, associated reports and documentation, and to undertake a Public Participation Process (PPP) in support of the proposed Kelvin Station CCGT project. EIMS is a private and independent environmental management consulting firm that was founded in 1993. EIMS has in excess of 30 years' experience in conducting EIA's, including EIA's relating to power stations, transmission and distribution infrastructure.

In terms of Regulation 13 of the EIA Regulations (GNR 982) as amended, an independent EAP, must be appointed by the applicant to manage the application. EIMS and the compiler of this report are compliant with the definition of an EAP as defined in Regulations 1 and 13 of the EIA Regulations, as well as Section 1 of the NEMA. This includes, inter alia, the requirement that EIMS:

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

The details of the EIMS EAP and consultant who compiled this report are as follows:

Table 2: EAP Details.

Name of Practitioner	John von Mayer (Project Manager/EAP)	Qaphela Magaqa (Consultant/Junior EAP)
Tel No:	+27 11 789 7170	+27 11 789 7170
Fax No:	+27 86 571 9047	+27 86 571 9047
E-mail:	kelvin@eims.co.za	kelvin@eims.co.za
Professional Registrations:	Professional Natural Scientist with the South African Council for Natural Scientific Professions - SACNASP (400336/11). Registered EAP with the Environmental Assessment Practitioners Association of South Africa - EAPASA (2019/1247).	Registered Certificated Natural Scientist with the South African Council for Natural Scientific Professions - SACNASP (148967). Registered Candidate EAP with the Environmental Assessment Practitioners Association of South Africa - EAPASA (2022/6016).

Mr John von Mayer is a senior consultant at EIMS and has been involved in numerous significant projects the past 14 years. He has experience in Project Management, small to large scale Environmental Impact Assessments, Environmental Auditing, Water Use Licensing, and Public Participation. He is a Registered Professional Natural Scientist (400336/11) with the South African Council Natural and Scientific Professions (SACNASP) as well as a registered Environmental Assessment Practitioners Association of South Africa (EAPASA) Environmental Practitioner (2019/1247).

Qaphela holds a BSc (Honours) degree in Geographical Information Systems and a BSc (majors in Geology and Geography). In addition, he has completed a course on Environmental Law at the North West University. Qaphela is an EAPASA registered candidate Environmental Assessment Practitioner (2022/6016) and SACNASP Registered Certificated Natural Scientist (148967) with 4 years of professional experience. His expertise lies in environmental management, waste management, GIS, compliance auditing, public participation, and reporting.



Qaphela is currently involved in various projects which include undertaking and managing various ongoing projects, environmental compliance monitoring, environmental authorisation, GIS mapping and Water Use License Applications (WULA) projects.

The declaration of independence of the EAP and the Curriculum Vitae (indicating the experience with environmental impact assessment and relevant application processes) of the consultants that were involved in the EIA process and the compilation of this report are attached as Appendix A

1.3 SPECIALIST STUDIES

As part of this EIA several specialist studies have been commissioned to investigate key impacts that require further investigation. A list of the preliminary specialist studies is included in Table 3. Any additional studies that may be identified during the scoping and consultation process will be considered and included in the EIA phase where relevant.

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

Specialist Discipline	Company/Organisation
Air Quality	Airshed Planning Professionals
Climate Change	Airshed Planning Professionals
Ecology (compliance statement)	The Biodiversity Company
Heritage and Palaeontology	PGS Heritage
Soils (compliance statement)	The Biodiversity Company
Noise	Airshed Planning Professionals
Socio-economic	Equispectives Research and Consulting Services
Major Hazardous Installation - Qualitative Risk Assessment	Riscom



2 LOCATION AND PROPERTY DESCRIPTION

Kelvin wishes to develop a CCGT Power Plant at the existing Kelvin Power Station which is situated within the City of Ekurhuleni Metropolitan Municipality, Kempton Park and is approximately 5 km north west of the O.R. Tambo International Airport. The proposed development is to be located at the previous coal powered Kelvin A-Station Power Plant that is undergoing a decommissioning process. The proposed gas pipeline connection is to be located within a Kelvin Power servitude, however the final alignment of the gas pipeline will be determined during the EIA phase. The centre point of the site is approximately 26° 6'45.84"S, 28°11'36.42"E.

A description of the application area and location as well as the properties are included in Table 4 below.

Table 4: Locality details

EA Application Area (ha)	The EA application area (proposed Kelvin Power CCGT plant) covers ~15 ha.	
Magisterial District	The proposed project falls within the Ekurhuleni North Magisterial District, Gauteng Province.	
Distance and direction from nearest towns	The EA Application area is situated ~4km to the west of Kempton Park CBD, 11 km east of Sandton, and ~14km south east of Midrand.	
Farm Name, Number and Portion as well as 21-digit Surveyor General Code	Farm Name, Number and Portion	21 Digit Surveyor General Code
	Zuurfontein Farm 33-IR portion 391 RE Zuurfontein Farm 33-IR portion 82 RE	TOIR00000000003300391 TOIR00000000003300082

Kindly refer to Figure 2 below for a map showing the proposed development location and boundary of the site.

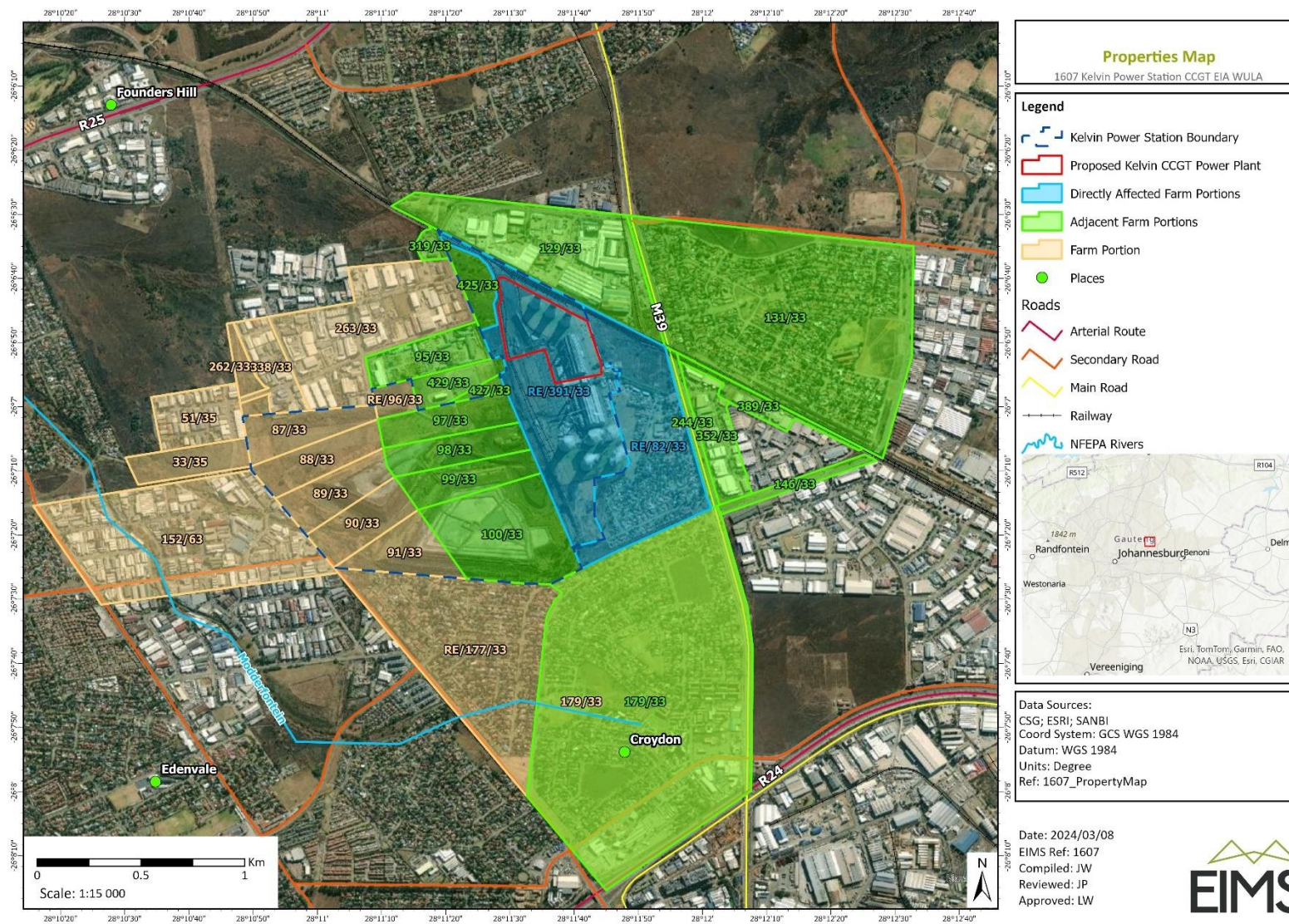


Figure 2: Map Showing Proposed Development Area and Affected Properties.



3 DESCRIPTION OF THE PROPOSED ACTIVITY

This section contains a description of the proposed Kelvin Power A-station CCGT project and its associated infrastructure. At the end of this section, the applicable listed activities¹ relating to the project are presented.

3.1 PROJECT DESCRIPTION

This section aims to describe the proposed project and associated structures and infrastructure. The project description enables a clear understanding of the project related activities and their extent (spatial and temporal) to gain an understanding of the potential impacts which require specific mitigation.

3.1.1 PROJECT OVERVIEW

Kelvin intends to construct a CCGT with generation capacity of up to 600 MW at the previous Kelvin A-station site area. Kelvin aims to supply the electricity generated to Eskom through a Power Purchase Agreement (PPA).

The CCGT² Power Plant will comprise of one gas turbine, a heat recovery boiler and a steam turbine (with associated High Voltage switchgear and control gear). The gas turbine will receive natural gas from the Sasol gas pipeline network into the gas turbine where the combustion will take place producing mechanical energy that is converted by a generator to electric power and a hot exhaust gas. The hot exhaust gas will be captured by the heat recovery boiler where treated water will be heated producing high pressure steam with high potential energy. The steam will be moved to the steam turbine where the potential energy contained in the steam will be converted to mechanical energy powering a generator that will produce electricity. The steam is then discharged into a condenser where it is then collected and returned to the boiler to produce more steam (recycling).

The proposed Kelvin Power CCGT plant will consist of a control room, steam turbine building, colling tower, cooling tower water treatment plant, gas turbine unit, heat recovery steam generator, HRSG stack, water treatment plant, raw water and demineralised water tanks, fuel gas compressor building, and a High Voltage switchyard. Kindly refer to Figure 3 for the preliminary site layout map. A laydown has been identified and will be located towards the eastern boundary of the site where the current A-station cooling towers (to be demolished) are located.

The CCGT configuration will allow for the use of the waste heat for production of electricity thus allowing for production of electricity with the use of less fuel. The proposed power plant is anticipated to require gas supplied at approximately 40 bar and will consume approximately 21 kg/s with a net efficiency of approximately 60%.

The proposed CCGT is proposed to consist MV to EHV step-up transformers to tie the generators to the grid. Electricity generated at the Kelvin Power CCGT Plant will be evacuated from the plant by means of new 275kV lines (or possibly cables) with an approximate length of 250 m from the generating plant to the Sebenza 275/88kV Substation located adjacent to the proposed CCGT plant. Eskom and City Power have shared ownership of the Sebenza Substation and already has space allocated for the integration of Kelvin Power via two 275kV bays. The Sebenza Substation is connected to the Eskom grid via two 275kV powerlines to Prospect Substation with a transfer capacity of approximately 625MVA each.

Kelvin Power also aims to construct a diesel storage area and a chemical stores area whose combined capacities are anticipated to exceed 500 cubic metres. The exact quantities are to be confirmed during the EIA phase.

Waste water from the Diepsloot Waste Water Treatment Works, brought in through an existing pipeline network will be treated at the Kelvin Power CCGT water treatment plant, and will be reticulated for usage through the plant through small reticulation pipelines. After use, the treated effluent water will be discharged

¹ "activity" means an activity identified in any notice published by the Minister or MEC in terms of the NEMA, NEMWA, NWA and/or NEMAQA as a listed activity or specified activity that may not commence without the requisite authorisation granted by the Minister or MEC;

² A CCGT power plant refers to a gas turbine consisting of a heat recovery system generator that captures exhaust heat produced by the gas turbine to power a steam turbine to produce additional power to run a generator or mechanical drive.



via the existing Kelvin Power effluent discharge point into the Modderfontein river channel. Kelvin Power wishes to commission the proposed CCGT plant in 2027/2028. The planned operational life cycle of the proposed CCGT plant is 20 years from commissioning. Kindly refer to Figure 4 below for a 3D image of a typical CCGT power plant.

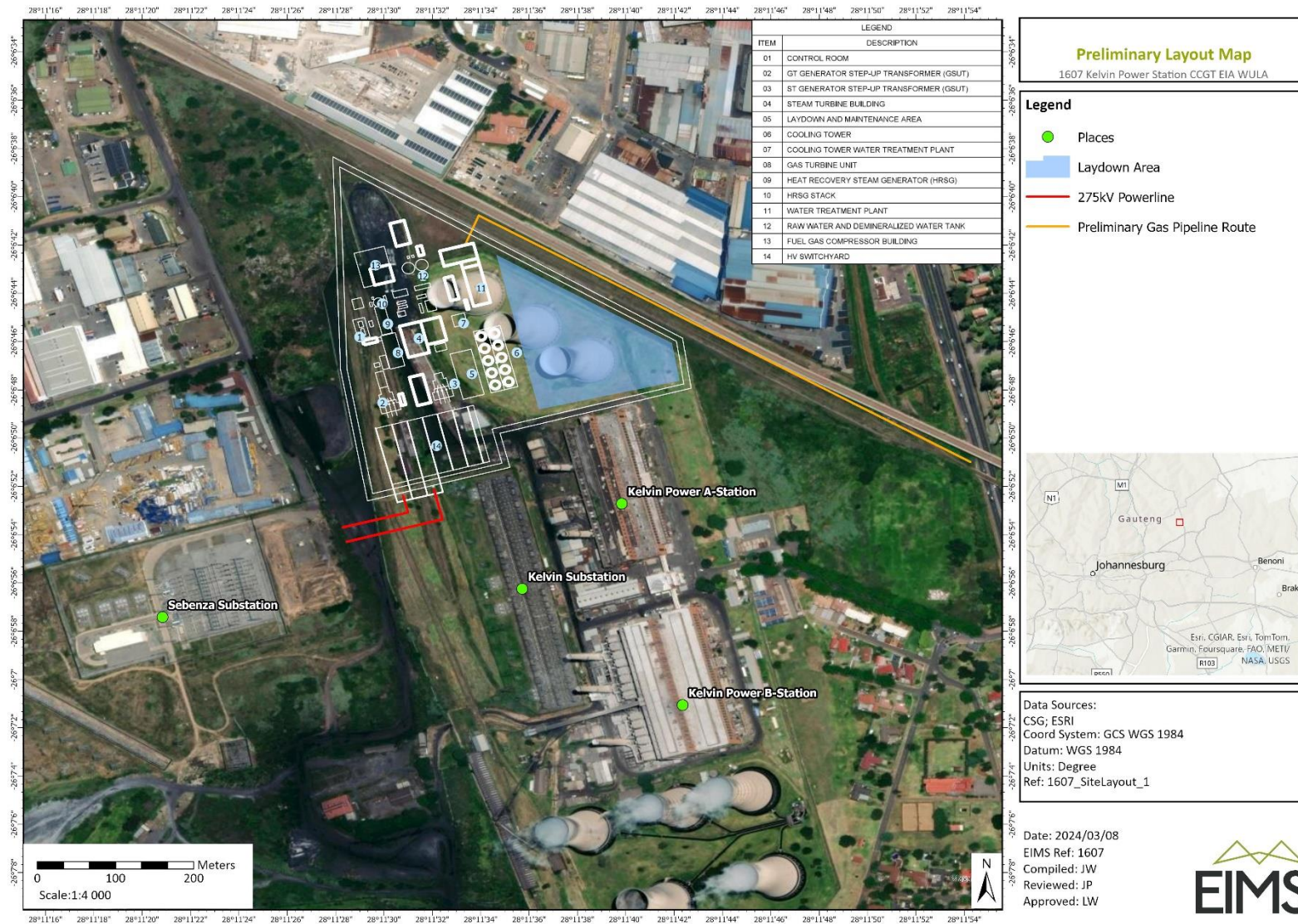


Figure 3: Preliminary Site Layout Map

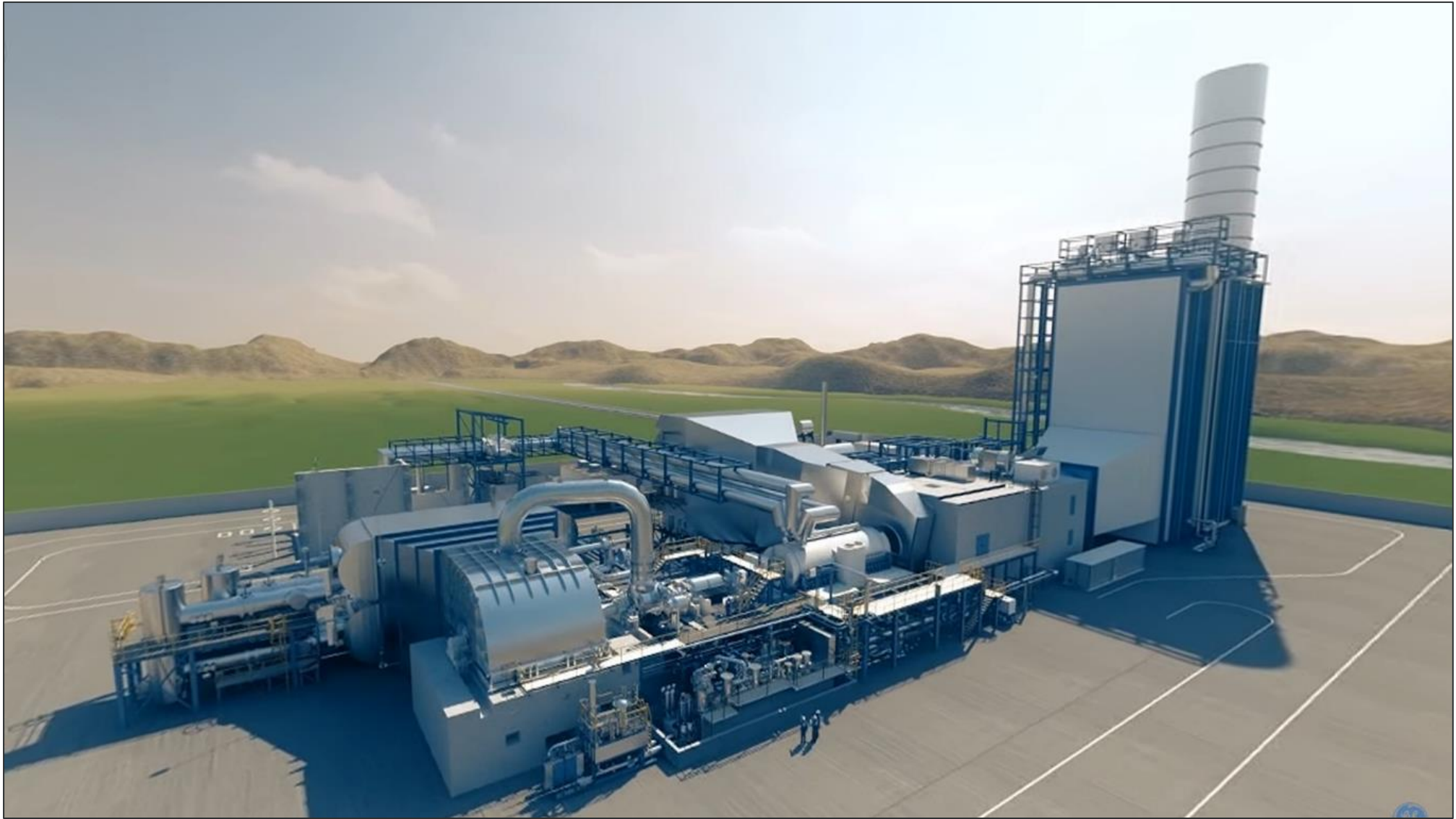


Figure 4: 3D Representation of a Typical CCGT Plant (Source: www.ge.com).



4 LISTED AND SPECIFIED ACTIVITIES TRIGGERED

In terms of Section 24(2) of NEMA, the Minister and/or any MEC in concurrence with the Minister may identify activities which require authorisation as these activities may negatively affect the environment. Environmental Impact Assessment (EIA) Regulations were promulgated in 2014 and amended in 2023 in terms of Section 24(5) and Section 44 of the National Environmental Management Act (NEMA), Act 107 of 1998 and consist of the following:

- *Regulation 982* provides details on the processes and procedures to be followed when undertaking an Environmental Authorisation application process (also referred to as the EIA Regulations);
- *Listing Notice 1* (Regulation 983) defines activities which will trigger the need for a Basic Assessment process;
- *Listing Notice 2* (Regulation 984) defines activities which trigger an Environmental Impact Assessment (EIA) process. If activities from both R 983 and R 984 are triggered, then an EIA process will be required; and
- *Listing Notice 3* (Regulations 985) defines certain additional listed activities for which a Basic Assessment process would be required within identified geographical areas.

The above regulations were assessed to determine whether the proposed project will trigger any of the above listed activities, and if so, which Environmental Authorisation Process would be required. The triggered listed activities presented in Table 5 will require authorisation in terms of GNR 984 Listing Notice 2 of the NEMA EIA Regulations 2014 as amended. A Scoping and EIA process is required in line with all the requirements of the NEMA EIA Regulations, 2014, as amended.

Table 5: NEMA Listed Activities Relevant to Project

Listing Notice	Activity Description	Applicability
Listing Notice 1 of the EIA Regulations, 2014		
60	<i>The expansion and related operation of facilities or infrastructure for the bulk transportation of dangerous goods - (i) in gas form, outside an industrial complex, by an increased throughput capacity of 700 tons or more per day.</i>	A gas pipeline linking the CCGT plant to the Sasol gas pipeline system would be required. The new pipeline will have capacity of greater than 700 tons per day.
Listing Notice 2 of the EIA Regulations, 2014		
2	<i>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.</i>	The CCGT plant will generate up to 600MW of electricity.
4	<i>The development and related operation of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.</i>	Diesel storage on site may take place in volumes exceeding 500 cubic meters.
6	<i>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</i>	An AEL is required for the CCGT. A WUL may also be required.



Listing Notice	Activity Description	Applicability
	<p><i>legislation governing the generation or release of emissions, pollution or effluent, excluding:</i></p> <p><i>(i) activities which are identified and included in Listing Notice 1 of 2014;</i></p> <p><i>(ii) activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies;</i></p> <p><i>(iii) the development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or</i></p> <p><i>(iv) where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.</i></p>	
9	<p><i>The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is-</i></p> <p><i>(a) temporarily required to allow for maintenance of existing infrastructure;</i></p> <p><i>(b) 2 kilometres or shorter in length;</i></p> <p><i>(c) within an existing transmission line servitude; and</i></p> <p><i>(d) will be removed within 18 months of the commencement of development</i></p>	<p>Electricity generated at the Kelvin Power CCGT Plant will be evacuated from the plant by means of two new 275kV lines (or possibly cables) with an approximate length of 250 m from the generating plant to the Sebenza 275/88kV Substation located adjacent to the proposed CCGT plant</p>
<p>Listing Notice 3 of the EIA Regulations, 2014</p>		
4	<p><i>The development of a road wider than 4 metres with a reserve less than 13,5 metres.</i></p> <p><i>vii. Sites identified as high potential agricultural land in terms of Gauteng Agricultural Potential Atlas.</i></p>	<p>The project involves development of access roads wider than 4m, with a reserve less than 13,5 m in areas considered as high agricultural potential land (land capability class value of 12)</p>

No waste management license activities are expected to be triggered by the proposed project based on the types and volume of waste expected to be generated. Potential NWA and NEMAQA listed activities are still to be confirmed , however these will be the subject of separate application processes.



5 POLICY AND LEGISLATIVE CONTEXT

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

5.1 CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA

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

- a) to an environment that is not harmful to their health or well-being; and*
- b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:
 - i. prevent pollution and ecological degradation;*
 - ii. promote conservation; and*
 - iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development”.**

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

5.2 THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA)

The main aim of the NEMA is to provide for co-operative governance by establishing decision-making principles on matters affecting the environment. In terms of the NEMA EIA Regulations, the applicant is required to appoint an EAP to undertake the EIA process, as well as conduct the public participation process towards an application for EA. In South Africa, EIAs became a legal requirement in 1997 with the promulgation of regulations under the Environment Conservation Act (ECA). Subsequently, NEMA was passed in 1998. Section 24(2) of NEMA empowers the Minister and any Member of Executive Council (MEC), with the concurrence of the Minister, to identify activities which must be considered, investigated, assessed and reported on to the competent authority responsible for granting the relevant EA. On 21 April 2006, the Minister of Environmental Affairs and Tourism (now Department of Forestry, Fisheries and the Environment – DFFE) promulgated regulations in terms of Chapter 5 of the NEMA. These regulations, in terms of the NEMA, were amended a number of times between 2010 and 2022. The NEMA EIA Regulations, 2014, as amended, are applicable to this project.

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

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

An environmental Scoping and Impact Assessment process is reserved for activities which have the potential to result in significant impacts which are complex to assess. Scoping and Impact Assessment studies accordingly provide a mechanism for the comprehensive assessment of activities that are likely to have more significant



environmental impacts. Figure 5 below provides a graphic representation of all the components of a full EIA process. The listed activities the proposed project triggers and consequently requires authorisation prior to commencement are detailed in Section 4.

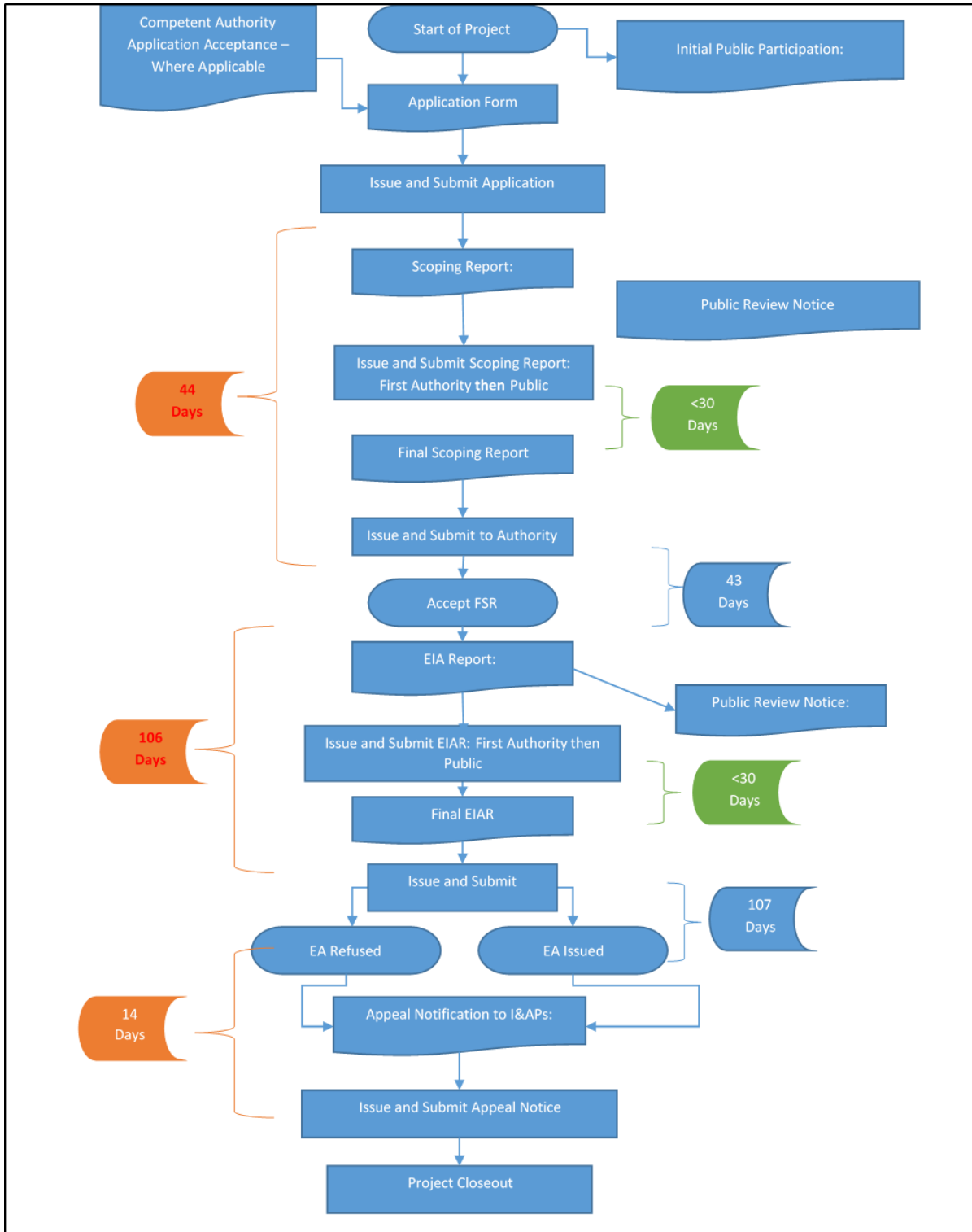


Figure 5: EIA process diagram.

The DFFE have published a number of guidelines and protocols which have been considered in the compilation of this report and include but not limited to:

- Public Participation Guideline in terms of NEMA EIA Regulations (2017).



- Need and desirability Guideline in terms of NEMA (2012).
- National guideline on minimum information requirements for preparing Environmental Impact Assessments for mining act activities that require environmental authorisation (2018).
- 2004 Information Series covering various aspects of the EIA process.
- Procedures for assessment and minimum criteria for specialist studies.

The impacts of climate change as a result of, as well as potentially affecting the project, are addressed by the environmental management tools of integrated environmental management (IEM) and EIA, as prescribed by the NEMA 107 of 1998. Given that the purpose of EIA is to give effect to the general objectives of IEM (section 24(1), NEMA), including sustainable development, there is a logical and necessary interrelationship between climate change and EIA.

NEMA sets out the general objectives of IEM in South Africa, of which the following two are of relevance for this report:

- Identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities. This is to be done with a view to minimising negative impacts, maximising benefits and promoting compliance with the principles of environmental management set out in section 2 (of NEMA).
- Ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them.

A Screening Tool Report was generated from the DFFE Screening tool as per the requirements of Regulation 16 (1)(b)(v) of the EIA Regulations 2014, as amended, and was included in the Application for EA. The screening Tool provided a list of specialist studies for consideration and inclusion in the Scoping and EIA process. In this regard, a Site Sensitivity Verification Report (SSVR) has been compiled to consider the recommendations of the DFFE Screening Tool Report and to provide a rationale for the selection of specialist studies included in line with the recommendations of the Plan of Study for EIA included in this Scoping Report. Please refer to Appendix E for the Screening Tool Report and accompanying SSVR.

5.3 THE NATIONAL WATER ACT

The purpose of the NWA is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors:

- a) meeting the basic human needs of present and future generations;
- b) promoting equitable access to water;
- c) redressing the results of past racial and gender discrimination;
- d) promoting the efficient, sustainable and beneficial use of water in the public interest;
- e) facilitating social and economic development;
- f) providing for growing demand for water use;
- g) protecting aquatic and associated ecosystems and their biological diversity;
- h) reducing and preventing pollution and degradation of water resources;
- i) meeting international obligations;
- j) promoting dam safety;
- k) managing floods and droughts,
- l) and for achieving this purpose, to establish suitable institutions and to ensure that they have appropriate community, racial and gender representation.



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

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

The above water use processes are described in Figure 6.

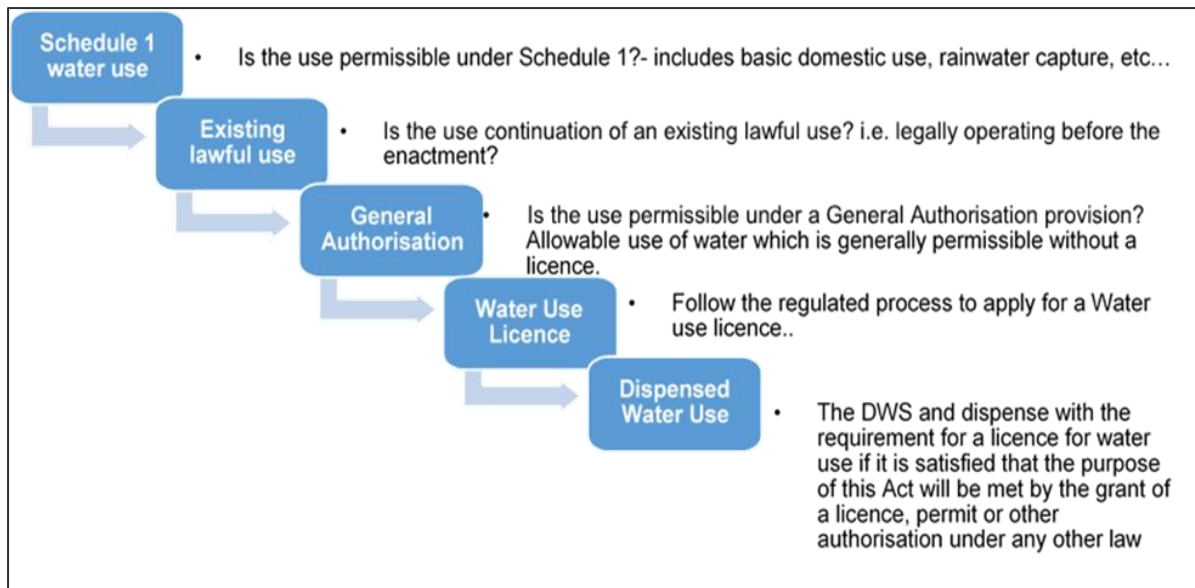


Figure 6: Authorisation processes for new water uses.

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

- a) Taking water from a water resource;
- b) Storing water;
- c) Impeding or diverting the flow of water in a watercourse;
- d) Engaging in a stream flow reduction activity contemplated in section 36;
- e) Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
- f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduits;
- g) Disposing of waste in a manner which may detrimentally impact on a water resource;
- h) Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- i) Altering the bed, banks, course or characteristics of a watercourse;
- j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- k) Using water for recreational purposes.



A watercourse is defined in terms of the Act as follows:

- a) a river or spring;
- b) a natural channel in which water flows regularly or intermittently;
- c) a wetland, lake or dam into which, or from which, water flows; and
- d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks;

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

- a) The outer edge of the 1 in 100-year flood line and/or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam;
- b) In the absence of a determined 1 in 100-year flood line or riparian area the area within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (subject to compliance to section 144 of the Act); or
- c) A 500 m radius from the delineated boundary (extent) of any wetland or pan.

Kelvin Power has an existing WUL (ref: 03/A21C/FGH/1110) for Section 21 (f), (g), and (h). Kelvin may have to amend their existing WUL or apply for a new WUL to ensure that the proposed activities are authorised as required by the NWA.

5.4 THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT (NEMWA)

On 1 June 2014, the NEMWA came into force. Waste is, accordingly, subject to all the provisions of the NEMWA.

The objectives of this Act are:

- a) to protect health, well-being and the environment by providing reasonable measures for-
 - i. minimising the consumption of natural resources;
 - ii. avoiding and minimising the generation of waste;
 - iii. reducing, re-using, recycling and recovering waste;
 - iv. treating and safely disposing of waste as a last resort;
 - v. preventing pollution and ecological degradation;
 - vi. securing ecologically sustainable development while promoting justifiable economic and social development;
 - vii. promoting and ensuring the effective delivery of waste services;
 - viii. remediating land where contamination presents, or may present, a significant risk of harm to health or the environment; and
 - ix. achieving integrated waste management reporting and planning;
- b) to ensure that people are aware of the impact of waste on their health, well-being and the environment;
- c) to provide for compliance with the measures set out in paragraph (a); and
- d) generally, to give effect to section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being.

Section 16 of the NEMWA states:

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



- a) *“Avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated;*
- b) *Reduce, re-use, recycle and recover waste;*
- c) *Where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;*
- d) *Manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour, or visual impacts;*
- e) *Prevent any employee or any person under his or her supervision from contravening the Act; and*
- f) *Prevent the waste from being used for unauthorised purposes.”*

The NEMWA provides for specific waste management measures to be implemented, as well as providing for the licensing and control of waste management activities. No NEMWA listed activities have been identified for this project. However, Kelvin Power will be responsible for ensuring that all waste produced at the CCGT plant is handled in accordance with the requirements of the Waste Act.

The Waste Classification and Management Regulations (GNR 634) are published under the NEMWA. The purpose of these Regulations is to –

- d) Regulate the classification and management of waste in a manner which supports and implements the provisions of the Act;
- e) Establish a mechanism and procedure for the listing of waste management activities that do not require a Waste Management Licence;
- f) Prescribe requirements for the disposal of waste to landfill;
- g) Prescribe requirements and timeframes for the management of certain wastes; and
- h) Prescribe general duties of waste generators, transporters and managers.

Waste classification, as presented in Chapter 4 of these regulations, entails the following:

- i) Wastes listed in Annexure 1 of these Regulations do not require classification in terms of SANS 10234;
- j) Subject to sub regulation (1), all waste generators must ensure that the waste they generate is classified in accordance with SANS 10234 within one hundred and eighty (180) days of generation;
- k) Waste must be kept separate for the purposes of classification in terms of sub regulation (2), and must not be mixed prior to classification;
- l) Waste must be re-classified in terms of sub regulation (2) every five (5) years, or within 30 days of modification to the process or activity that generated the waste, changes in raw materials or other inputs, or any other variation of relevant factors;
- m) Waste that has been subjected to any form of treatment must be re-classified in terms of sub regulation (2), including any waste from the treatment process; and
- n) If the Minister reasonably believes that a waste has not been classified correctly in terms of sub regulation (2), he or she may require the waste generator to have the classification peer reviewed to confirm the classification.

Furthermore, Chapter 8 of the Regulations stipulates that unless otherwise directed by the Minister to ensure a better environmental outcome, or in response to an emergency so as to protect human health, property or the environment –

- o) Waste generators must ensure that their waste is assessed in accordance with the Norms and Standards for Assessment of Waste for Landfill Disposal set in terms of section 7(1) of the Act prior to the disposal of the waste to landfill;



- p) Waste generators must ensure that the disposal of their waste to landfill is done in accordance with the Norms and Standards for Disposal of Waste to Landfill set in terms of section 7(1) of the Act; and
- q) Waste managers disposing of waste to landfill must only do so in accordance with the Norms and Standards for Disposal of Waste to Landfill set in terms of section 7 (1) of the Act.

5.5 THE NATIONAL ENVIRONMENTAL MANAGEMENT AIR QUALITY ACT (NEMAQA)

The National Framework for achieving the NEM:AQA was published in the Government Gazette on the 11th of September 2007 (and amended in 2018). The National Framework is a medium- to long term plan on how to implement the NEM:AQA to ensure the objectives of the act are met. The National Framework states that aside from the various spheres of government responsibility towards good air quality, industry too has a responsibility not to impinge on everyone's right to air that is not harmful to health and well-being. Industries therefore should take reasonable measures to prevent such pollution degradation from occurring, continuing, or recurring. In terms of NEM:AQA, certain industries have further responsibilities, including:

- Comply with any relevant national standards for emissions from point, non-point or mobile sources in respect of substances or mixtures of substances identified by the Minister, Member of the Executive Council (MEC) or municipality.
- Comply with the measurement requirements of identified emissions from point, non-point or mobile sources and the form in which such measurements must be reported and the organs of state to whom such measurements must be reported.
- Comply with relevant emission standards in respect of controlled emitters if an activity undertaken by the industry and/or an appliance used by the industry is identified as a controlled emitter.
- Comply with any usage, manufacture or sale and/or emissions standards or prohibitions in respect of controlled fuels if such fuels are manufactured, sold or used by the industry.
- Comply with the Minister's requirement for the implementation of a pollution prevention plan in respect of a substance declared as a priority air pollutant.
- Comply with an Air Quality Officer's (AQOs) legal request to submit an Atmospheric Impact Report (AIR) in a prescribed form (if required).
- Take reasonable steps to prevent the emission of any offensive odour caused by any activity on their premises.
- Furthermore, industries identified as Listed Activities have further responsibilities, including:
 - Making application for an Atmospheric Emission License (AEL) and complying with its provisions.
 - Compliance with any minimum emission standards in respect of a substance or mixture of substances identified as resulting from a listed activity.
 - Designate an Emission Control Officer if required to do so.

5.5.1 NATIONAL MINIMUM EMISSION LIMITS

The Minister, in terms of Section 21 of the NEM:AQA, published a list of activities which result in atmospheric emissions and which are believed to have significant detrimental effects on the environment, human health and social welfare. The Listed Activities and Minimum National Emission Standards were first published on the 31st of March 2010 (Government Gazette No. 33064), with a revision of the schedule on the 22nd of November 2013 (Government Gazette No. 37054) and an amendment of certain sections and annexure A on the 31st of October 2018 (Government Gazette No. 42013). The project processes fall under Category 1: Combustion Installations.



Based on the nature of the operations and wording in the latest Listed Activities and Minimum National Emission Standards, the proposed project at the site should trigger Subcategories 1.4 of the listed activities (Table 6):

- Gas Combustion Installations – Gas combustion used primarily for steam raising or electricity generation (more than 50-megawatt (MW) heat input per unit). MES subcategory 1.4 are applicable (Table 6) during normal operating conditions using natural gas.

Table 6: MES for Gas Combustion Installations

Subcategory 1.4: Gas Combustion Installations		
Description	Gas combustion (including gas turbines burning natural gas) used primarily for steam raising or electricity generation.	
Application	All installations with design capacity equal to or greater than 50 MW heat input per unit based on the lower calorific value of the fuel used.	
Substance or mixture of substances		mg/Nm³ under normal conditions of 3% O₂, 273 K and 101.3 kPa
Common Name	Chemical Symbol	New plant
Particulate matter (PM)	Not applicable	10
Sulfur dioxide	SO ₂	400
Oxides of nitrogen	NO _x expressed as NO ₂	50

Notes:

- (a) The following special arrangement shall apply:
- i. Reference conditions for gas turbines shall be 15% O₂, 273 K and 101.3 kPa; and
 - ii. Where co-feeding with waste materials with calorific value allowed in terms of the Waste Disposal Standards published in terms of the Waste Act, 2008 (Act No.59 of 2008) occurs, additional requirements under subcategory 1.6 shall apply. (This would not be applicable to the current project)

5.5.2 ATMOSPHERIC EMISSION LICENSE (AEL) APPLICATION

The application for an AEL must include all sources of emission, not only those considered listed activities. In terms of the AEL application, the applicant should take into account the following sections of NEM:AQA:

37. *Application for atmospheric emission licences:*
- (1) *A person must apply for an AEL by lodging with the licencing authority of the area in which the listed activity is to be carried out, an application in the form required.*
 - (2) *An application for an AEL must be accompanied by –*
 - (a) *The prescribed processing fee; and*
 - (b) *Such documentation and information as may be required by the licencing authority.*
38. *Procedure for licence applications:*
- (1) *The licencing authority –*



- (a) *May, to the extent that is reasonable to do so, require the applicant, at the applicant's expense, to obtain and provide it by a given date with other information contained in or submitted in connection with the application;*
- (b) *May conduct its own investigation on the likely effect of the proposed licence on air quality;*
- (c) *May invite written comments from any organ of state which has an interest in the matter; and*
- (d) *Must afford the applicant an opportunity to make representations on any adverse statements or objections to the application.*

(2) *Section 24 of the NEMA and section 22 of the Environmental Conservation Act apply to all applications for atmospheric emission licences, and both an applicant and the licencing authority must comply with those sections and any applicable notice issued or regulations made in relation to those sections.*

(3) –

- (a) *An applicant must take appropriate steps to bring the application to the attention of relevant organs of state, interested persons and the public.*
- (b) *Such steps must include the publication of a notice in at least two newspapers circulating the area in which the listed activity is applied for is or is to be carried out and must-*
 - (i) *Describe the nature and purpose of the licence applied for;*
 - (ii) *Give particulars of the listed activity, including the place where it is to be carried out;*
 - (iii) *State a reasonable period within which written representations on or objections to the application may be submitted and the address or place where it must be submitted; and*
 - (iv) *Contain such other particulars as the licencing authority may require.*

46. Variation of provisional atmospheric emission licences and atmospheric emission licences

(1) *A licensing authority may, by written notice to the holder of a provisional atmospheric emission licence or an atmospheric emission licence, vary the licence –*

- (a) *if it is necessary or desirable to prevent deterioration of ambient air quality;*
- (b) *if it is necessary or desirable for the purposes of achieving ambient air quality standards;*
- (c) *if it is necessary or desirable to accommodate demands brought about by impacts on socioeconomic circumstances and it is in the public interest to meet those demands;*
- (d) *at the written request of the holder of the licence;*
- (e) *if it is transferred to another person in terms of section 44; or*
- (f) *if it is reviewed in terms of section 45.*

(2) *The variation of a licence includes –*

- (a) *the attaching of an additional condition or requirement to the licence;*
- (b) *the substitution of a condition or requirement;*
- (c) *the removal of a condition or requirement; or*
- (d) *the amendment of a condition or requirement.*

(3) *If a licensing authority receives a request from the holder of a licence in terms of subsection (1)(d), the licensing authority must require the holder of the licence to take appropriate steps to bring the request to the attention of relevant organs of state, interested persons and the public if –*

- (a) *the variation of the licence will authorise an increase in the environmental impact regulated by the licence;*



- (b) the variation of the licence will authorise an increase in atmospheric emissions; and*
 - (c) the proposed variation has not, for any reason, been the subject of an authorisation in terms of any other legislation and public consultation.*
- (4) Steps in terms of subsection (3) must include the publication of a notice in at least two newspapers circulating in the area in which the listed activity authorised by the licence is, or will be, carried out –*
- (a) describing the nature and purpose of the request;*
 - (b) giving particulars of the listed activity, including the place where it is or will be carried out;*
 - (c) stating a reasonable period within which written representations on or objections to the request may be submitted, and the address or place where representations or objections must be submitted; and*
 - (d) containing such other particulars as the licensing authority may require.*
- (5) Sections 38 and 40, read with the necessary changes as the context may require, apply to the variation of a licence.*

5.5.3 ATMOSPHERIC IMPACT REPORT

According to NEM:AQA in terms of Section 30, an AQO may require the submission of an Atmospheric Impact Report (AIR) if:

- The Air Quality Officer reasonably suspects that a person has contravened or failed to comply with the AQA or any conditions of an AEL and that detrimental effects on the environment occurred or there was a contribution to the degradation in ambient air quality.
- A review of a provisional AEL or an AEL is undertaken in terms of Section 45 of NEM:AQA.

The format of the AIR is stipulated in the Regulations Prescribing the Format of the Atmospheric Impact Report, Government Gazette No. 36904, Notice Number 747 of 2013 (11 October 2013), its amendment stipulated in Government Gazette No. 38633, No. R284 (2 April 2015). An AIR can be compiled prior to AEL application when plant design is finalised. An Air Quality Impact Assessment Report is being prepared as part of the EIA.

5.5.4 NATIONAL ATMOSPHERIC EMISSIONS REPORTING REGULATIONS

The National Atmospheric Emission Reporting Regulations (Government Gazette No. 38633) came into effect on 2 April 2015. The purpose of the regulations is to regulate the reporting of data and information from an identified point, non-point and mobile sources of atmospheric emissions to an internet-based National Atmospheric Emissions Inventory System (NAEIS). The NAEIS is a component of the South African Air Quality Information System (SAAQIS). Its objective is to provide all stakeholders with relevant, up to date and accurate information on South Africa's emissions profile for informed decision making.

Emission sources and data providers are classified according to groups. The project would be classified under Group A ("Listed activity published in terms of section 21(1) of the Act"). Emission reports from this group must be made in the format required for NAEIS and if applicable should be in accordance with the AEL or provisional AEL.

As per the regulations, the project and/or their data provider should register on the NAEIS system. Data providers must inform the relevant authority of changes if there are any:

- Change in registration details;
- Transfer of ownership; or
- Activities being discontinued.



A data provider must submit the required information for the preceding calendar year to the NAEIS by 31 March of each year. Records of data submitted must be kept for a period of 5 years and must be made available for inspection by the relevant authority.

The relevant authority must request, in writing, a data provider to verify the information submitted if the information is incomplete or incorrect. The data provider then has 60 days to verify the information. If the verified information is incorrect or incomplete the relevant authority must instruct a data provider, in writing, to submit supporting documentation prepared by an independent person. The relevant authority cannot be held liable for cost of the verification of data. A person guilty of an offence in terms of section 13 of these regulations is liable for penalties.

5.5.5 ATMOSPHERIC MODELLING REGULATIONS

Air dispersion modelling provides a cost-effective means for assessing the impact of air emission sources, the major focus of which is to determine compliance with the relevant ambient air quality standards. Dispersion modelling provides a versatile means of assessing various emission options for the management of emissions from existing or proposed installations. Regulations regarding Air Dispersion Modelling were promulgated in Government Gazette No. 37804 vol. 589; 11 July 2014, (Government Gazette, 2014) and recommend a suite of dispersion models to be applied for regulatory practices as well as guidance on modelling input requirements, protocols and procedures to be followed. The Regulations regarding Air Dispersion Modelling are applicable –

- (a) in the development of an air quality management plan, as contemplated in Chapter 3 of the NEM:AQA;
- (b) in the development of a priority area air quality management plan, as contemplated in Section 19 of the NEM:AQA;
- (c) in the development of an AIR, as contemplated in Section 30 of the NEM:AQA; and,
- (d) in the development of a specialist air quality impact assessment study, as contemplated in Chapter 5 of the NEM:AQA.

Three Levels of Assessment are defined in the Regulations. The three levels are:

- Level 1: where worst-case air quality impacts are assessed using simpler screening models
- Level 2: for assessment of air quality impacts as part of license application or amendment processes, where impacts are the greatest within a few kilometres downwind (less than 50 km)
- Level 3: require more sophisticated dispersion models (and corresponding input data, resources and model operator expertise) in situation:
 - where a detailed understanding of air quality impacts, in time and space, is required;
 - where it is important to account for causality effects, calms, non-linear plume trajectories, spatial variations in turbulent mixing, multiple source types & chemical transformations;
 - when conducting permitting and/or environmental assessment process for large industrial developments that have considerable social, economic and environmental consequences;
 - when evaluating air quality management approaches involving multi-source, multi-sector contributions from permitted and non-permitted sources in an air-shed; or,
 - when assessing contaminants resulting from non-linear processes (e.g. deposition, ground-level O₃, particulate formation, visibility).

The first step in the dispersion modelling exercise requires a clear objective of the modelling exercise and thereby gives clear direction to the choice of the dispersion model most suited for the purpose. Accordingly, Level 2 or Level 3 would be appropriate for this study.



5.5.6 THE HIGHVELD PRIORITY AREA

The Highveld Airshed (HPA) was declared the second priority area by the minister at the end of 2007. This required that an Air Quality Management Plan for the area be developed. The plan includes the establishment of an emissions reduction strategies and intervention programmes based on the findings of a baseline characterisation of the area. The implication of this is that all contributing sources in the area will be assessed to determine the emission reduction targets to be achieved over the following few years.

The proposed project is located within the footprint demarcated as the HPA. The DFFE published the management plan for the HPA in September 2011. Included in this management plan are seven goals, each of which has a further list of objectives that have to be met. The goals for the Highveld Priority area are as follows:

- **Goal 1:** By 2015, organisational capacity in government is optimised to efficiently and effectively maintain, monitor and enforce compliance with ambient air quality standards
- **Goal 2:** By 2020, industrial emissions are equitably reduced to achieve compliance with ambient air quality standards and dustfall limit values
- **Goal 3:** By 2020, air quality in all low-income settlements is in full compliance with ambient air quality standards
- **Goal 4:** By 2020, all vehicles comply with the requirements of the National Vehicle Emission Strategy
- **Goal 5:** By 2020, a measurable increase in awareness and knowledge of air quality exists
- **Goal 6:** By 2020, biomass burning and agricultural emissions will be 30% less than current
- **Goal 7:** By 2020, emissions from waste management are 40% less than current

A draft of the second-generation air quality management plan for the HPA was published in August 2023. The proposed strategies to reduce the industrial emissions within the HPA were developed in line with the 2020 MES and are summarised below.

Table 7: HPA Air Quality Management Plan summary

Objectives	Key Activities/ Opportunities	Responsibility
Reduce emissions from industries	Compliance with the minimum emission standards and other atmospheric emission licence condition	Identified stakeholders in regulation 3(1)(a) and 3(1)(b).
	Assessment of compliance monitoring reports	Identified stakeholders in regulation 3(1)(d): DFFE, Provinces, Metros, Districts and Local municipalities
	Development and Implementation of emission reduction plans	Identified stakeholders in regulation 3(1)(a) and 3(1)(b).
	Monitor and enforce compliance	Identified stakeholders in regulation 3(1)(d): DFFE, Provinces, Metros, Districts and Local municipalities
	Identify opportunities and incentive schemes to support industries to implement air quality improvement initiatives.	Identified stakeholders in regulation 3(1)(d): DTIC, DFFE, Provinces, Metros, Districts and Local municipalities
	Establish incentive schemes for energy efficiency improvements and fuel switching that directly reduce air emissions.	Identified stakeholders in regulation 3(1)(d): DTIC, DFFE, Provinces, Metros, Districts and Local municipalities



Objectives	Key Activities/ Opportunities	Responsibility
Notes: DTIC – Department of Trade, Industry and Competition, DFFE – Department of Forestry, Fisheries and the Environment		

5.5.7 NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)

Criteria pollutants are considered those pollutants most commonly found in the atmosphere, that have proven detrimental health effects when inhaled and are regulated by ambient air quality criteria. South African NAAQS for SO₂, nitrogen dioxide (NO₂), PM₁₀, CO, (O₃), benzene (C₆H₆), and lead (Pb) were published on 13 March 2009. Standards for PM_{2.5} were published on 24 June 2012. All standards are listed in Table 8

Table 8: National Ambient Air Quality Standards for Criteria Pollutants.

Pollutant	Averaging Period	Limit Value (µg/m ³)	Limit Value (ppb)	Frequency of Exceedance	Compliance Date
SO ₂	10-minute	500	191	526	Currently enforceable
	1-hour	350	134	88	Currently enforceable
	24-hour	125	48	4	Currently enforceable
	1-year	50	19	-	Currently enforceable
NO ₂	1-hour	200	106	88	Currently enforceable
	1-year	40	21	-	Currently enforceable
PM ₁₀	24-hour	75	-	4	Currently enforceable
	1-year	40	-	-	Currently enforceable
PM _{2.5}	24-hour	40	-	4	1 Jan 2016 – 31 Dec 2029
		25	-	4	1 Jan 2030
	1-year	20	-	-	1 Jan 2016 – 31 Dec 2029
		15	-	-	1 Jan 2030
CO	1-hour	30 000	26 000	88	Currently enforceable
	8-hour	10 000	8 700	11	Currently enforceable
Benzene (C ₆ H ₆)	1-year	5	1.6	-	Currently enforceable
Ozone (O ₃)	8 hours (running)	120	61	11	Currently enforceable
Lead (Pb)	1-year	0.5	-	-	Currently enforceable

5.6 THE NATIONAL HERITAGE RESOURCES ACT (NHRA)

The National Heritage Resources Act (Act 25 of 1999 – NHRA) stipulates that cultural heritage resources may not be disturbed without authorisation from the relevant heritage authority. Section 34(1) of the NHRA states that, “no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority...” The NHRA is utilised as the basis for the



identification, evaluation and management of heritage resources and in the case of Cultural Resource Management (CRM) those resources specifically impacted on by development as stipulated in Section 38 of NHRA, and those developments administered through the NEMA, MPRDA and the Development Facilitation Act (FDA) legislation. In the latter cases the feedback from the relevant heritage resources authority is required by the State and Provincial Departments managing these Acts before any authorisations are granted for a development. The last few years have seen a significant change towards the inclusion of heritage assessments as a major component of Environmental Impact Processes required by the NEMA.

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

In accordance with the legislative requirements and EIA rating criteria, the regulations of the South African Heritage Resources Agency (SAHRA) and Association of Southern African Professional Archaeologists (ASAPA) have also been incorporated to ensure that a comprehensive and legally compatible Heritage Report is compiled. As part of this Kelvin CCGT application PGS Heritage is currently undertaking Heritage and Palaeontology studies.

5.7 THE NATIONAL ENVIRONMENTAL MANAGEMENT BIODIVERSITY ACT (NEMBA)

The National Environmental Management Biodiversity Act (Act No. 10 of 2004 – NEMBA) provides for the management and conservation of South Africa’s biodiversity within the framework of the NEMA as well as the protection of species and ecosystems that warrant national protection. Within the framework of this act, various regulations are promulgated which provide specific requirements and management measures relating to protecting threatened ecosystems, threatened or protected species as well as the control of alien and invasive species. A summary of these regulations is presented below.

The National List of Ecosystems that are Threatened and Need of Protection (GN 1002 of 2011) are promulgated under the NEMBA, and these Regulations provide for listing of threatened or protected ecosystems in one of the following categories:

- Critically Endangered (CR) ecosystems, being ecosystems that have undergone severe degradation of ecological structure, function or composition as a result of human intervention and are subject to an extremely high risk of irreversible transformation;
- Endangered (EN) ecosystems, being ecosystems that have undergone degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems;
- Vulnerable (VU) ecosystems, being ecosystems that have a high risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems or endangered ecosystems; and
- Protected ecosystems, being ecosystems that are of high conservation value or of high national or provincial importance, although they are not listed as critically endangered, endangered or vulnerable.

The proposed development is located within a brownfield development site and no Threatened Ecosystems in Need of Protection will be disrupted as a result of the proposed development. .

Further regulations published under the NEMBA are the threatened or protected Species Regulations (GN R 152 OF 2007) which aims to:



- (a) further regulate the permit system set out in Chapter 7 of the Biodiversity Act insofar as that system applies to restricted activities involving specimens of listed threatened or protected species;
- (b) provide for the registration of captive breeding operations, commercial exhibition facilities, game farms, nurseries, scientific institutions, sanctuaries and rehabilitation facilities and wildlife traders;
- (c) provide for the regulation of the carrying out of a specific restricted activity, namely hunting;
- (d) provide for the prohibition of specific restricted activities involving specific listed threatened or protected species;
- (e) provide for the protection of wild populations of listed threatened species; and
- (f) provide for the composition and operating procedure of the Scientific Authority.

The proposed development is located within a brownfield development site and no Threatened or Protected Species (TOPS) were noted during the Site Sensitivity Verification site visit.

The Alien and Invasive Species Lists are promulgated under the NEMBA with the aim of protecting the quality and quantity of arable land in South Africa. Loss of arable land should be avoided and declared Weeds and Invaders in South Africa are categorised according to one of the following categories, and require control or removal:

- Category 1a Listed Invasive Species: Category 1a Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be combated or eradicated;
- Category 1b Listed Invasive Species: Category 1b Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be controlled;
- Category 2 Listed Invasive Species: Category 2 Listed Invasive Species are those species listed by notice in terms of section 70(1)(a) of the Act as species which require a permit to carry out a restricted activity within an area specified in the Notice or an area specified in the permit, as the case may be; and
- Category 3 Listed Invasive Species: Category 3 Listed Invasive Species are species that are listed by notice in terms of section 70(1)(a) of the Act, as species which are subject to exemptions in terms of section 71(3) and prohibitions in terms of section 71A of Act, as specified in the Notice.

During the initial site sensitivity verification study, AIP were identified by the EAP. The presence of and type of AIP will be confirmed by the ecologist and relevant measures will be incorporated into the EMPr. In giving effect to the above, the Alien and Invasive Species Regulations (GNR 1020 of 2020) provide for amongst others, the prevention of the spread or allowing the spread of, any specimen of a listed invasive species.

5.8 ENVIRONMENT CONSERVATION ACT (ECA)

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

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

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

Section 4 of the Regulations prohibits a person from making, producing or causing a disturbing noise, or allowing it to be made produced or caused by any person, machine, device or apparatus or any combination thereof. A disturbing noise is defined in the Regulations as *“a noise level which exceeds the zone sound level or if no zone*



sound level has been designated, a noise level which exceeds the ambient sound level at the same measuring point by 7 dBA or more.”

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

There are a few SANS relevant to noise from mines, industry and roads. They are:

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

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

5.9 THE SPATIAL PLANNING AND LAND USE MANAGEMENT ACT

The Spatial Planning and Land Use Management Act, No.16 of 2013, has been in effect since July 2015. Essentially SPLUMA applies to the governance of how land is used, which is significant for developers who are applying for land developments. The objectives of the act are to:

- provide for a uniform, effective and comprehensive system of spatial planning and land use management for the Republic;
- ensure that the system of spatial planning and land use management promotes social and economic inclusion;
- provide for development principles and norms and standards;
- provide for the sustainable and efficient use of land;
- provide for cooperative government and intergovernmental relations amongst the national, provincial and local spheres of government; and
- redress the imbalances of the past and ensure that there is equity in the application of spatial development planning and land use management systems.

The proposed site falls within an “Industrial and commercial focus zone” and the proposed development is a power producing CCGT power station (industrial facility), effectively being located within an appropriate land use zone. No SPLUMA application will be required for the new CCGT plant.

5.10 PROMOTION OF ADMINISTRATIVE JUSTICE ACT 3 OF 2000

The Bill of Rights in the Constitution of the Republic of South Africa 1996 states that everyone has the right to administrative action that is legally recognised, reasonable, and procedurally just. The Promotion of Administrative Justice Act (PAJA) 3 of 2000 gives effect to this right. The PAJA applies to all decisions of all State organisations exercising public power or performing a public function in terms of any legislation that negatively affects the rights of any person. The Act prescribes what procedures an organ of State must follow when it takes



decisions. If an organ of State implements a decision that impacts on an individual or community without giving them an opportunity to comment, the final decision will be illegal and may be set aside. The Promotion of Administrative Justice Act 3 of 2000 also forces State organisations to explain and give reasons for the manner in which they have arrived at their decisions and, if social issues were involved, and how these issues were considered in the decision-making process. The Promotion of Administrative Justice Act 3 of 2000 therefore protects the rights of communities and individuals to participate in decision-making processes, especially if these processes affect their daily lives. This EIA process gives effect to the PAJA.

5.11 THE NATIONAL ROAD TRAFFIC ACT

The National Road Traffic Regulations (1999) promulgated under Section 75 of the National Road Traffic Act (Act No. 93 of 1996) regulate the conveyance of abnormal loads and dangerous goods on public roads.

The National Road Traffic Act (1996) seeks to ensure that unintentional incidents are prevented and managed in a responsible way, and it makes persons accountable for their actions. Some of the requirements in the legislation include:

- Registration of operators: All dangerous goods operators who are operating vehicles whose gross vehicle mass is in excess of 3500 kilograms are required to register with the Department of Transport as dangerous goods operators.
- Driving licence: A special category D professional driving licence will be required. Signage on vehicles: All operators transporting dangerous goods will be required to identify their vehicles accordingly. This will include an orange diamond in front of the vehicle, placards on the sides and rear of the vehicle;
- Documentation: The driver of the vehicle will be required to carry at least 3 different documents, including a route plan, a transport emergency card and a document known as the dangerous goods declaration. The dangerous goods declaration will contain details of the consignor, consignee, the operator, the correct name of the product and the hazards associated with the chemical. The operator is also required to inform the emergency services situated along the routes which he will travel, what will be transported and the quantities so that appropriate measures will be taken to deal with an emergency;
- Responsibility of consignors and consignees: The legislation requires operators, consignors and consignees to take responsibility for their actions within each phase of the transport process. Each Party will be required by law to sign an operational agreement confirming the responsibility attached to them. In this way the responsible person could be held accountable in the event of an incident arising out of negligence.

It is understood that storage of emergency diesel will be undertaken at the Kelvin Power CCGT Station and other chemicals. Transportation of the dangerous goods (e.g. diesel and chemicals) will be undertaken via roads. Kelvin Power will need to ensure that all service providers abide by the provisions of the National Traffic Act.

5.12 HAZARDOUS SUBSTANCES ACT

The Hazardous Substances Act (Act 15 of 1973) regulates the control of substances that may cause injury, or ill health, or death, due to their toxic, corrosive, irritant, strongly sensitising or flammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products. A license is required for an operation that stores, handles and sells Group I substances. The Act also prescribed the disposal of certain hazardous substances and their containers. Hazardous wastes temporarily stored on site will require disposal in line with the requirements of this Act.

5.13 DISASTER MANAGEMENT ACT

The Disaster Management Act 57 of 2002 makes provision for national, provincial, and municipal disasters. It requires disaster management frameworks on all three spheres of government. Each district municipality must



establish a disaster management centre in consultation and partnership with local municipalities. The act spells out the duties and powers of a municipal disaster management centre, specifying that it must specialise in issues relevant to the municipal area and promote an integrated and coordinated approach to disaster management. It encourages a risk averse approach and the development of a municipal disaster management plan. The act identifies the responsibilities of the municipality in the event of a local disaster and requirements to declare a municipal state of disaster. It further sets out principles about funding of post-disaster recovery and rehabilitation. Kelvin Power must ensure that should any events that may impact municipal infrastructure or people's health occur they will swiftly notify the municipality of such to ensure it is handled accordingly.

5.14 OCCUPATIONAL HEALTH AND SAFETY ACT

The Occupational Health and Safety Act (Act 85 of 1993 - OHSA) provides for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work; to establish an advisory council for occupational health and safety; and to provide for matters connected therewith. Worker safety will form part of the contractor's safety requirements and be guided by the OHSA. This would entail a full health and safety file including but not limited to pre-mobilization medical assessments, work environment and task specific risk assessments and method statements etc. Once the plant is in operation worker safety will be covered by the Kelvin Power safety philosophy, risk assessments and Standard Operating Procedures which are all required to comply with the OHSA. Therefore safety of all personnel will be guided by overarching South African legislation.

The Major Hazard Installation Regulations (GNR 692 of 30 July 2001) are promulgated under the OHSA and apply to employers, self-employed persons and users, who have on their premises, either permanently or temporarily, a major hazard installation or a quantity of a substance which may pose a risk that could affect the health and safety of employees and the public.

A "major hazard installation" means an installation-

- a) where more than the prescribed quantity of any substance is or may be kept, whether permanently or temporarily; or
- b) where any substance is produced, processed, used, handled or stored in such a form and quantity that it has the potential to cause a major incident;

MHI qualitative risk assessment shall be undertaken to confirm whether the project or any of its components is/are defined as an MHI, and to inform the necessary risk mitigation.

5.15 BASIC CONDITIONS OF EMPLOYMENT ACT

The Basic Conditions of Employment Act (Act 75 of 1997) gives effect to the right to fair labour practices referred to in section 23(1) of the Constitution by establishing and making provision for the regulation of basic conditions of employment; and thereby to comply with the obligations of the Republic as a member state of the International Labour Organisation. The Basic Conditions of Employment Amendment Act, No 20 of 2013 was published and became effective on 1 September 2014. Kelvin Power will need to ensure that they are compliant to all provisions of this act.

5.16 LABOUR RELATIONS ACT

The Labour Relations Act (Act 66 of 1995) aims to promote economic development, social justice, labour peace and democracy in the workplace. It sets out to achieve this by fulfilling the primary objectives of the Act, which are to give effect to and regulate the fundamental rights conferred by section 27 of the Constitution, including the right to fair labour practices, to form and join trade unions and employer's organisations, to organise and bargain collectively, and to strike and lock out; to provide a framework for regulating the relationship between employees and their unions on the one hand, and employers and their organisations on the other hand. At the same time it also encourages employers and employees to regulate relations between themselves; and to promote orderly collective bargaining, collective bargaining at sectoral level, employee participation in decision-



making in the workplace and the effective resolution of labour disputes. Kelvin Power will need to ensure that they are compliant to all provisions of this act.

5.17 EMPLOYMENT EQUITY ACT

The Employment Equity Act (Act 55 of 1998) promotes equity in the workplace, ensures that all employees receive equal opportunities and that employees are treated fairly by their employers. The law protects employees from unfair treatment and any form of discrimination. The law states that an employer may not discriminate against an employee directly or indirectly through employment policy or practice on the grounds of race, gender, pregnancy, marital status, family responsibility, ethnic or social origin, colour, sexual orientation, age, disability, religion, HIV status, conscience, belief, political opinion, culture, language, and birth.

The law aims to redress injustices of the past by implementing affirmative action measures. According to the legislation, it isn't unfair discrimination to promote affirmative action consistent with the Act or to prefer or exclude any person on the basis of an inherent job requirement. Kelvin Power will need to ensure that they are compliant to all provisions of this act.

5.18 PROMOTION OF EQUALITY AND PREVENTION OF UNFAIR DISCREMINATION

The Promotion of Equality and Prevention of Unfair Discrimination Act (Act 4 of 2000) gives expression to the right to equality. Section 8 stipulates that no person may be unfairly discriminated against on the grounds of gender, expressly including gender-based violence. Section 8 of the Act goes onto prohibit any limitation of women's access to social services, such as health or education, and the denial or systemic inequality of access to opportunities. Kelvin Power will need to ensure that they are compliant to all provisions of this act.

5.19 NATIONAL ENERGY ACT

The National Energy Act (Act 34 of 2008) provides to ensure that diverse energy resources are available, in sustainable quantities and at affordable prices, to the South African economy in support of economic growth and poverty alleviation, taking into account environmental management requirements and interactions amongst economic sectors; to provide for energy planning, increased generation and consumption of renewable energies, contingency energy supply, holding of strategic energy feedstocks and carriers, adequate investment in, appropriate upkeep and access to energy infrastructure; to provide measures for the furnishing of certain data and information regarding energy demand, supply and generation; to establish an institution to be responsible for promotion of efficient generation and consumption of energy and energy research; and to provide for all matters connected therewith. Importantly, the Department of Energy (DoE) is mandated to provide for energy planning and measures for the furnishing of certain data and information regarding energy demand, supply and generation.

The objectives of this Act are to:

- a) Ensure uninterrupted supply of energy to the Republic;
- b) Promote diversity of supply of energy and its sources;
- c) Facilitate effective management of energy demand and its conservation;
- d) Promote energy research;
- e) Promote appropriate standards and specifications for the equipment, systems and processes used for producing, supplying and consuming energy;
- f) Ensure collection of data and information relating to energy supply, transportation and demand;
- g) Provide for optimal supply, transformation, transportation, storage and demand of energy that are planned, organised and implemented in accordance with a balanced consideration of security of supply, economics, consumer protection and a sustainable development;
- h) Provide for certain safety, health and environment matters that pertain to energy;
- i) Facilitate energy access for improvement of the quality of life of the people of Republic;



- j) Commercialise energy related technologies;
- k) Ensure effective planning for energy supply, transportation and consumption; and
- l) Contribute to sustainable development of South Africa s economy.

The Act provides for the establishment of the South African National Energy Development Institution (SANEDI), whose functions include:

Energy efficiency –

- i. Undertake energy efficiency measures as directed by the Minister;
- ii. Increase energy efficiency throughout the economy;
- iii. Increase the gross domestic product per unit of energy consumed; and
- iv. Optimise the utilisation of finite energy resources;

Energy research and development -

- i. Direct, monitor, conduct and implement energy research and technology development in all fields of energy, other than nuclear energy;
- ii. Promote energy research and technology innovation; and
- iii. Provide for –
 - a. training and development in the field of energy research and technology development;
 - b. establishment and expansion of industries in the field of energy; and
 - c. commercialisation of energy technologies resulting from energy research and development programmes;
- iv. Register patents and intellectual property in its name resulting from its activities;
- v. Issue licences to other persons for the use of its patents and intellectual property;
- vi. Publish information concerning its objects and functions;
- vii. Establish facilities for the collection and dissemination of information in connection with research, development and innovation;
- viii. Undertake any other energy technology development related activity as directed by the Minister, with the concurrence of the Minister of Science and Technology;
- ix. Promote relevant energy research through cooperation with any entity, institution or person equipped with the relevant skills and expertise within and outside the Republic;
- x. Make grants to educational and scientific institutions in aid of research by their staff or for the establishment of facilities for such research;
- xi. Promote the training of research workers by granting bursaries or grants in aid for research;
- xii. Undertake the investigations or research that the Minister, after consultation with the Minister of Science and Technology, may assign to it; and
- xiii. Advise the Minister and the Minister of Science and Technology on research in the field of energy technology.

Kelvin aims to produce electricity through the use of gas providing energy to be supplied to end users via the Eskom grid. The production of energy at the Kelvin CCGT plant will be subject to the conditions and requirements of this Act, and the gas production on the whole will contribute to the South African economy.



5.20 GAS ACT

The Gas Act (Act 48 of 2001) aims to promote the orderly development of the piped gas industry; to establish a national regulatory framework; to establish a National Gas Regulator as the custodian and enforcer of the national regulatory framework; and to provide for matters connected therewith. This Kelvin CCGT project may indirectly promote development piped gas. Section 15(1) of the Gas Act states that no person may without a licence issued by the Gas Regulator:

- a) construct gas transmission, storage, distribution, liquefaction and re-gasification facilities or convert infrastructure into such facilities;
- b) operate gas transmission, storage, distribution, liquefaction or re- gasification facilities; or
- c) trade in gas.

Kelvin may require a licence from the Gas Regulator for the gas infrastructure that may be required on this CCGT Project.

5.21 NATIONAL GAS INFRASTRUCTURE PLAN

The gas infrastructure plan is intended to be a strategy for the development of the natural gas industry in South Africa. Government wishes to promote the gas industry based on its energy policy objectives as set out in the White Paper on Energy (1998). These include:

- Increasing access to affordable energy services;
- Improving energy governance;
- Stimulating economic activity;
- Managing energy-related environmental impacts;
- Securing security of supply through diversity of supply;
- Competition within and between energy carriers; and
- Promoting New Partnership for African Development (NEPAD) cross-border type projects.

It is noteworthy that a supply of gas will be required as fuel for the CCGT plant. The gas will be supplied to the CCGT through a short connection from an Sasol gas pipeline. Various stakeholders are being engaged for the supply of gas. The proposed power generation plant is privately owned and will be in a position to supply energy to the grid through a PPA at competitive prices.

5.22 INTEGRATED RESOURCE PLAN

The Minister of Mineral Resources and Energy (Minister) published the current Integrated Resource Plan (IRP 2019) as GN 1360 of 18 October 2019 in Government Gazette No. 4278. The Determination provides for various energy sources to be procured from Independent Power Producers (IPPs) through one or more IPP Procurement Programmes as contemplated in the Electricity Regulations on New Generation Capacity, 2011. The plan aimed to balance a number of objectives, namely to ensure security of supply, to minimize cost of electricity, to minimize negative environmental impact (emissions) and to minimize water usage. The IRP 2019 makes provision for gas from year 2024.

A Draft IRP (2023) has been published for comment as necessitated by changing circumstances. The IRP continues to highlight South Africa's pursuit of a diversified energy mix that will provide security of supply while ensuring compliance with its emission reduction plan. The Draft IRP highlights that Gas to power technologies in the form of CCGT, Closed Cycle Gas Engine (CCGE) or Internal Combustion Engine (ICE) provide the flexibility required to complement renewable energy. South Africa looks to import gas whilst promoting exploration of gas locally and regionally to enable scaling up. It is noteworthy that the Draft IRP (2023) has not yet been promulgated.



5.23 GREEN HOUSE GAS AND CLIMATE CHANGE

GHGs are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of thermal infrared radiation emitted by the Earth's surface, the atmosphere itself, and by clouds. This property causes the greenhouse effect. Water vapour (H₂O), carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄) and ozone (O₃) are the primary greenhouse gases in the earth's atmosphere. Moreover, there are a number of entirely human-made greenhouse gases in the atmosphere, such as the halocarbons and other chlorine and bromine containing substances, dealt with under the Montreal Protocol. Beside CO₂, N₂O and CH₄, the Kyoto Protocol deals with the greenhouse gases sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) (IPCC, 2007). Human activities since the beginning of the Industrial Revolution (taken as the year 1750) have produced a 40% increase in the atmospheric concentration of carbon dioxide, from 280 ppm in 1750 to 415 ppm in early September 2021 (NOAA, 2021). This increase of CO₂ in the Earth's atmosphere has occurred despite the uptake of a large portion of the emissions by various natural "sinks" involved in the carbon cycle (NOAA, 2021). Anthropogenic CO₂ emissions (i.e., emissions produced by human activities) come from combustion of fossil fuels, principally coal, oil, and natural gas, along with waste processing and decomposition, deforestation, soil erosion and animal agriculture (IPCC, 2007).

The IFC lists methods that countries and projects can reduce GHG impacts. These include carbon financing; improvement of energy efficiency; GHG sinks and reservoir protection and improvements; that environmentally friendly agriculture and forestry be encouraged; the increased use of renewable energy methods; implementation of carbon capture and sequestration methods; and improved waste management (recovery and use of methane emissions) as well as reducing GHG emissions from vehicle use and industrial, construction and energy production processes (IFC, 2007). Carbon financing may have much potential in developing countries as well as sustainable agriculture and forestry practices (IFC, 2012), and when supported by governments may be a way of reducing the country's GHG impacts, where projects receive carbon credits and financing for reducing GHG emissions and installing more environmentally friendly alternatives. Because different industries contribute various amounts of GHG emissions, the IFC performance standards suggests that for industrial processes the CO₂-equivalent (CO₂-e) emissions per year do not exceed 100 000 tonnes, this including direct (Scope 1) and indirect (Scope 2) sources (IFC, 2012).

5.23.1 INTERNATIONAL AGREEMENTS

In 1992, countries joined an international treaty, the United Nations Framework Convention on Climate Change, (UNFCCC) as a framework for international cooperation to combat climate change by limiting average global temperature increases and the resulting climate change, and coping with impacts that were, by then, inevitable.

By 1995, countries launched negotiations to strengthen the global response to climate change, and, two years later, adopted the Kyoto Protocol. The Kyoto Protocol legally binds developed country parties to emission reduction targets. The Protocol's first commitment period started in 2008 and ended in 2012. As agreed in Doha in 2012, the second commitment period began on 1 January 2013 and will end in 2020 (UNFCCC, 2017) but due to lack of ratification has not come into force.

The Paris Agreement (2016) builds upon the Convention and – for the first time – brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so. As such, it charts a new course in the global climate effort.

The central aim of the Paris Agreement is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2.0°C above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5°C. Additionally, the agreement aims to strengthen the ability of countries to deal with the impacts of climate change. To reach these ambitious goals, appropriate financial flows, a new technology framework and an enhanced capacity building framework will be put in place, thus supporting action by developing countries and the most vulnerable countries, in line with their own national objectives.



The Paris Agreement requires all Parties to put forward their best efforts through “nationally determined contributions” (NDCs) and to strengthen these efforts in the years ahead. This includes requirements that all Parties report regularly on their emissions and on their implementation efforts.

In 2018, Parties took stock of the collective efforts in relation to progress towards the goals set in the Paris Agreement to inform the preparation of NDCs. There will also be a global stocktake every five years to assess the collective progress towards achieving the purpose of the Agreement and to inform further individual actions by Parties.

As of October 2022, 194 Parties of the 197 Parties to the UNFCCC Convention, including South Africa, had ratified the Paris Agreement. South Africa submitted its NDC to the UNFCCC on 25 September 2016 and an updated NDC in September 2021.

5.23.2 SOUTH AFRICAN NATIONAL CLIMATE CHANGE RESPONSE POLICY 2011

South Africa ratified the UNFCCC in August 1997 and acceded to the Kyoto protocol in 2002, with effect from 2005. However, since South Africa is an Annex 1 country it implies no binding commitment to cap or reduce GHG emissions. South Africa later also ratified the Paris Agreement (as signed on 22 April 2016) which although not bound to commit to a cap or reduce GHG emissions, pledged to reduce emissions by 34% below Business-As-Usual (BAU) emissions by 2020 and 42% below BAU by 2025. The proposed 2030 target range represents a 28% reduction in GHG emissions commitment from the original 2015 NDC targets. However, these original goals were ambitious and South Africa subsequently shifted from BAU-based targets for 2020 and 2025 in terms of the Cancun Agreement under the UNFCCC, to absolute GHG emissions targets under the Paris Agreement. This update demonstrates reducing the upper range of South Africa’s targets by a more realistic 17% for 2025 and 28% for 2030, respectively.

The National Climate Change Response White Paper, passed by Cabinet in October 2011, stated that in responding to climate change, South Africa has two objectives: to manage the inevitable climate change impacts and to contribute to the global effort in stabilising GHG emissions at a level that avoids dangerous anthropogenic interference with the climate system. The White Paper proposes mitigation actions, especially a departure from coal-intensive electricity generation, be implemented in the short- and medium-term to match the GHG trajectory range. Peak GHG emissions are expected between 2020 and 2025 before a decade long plateau period and subsequent reductions in GHG emissions.

The White Paper also highlighted the co-benefit of reducing GHG emissions by improving air quality and reducing respiratory diseases by reducing ambient particulate matter, ozone, and sulphur dioxide concentrations to levels in compliance with the National Ambient Air Quality Standards (NAAQS) by 2020. To achieve these objectives, the Department of Forestry, Fisheries and Environment (DFFE) established a national GHG emissions inventory that reports through the South African Atmospheric Quality Information System (SAAQIS).

The draft Climate Change Bill was published for comment on the 8th of June 2018 and introduced to parliament on the 18th of February 2022 (B9-2022). The Bill is aligned with international policies guidelines and South Africa’s NDC and aim to reduce GHG emissions as primary driver to anthropogenic climate change. The aim of the Bill is to achieve an effective climate change response through a long-term just transition to a low carbon economy that is climate resilient and allows for sustainable development of South Africa. When in force, the Bill will:

- Establish provincial and municipal forums on climate change which will be responsible for co-ordinating climate change response actions in each province.
- Strengthen the establishment of the Presidential Climate Change Coordinating Commission (4PC). Although, the 4PC has already been established and has been working for the Government since December 2020, its establishment only carries legal force after the Bill becomes an Act.
- Establish a National Adaptation Strategy to guide South Africa's adaptation to the impacts of climate change and develop adaptation scenarios which anticipate the likely impacts over the short, medium, and long term.



- Determine a national GHG emissions trajectory, which must be reviewed every five years, and which indicates an emissions reduction objective.
- Put in place a 5-yearly sectoral emission targets for identified sectors and sub-sectors that must be aligned with the national GHG emissions trajectory and include quantitative and qualitative GHG emission reduction goals.
- Bring into force the carbon budget allocation mechanism, which will be linked to the Carbon Tax Act, which will replace the current National Pollution Prevention Plan mechanism which is enforced under the National Environmental Management: Air Quality Act (NEM:AQA).

The Bill is nearing the end of its parliamentary process having been passed by the National Council of Provinces and been returned to the National Assembly for concurrence. It is likely to be enacted during the operational lifetime of the proposed project activities, if not before.

5.23.3 NATIONALLY DETERMINED CONTRIBUTION

The first South African NDC submission was completed in 2016. This was undertaken to comply with decision 1/CP.19 and 1/CP.20 of the Conference of the Parties to the UNFCCC. An update of the first NDC was published submitted to the UNFCCC on 27 September 2021 in preparation for the 26th Conference of the Parties (held in Glasgow, Scotland in November 2021). This document describes South Africa's NDC on adaptation, mitigation and finance and investment necessities to undertake the resolutions with updated revisions to the adaptation goals and mitigation targets.

As part of the updated adaption portion the following goals have been assembled:

1. Goal 1: Enhance climate change adaptation governance and legal framework.
2. Goal 2: Develop an understanding of the impacts on South Africa of 1.5 and 2°C global warming and the underlying global emission pathways through geo-spatial mapping of the physical climate hazards, and adaptation needs in the context of strengthening the key sectors of the economy. This will provide the scientific basis for strengthening the national and provincial governments' readiness to respond to climate risk.
3. Goal 3: Implementation of National Climate Change Adaptation Strategy adaptation interventions for the period 2021 to 2030, where priority sectors have been identified as biodiversity and ecosystems; water; health; energy; settlements (coastal, urban, rural); disaster risk reduction, transport infrastructure, mining, fisheries, forestry, and agriculture.
4. Goal 4: Mobilise funding for adaptation implementation through multilateral funding mechanisms.
5. Goal 5: Quantification and acknowledgement of the national adaptation and resilience efforts.

As part of the mitigation portion the following have been, or can be, implemented at National level:

- The approval of 79 (5 243 MW) renewable energy Independent Power Producer projects as part of a Renewable Energy Independent Power Producer Procurement Programme. An additional 6 300 MW is being deliberated.
- A "Green Climate Fund" has been created to back green economy initiatives. This fund will be increased in the future to sustain and improve successful initiatives.
- It is intended that by 2050 electricity will be decarbonised.
- Carbon Capture and Sequestration (or Carbon Capture and Storage) (CCS).
- To support the use of electric and hybrid electric vehicles.
- Reduction of emissions can be achieved through the use of energy efficient lighting; variable speed drives and efficient motors; energy efficient appliances; solar water heaters; electric and hybrid electric vehicles; solar photovoltaic (PV); wind power; CCS; and advanced bioenergy.



- Updated targets based on revised 100-year global warming potential (GWP) factors (published in the Annex to decision 18/CMA.1 of the Intergovernmental Panel on Climate Change’s (IPCC) 5th assessment report) and based on exclusion of land sector emissions arising from natural disturbance. The updated NDC mitigation targets, consistent with South Africa’s fair share, are presented in Table 9.

Table 9: South Africa's NCD mitigation targets.

Year	Target	Corresponding period
2025	South Africa’s annual GHG emissions will be in a range between 398 - 510 Mt CO ₂ -e.	2021-2025
2030	South Africa’s annual GHG emissions will be in a range between 398 - 440 Mt CO ₂ -e.	2026-2030

5.23.4 THE CARBON TAX ACT

The Carbon Tax Act gives effect to the polluter-pays-principle for large emitters and helps to ensure that firms and consumers take the negative adverse costs (externalities) into account in their future production, consumption and investment decisions. Firms are incentivized towards adopting cleaner technologies over the next decade and beyond.

The Government of South Africa has outlined its strong commitment to play its part in global efforts to mitigate Green House Gases (GHG) emissions as outlined in the National Climate Change Response Policy (NCCRP) of 2011 and the National Development Plan (NDP) of 2012. South Africa subsequently set its own domestic targets as outlined in the Nationally Determined Contribution (NDC), which was incorporated as the South African commitment in the Paris Agreement (convened by the United Nations Framework Convention on Climate Change (UNFCCC). South Africa ratified the Paris Agreement in November 2016. The carbon tax forms an integral part of ensuring that South Africa meets these targets. The carbon tax will initially only apply to scope 1 emitters in the first phase. The first phase will be from 1 June 2019 to 31 December 2022, and the second phase from 2023 to 2030.

The introduction of the carbon tax will also not have any impact on the price of electricity for the first phase. This will result in a relatively modest carbon tax rate ranging from R6 to R48 per tonne of CO₂ equivalent emitted, which is a relatively low tax rate to further provide current significant emitters time to transition their operations to cleaner technologies through investments in energy efficiency, renewables, and other low carbon measures.

A review of the impact of the tax will be conducted before the second phase, after at least three years of implementation of the tax, and will consider the progress made to reduce GHG emissions in line with our NDC Commitments. Any person, company or entity who undertakes an activity (above a certain threshold) and is responsible for the release of GHG emissions is required to report on their emissions to the DFFE by the 31 March each year and pay tax on those emissions by July each year. Kelvin is to ensure they comply with the Act as the proposed development entails the generation of emissions from the power plant.

5.23.5 THE NATIONAL GREEN HOUSE GASES EMISSION REPORTING REGULATIONS, 2017

The following six Green House Gases (GHGs) were declared as priority air pollutants in South Africa:

- Carbon dioxide (CO₂)
- Methane (CH₄)
- Nitrous Oxide (N₂O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulphur hexafluoride (SF₆)

National GHG Emission Reporting Regulations (Government Gazette No. 40762 of 3 April 2017), as amended (General Notice 994 in Government Notice 43712 of 11 September 2020), were published by the DFFE. A person identified as a data provider in terms regulation 4(1) of these regulations, must register their facilities using the



online South African Greenhouse Gas Reporting System (SAGERS) (<https://ghgreporting-public.environment.gov.za/GHGlanding/>). Once registered the data provider must submit a GHG emissions inventory, activity data and report in the required format given under Annexure 3 of these regulations on an annual basis. All data must be provided annually, by the 31 March of the following year. Based on the EAPs preliminary assessment, the proposed CCGT plant will trigger Annexure A listed activities. Kelvin Power will need to quantify and report on the proposed plant's GHG emissions by the 31 March of each year.

5.23.6 GREEN HOUSE GAS INVENTORIES

5.23.6.1 NATIONAL GHG EMISSIONS INVENTORY

South Africa is a GHG contributor and is undertaking steps to mitigate and adapt to the changing climate. DFFE is categorised as the lead climate change institution and is required to coordinate and manage climate related information such as development of mitigation, monitoring, adaptation and evaluation strategies (DFFE, 2022a). This includes the establishment and updating of the National GHG Inventory. The National Greenhouse Gas Improvement Programme (GHGIP) has been initiated; it includes sector specific targets to improve methodology and emission factors used for the different sectors as well as the availability of data.

The 2020 National GHG Inventory was prepared using the 2006 IPCC Guidelines (IPCC, 2006). According to the draft 8th National GHG Inventory Report to the UNFCCC (DFFE, 2021), the total GHG emissions in 2020 were estimated at approximately 478.634 million metric tonnes CO₂-e (excluding Forestry and Other Land Use (FOLU)). This was a 1% increase from the 2000 total GHG emissions (excluding FOLU). FOLU is estimated to be a net carbon sink which reduces the 2020 GHG emissions to 445.566 million metric tonnes CO₂-e. The assessment (excluding FOLU) showed the main sector contributing to GHG emissions in 2020 to be the energy industry, contributing 79.4 % to the total GHG emissions (excluding FOLU), this increased by 2.4% from 2000.

5.23.6.2 GHG EMISSIONS INVENTORY FOR THE SECTOR

The proposed project would be categorised in the energy category for both the global GHG inventory and for the national GHG inventory. According to the World Resources Institute – CAIT Climate Data Explorer the 2020 global GHG emissions from the energy category were approximately 937 000 Gt CO₂-e; 74% of the total GHG emissions (including Land-Use Change and Forestry (LUCF)). The South African energy sector contributed 11.9 Gt CO₂-e, ~1.3% of the global emissions from the energy sector in 2020.

5.23.6.3 DRAFT NATIONAL GUIDELINE OF CLIMATE CHANGE IN DEVELOPMENT APPLICATIONS, JUNE 2021

The DFFE published (on 25 June 2021) a notice under the NEMA requesting public comment on the Draft National Guideline for the consideration of climate change implications in applications for environmental authorisation, atmospheric emission licences and waste management licences.

The Draft National Guideline has been developed to support the inclusion of climate change considerations into the Environmental Impact Assessment (EIA) process, and to create a consistent approach for such incorporation, which will help proponents to assess:

- How a proposed development will likely exacerbate climate change;
- The impact of a development on features (natural and built) that are crucial for climate change adaptation and resilience; and,
- The sustainability of a development in the context of climate change projection.

The Guideline puts forward “a consistent approach in providing interested and affected parties (for example, proponents, EAPs and specialists) with the minimum requirements to consider when undertaking a climate change assessment, which forms part of an application for environmental authorisation, an atmospheric emissions licence, and/or waste management licence”.

One of the impact requirements for a climate change assessment is an estimation of the GHG emissions, direct and indirect (including upstream GHG emissions) that will be released into the atmosphere annually throughout the impact related to the activity. This implies that scope 1, 2 and 3 will need to be quantified.



The comment period for amendments to the draft guideline has now closed but the final guideline has not yet been published. As far as possible the guideline has been followed in the preparation of this climate change impact assessment in support of environmental authorisation.

The above draft regulations will be considered during the undertaking of this EIA assessment.

5.24 THE GAUTENG ENVIRONMENTAL MANAGEMENT FRAMEWORK

The Gauteng Department of Agriculture and Rural Development and Environment (GDARDE) has developed an Environmental Management Framework Tool to streamline the requirements for an Environmental Impact Assessment (EIA) and reduce the need for the undertaking of EIA requirements, a reduction in timeframes for approvals and as a contribution towards reducing the cost of doing business in Gauteng. In this tool, several NEMA listed activities are excluded from the requirement to obtain an EA. Government Notice 164 in Government Gazette No. 41473 of 2 March 2018 presents a list of activities that are excluded from the need to obtain an Environmental Authorisation as they occur within Zones 1 and 5 of the Gauteng Provincial Environmental Management Framework (GPEMF).

Table 10: Gauteng Provincial Environmental Management Framework Zones

ZONE	INTENTION
Zone 1: Urban development zone	The intention with this zone is to streamline urban development activities in it and to promote development infill, densification and concentration of urban development, in order to establish a more effective and efficient city region that will minimise urban sprawl into rural areas.
Zone 2: High control zone (within the urban development zone)	This zone is sensitive to development activities. Only conservation should be allowed in this zone. Related tourism and recreation activities must be accommodated in areas surrounding this zone
Zone 3: High control zone (outside the urban development zone)	This zone is sensitive to development activities and in several cases also have specific values that need to be protected. Conservation and related tourism and recreation activities should dominate development in this zone.
Zone 4: Normal control zone	Intention This zone is dominated by agricultural uses outside the urban development zone. Agricultural and rural development that support agriculture should be promoted
Zone 5: Industrial and large commercial focus zone Intention	The intention with Zone 5 is to streamline non-polluting industrial and large-scale commercial (warehouses etc.) activities in areas that are already used for such purposes and areas that are severely degraded but in proximity to required infrastructure.

The Kelvin power station plant site was found to fall within Zone 5 of the GPEMF (Figure 7). Various EIA Activities are excluded under the GPEMF (Listing Notice 2, Activity 4 and 9). DFFE however advised that the activities that fall under the Gauteng EMF zone 5 must still be included as part of the application for the CCGT, therefore these activities have been included in the EA application and in Section 4 of this report.

5.25 THE GAUTENG POLLUTION BUFFER ZONES

The GDARD's Gauteng Buffer Zone Guideline was initially developed in 2002 and reviewed in 2006. GDARD has undertaken to revise the guideline to determine its effectiveness, relevance and applicability to the current operating environment in the province. The guideline was developed to ensure that pollution buffer areas are



created between the pollution sources and the nearest human settlements. Over the years of using the buffer zone guideline, GDARD has realized that due to the constantly changing landscape in the province, as influenced by factors such as development pressure and technological changes, the sole reliance on just the buffer areas as stipulated in the authorisations, permits and licenses to protect the receiving environment from the effects of pollution, needs to be periodically enhanced. The department (GDARD) is continuously adopting the approach of integrated management of the buffer zones inclusive of stakeholders such as the municipalities and the industries.

GDARD is the responsible authority for issuing environmental authorisations in the Gauteng Province where relevant. The department has reviewed guidelines for Pollution Buffer Zones with an intention to provide direction on how to respond to the development applications that require pollution buffers due to their proximity to industrial and other land uses that may have a deleterious health effect on people. The purpose of this guideline is to ensure that the residents of the Gauteng province are protected from the emissions from pollution generators. Care should be taken in the placement of incompatible land uses with an emphasis on mitigation measures that will be implemented; this should not be a norm, but a consideration on a case by case basis.

Industries and other pollution sources identified in Gauteng were classified based on the department 's brief and the release or potential for the release of harmful effluent or emissions and associated nuisance factors like noise. The classification is made on the basis of the nature and level of pollution or potential release of effluents or emissions associated with particular industrial areas. Industrial areas with pollution risks that can have potentially serious health effects on a large scale have been placed in Category 1. Industrial areas with pollution risks that may cause minor health effects or with activities that result in nuisance rather than actual health impacts were placed in Category 2. Industrial areas that pose little or no health impacts and that may result in a nuisance on a localized scale have been placed in Category 3. A review of the scope of the proposed development, the spatial location and GDARD's Gauteng Buffer Zone Guideline found that the proposed Kelvin CCGT powerplant plant in Kempton Park falls within Category 1. Category 1 industries have a best-case scenario buffer: of 1500m and worst-case buffer of 750m. It is however, noteworthy that the proposed development is located within an area classified in the GPEMF as a Zone 5 Industrial area. As such the proposed development is permissible within the proposed area. Provisions will be made in the EMPr to ensure the control of pollution as a result of the proposed development.

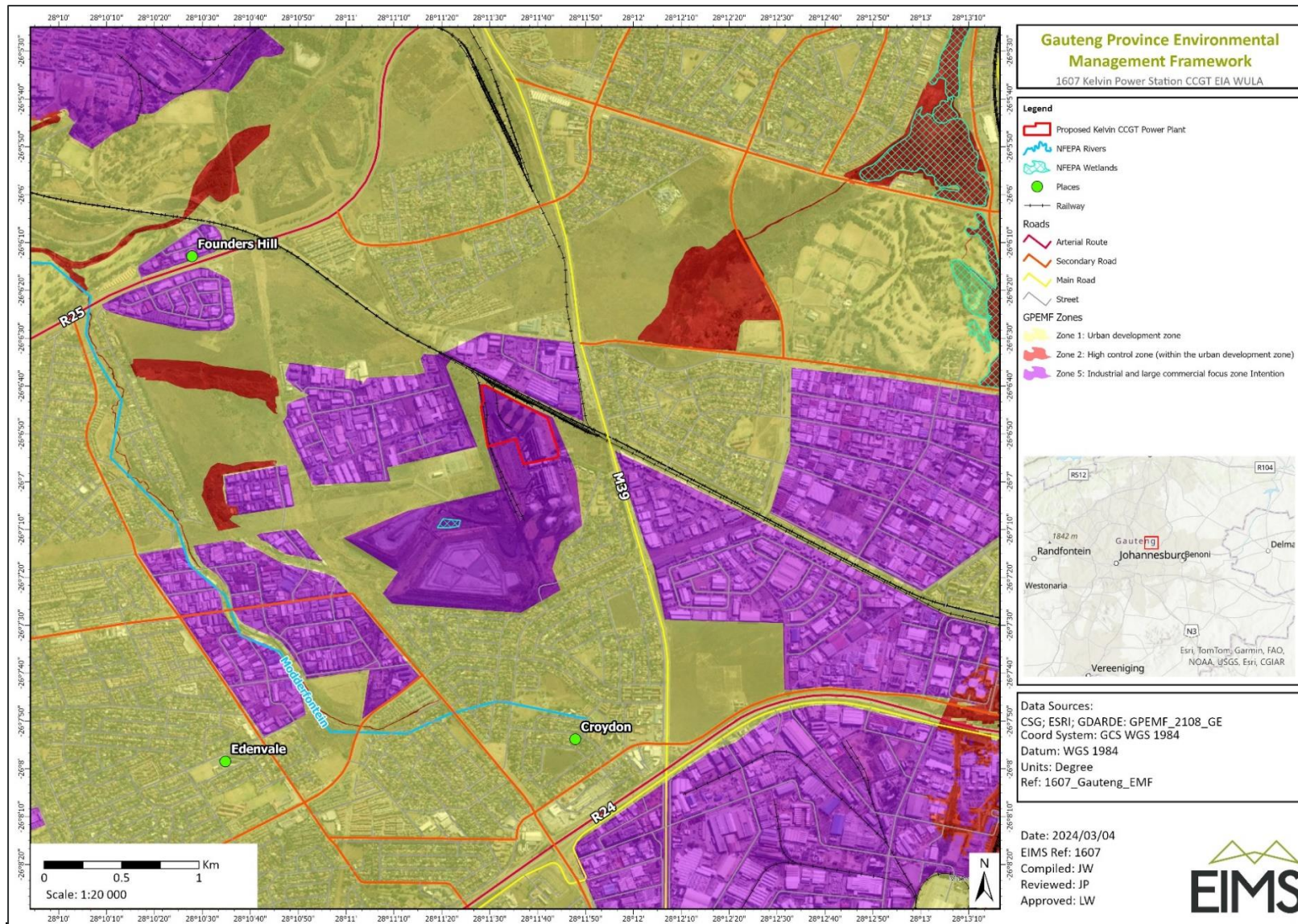


Figure 7: Map Illustrating Proposed Kelvin Power CCGT Plant within the GPEMF.



5.26 CITY OF EKURHULENI INTEGRATED DEVELOPMENT PLAN (IDP)

The City of Ekurhuleni 2022/23 – 2026/27 Integrated Development Plan (IDP) was approved in 2022 and reviewed for implementation in the 2023/24 financial year. The following priorities have been put in place by the City of Ekurhuleni:

- Ensure that every community has access to reliable, clean, running water, that is safe to drink and to prepare food; modernise water management and the detection of water leaks; and prevent untreated wastewater contaminating the environment, homes, streets, and sidewalks within the municipality.
- Ensure there is a hygienic environment to live and play delivered through effective waste collection and rubbish disposal to protect the environment and the health of residents; comply with environmental legislation; and ensure working landfill sites; and the implementation of recycling programmes.
- Give residents back their power by helping to reduce their vulnerability to Eskom load shedding and eradicate ESKOM supply areas; and enhance access to reliable, affordable, and sustainable electricity; incentivise pre-paid electricity systems and private electricity generation.
- Reclaim public spaces currently taken over by lawlessness, litter, and neglect so that they may be places for all residents to enjoy once again.
- Invest in safe, reliable, and affordable public transport, and well-maintained roads; and work to eradicate irrational national taxes and tolls on roads affecting municipal areas.
- Develop a holistic infrastructure strategy which combines the imperatives of an increased spend on PPE maintenance, infrastructure renewal and measures to safeguard infrastructure from vandalism and theft.
- Be tough on crime and tougher on the causes of crime by investing in localised law enforcement and tackling the local conditions which give rise to crime in the first place.
- Focus first on getting the basics right as the foundation to bringing in investment and jobs to the local economy. Beyond that the parties to this agreement are committed to improving the business environment by making it easier to do business within the municipality.
- Collaborate for transparent sustainable housing by increasing the scale of housing delivered through private initiative, diversifying housing options, and ensuring more people own their homes and receive their valid title deeds.
- Adopt a holistic approach to keeping communities in good health by ensuring that all departments work together to minimise the risks which lead to poor health, to respond effectively to health emergencies, and to achieve overall positive health outcomes.
- Govern in the interests of the people by eliminating corruption, adopting best practices in good governance, and ensuring the resilience of communities through effective disaster risk management.
- Support devolution of power to the lowest effective level within the constitutional and legislative framework; and ensure the effective functioning of ward committees by providing adequate administrative support.
- Promote, where it is deemed appropriate by a competent feasibility study, the establishment of sub-Councils in Metropolitan local governments.
- Audit and review the municipality's organogram and staff complement, including a review as envisioned by Section 4(3)a of the Regulations of the Municipal Structures Act, including remuneration levels; ensure the appointment of fit-for-purpose officials and the review of salary scales before filling vacant posts, where this is indicated by the review; and implement consequence management procedures for the transgression of laws and regulations, or non-performance.



- As per legislation municipal services should be run in a cost reflective manner, where possible we will avoid above-inflation increases in tariffs, rates and taxes, where unavoidable, this shall be adequately explained to the public.
- As per legislation municipal services should be run in a cost reflective manner, where possible we will avoid above-inflation increases in tariffs, rates and taxes, where unavoidable, this shall be adequately explained to the public.
- Be cognisant that illegal immigration and failures to document legal immigrants are issues that impact local governments and requires this coalition government to develop a holistic strategy to respond to these challenges. Any action in relation to illegal immigrants must adhere to the provisions of the South African Constitution, South African law, precepts of international law, the basic tenets of human compassion and decency, and avoid the promotion of xenophobia.

The proposed Kelvin project relates to the development of a CCGT plant within the City of Ekurhuleni and will be required to comply with the IDP.

In addition to the relevant district or local plans, there exists various international guidelines or standards that have relevance to this project and application, and these are described below.

5.27 NATIONAL AND INTERNATIONAL STANDARDS

National and international industry standards aimed at sustainable development and social justice specifically have become abundant in the last decade. Many industries use these standards as indicators for best practice. The discussion below highlights only a few of these standards.

5.27.1 ISO 26000:2010/SANS 26000:2010

Performance standards have long been a voluntary tool used by industry to achieve certain outcomes. The first standard on social responsibility, ISO 26000 was published on 1 November 2010 (ISO, 2010). It was developed using a multi-stakeholder approach involving experts from more than 90 countries and 40 international or broadly based regional organisations involved in different aspects of social responsibility (ISO, 2010).

The South African Bureau of Standards (SABS), a statutory body that is mandated to develop, promote, and maintain South African National Standards (SABS, [sa]) adopted the ISO 26000 Standard as a South African National Standard (SANS) 26000:2010.

Social responsibility is defined in the standard as the responsibility of an organisation for the impacts of its decisions and activities on society and the environment, through transparent and ethical behaviour that contributes to sustainable development, including health and welfare of society; takes into account the expectations of the stakeholders; complies with applicable law and is consistent with international behaviour norms, and is integrated throughout the organisation and practiced in its relationships (ISO, 2010).

The document identifies seven principles for social responsibility and seven core subjects that should be addressed by organisations. The seven principles for social responsibility are accountability, transparency, ethical behaviour, respect for stakeholder interests, respect for the rule of law, respect for international norms of behaviour and respect for human rights (ISO, 2010). The core subjects that should be addressed include organisational governance, human rights, labour practices, environment, fair operating practices, consumer issues and community involvement and development (ISO, 2010). Economic aspects, health and safety and the value chain are dealt with throughout the seven core subjects, and gender issues are considered.

ISO 26000 is a good introduction to what social responsibility is and what measures should be taken to move towards being a more socially responsible company. It deals with equity issues and can encourage social development initiatives by companies through activities such as social investment projects, employment creation, skills development, and income creation.



5.27.2 IFC PERFORMANCE STANDARDS

The IFC is an international financial institution that offers investment, advisory, and asset management services to encourage private sector development in developing countries.

The IFC's stated aim is to create opportunities for people to escape poverty and achieve better living standards by mobilizing financial resources for private enterprise, promoting accessible and competitive markets, supporting businesses and other private sector entities, and creating jobs and delivering necessary services to those who are poverty-stricken or otherwise vulnerable. Since 2009, the IFC has focused on a set of development goals that supported projects are expected to target. Its goals are to increase sustainable agriculture opportunities, improve health and education, increase access to financing for microfinance and business clients, advance infrastructure, help small businesses grow revenues, and invest in climate health.

The IFC's Sustainability Framework articulates the Corporation's strategic commitment to sustainable development and is an integral part of IFC's approach to risk management. The Sustainability Framework comprises IFC's Policy and Performance Standards on Environmental and Social Sustainability, and IFC's Access to Information Policy. The Policy on Environmental and Social Sustainability describes IFC's commitments, roles, and responsibilities related to environmental and social sustainability. IFC's Access to Information Policy reflects IFC's commitment to transparency and good governance on its operations and outlines the Corporation's institutional disclosure obligations regarding its investment and advisory services. The Performance Standards (PSs) are directed towards clients, providing guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities. In the case of its direct investments (including project and corporate finance provided through financial intermediaries), IFC requires its clients to apply the PSs to manage environmental and social risks and impacts so that development opportunities are enhanced. IFC uses the Sustainability Framework along with other strategies, policies, and initiatives to direct the business activities of the Corporation to achieve its overall development objectives. The PSs are often also be applied by other financial institutions and therefore these PSs are discussed in Table 11 in terms of the applicability of the various PSs to this project as a benchmark for sustainable development.

Table 11: IFC Performance Standards applicability to this project.

Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts	
Overview	Performance Standard 1 underscores the importance of managing environmental and social performance throughout the life of a project. An effective Environmental and Social Management System (ESMS) is a dynamic and continuous process initiated and supported by management, and involves engagement between the client, its workers, local communities directly affected by the project (the Affected Communities) and, where appropriate, other stakeholders.
Objectives	<ul style="list-style-type: none"> ➤ To identify and evaluate environmental and social risks and impacts of the project. ➤ To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment. ➤ To promote improved environmental and social performance of clients through the effective use of management systems. ➤ To ensure that grievances from Affected Communities and external communications from other stakeholders are responded to and managed appropriately. ➤ To promote and provide means for adequate engagement with Affected Communities throughout the project cycle on issues that could potentially affect them and to



	ensure that relevant environmental and social information is disclosed and disseminated.		
Aspects	1.1	<ul style="list-style-type: none"> • Policy 	<p><u>Consideration of PS1 to this project:</u></p> <p>The South African NEMA EIA Regulations are specifically geared towards ensuring that a projects environmental and social risks and impacts are identified and assessed in order to put forward suitable impact management actions and outcomes for final decision making by the Competent Authority.</p> <p>This PS has been considered in the compilation of this Scoping Report and will further inform the EIA Report where the environmental and social risks and impacts will be identified. This will culminate in the development of an EMPr containing the relevant mitigation measures which are aimed at limiting the final significance of each identified impact. Throughout the EIA application process, stakeholder engagement will be undertaken in accordance with the NEMA EIA Regulations to solicit input from I&APs and ongoing stakeholder engagement and communication will be ongoing during the lifecycle of the project.</p>
	1.2	<ul style="list-style-type: none"> • Identification of Risks and Impacts 	
	1.3	<ul style="list-style-type: none"> • Management Programmes 	
	1.4	<ul style="list-style-type: none"> • Organisational Capacity and Competency 	
	1.5	<ul style="list-style-type: none"> • Emergency Preparedness and Response 	
	1.6	<ul style="list-style-type: none"> • Monitoring and Review 	
	1.7	<ul style="list-style-type: none"> • Stakeholder Engagement 	
	1.8	<ul style="list-style-type: none"> • External Communication and Grievance Mechanism 	
	1.9	<ul style="list-style-type: none"> • Ongoing Reporting to Affected Communities 	
Performance Standard 2: Labour and Working Conditions;			
Overview	Performance Standard 2 recognises that the pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of workers.		
Objectives	<ul style="list-style-type: none"> ➤ To promote the fair treatment, non-discrimination, and equal opportunity of workers. ➤ To establish, maintain, and improve the worker-management relationship. ➤ To promote compliance with national employment and labour laws. ➤ To protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the client’s supply chain. ➤ To promote safe and healthy working conditions, and the health of workers. ➤ To avoid the use of forced labour. 		



Aspects	2.1	<ul style="list-style-type: none"> • Working Conditions and Management of Worker Relationship • Human Resources Policy and Management • Working Conditions and terms of Engagement • Workers organisation • Non-Discrimination and Equal Opportunity • Retrenchment • Grievance Mechanism 	<p><u>Consideration of PS2 to this project:</u></p> <p>This project will require temporary as well as permanent workers during the various project phases. In terms of South African labour legislation (OHSA), it will be obligatory on Kelvin Power including all sub-contractors to ensure that workers operate in a safe working environment and that employment contracts are fair and reasonable.</p>
	2.2	<ul style="list-style-type: none"> • Protecting the Workforce • Child Labour • Forced Labour 	
	2.3	<ul style="list-style-type: none"> • Occupational health and Safety 	
	2.4	<ul style="list-style-type: none"> • Workers Engaged by Third Parties 	
	2.5	<ul style="list-style-type: none"> • Supply Chain 	

Performance Standard 3: Resource Efficiency and Pollution Prevention

Overview	<p>Performance Standard 3 recognises that increased economic activity and urbanisation often generate increased levels of pollution to air, water, and land, and consume finite resources in a manner that may threaten people and the environment at the local, regional, and global levels. There is also a growing global consensus that the current and projected atmospheric concentration of GHG threatens the public health and welfare of current and future generations. At the same time, more efficient and effective resource use and pollution prevention and GHG emission avoidance and mitigation technologies and practices have become more accessible and achievable in virtually all parts of the world.</p>
Objectives	<ul style="list-style-type: none"> ➤ To avoid or minimise adverse impacts on human health and the environment by avoiding or minimising pollution from project activities.



		<ul style="list-style-type: none"> ➤ To promote more sustainable use of resources, including energy and water. ➤ To reduce project related GHG emissions. 	
Aspects	3.1	<ul style="list-style-type: none"> • Policy Resource Efficiency • Greenhouse Gases • Water Consumption 	<p><u>Consideration of PS3 to this project:</u></p> <p>The various pollution sources and associated impacts of this project have been identified and will be further assessed in the EIA phase.</p> <p>A Climate Change Assessment will be undertaken to quantify the GHG emissions.</p>
	3.2	<ul style="list-style-type: none"> • Pollution Prevention • Air Emissions • Stormwater • Waste Management • Hazardous Materials Management • Pesticide use and Management 	<p>An Air Quality Assessment will be undertaken to identify any air pollutants and sensitive receptors and suggest mitigation measures and management objectives where required.</p> <p>Water efficiency through the treatment and reuse of effluent water will be undertaken.</p> <p>Management actions for general and hazardous waste, pesticide use and management, etc. will be identified and included in the EMPr (to be developed in the upcoming EIA Phase of this application).</p>
Performance Standard 4: Community Health, Safety, and Security			
Overview	Performance Standard 4 recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts.		
Objectives	<ul style="list-style-type: none"> ➤ To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances. ➤ To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities. 		
Aspects	4.1	<ul style="list-style-type: none"> • Community Health and Safety • Infrastructure and Equipment Design and Safety • Hazardous Materials Management and Safety • Ecosystem Services 	<p><u>Consideration of PS4 to this project:</u></p> <p>The aspects included in this PS will be considered in this application and mitigation measures will be included in the EMPr.</p> <p>Specialist studies will identify and assess the potential health and safety impacts on surrounding communities and include the Social Impact Assessment as well as the MHI risk assessments.</p>



		<ul style="list-style-type: none"> • Community Exposure to Disease • Emergency Preparedness and Response 	
	4.2	<ul style="list-style-type: none"> • Security Personnel 	
Performance Standard 5: Land Acquisition and Involuntary Resettlement			
Overview	Performance Standard 5 recognises that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons that use this land. Involuntary resettlement refers both to physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or other means of livelihood) as a result of project-related land acquisition and/or restrictions on land use.		
Objectives	<ul style="list-style-type: none"> ➤ To avoid, and when avoidance is not possible, minimise displacement by exploring alternative project designs. ➤ To avoid forced eviction. ➤ To anticipate and avoid, or where avoidance is not possible, minimise adverse social and economic impacts from land acquisition or restrictions on land use by (i) providing compensation for loss of assets at replacement cost and (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected. ➤ To improve, or restore, the livelihoods and standards of living of displaced persons. ➤ To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure at resettlement sites. 		
Aspects	5.1	<ul style="list-style-type: none"> • Displacement • Physical Displacement • Economic Displacement • Private Sector Responsibilities under Government Managed Resettlement 	<p><u>Consideration of PS5 to this project:</u></p> <p>The proposed project will be undertaken on a property owned by Kelvin Power and is not anticipated to result in physical and economic displacement of any private landowners. However, the impact of physical or economic displacement caused by this project on private landowners will be assessed during the course of this EIA process. Through consultation with affected landowners, suitable mitigation measures will be identified to avoid and/or minimise displacement.</p> <p>It has been noted that land claims have been lodged on the parent farm on which Kelvin Power sits and all reasonable measures will be undertaken to identify the portions of land subjected to land claims and consultations with the land claimants as part of the stakeholder engagement.</p>



Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

Overview	Performance Standard 6 recognizes that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development.		
Objectives	<ul style="list-style-type: none"> ➤ To protect and conserve biodiversity. ➤ To maintain the benefits from ecosystem services. ➤ To promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities. 		
Aspects	6.1	<ul style="list-style-type: none"> • Protection and Conservation of Biodiversity 	<p><u>Consideration of PS6 to this project:</u></p> <p>Due to the nature of the proposed development being a brownfield development, it is not anticipated to pose any threats to biodiversity. A terrestrial biodiversity compliance statement will be undertaken as part of this process by a suitably qualified ecologist.</p> <p>Alien and invasive species will be controlled throughout the lifecycle of the project through the implementation of an alien and invasive management plan.</p>

Performance Standard 7: Indigenous People

Overview	Performance Standard 7 recognizes that Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalized and vulnerable segments of the population. In many cases, their economic, social, and legal status limits their capacity to defend their rights to, and interests in, lands and natural and cultural resources, and may restrict their ability to participate in and benefit from development. Indigenous Peoples are particularly vulnerable if their lands and resources are transformed, encroached upon, or significantly degraded.		
Objectives	<ul style="list-style-type: none"> ➤ To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples. ➤ To anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts. ➤ To promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner. ➤ To establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by a project throughout the project's life-cycle. ➤ To ensure the Free, Prior, and Informed Consent (FPIC) of the Affected Communities of Indigenous Peoples when the circumstances described in this Performance Standard are present. ➤ To respect and preserve the culture, knowledge, and practices of Indigenous Peoples. 		



Aspects	7.1	<ul style="list-style-type: none"> • General • Avoidance of Adverse Impacts • Participation and Consent 	<p><u>Consideration of PS7 to this project:</u></p> <p>As per IFC Guidance Note 7, in this Performance Standard, the term “Indigenous Peoples” is used in a generic sense to refer to a distinct social and cultural group possessing the following characteristics in varying degrees:</p> <ul style="list-style-type: none"> • <i>Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;</i> • <i>Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories;</i> • <i>Customary cultural, economic, social, or political institutions that are separate from those of the mainstream society or culture; or</i> • <i>A distinct language or dialect, often different from the official language or languages of the country or region in which they reside.</i> <p>With due consideration of the above accepted definition in IFC Guidance Note 7 and as per the international instruments under the United Nations (UN) Human Rights Conventions, no indigenous peoples are present within the study area and therefore PS7 is not triggered by this proposed development and no further assessment in this regard is required.</p>
	7.2	<ul style="list-style-type: none"> • Circumstances Requiring Free, Prior, and Informed Consent • Impacts on Lands and Natural Resources Subject to Traditional Ownership or Under Customary Use • Critical Cultural Heritage • Relocation of Indigenous Peoples from Lands and Natural Resources Subject to Traditional Ownership or Under Customary Use 	
	7.3	<ul style="list-style-type: none"> • Mitigation and Development Benefits 	
	7.4	<ul style="list-style-type: none"> • Private Sector Responsibilities Where Government is Responsible for Managing Indigenous Peoples Issues 	

Performance Standard 8: Cultural Heritage

Overview	Performance Standard 8 recognizes the importance of cultural heritage for current and future generations.
Objectives	➤ To protect cultural heritage from the adverse impacts of project activities and support its preservation.



➤ To promote the equitable sharing of benefits from the use of cultural heritage.			
Aspects	8.1	<ul style="list-style-type: none"> • Protection of Cultural Heritage in Project Design and Execution 	<p><u>Consideration of PS8 to this project:</u></p> <p>A detailed Heritage and Palaeontological Impact Assessment as well as a will be undertaken by suitably qualified specialists to identify cultural heritage resources and identify suitable mitigation measures to protect such resources.</p>

5.28 WORLD BANK (WB) AND INTERNATIONAL FINANCE CORPORATION (IFC) GUIDELINES

5.28.1 WB ENVIRONMENTAL HEALTH AND SAFETY GUIDELINE FOR THERMAL POWER PLANTS

The EHS Guidelines for Thermal Power Plants include 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) on Higher Heating Value (HHV) basis. It applies to boilers, reciprocating engines, and combustion turbines in new and existing facilities. The key issues identified for gas facilities related to environmental issues, occupational health and safety issues, and community health and safety issues.

The following environmental issues should be considered as part of a comprehensive assessment and management program that addresses project-specific risks and potential impacts. Potential environmental issues associated with thermal power plant projects primarily include the following:

- Air emissions;
- Energy efficiency and Greenhouse Gas emissions;
- Water consumption and aquatic habitat alteration;
- Effluents;
- Solid wastes;
- Hazardous materials and oil; and
- Noise

Occupational health and safety issues associated with gas facilities operations include the following:

- Non-ionizing radiation;
- Heat;
- Noise;
- Confined spaces;
- Electrical hazards;
- Fire and explosion hazards;
- Chemical hazards; and
- Dust



5.28.2 IFC ENVIRONMENTAL NOISE GUIDELINE

The IFC General Environmental Health and Safety Guidelines on noise address impacts of noise beyond the property boundary of the facility under consideration and provides noise level guidelines. The IFC states that noise impacts should not exceed the levels presented in Table 12, or result in a maximum increase above background levels of 3 dBA at the nearest receptor location off-site (IFC, 2007). For a person with average hearing acuity an increase of less than 3 dBA in the general ambient noise level is not detectable. $\Delta = 3$ dBA is therefore a useful significance indicator for a noise impact.

It is further important to note that the IFC noise level guidelines for residential, institutional and educational receptors correspond with the SANS 10103 guidelines for urban districts.

Table 12: IFC noise level guidelines.

Area	One Hour LAeq (dBA)	One Hour LAeq (dBA)
	07:00 to 22:00	22:00 to 07:00
Industrial receptors	70	70
Residential, institutional and educational receptors	55	45



6 NEED AND DESIRABILITY OF THE PROPOSED ACTIVITY

In South Africa, an Environmental Impact Assessment (“EIA”) is required for various types of activities and projects to ensure that their potential environmental and social impacts are properly assessed and mitigated. The legal and other triggers for an EIA in South Africa are primarily outlined in the NEMA and associated regulations.

NEMA includes a list of activities that are classified as “listed activities” and if a project meets the criteria outlined in this list, it triggers the need for an EIA. In this regard Kelvin wishes to establish a CCGT power plant at the previous coal fired A-station power plant located in farm Zuurfontein 33 remainder of portion 391, and remainder of portion 82. and a short connection to the Sasol gas pipeline The proposed development covers an area of 15 hectares (ha).

As the result of the need for an EIA, a need and desirability assessment is also required. This is a critical assessment that ensures development projects are conducted in an environmentally responsible and sustainable manner. Specific factors that require consideration are listed in the Guideline on Need and Desirability published by DFFE and updated in 2017.

Generally, a need and desirability analysis establishes a well-defined framework for decision-making, facilitating the evaluation of whether a proposed project should proceed while considering its socio-economic and environmental desirability. Additionally, the need and desirability analysis encompass public engagement, delineating the involvement of stakeholders, including affected communities and environmental organisations, ensuring their perspectives are considered throughout the EIA process. Moreover, this assessment fosters transparency and accountability by elucidating the project's objectives, rationale, and potential impacts, thereby enabling both the public and authorities to hold project proponents accountable. Furthermore, it ensures alignment with South Africa's rigorous environmental laws and policies, verifying that projects conform to these frameworks and promoting compliance. The need and desirability analysis also initiates risk assessments and encourages the exploration of alternative project designs or locations, emphasising environmental and sustainability goals. Finally, it prompts the consideration of cumulative impacts, which is vital for assessing the long-term sustainability of development in each region.

Below are key points to evaluate in need and desirability analysis and these constitute the foundation of the analysis for this Kelvin Power CCGT project:

1. **Alternative Solutions:** The need and desirability analysis should explore and evaluate alternative economic solutions to address the identified need. This might include considering different project designs, technologies, or approaches that could achieve the same economic objectives with lower environmental or social impacts. (Given the urgency of global warming and its contribution to negative climate change, this factor is probably top of mind for most stakeholders and is listed as the first consideration).
2. **Economic Justification:** The need and desirability analysis should provide a clear and robust economic justification for the proposed project. This justification should outline the economic benefits and contributions the project is expected to make to the local and national economy. It needs to include factors such as job creation, increased tax revenue, economic growth, and contributions to GDP.
3. **Market Demand:** The need and desirability analysis should assess the market demand for the project's outputs or services. It should demonstrate that there is a legitimate need for the project within the local or regional economy and that it will meet this demand efficiently.
4. **Cost-Benefit Analysis:** Consideration of economic desirability involves conducting a cost-benefit analysis. This analysis compares the anticipated costs of the project to the expected economic benefits, considering both direct and indirect impacts. It aims to determine whether the project's benefits outweigh its costs.
5. **Sustainability and Long-Term Viability:** Economic desirability should not be limited to short-term gains. The need and desirability analysis should also assess the project's long-term economic viability and



sustainability, considering factors like ongoing operational costs, revenue projections, and potential risks.

6. Job Creation and Skills Development: If relevant, the need and desirability analysis should discuss the potential for job creation and skills development associated with the project. This can be an essential economic benefit, especially in areas with high unemployment rates.
7. Local and Regional Benefits: The need and desirability analysis should highlight how the project will benefit the local and regional economy. This might include discussions of supply chain impacts, local procurement commitments, and initiatives to support local businesses.
8. Compliance with Economic Policies: Ensure that the project aligns with South Africa's economic policies and development strategies. This includes considering national and regional economic development plans and objectives.
9. Consultation with Stakeholders: Engage with relevant stakeholders, including local communities, government agencies, and economic experts, to gather input and feedback on the economic need and desirability of the project.
10. Address the specific questions that should be engaged as listed in the Guideline on Need and Desirability published by the DFFE in 2017.

In summary, the need and desirability analysis should provide a thorough and evidence-based assessment of why the proposed project is economically necessary and desirable. It should consider economic benefits, costs, alternatives, and long-term sustainability to inform decision-making within the framework of South African EIA requirements.

6.1 NEED AND DESIRABILITY STATEMENT

South Africa has been faced with a number of issues impacting electricity generation and production over the most recent years. These include, but are not limited to:

- Financial crisis faced by Eskom;
- Aging electricity generation infrastructure;
- Lack of new generation capacity;
- Policy and regulation uncertainties;
- High coal energy dependency; and
- Renewable Energy Integration.

These have resulted in the implementation of loadshedding³ across South Africa at varying levels. The proposed CCGT development will allow for the generation of up to 600 MW of electricity to be put on to the electricity grid. It is further noteworthy that the proposed project will not eradicate loadshedding but can be used as a tool to assist in the reduction loadshedding intensity by the installation of more generation capacity (of up to 600 MW). The needs and desirability of the proposed Kelvin Power CCGT Plant are described below.

The proposed CCGT plant development will assist Kelvin Power, whose business is to generate and sell electricity to produce power as it is noteworthy that the coal fired A-station stopped producing electricity in 2012 and is undergoing a decommissioning process. The development of the CCGT plant thus provides Kelvin Power with an opportunity to successfully continue with their business mandate whilst taking into consideration the known impacts of coal fired power stations.

Below listed are some of the identified need and desirability statements for the proposed development,

³ Load shedding is an energy utility's method of reducing demand on the energy generation system by temporarily switching off the distribution of energy to certain geographical areas.



Loadshedding Mitigation:

- **Reliable Power Supply:** CCGT plants notably offer stable and consistent power generation, reducing the risk of load shedding and ensuring a reliable electricity supply to meet the growing demand.
- A CCGT plant has quick start-up times and flexibility in adjusting power output making the newly proposed CCGT plant well-suited to handle sudden changes in demand and emergencies, minimizing the impact of load shedding.

Energy Security:

- Adding CCGT capacity diversifies the energy mix, reducing reliance on a single energy source and enhancing overall energy security. South Africa is currently heavily reliant on coal as a source of electricity, Kelvin Power's proposed CCGT power plant will enhance Kelvin Power's ability to continue producing power for supply into the grid network whilst also ensuring that gas is being added into the energy mix.
- The proposed Kelvin Power CCGT plant will assist with the grid strengthening for South Africa, ensuring a robust and resilient power system that can withstand disruptions and unforeseen challenges. Although the proposed development entails 600 MW of capacity, it is notable that it alone cannot provide a substantial grid strengthening for the South African electricity grid but when evaluated holistically, Eskom is continuously aiming to strengthen the South African grid through various projects including construction of transmission lines, to assist with grid integration of electricity produced as a result of the Renewable Energy Independent Power Producer (REIPP) programme.

Economic Advantages:

- CCGT power plants are considered highly efficient with relatively lower operating costs, contributing to a more cost-effective energy production model.
- **Job Creation:** The construction and operation of the Kelvin Power CCGT plant will create employment opportunities (more opportunities will be created during the construction period and relatively fewer employees will be required during the operational phases of the project). The proposed Kelvin Power CCGT plant is anticipated to contribute to the local economy.

Environmental Considerations:

- CCGT plants produce lower emissions compared to traditional coal-fired plants, the construction of the Kelvin Power CCGT plant will allow for Kelvin Power to align with global efforts to mitigate climate change and improve air quality whilst continuing to provide electricity.
- **Sustainable Energy Transition:** Investing in CCGT technology represents a step towards a more sustainable and environmentally friendly energy mix, aligning with international goals and commitments (adopted nationally). The 2023 Draft IRP provides for gas-to-power technologies such as CCGT as it has been identified to provide the flexibility required to complement renewable energy sources.

International Competitiveness:

- Establishing modern and efficient power infrastructure will enhance South Africa's chances of securing foreign investments, supporting economic growth and competitiveness on the global stage.
- Adopting CCGT technology aligns South Africa with global energy standards and positions the country as a forward-thinking player in the international energy landscape.

Regulatory Compliance:



- CCGT plants often meet stringent environmental regulations, helping South Africa meet its commitments to reduce greenhouse gas emissions and protect the environment whilst also reducing the associated health and climate change risks noted from the heavy reliance from coal energy.

6.2 NEED AND DESIRABILITY ANALYSIS

The needs and desirability analysis component of the Guideline on Need and Desirability published by DFFE in 2014 and updated in 2017 includes, but is not limited to, describing the linkages and dependencies between human well-being, livelihoods and ecosystem services applicable to the area in question, and how the proposed development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.). Table 13 present the needs and desirability analysis undertaken for the project by answering the questions as presented in Section 4 of the DFFE Need and Desirability Guideline. This analysis will be revisited and revised during the EIA phase once further detail is available (i.e. from specialist assessments, and development plans).



Table 13: Need and Desirability Analysis

Ref No.	Question	Answer
1	Securing ecological sustainable development and use of natural resources	
1.1	How were the ecological integrity considerations taken into account in terms of: Threatened Ecosystems, Sensitive and vulnerable ecosystems, Critical Biodiversity Areas, Ecological Support Systems, Conservation Targets, Ecological drivers of the ecosystem, Environmental Management Framework, Spatial Development Framework (SDF) and global and international responsibilities.	<p>A number of specialist studies will inform this application and environmental impact assessment and include amongst others:</p> <ul style="list-style-type: none"> • Air Quality and GHG Assessment • Noise Impact Assessment • Terrestrial Ecology and Biodiversity Compliance Statement • Soils and Hydropedology Compliance Statement • Socio-economic Impact Assessment • Major Hazardous Installation – Qualitative Risk Assessment <p>The above studies will assist in identifying any Threatened Ecosystems, Sensitive and vulnerable ecosystems, Critical Biodiversity Areas, Ecological Support Systems, Conservation Targets and Ecological drivers of the ecosystem. Notwithstanding the fact that the proposed development is to be located on a brownfield site, where sensitive species or ecosystem drivers are identified, relevant mitigation measures shall be put forward to prevent or minimise the impacts.</p>
1.2	How will this project disturb or enhance ecosystems and / or result in the loss or protection of biological diversity? What measures were explored to avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?	<p>The proposed project is located on a brownfield site. The proposed project is to be developed at the previous coal fired Kelvin Power plant that is undergoing decommissioning. Due to the nature of this development being a brown field development it is not anticipated to cause any significant impacts or harm to biological diversity.</p> <p>A preliminary impact assessment is included in this Scoping Report and will be refined during the EIA phase through specialist inputs. Furthermore, specialist assessments and compliance statements will be undertaken to inform mitigation measures that can be applied to reduce the final significance of identified impacts to any sensitive receptors and enhance positive impacts.</p>
1.3	How will this development pollute and / or degrade the biophysical environment? What measures were explored to either avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?	<p>Existing and future alien and invasive species will be controlled which will enhance the opportunities for indigenous and beneficial species in the environment.</p>



Ref No.	Question	Answer
1.4	<p>What waste will be generated by this development? What measures were explored to avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and / or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?</p>	<p>Due to the nature of this development being a CCGT plant, it is not anticipated that a large volume of waste will be generated. However, the following waste types are anticipated to be generated during the construction and operation phases of the proposed CCGT power plant:</p> <ul style="list-style-type: none"> • General office waste; • Gas turbine air intake filters (typically replaced annually); • Ion exchange resins (typically replaced at 5 year intervals); • Used Reverse Osmosis membranes (Potentially); • Separated oil / sludge from oil / water separators / lubricating oil; and • Oil and/or chemical containers. <p>Some construction and decommissioning waste can be expected to be generated during the construction phase of the project. All of the above-mentioned wastes are to be stored in suitable containers and within a designated waste storage area and removed from site by an appropriately qualified waste removal contractor for disposal at a appropriately licensed facilities.</p>
1.5	<p>How will this project disturb or enhance landscapes and / or sites that constitute the nation’s cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?</p>	<p>A specialist heritage and palaeontological study has been commissioned in order to identify sites of cultural heritage or palaeontological significance. The identified sites including suitable buffers will be identified as highly sensitive / no-go areas to prevent adverse impacts in these areas.</p> <p>In addition to the above, a chance find procedure will be developed should any unidentified sites of cultural heritage or palaeontological significance be identified during the construction process.</p>
1.6	<p>How will this project use and / or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?</p>	<p>It is acknowledged that the proposed CCGT power plant will utilise a non-renewable gas resource. However, it is noteworthy that gas is considered to be cleaner than other fossil fuels such as coal which is currently the predominant fuel source for energy generation in South Africa. Furthermore, gas to power can complement the transition to renewable power while reducing the reliance on coal to power in the short to medium term.</p> <p>The proposed development is on a brownfield site and will not pose any significant risk to terrestrial biodiversity and ecology. A specialist assessment and compliance</p>



Ref No.	Question	Answer
1.7	How will this project use and / or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and / or impacts on the ecosystem jeopardise the integrity of the resource and / or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?	statement will be undertaken during the EIA phase to confirm this. The development of a CCGT plant at the Kelvin power station will contribute to the strengthening of the South African power supply through an additional 600MW to the grid which will be added to the Eskom grid. The proposed development will contribute to the country's economy directly and indirectly whilst complementing the transition to renewable power while reducing the reliance on coal to power in the short to medium term.
1.7.1	Does the proposed project exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)?	The proposed project will generate electricity through a non-renewable resource (gas). The proposed project will provide an opportunity for South Africa to move away from dirtier energy (coal) while transitioning to a more renewable energy source. This can be translated into a "reduced dirty resource dependency".
1.7.2	Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used?	<p>The generation of power from gas provides an opportunity for the reduction of reliance from coal (a dirtier natural resource) for electricity generation in South Africa whilst enabling the transition to more renewable sources of electricity. This ensures reduced emissions in the immediate to medium term.</p> <p>An assessment of the impact of this Kelvin CCGT Project will be undertaken and the assessment will be compared to the No-Go alternative which is described in Section 10.2.5.</p>
1.7.3	Do the proposed location, type and scale of development promote a reduced dependency on resources?	The location, type and scale of the proposed development promotes a reduced dependency on from coal resources which are considered a dirtier natural resource and is currently not available in the immediate vicinity of the Kelvin power station. Coal has been transported via locomotives and in the more recent periods via trucks. The proposed project will receive gas through a connection to an existing gas pipeline thus also reducing downstream pollution and dependency on fuel intensive transportation. As such, this project should not be viewed in isolation in terms of resources but in a holistic manner both nationally and globally.
1.8	How were a risk-averse and cautious approach applied in terms of ecological impacts:	



Ref No.	Question	Answer
1.8.1	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	In order to prevent repetition, the reader is directed to the assumptions and limitations presented in Section 13.
1.8.2	What is the level of risk associated with the limits of current knowledge?	The level of risk is considered low at this stage and will be further interrogated during the EIA phase (where applicable).
1.8.3	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	During this scoping phase assessment, the baseline sensitivities have been identified which will assist in adjusting the preliminary layout of the proposed well field and associated infrastructure to minimise impacts on identified sensitivities. This will be further refined in the EIA phase where detailed specialists will undertake more detailed site assessments to further identify site specific sensitivities which will then be mitigated through the first tier of the mitigation hierarchy (i.e. avoidance) and where this is not possible, identify suitable mitigation to minimise the impacts.
1.9	How will the ecological impacts resulting from this development impact on people's environmental right in terms following?	
1.9.1	Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	<p>The following specialists have been appointed to inform this EIA process:</p> <ul style="list-style-type: none"> • Air Quality Impact Assessment • Climate Change Impact Assessment • Terrestrial Ecology Compliance Statement • Soils and Land Capability Compliance Statement • Noise Impact Assessment • Socio-economic Impact Assessment • Heritage and Palaeontological Impact Assessment (if required by SAHRA) • Major Hazardous Installation Risk Assessment. <p>This team of specialists will assist in identifying relevant avoidance mechanisms for negative impacts as a first priority and where not possible, suitable mitigation</p>
1.9.2	Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?	



Ref No.	Question	Answer
		measures will be put forward to minimize the impacts. The specialists will similarly identify measures to enhance positive impacts where possible or at least prevent a reduction of positive impacts as far as possible.
1.10	Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?	The proposed development is located on the previous coal powered A-Station plant that is currently undergoing a decommissioning process. The proposed CCGT power plant is to be located on a site that was being used for the generation of power and will cause minimal changes to the environment as it relates to a continued power generation land use. The construction phase of the development will likely result in a disturbance of the surrounding land-uses as opposed to the operational phases of the development. The relevant specialists will assess these impacts on livelihoods, loss of heritage site, opportunity costs, etc to avoid or minimise these impacts as far as possible.
1.11	Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives / targets / considerations of the area?	The overall impact on the ecological integrity objectives or targets or considerations of the area will be assessed by the terrestrial specialist and reported on in the EIA phase.
1.12	Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?	As part of the scoping phase, suitable alternatives are being considered and will be finalised in the EIA phase once due consideration of alternatives has been completed. Therefore at this stage of the application process, this aspect is yet to be concluded.
1.13	Describe the positive and negative cumulative ecological / biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?	Refer to Section 10 of this report for the preliminary impact assessment. This assessment will be refined in the EIA phase.
2	Promoting justifiable economic and social development	
2.1	What is the socio-economic context of the area, based on, amongst other considerations, the following:	



Ref No.	Question	Answer
2.1.1	The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks or policies applicable to the area,	Details of the IDP for the City of Ekurhuleni has been included in Section 5.26. The City of Ekurhuleni seeks to reduce the vulnerability of its residents from Eskom loadshedding. The proposed development produces an opportunity for the reduction of loadshedding as it is to ensure an additional 600 MW capacity on the grid. The project is seen as a continuation of the currently existing land use as the proposed CCGT power plant is to be developed on the previously coal powered A-station power plant currently undergoing a decommissioning process.
2.1.2	Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),	
2.1.3	Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and	
2.1.4	Municipal Economic Development Strategy ("LED Strategy").	
2.2	Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?	This project will result in positive socio-economic impacts in the local, regional and national economy. Refer to the impact assessment in Section 10 in this report.
2.2.1	Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?	An estimate of 200 temporary skilled and 500 temporary unskilled jobs will be created during construction. 50 unskilled and 50 skilled permanent jobs are anticipated for operations at this stage. Where possible, existing local labour will be utilised. Labourers will mostly be sourced from the surrounding area. This will create opportunities for local economic development in the area.
2.3	How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	The baseline receiving environment is presented in Section 9. The impact of this project on the physical, psychological, developmental, cultural and social needs and interests of the relevant communities will be updated during the EIA phase once more consultation with the relevant communities has been undertaken.
2.4	Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?	An environmental impact assessment is being undertaken to identify the positive and negative impacts to ultimately determine the short- and long-term impacts from a social and economic perspective. Once the EIA phase assessment has been concluded, this question can be answered in more detail.



Ref No.	Question	Answer
2.5	In terms of location, describe how the placement of the proposed development will:	
2.5.1	Result in the creation of residential and employment opportunities in close proximity to or integrated with each other.	It is unlikely that this project will result in the creation of residential opportunities however the project is likely to result in limited employment opportunities, especially during its construction phase. The proposed development is located in close proximity to existing residential areas and it is highly unlikely that it will result in residential opportunities and/or impact the current pedestrian transport situation. This project will likely reduce the need of transportation of goods (coal) which has been transported to site via trucks as gas will be transported to site via existing Sasol pipeline infrastructure.
2.5.2	Reduce the need for transport of people and goods.	
2.5.3	Result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms of public transport),	
2.5.4	Compliment other uses in the area,	This project is a continuation of the current power generation activities on site. Although the A-station is currently undergoing a decommissioning process the B-station is still operational and this development will supplement power generation activities within the property. Furthermore, the Kelvin Power Station is located within / or in close proximity to an industrial area although some residential areas exist in the adjacent land parcels.
2.5.5	Be in line with the planning for the area.	Refer to item 2.1.1 of this table (above).
2.5.6	For urban related development, make use of underutilised land available with the urban edge.	Not applicable. The proposed project is a brownfield development.
2.5.7	Optimise the use of existing resources and infrastructure,	The proposed project is a brownfield development located at the existing Kelvin power station, where the previously coal fired A-station was situated and as such will utilise currently existing infrastructure such as the Diepsloot wastewater pipeline connections, Rand Water potable water pipeline connection, existing Sasol gas pipeline (will require a short connection to the plant) etc. As such the proposed project will utilise existing infrastructure as far as possible. It is to be further noted that the proposed plant will utilise treated waste water from Diepsloot for cooling presenting an opportunity for usage of recycled water and reduced reliance on potable water supply.
2.5.8	Opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),	



Ref No.	Question	Answer
2.5.9	Discourage "urban sprawl" and contribute to compaction / densification.	This project is a brownfield development in located in an area currently used for the production of electricity and is within an urban setting, surrounded by light industries and residential areas. It is thus understood that this project will not contribute to "urban sprawl".
2.5.10	Contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,	Refer to items 2.5.7 – 2.5.9 of this table (above).
2.5.11	Encourage environmentally sustainable land development practices and processes	This project will have a minimal impact on the current land uses in the application area as it is a brownfield development and a continuation of the current power production activities.
2.5.12	Take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),	This Kelvin CCGT project aims to make use of the existing water pipeline infrastructure, existing Sasol gas pipeline infrastructure and will be located within close proximity to the City Power Sebenza Substation reducing the need for construction of distribution infrastructure. Furthermore, the proposed development is located in a property with on going power generation and as such will not lead to unintended changes of its immediate surroundings.
2.5.13	The investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential).	As mentioned in 2.5.11 above, this project will not sterilise existing land uses and therefore it will in fact result in higher economic returns as the CCGT plant will produce more power (up to 600MW) which will be integrated into the national grid and will assist in the curbing of loadshedding.
2.5.14	Impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and	A Heritage Impact Assessment and a Social Impact Assessment will be undertaken to determine the impact of this project on existing socio-cultural and heritage sites and the results of this assessment will be presented in the EIA phase.
2.5.15	In terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	It is not anticipated that this project will have an impact the existing settlements in the area. This aspect will however be investigated by the Social specialists and will be elaborated on in the EIA phase.



Ref No.	Question	Answer
2.6	How was a risk-averse and cautious approach applied in terms of socio-economic impacts:	
2.6.1	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	Refer to Section 13 of this report. It is worth noting that the supplier of gas has not been identified yet. The assumption is that the supply of gas will be stable and long term.
2.6.2	What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?	The level of risk is considered low as the project is not expected to have far reaching negative impacts on socio-economic conditions. This will however be elaborated upon in the EIA phase once the Social and Major Hazardous Installation specialist studies have been concluded along with public feedback on this application.
2.6.3	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	Where uncertainties exist, the approach was taken to assume the worst-case scenario for impact planning purposes.
2.7	How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:	
2.7.1	Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	The preliminary positive and negative socio-economic impacts have been identified and will be assessed in more detail during the EIA phase.
2.7.2	Positive impacts. What measures were taken to enhance positive impacts?	
2.8	Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socioeconomic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	



Ref No.	Question	Answer
2.9	What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	
2.10	What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	
2.11	What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	The potential impact on existing land uses has been identified and an assessment of this impact as well as mitigation measures will be put forward to prevent undue negative impacts in this regard.
2.12	What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	This application will include an assessment of the projects impacts on the environmental health and safety through various specialist studies including Air Quality Impact Assessment, Major Hazardous Installation Risk Assessment and Climate Change and GHG specialist assessments. The results of these assessment will be presented in the EIA phase.
2.13	What measures were taken to:	
2.13.1	Ensure the participation of all interested and affected parties.	Notwithstanding the detailed description of the stakeholder consultation process included in Section 8 of this report, the consultation process has been undertaken in 2 languages (English and isiZulu).
2.13.2	Provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,	



Ref No.	Question	Answer
2.13.3	Ensure participation by vulnerable and disadvantaged persons,	<p>To date, the public participation process that has been undertaken includes, but is not limited to:</p> <ul style="list-style-type: none"> • Placement of 16 A1 site notice boards were placed at the entrance to the site and various surrounding areas; • Notification letters were sent to various pre-identified Interested and Affected Parties (I&APs) via email, post, fax and SMS; • 2 Newspaper adverts were placed on the Bedfordview and Edenvale News and Kempton Express Newspapers with adequate circulation within the project area; • A notice was placed in the Gauteng Provincial Gazette. <p>Furthermore, public meetings will be undertaken during the Scoping and EIA phase consultation during which any additional consultation requirements of the I&APs will be identified and addressed where necessary.</p>
2.13.4	Promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means,	
2.13.5	Ensure openness and transparency, and access to information in terms of the process,	
2.13.6	Ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge,	
2.13.7	Ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein will be promoted?	
2.14	Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	
2.15	What measures have been taken to ensure that current and / or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	
2.16	Describe how the development will impact on job creation in terms of, amongst other aspects:	



Ref No.	Question	Answer
2.16.1	The number of temporary versus permanent jobs that will be created.	An estimate of 200 temporary skilled and 500 temporary unskilled jobs will be created during construction. 50 unskilled and 50 skilled permanent jobs are anticipated for operations at this stage. Where possible, existing local labour will be utilised. Labourers will mostly be sourced from the surrounding area.
2.16.2	Whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area).	
2.16.3	The distance from where labourers will have to travel.	
2.16.4	The location of jobs opportunities versus the location of impacts.	
2.16.5	The opportunity costs in terms of job creation.	
2.17	What measures were taken to ensure:	
2.17.1	That there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment.	The Scoping and EIA Process requires governmental departments to communicate regarding any application. In addition, all relevant departments are notified at various phases of the project by the EAP and any feedback received from government departments is considered where relevant. Should any conflicts of interest between organs or state be identified, these will be resolved through appropriate channels.
2.17.2	That actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures.	
2.18	What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	Environmental attributes that may be impacted by this project have been identified and where relevant, specialist input will be solicited to ensure that a rigorous impact assessment process is undertaken. Where positive impacts on the interests of the public have been identified (e.g. job creation, impact on existing land use, etc.), mitigation measures are put forward to enhance positive impacts and similarly, mitigation measures will be put forward to reduce negative impacts.
2.19	Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	At this scoping phase, only preliminary mitigation is put forward. On completion of the specialist assessments and public consultation process in the EIA phase, the mitigation measures will be adjusted where necessary to ensure that they are realistic and implementable to achieve the intended outcomes.



Ref No.	Question	Answer
2.20	What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	This aspect will be further explored in the EIA phase and findings thereof presented in the EIA Report and EMPr.
2.21	Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	Refer to Section 7 wherein a description of the identified alternatives is provided as well as the preliminary process followed to identify which alternatives to assess further in the EIA phase.
2.22	Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?	Refer to the impact assessment and mitigation measures in Section 10 of this Report.



7 PROJECT ALTERNATIVES

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

- Property on which or location where it is proposed to undertake the activity;
- Type of activity to be undertaken;
- Scheduling alternatives;
- Design or layout of the activity;
- Technology to be used in the activity;
- The option of not implementing the activity (No-go alternative)

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

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

7.1 LOCATION OR PROPERTY ALTERNATIVES

Location alternatives can apply to the entire project (e.g. the strategic decision to locate the proposed development in the City of Ekurhuleni within the Gauteng Province (where Kelvin owns the property on which the development is proposed with an operational power plant), as well as the spatial alternatives for specific individual components of the proposed developments (e.g. the location of the CCGT and associated infrastructure within the study area).

Kelvin owns the remainder of portion 391 (RE/391) of farm Zuurfontein (33) on which the proposed development is proposed. The proposed CCGT plant is to be located where the coal fired A-station, currently undergoing a decommissioning process, is located as this property was previously used for power generation and is continuously generating power with the currently operational B-station. As such, no alternative properties were considered for this development.

7.2 ACTIVITY ALTERNATIVES

These are sometimes referred to as project alternatives, although the term activity can be used in a broad sense to embrace policies, plans and programmes as well as projects. Consideration of such alternatives requires a change in the nature of the proposed activity. This would entail a process where a different project is proposed instead of the power generating plant. Kelvin is a company in the power generating industry, whose main business is power generation and as such no alternative activities were identified and evaluated.



7.3 SCHEDULING ALTERNATIVES

Scheduling alternatives are sometimes known as sequencing or phasing alternatives. In this case an activity may comprise several components, which can be scheduled in a different order or at different times and as such produce different impacts. No scheduling alternatives were identified for this project.

7.4 DESIGN OR LAYOUT ALTERNATIVES

Design and layout alternatives ensure the consideration of different design and spatial configurations of the proposed development within a specific location, in order to enhance the positive impacts and to reduce the negative impacts. During the prefeasibility studies a layout alternatives analysis was undertaken for the proposed CCGT plant. The layout alternative analysis that was undertaken took into consideration two main factors, namely, available land and equipment layout.

The assessment of the available land for the proposed development considered the decommissioning of the A-station infrastructure including the three cooling towers, location of existing servitudes where it was noted that two (2) servitudes were located within the Kelvin power station (namely, an existing transmission line servitude and a new Eskom servitude) and other existing land areas which were noted to be actively in use by the B-Station. An overview of the available land assessment is represented in Figure 8 (WSP, 2023) below.

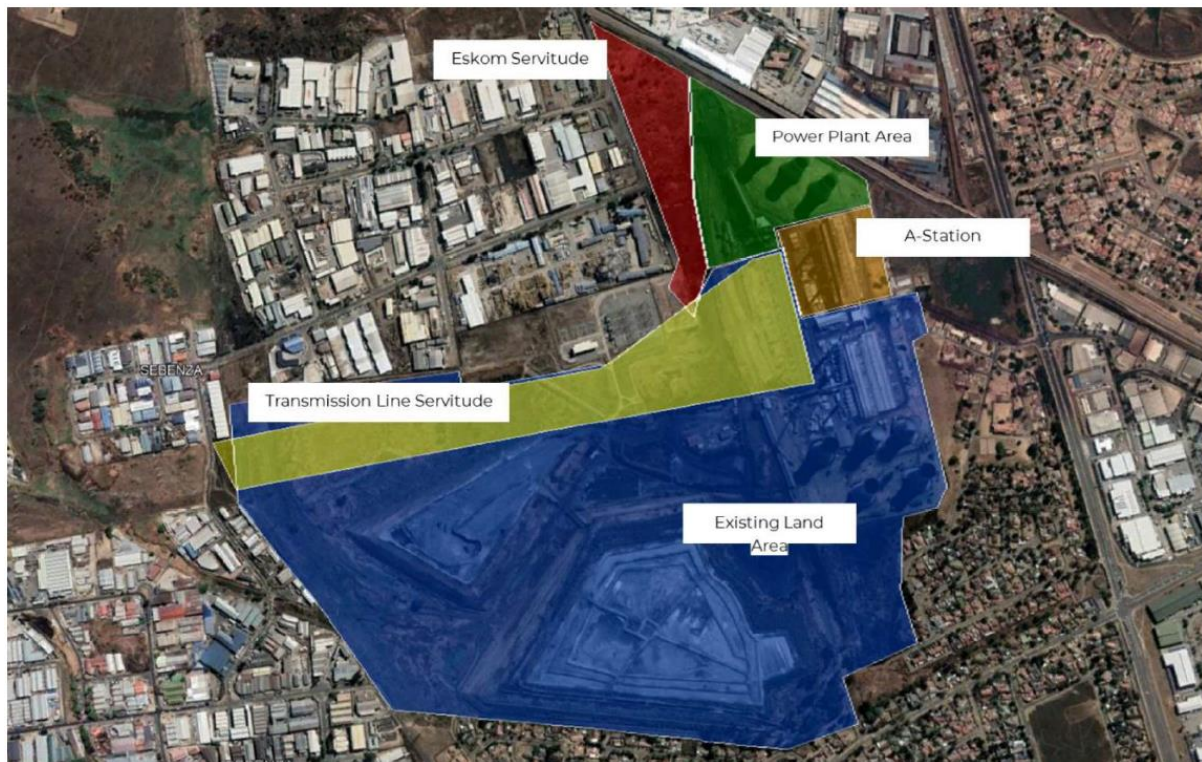


Figure 8: Available land analysis (WSP, 2023)

It was noted that the decommissioning of the A-station building including stacks could potentially take longer than the targeted construction start date of the proposed CCGT plant due to removal of asbestos in A-station. As such the A-station building area has been considered unavailable land and will be avoided by the layout, thus locating the proposed CCGT plant at the location on which the A-station cooling towers, workshop, coal store and conveyor belts, East and West wagon tippers track hopper and weigh bridge sites that are undergoing decommissioning/demolition activities. The identified available land (shaded green in Figure 8) was considered for the placement of the plant. On the available land identified, further analysis was undertaken for the equipment layout in consideration of the proven Original Equipment Provider (OEM) power block layout design, placement of cooling towers downstream of prevailing winds, substation and evacuation transmission line's location, and proximity of gas turbine and cooling tower to neighbours. Kindly refer to Figure 3 for a map showing the current preliminary CCGT layout map.



A short powerline connection of approximately 250m will be required to connect the proposed CCGT plant to the electricity transmission and distribution grid infrastructure. The final routing of these powerlines/cables will be decided during the EIA phase.

A connection to the Sasol gas pipeline infrastructure will be required. The gas pipeline is expected to follow the existing Kelvin Power servitudes into the proposed plant, it is noteworthy that Kelvin Power is engaging with Sasol regarding the routing and requirements of the required gas pipeline connection and routing details are to be finalized during the EIA phase. The sensitivity planning approach as described in Section 11 of this report will guide the final layout position of the various infrastructure.

7.5 TECHNOLOGY ALTERNATIVES

The selection of the technology to be adopted for the proposed power generation facility has considered the available technological and equipment alternatives. This report considers various technology alternatives that can be utilised for the generation of power at the Kelvin power plant. The purpose of considering such alternatives is to include the option of achieving the same goal by using a different method or process. Various system technologies and turbine options.

7.5.1 SYSTEM TECHNOLOGY ALTERNATIVES

A gas turbine is a type of internal combustion engine that can convert natural gas or other fuel gas into mechanical rotational energy which drives a generator that produces electrical energy. Two (2) types of technologies are currently in place for power generating gas turbines, namely, Open Cycle Gas Turbines (OCGT) and Combined Cycle Gas Turbines (CCGT). Both options are discussed further below.

7.5.1.1 OPEN CYCLE GAS TURBINES (OCGT)

OCGTs are described in International Association of Oil & Gas Producers (IOGP) (2022) as the simplest application of gas combustion for power/electricity generation. OCGTs consist of only a gas turbine and do not recover any waste heat released during the combustion process. OCGTs are thus deemed as less efficient compared to technologies that utilises the extra heat for heating or extra power production. IOGP (2022) highlights that due to the decreased efficiency of an OCGT turbine, more fuel is required per unit power output. The use of OCGT turbines therefore tends to result in increased GHG emissions.

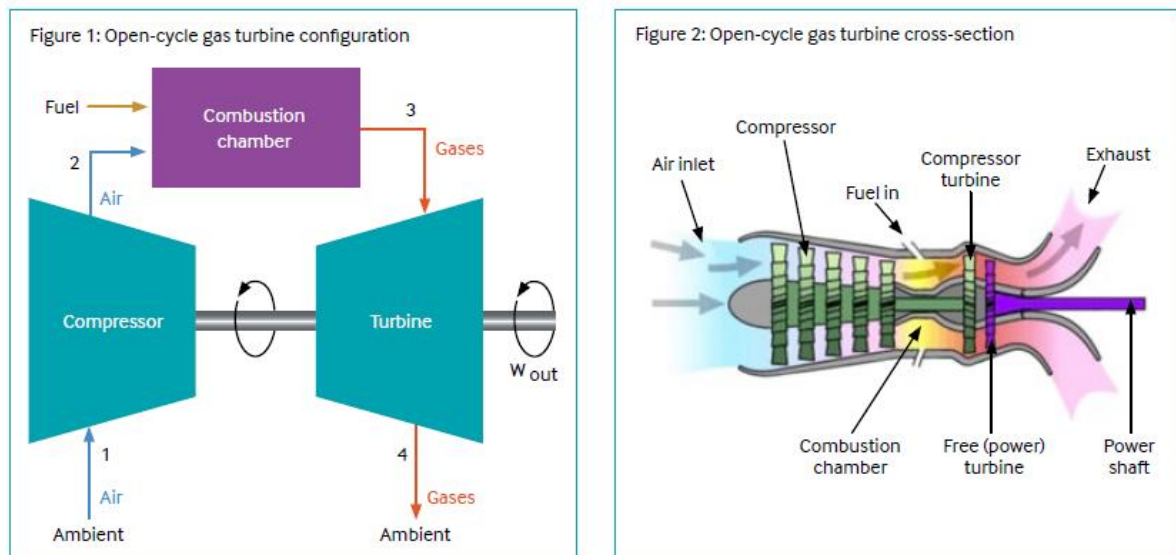


Figure 9: OCGT configuration (Left) OCGT cross section (Right) (Source: IOGP, 2022)

7.5.1.2 COMBINED CYCLE GAS TURBINE

CCGT power plants refer to a gas turbine system with an additional component known as a heat recovery steam generator (HRSG) for cogeneration. IOGP (2022) defines cogeneration as a process where waste heat recovered



from the gas turbine exhaust to power a steam engine for the generation of power. CCGT are noted to be more efficient than OCGTs as they can produce more power from less fuel, thus contributing to lower GHG emissions. The European Commission (2009) highlights that electricity production efficiencies varies according to the to the fuel and technology, however, cogeneration in CCGTs can have 85% total efficiency for electricity or more. Refer to Figure 10 for a schematic flow diagram and configuration drawing of a typical CCGT.

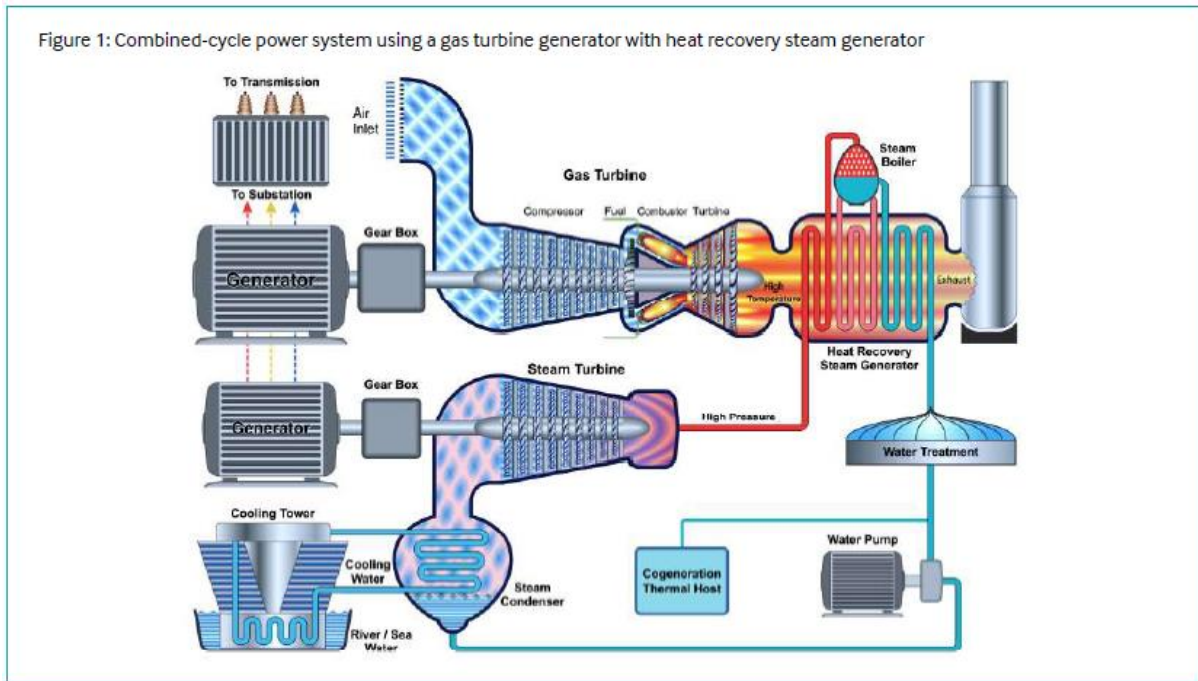


Figure 10: CCGT schematic drawing (Source: IOGT, 2022)

7.5.2 TURBINE OPTIONS

Gas turbine technologies are typically classified by letter designation to identify their technologies which is differentiated by the by volumetric air flow, its compressor pressure ratio, and most importantly the turbine inlet firing temperature (Zachary, 2008 cited in Mondol and Carr, 2017). Mondol and Carr (2017) further add that progression in turbine technologies has been noted with D and E class engines dominating in the 1980's, F-class engines in the 1990's and the more advanced GT class (G, H and J) being the most recently developed engine types. The various engine types generally have varying firing temperatures, cooling technologies and materials with the more recently developed engines being able to reach higher firing temperatures and having been noted to be more efficient technologies, kindly refer to Figure 11 below for a progression of gas turbine technologies and efficiencies.

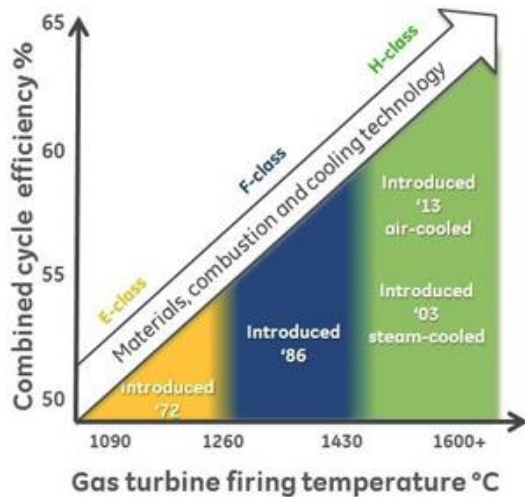


Figure 11: Progression of Gas Turbine Technologies and Efficiencies (Source: Vanderfort *et al.*, 2016)

A pre-feasibility study was undertaken for the development of a gas power plant with a power output of up to 600 MW. Various gas turbine technologies and configurations were considered. The gas turbine technologies that were considered included the F, H and J class gas turbines. A recommendation on the type of engine to be utilised for the CCGT was made based on high power outputs and efficiency.

7.6 NO-GO ALTERNATIVE

The “No Go” or “No Action” alternative refers to the alternative of not undertaking the proposed project at all. This alternative would imply that the current status quo without the proposed Kelvin Power CCGT plant project would remain (i.e. current land use only). It is important to note that the No Go alternative is the baseline against which all other alternatives and the development proposal are assessed.

When considering the No Go alternative, the impacts (both positive and negative) associated with any other specific alternative, or the current project proposal would not occur and in effect the impacts of the No Go alternative are therefore inadvertently assessed by assessing the other alternatives (i.e. the change caused by the project from baseline current conditions). The proposed development is located on the previous A-station coal fired plant that is currently undergoing decommissioning, not constructing the proposed CCGT plant would mean that this land would have to be rehabilitated and left vacant. The proposed development is located on a Zone 5 GPEMF zone surrounded by residential and industrial land uses, not implementing the proposed development would mean that the current land use of the property would not be continued with. It is further noteworthy that all identified positive and negative impacts associated with the proposed project would not occur.

7.7 ALTERNATIVE ASSESSMENT

Table 14 in this section describes the advantages and disadvantages of the alternatives identified above. The alternatives will be compared to each other as well as with the No-Go alternative. The significance rating of identified impacts for each alternative is listed in terms of their significance, duration, probability, reversibility and chance to cause irreplaceable loss in Section 10.2. Table 14 further details which alternatives are to be taken forward for further investigation in the EIA phase.



Table 14: Alternatives assessment.

Alternative Category	Alternative	Alternative Description Summary	Advantages	Disadvantages/ Risks	Carried into EIA
Location Alternatives	No specific feasible or desirable location alternatives were identified.				No
Activity Alternatives	It is not deemed reasonable or practical to assess any other type of activities. Kelvin Power is a power generating company whose main business is to generate electricity. The development of a CCGT is identified as the only feasible activity through the applicant's pre-feasibility assessments.				No
Scheduling Alternatives	No scheduling alternatives were identified for this project.				No
Layout Alternatives	A preliminary layout has been developed and assessed as part of the scoping report. Once the gas pipeline and powerline and/cable layouts be identified a detailed analysis of the layouts will be undertaken in the EIA phase. On site sensitivities will also be identified in the EIA phase which could affect the layout / footprint.				Yes
Technology Alternatives	System Tech 1 – Open Cycle Gas Turbine	The use of an OCGT for the generation of electricity.	The construction of an OCGT plant is less costly.	<ul style="list-style-type: none"> • High fuel consumption for relatively lower output electricity; and • Higher GHG emissions • Lower electricity generation efficiency. 	No
	System Tech 2 – Closed Cycle Gas Turbine	The use of an CCGT for the generation of electricity.	<ul style="list-style-type: none"> • CCGTs are more efficient as they can produce more electricity from less fuel. • Recover waste heat through the HRSG to be used for cogeneration. • Higher electricity generation efficiency. • Lower GHG emissions. 	The relative cost of buying a CCGT and constructing a plant is high.	Yes



Alternative Category	Alternative	Alternative Description Summary	Advantages	Disadvantages/ Risks	Carried into EIA
			<ul style="list-style-type: none"> Continuously improved technology 		
	Turbine Alternatives	Gas turbine technologies were assessed, and it was concluded that the H class engine that was identified during the applicant's feasibility study was the most reasonable alternative as it entails the latest CCGT technology with the highest power outputs and efficiencies.			No
No-Go Alternative	No-Go	The proposed activity will not take place on-site and the site will remain unutilized.	No environmental impacts as a result of the CCGT plant project.	<ul style="list-style-type: none"> No benefits with respect to job creation and also no indirect socio-economic benefits created. Inefficient use of an already disturbed, available space. No additional power generation capacity. 	Yes



8 STAKEHOLDER ENGAGEMENT PLAN

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

- Compliance with international best practise options;
- Compliance with national legislation;
- Establish and manage relationships with key stakeholder groups; and
- Encourage involvement and participation in the environmental study and authorisation / approval process.

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

- Provide an opportunity for I&APs to obtain clear, accurate and comprehensible information about the proposed activity, its alternatives or the decision and the environmental impacts thereof;
- Provide I&APs with an opportunity to indicate their viewpoints, issues and concerns regarding the activity, alternatives and / or the decision;
- Provide I&APs with the opportunity to suggest ways of avoiding, reducing or mitigating negative impacts of an activity and enhancing positive impacts;
- Enable the applicant to incorporate the needs, preferences and values of I&APs into the activity;
- Provide opportunities to avoid and resolve disputes and reconcile conflicting interests;
- Enhance transparency and accountability in decision-making;
- Identify all significant issues for the project; and
- Identify possible mitigation measures or environmental management plans to minimise and / or prevent environmental impacts associated with the project.

The PPP for this project has been undertaken in accordance with the requirements of the NEMA, as well as in line with the principles of Integrated Environmental Management (IEM). IEM implies an open and transparent participatory process, whereby stakeholders and other I&APs are afforded an opportunity to comment on the project.

8.1 LEGAL COMPLIANCE

The PPP must comply with several important sets of legislation that require public participation as part of an application for authorisation or approval, namely:

- The National Environmental Management Act (Act No. 107 of 1998 – NEMA);
- The National Water Act (Act No. 36 of 1998).

Adherence to the requirements of the above-mentioned Acts will allow for an Integrated PPP to be conducted, and in so doing, satisfy the requirement for public participation referenced in the Acts. The details of the Integrated PPP followed are provided below.

8.2 GENERAL APPROACH TO PUBLIC PARTICIPATION

The PPP has been undertaken in accordance with the requirements of the NEMA (and the NWA where applicable) as well as in line with the principles of Integrated Environmental Management (IEM). IEM implies an



open and transparent participatory process, whereby stakeholders and other I&APs are afforded an opportunity to comment on the project.

8.3 IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES

The I&AP databases compiled for various past environmental authorisation processes in the vicinity of the proposed facility have been utilised towards compiling a pre-notification register of key I&APs to be notified of the Environmental Authorisation Application. The I&AP database includes amongst others: landowners, communities, regulatory authorities and other specialist interest groups. Additional I&APs have been registered during the initial notification and call to register period. The I&APs database will continue to be updated throughout the duration of the EIA process. A full list of I&APs is attached in Appendix C.

8.3.1 LIST OF AUTHORITIES IDENTIFIED AND NOTIFIED

The following Government Authorities were notified of the proposed project:

- City of Ekurhuleni Metropolitan Municipality
- City of Johannesburg Metropolitan Municipality
- City Power
- Department of Employment & Labour
- Department of Public Works, Roads and Transport (DPWR) (National)
- Department of Road and Transport
- Eskom Holdings SOC Limited
- Gauteng Department of Agriculture, Rural Development and Environment
- Gauteng Department of Co-operative Governance and Traditional Affairs
- Gauteng Department of Economic Development
- Gauteng Department of Human Settlements
- Gauteng Department of Roads and Transport
- Gauteng Department of Social Development
- Gauteng Provincial Government
- Gauteng Provincial Government - Department of Community Safety
- Gauteng Provincial Government - Department of Health
- Gauteng Provincial Government - Department of Infrastructure Development
- Gauteng Provincial Government - Department of Roads and Transport
- Gauteng Provincial Government - Department of Sport, Arts, Culture and Recreation
- Gauteng Tourism Authority
- Gauteng Wetland Forum
- National Department Of Agriculture, Land Reform And Rural Development
- National Department of Forestry, Fisheries and Environment (DFFE)
- National Department of Human Settlements
- National Department of Mineral Resources & Energy (DMRE)
- National Department of Tourism
- National Department of Transport
- National Department of Water and Sanitation (DWS)
- National Energy Regulator of South Africa (NERSA)
- National House of Traditional Leaders
- Petroleum Agency SA
- PetroSA
- Presidential Climate Commission



- Provincial Heritage Resources Authority Gauteng (PHRAG)
- Rand Water
- South African Civil Aviation Authority
- South African Heritage Resource Agency (SAHRA)
- South African National Parks
- South African National Road Agency (SANRAL)
- Transnet
- Ward councillors

8.3.2 OTHER KEY STAKEHOLDERS IDENTIFIED AND NOTIFIED

The following key stakeholders have been identified and notified of the proposed project:

- African Conservation Trust
- AfriForum
- Air Traffic and Navigation Service (ATNS)
- Airports Company South Africa (ACSA)
- BirdLife South Africa
- Botanical Society
- Centre for Environmental Rights (CER)
- Conservation South Africa (CSA)
- Council for Geoscience (CGS)
- Earth Life Africa
- Endangered Wildlife Trust (EWT)
- The Green Connection
- Federation of Sustainable Environment (FSE)
- Gautrain Management Agency
- Kelvin Estate Club House
- Kelvin Homeowners Association
- Kelvin Power Station
- Kempton Park Golf Club
- Modderfontein Reserve
- Natural Justice
- Sasol
- South African National Biodiversity Institute
- Wildlife and Environment Society of South Africa (WESSA)

8.4 INITIAL NOTIFICATION OF I&APS

The PPP commenced on the 14th of February 2024 with an initial call to register notification. Notification during this initial consultation was given in the manner described below.

8.4.1 REGISTERED LETTERS, FAXES AND EMAILS

Notification letters in English and isiZulu were distributed to pre-identified I&APs through either faxes, registered letters and/or emails.

The notification documents included the following information:

- List of anticipated activities to be authorised;
- Sufficient detail of the proposed development to enable I&APs to assess/surmise what impact the development will have on them or on the use of their land;
- The purpose of the proposed project;
- Details of the application processes associated with proposed activities;
- Details of the affected properties (including a locality map);
- Details of the South African environmental legislation that must be adhered to;



Proof of the registered letters, emails and facsimiles that were distributed during the initial notification and call to register period are attached in Appendix C.

8.4.2 SITE NOTICES AND POSTERS

Sixteen (16) A1 Correx site notices and one (1) A3 poster (in English and isiZulu) were placed at 17 locations along, and surrounding the perimeter of the proposed project study area on the 14th of February 2024. The on-site notices included the following information:

- Project name;
- Applicant name;
- Project location;
- Map of proposed project area;
- Project description;
- Legislative requirements; and
- Relevant EIMS contact person for the project.

Please refer to Appendix C. for proof of site notice and poster placement.

8.4.3 NEWSPAPER ADVERTISEMENTS

Advertisements describing the proposed project and EIA process were placed in the Bedfordview and Edenvale News Newspaper (in English) with circulation in the vicinity of the study area on the 21st of February 2024, as well as the Kempton Express Newspaper (in English and isiZulu) with circulation in the vicinity of the study area on the 22nd of February 2024. Notices (in English and isiZulu) describing the proposed project and EIA process were placed in the Gauteng Provincial Government Gazette with publication on the 6th of March 2024. The newspaper adverts included the following information:

- Project name;
- Applicant name;
- Project location;
- Nature of the activity;
- Legislative requirements; and
- Relevant EIMS contact person for the project.

8.5 NOTIFICATION OF AVAILABILITY OF SCOPING REPORT

Notification (in English and isiZulu) regarding the availability of the Draft Scoping Report and associated appendices will be provided to pre-identified and registered I&APs through either email, fax, and/or registered mail where contacts are available. The notification will include details regarding where a hard copy of the report can be accessed. Contact details will be provided to I&APs if they require assistance accessing the information or require copies of the report.

The Scoping Report will be available for public review from 15 March 2024 – 16 April 2024, for a period of 30 days at the following venues:

- Kempton Park Library; and
- Electronic copies will be available on the EIMS website (www.eims.co.za/public-participation/).



8.6 ISSUES AND REPOSES

Issues raised to date have been addressed in a transparent manner and the full details such as the comment received, the name of the I&AP who commented, the issue raised and the main aspect of the raised issue, as well as the response provided to the I&AP included in the Public Participation Report (Appendix C). As the project is still at Draft Scoping stage most of the comments received so have been requests to be included on the database and requests for additional information, refer to the Public Participation Report in Appendix C for details of comments received.

To date the following comments have been received:

- I&AP registrations.
- Requests to be deregistered from the I&AP Database.
- Request for shapefiles/KMZ files, locality map and application from Rand Water.
- Acknowledgement from the Department of Water and Sanitation (DWS) of receipt of the initial notification.
- Department of Agriculture, Land Reform & Rural Development (DALRRD):
 - Office of the Regional Land Claims Commission – Gauteng Province provided a letter regarding any land claims on the property Zuurfontein 33 IR, Gauteng. Further investigation is being undertaken to verify whether there are any existing land claims on the application area's property, portion 391 R/E of Zuurfontein Farm 33-IR.
- Requests from Eskom to be informed regarding the progress of the application and for KMZ files of the proposed development area.
- Enquiry from Transnet Freight Rail about whether the proposed project would affect Transnet's railway infrastructure. Transnet Freight Rail were provided with KMZ files of the development area and a locality map, and were asked to confirm whether Transnet's railway infrastructure would be affected. EIMS has not yet received a response.
- Request from Transnet Pipelines for the Background Information Document.
- Confirmation from Transnet Pipelines that the proposed project does not affect Transnet Pipelines.
- Request from the Ward Councillor and Chair of the Kelvin Homeowner's Association that a presentation be held for the residents to explain the project.
- Requests for more information about the project:
 - General/ further information about the project
 - Enquiries as to whether the power station belongs to Johannesburg and if there are any benefits for anyone else from the development.
 - Stated interest in the health of the stream and catchment.
 - Enquiries for clarity on what the proposed development means for residents and how they are affected.
 - Enquiries on the potential impact that the proposed development would have on business and the surroundings.



9 ENVIRONMENTAL ATTRIBUTES AND BASELINE ENVIRONMENT

This section of the Scoping Report provides a description of the environment that may be affected by the proposed CCGT project. Aspects of the biophysical, social and economic environment that could be directly or indirectly affected by, or could affect, the proposed project have been described. Baseline information sourced from various spatial datasets and information from the specialist team utilised to prepare the environmental attributes baseline below.

9.1 RAINFALL AND TEMPERATURE

Period and diurnal wind roses drawn from the South African Weather Service (SAWS) OR Tambo meteorological station data are shown in Figure 12. During the period January 2020 to December 2022, the dominant wind field was from the north-western sector. Calm conditions occurred 2% of the time. The predominant wind direction for day- and night-time conditions was from the northwest and north respectively.

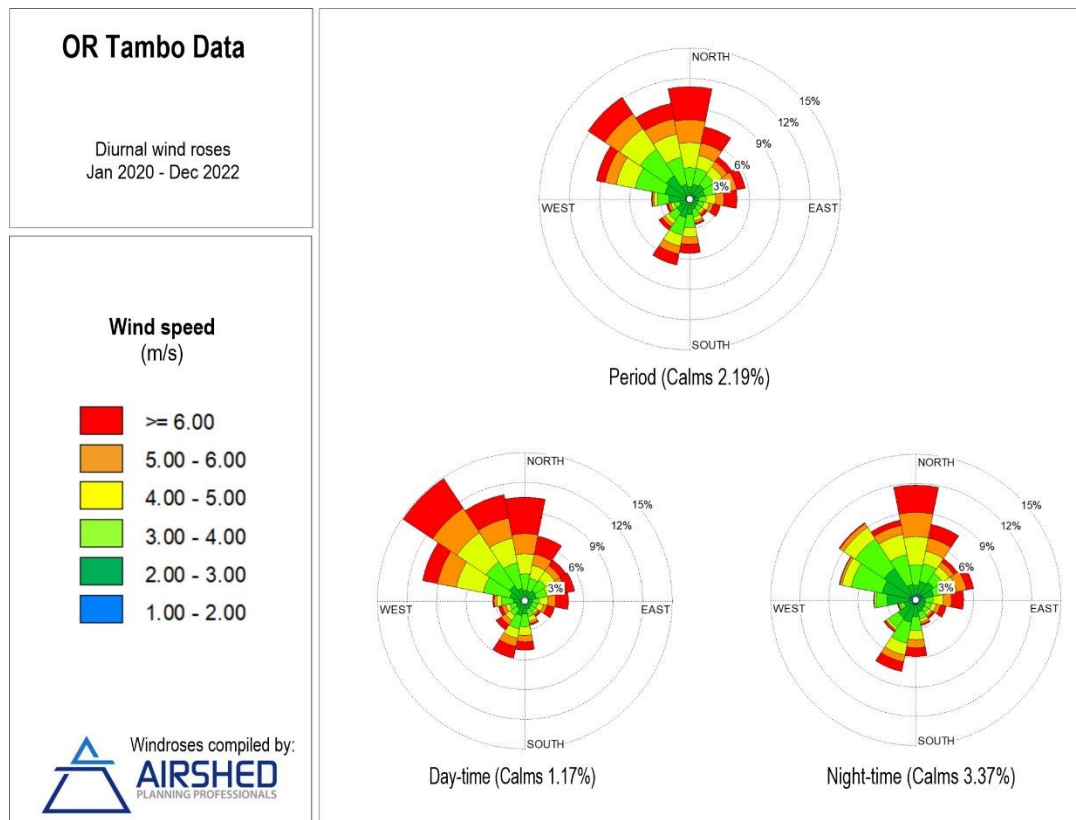


Figure 12: Period average, daytime and night-time wind roses (measured data; January 2020 to December 2022; SAWS OR Tambo meteorological station)

Monthly mean, maximum and minimum temperatures are given in Table 15. Diurnal temperature variability is presented in Figure 13. Average monthly temperatures ranged between 10.6°C and 19.7°C. During the day, temperatures increase to reach maximum at about 15:00 in the late afternoon. Ambient air temperature decreases to reach a minimum at between 05:00 and 06:00, i.e., just before sunrise.

Table 15: Monthly average temperature summary (OR Tambo meteorological station for the period January 2020 to December 2022)

Hourly Minimum, Hourly Maximum and Monthly Average Temperatures (°C)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minimum	15.8	15.4	14.3	12.1	9.1	6.0	6.0	8.2	11.7	14.1	14.8	15.5



Hourly Minimum, Hourly Maximum and Monthly Average Temperatures (°C)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average	19.7	19.5	18.3	16.0	13.8	10.6	10.9	13.3	17.7	19.0	18.9	19.2
Maximum	23.9	23.7	22.6	20.6	19.1	16.1	16.6	19.2	24.0	24.4	23.2	23.6

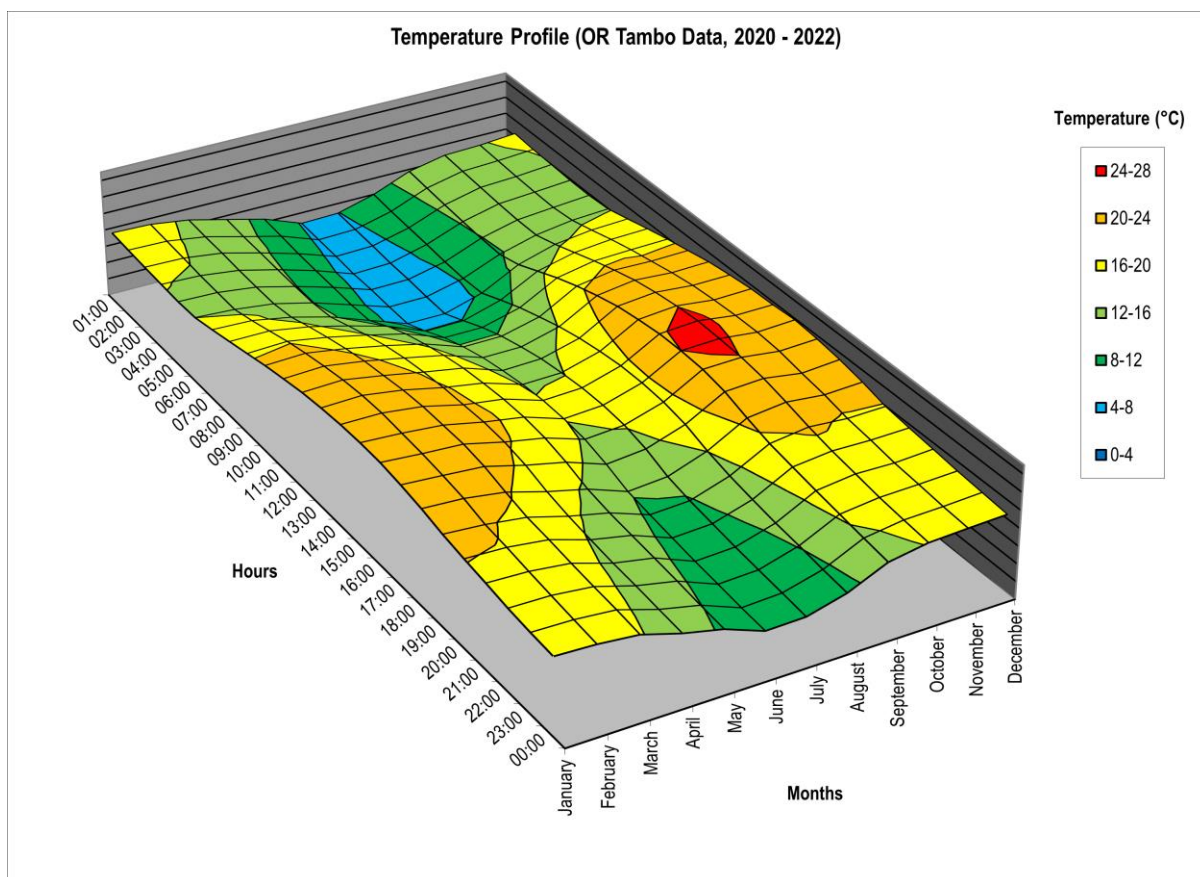


Figure 13: Diurnal temperature profile (OR Tambo meteorological station for the period January 2020 to December 2022)

Air Quality Monitoring Stations (AQMS) within the study area include Buccleugh AQMS (~11.5 km northwest of the project) and Alexandra AQMS (~7.8 km west of the project) both owned by the City of Johannesburg and Bedfordview AQMS (~8.8 km southwest of the project) owned by the Ekurhuleni Metropolitan Municipality. Potential sensitive receptors within 5 km from the project include residential areas, i.e., Esther Park, Edleen, Cresslawn, Kelvin Estate, Croydon, Eden Glen and Illiondale. Residential areas within 10 km from the project site include Edenvale, Kempton Park, and Lethabong (Figure 14). The list of hospitals and schools within the study area is provided in Table 16.

Table 16: Location of Air Quality Monitoring Stations (AQMS), hospitals and schools within the study area

ID	UTM WGS84 (35S)		Name	Distance from project centre (m)
	Easting	Northing		
AQMS				
1	611016	7111989	Alexandra AQMS	8 312
2	609936	7118870	Buccleugh AQMS	12 092
3	613234	7104036	Bedfordview AQMS	9 389



ID	UTM WGS84 (35S)		Name	Distance from project centre (m)
	Easting	Northing		
Hospitals				
4	624862	7102933	Advanced East Rand Day Hospital	9 976
5	623594	7112000	Arwyp Medical Centre	4 374
6	623070	7116306	Birchleigh Clinic	6 345
7	622101	7116267	Birchmed Day Hospital	5 786
8	612993	7115449	Busamed Modderfontein Private Hospital Orthopaedic & Oncology Centre	7 593
9	612872	7109642	Edenvale Hospital	6 608
10	623539	7112561	Ekurhuleni Surgiklin Day Hospital	4 458
11	619019	7102272	Knights Chest Hospital	8 941
12	612076	7102809	Life Bedford Gardens Hospital - Emergency Unit	11 073
13	612190	7102722	Life Bedford Gardens Private Hospital - Medical Ward	11 066
14	617028	7104065	Life Roseacres Hospital	7 494
15	623313	7111960	Marymount Hospital	4 091
16	609544	7106167	Netcare Linksfield Hospital	10 974
Schools				
17	624359	7114148	Aston Manor Primary School	5 858
18	613050	7103178	Bedfordview Academy	10 171
19	612812	7102223	Bedfordview High School	11 079
20	613966	7103999	Bedfordview Primary School	8 964
21	622415	7106840	Benoni Secondary School	5 370
22	609736	7111223	Bovet Primary School	9 555
23	614264	7105711	Crawford International - Bedfordview	7 450
24	620686	7111104	Cresslawn Primary School	1 398
25	617734	7108045	Curro Edenvale High School	3 527
26	624026	7113206	Destiny Independent School Kempton Park	5 138
27	614632	7108111	Dowerglen High School	5 595
28	615265	7106627	Dunvegan Primary School	6 100
29	610891	7112912	East Bank High School	8 571
30	615684	7108937	Eastleigh Primary School	4 264
31	617640	7108732	Edenglen High School	2 977
32	614783	7107361	Edenvale High School	5 928
33	619831	7113255	Edleen Primary	2 116
34	626139	7103620	Eduvu - Remedial School / Academy	10 221
35	609376	7111753	Ekukhanyisweni Primary School	9 930
36	612979	7102665	Elandspark School	10 622
37	616012	7118999	Gideon Rambuwani Primary School	8 452
38	623732	7117645	Hoërskool Birchleigh	7 819
39	621615	7115369	Hoërskool Jeugland	4 765
40	614505	7101949	Hoërskool Primrose	10 424
41	615778	7107158	Holy Rosary School for Girls	5 362
42	610500	7112467	Ikage Primary School	8 881
43	609526	7111117	Inkanyezi Waldorf Centre	9 766
44	616591	7110033	Jacaranda Academy	2 945
45	623609	7113318	Kempton Park Primary School	4 805
46	611247	7112919	Kwabhekilanga Secondary School	8 224
47	623238	7116981	Laerskool Birchleigh	6 992
48	620801	7113420	Laerskool Edleen	2 678
49	623724	7110930	Laerskool Kempton Park FSS	4 441
50	623673	7112744	Laerskool Kreft	4 643



ID	UTM WGS84 (35S)		Name	Distance from project centre (m)
	Easting	Northing		
51	624700	7115735	Laerskool Kruinsig	7 052
52	620920	7114905	Laerskool Van Riebeeckpark	4 039
53	627936	7103441	Laerskool Westwood	11 622
54	610800	7112802	M.C. Weiler Primary School	8 640
55	616321	7120101	Maphutha Secondary School	9 375
56	624876	7115967	Maranatha Christian School	7 337
57	625053	7101750	Martin Primary School	11 075
58	617148	7120125	Mayibuye Primary School - New	9 170
59	614406	7119337	Midrend Primary School	9 484
60	622540	7107594	Moduopo Primary School	4 860
61	614622	7111838	Nobel Primary School	4 711
62	622479	7117114	Norkem Park Primary School	6 710
63	610097	7111410	Pholoshu Primary School	9 197
64	618406	7118236	Phomolong Secondary School	7 083
65	615908	7113541	Pinnacle College Founders Hill	4 109
66	614408	7102517	Primrose Hill Primary School	9 969
67	616195	7103186	Primrose Primary School	8 599
68	614540	7101933	Primrose Technical High School	10 422
69	611524	7103025	Reddam House Bedfordview	11 284
70	622888	7109793	Rhodesfield High School	3 865
71	622678	7112774	Sir Pierre van Reyneveld High School	3 730
72	611780	7112738	Skeen Primary School	7 665
73	613624	7104762	St Benedict's College	8 584
74	613703	7104351	St Benedict's Junior Preparatory School	8 846
75	615706	7108363	Success College Primary	4 578
76	627902	7105597	Summerfields Primary School	10 278
77	617239	7104746	Sunnyridge Primary School.	6 781
78	614919	7120295	Taal-Net Midrand School	10 083
79	624414	7112252	Taalnet Primary & High School Kempton Park	5 228
80	618745	7120880	Tembisa West Secondary School	9 687
81	622421	7120743	Thuthuka Primary School	10 035
82	619570	7114484	Westside Primary School	3 287
83	621920	7103141	Wit Deep Primary School	8 485
84	625874	7105122	Woodlands International College	8 965
85	612872	7101800	Wychwood Primary School	11 390

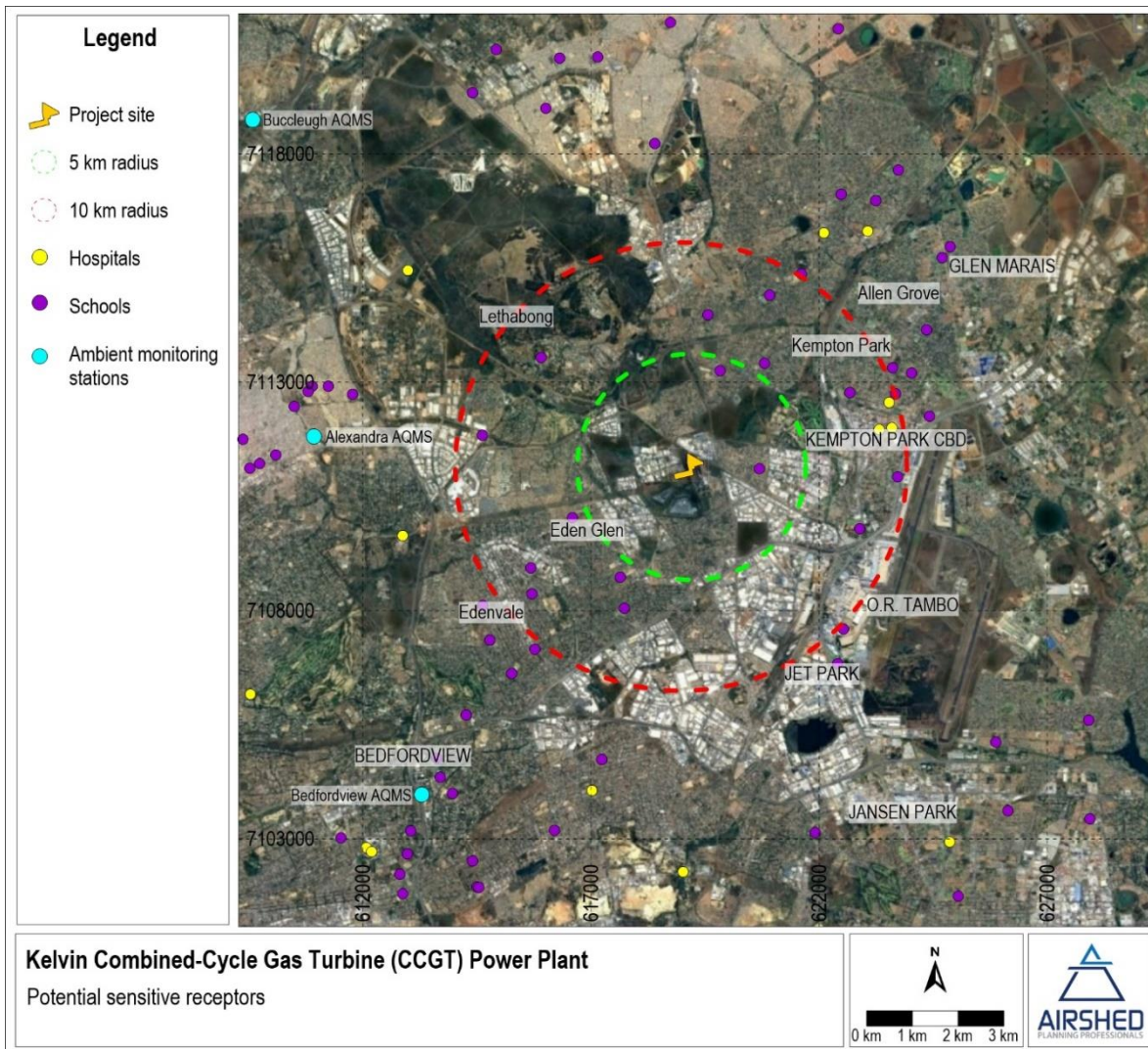


Figure 14: Potential sensitive receptors within the study area.

A summary of the measured ambient air quality data for the period 2023 from the Buccleugh AQMS, Alexandra AQMS and Bedfordview AQMS is provided in Table 17. Data availability for the pollutants measured at Alexandra AQMS was more than 80%. The data availability for the pollutants measured at Buccleugh AQMS was less than 60% with availability at Bedfordview AQMS being less than 20%. Non-compliance of the daily and annual NAAQS for PM10 and PM2.5 were recorded for the period 2023 at the Alexandra AQMS.

Table 17: Summary of the ambient measurements at the AQMS within the study area for the period 2023^{(a)(b)}

AQMS	Data Availability	Hourly			Daily			Annual Average	No of recorded hourly exceedances	No of recorded daily exceedances
		Maximum	99 th Percentile	50 th Percentile	Maximum	99 th Percentile	50 th Percentile			
SO₂ (µg/m³)										
Criteria		350 µg/m ³			125 µg/m ³			50 µg/m ³	88 hours per year	4 days per year
Alexandra	87%	268.2	78.8	7.2	59.6	44.4	8.9	12.0	0	0
Buccleugh	56%	233.2	57.4	6.2	43.3	23.0	4.2	10.0	0	0
Bedfordview	13%	193.3	107.5	19.2	67.6	59.6	23.2	25.6	0	0
O₃ (µg/m³)										



AQMS	Data Availability	Hourly			Daily			Annual Average	No of recorded hourly exceedances	No of recorded daily exceedances
		Maximum	99 th Percentile	50 th Percentile	Maximum	99 th Percentile	50 th Percentile			
Criteria		120 µg/m³							11 periods per year	
Buccleugh	55%	139.5	108.4	28.6					23	
CO (µg/m³)										
Criteria		30 000 µg/m³			10 000 µg/m³				88 hours per year	11 periods per year
Buccleugh	46%	9 229.0	2 942.5	503.8	3 487.0	2 585.7	570.2		0	0
Bedfordview	12%	3 182.3	2 327.6	576.4	2 430.3	1 959.3	639.0		0	0
PM₁₀ (µg/m³)										
Criteria					75 µg/m³			40 µg/m³		4 days per year
Alexandra	83%				179.5	132.1	54.5	46.4		102
Buccleugh	47%				131.4	66.0	27.2	28.9		2
Bedfordview	17%				68.5	68.4	39.8	41.5		0
PM_{2.5} (µg/m³)										
Criteria					40 µg/m³			20 µg/m³		4 days per year
Alexandra	84%				118.1	82.9	28.2	22.8		100
Buccleugh	14%				42.1	40.1	17.2	19.2		2
Bedfordview	17%				38.5	38.5	21.7	21.9		0

Notes:

- (a) Red text denotes less than 80% data availability
- (b) Bold text denotes exceedance of the NAAQS

9.2 CLIMATE

Climate change metrics focus on temperature; the number of very hot days (where temperatures exceed 35°C); rainfall and extreme rainfall events (more than 20 mm in 24 hours). The baseline (1961 to 1990) annual averages for these metrics were accessed for the area near the project site from the South Africa 'Green Book' (CSIR, 2019). The metrics include three percentiles¹ (10th, 50th, and 90th) as an indication of the variability within the measured data set.

Baseline annual average temperature was in the range 15.57°C (10th percentile) and 15.81°C (90th percentile) (Figure 17) with the number of very hot days varying between 0.12 (10th percentile) and 0.84 (90th percentile) days per year (Figure 18). The range between the 10th and 90th percentiles is 832.92 mm and 916.83 mm (Figure 19). Extreme rainfall days varied between 8.89 (10th percentile) and 9.94 (90th percentile) days per year (Figure 20).

Recent change in climatic conditions near the project site were accessed from MeteoBlue a weather forecasting platform developed at the University of Basel, Switzerland and based on models of National Oceanic and Atmospheric Administration (NOAA) or National Centres for Environmental Prediction (NCEP). The data sets also include historical climate data tracking changes in climate by referencing ERA5, the fifth generation ECMWF (European Centre for Medium-Range Weather Forecasts) atmospheric reanalysis of the global climate, for the

¹ A percentile is a statistical measure to indicate the value below which a given percentage of observations in a group of observations falls. For example, the 90th percentile is the value below which 90% of the observations fall. The 10th percentile is the value below which 10% of the observations fall.



period between 1979 to 2021, with a spatial resolution of 30 km. Based on a point selected over the project site, an increasing trend in the annual average temperatures have been observed from 15.3°C in 1979 to 16.7°C in 2023 (Figure 15). The lower part the graph shows the so-called warming stripes. Each coloured stripe represents the average temperature for a year - blue for colder and red for warmer years. The change in rainfall over the same period (1979 – 2023) displays a slight decreasing trend from 807.5 mm in 1979 to 720.1 mm in 2023 (Figure 16), where the difference from long-term average for each year in the data set is visualised by the stripes in the lower panel of Figure 16 brown stripes indicate lower than average rainfall and green stripes above average rainfall).

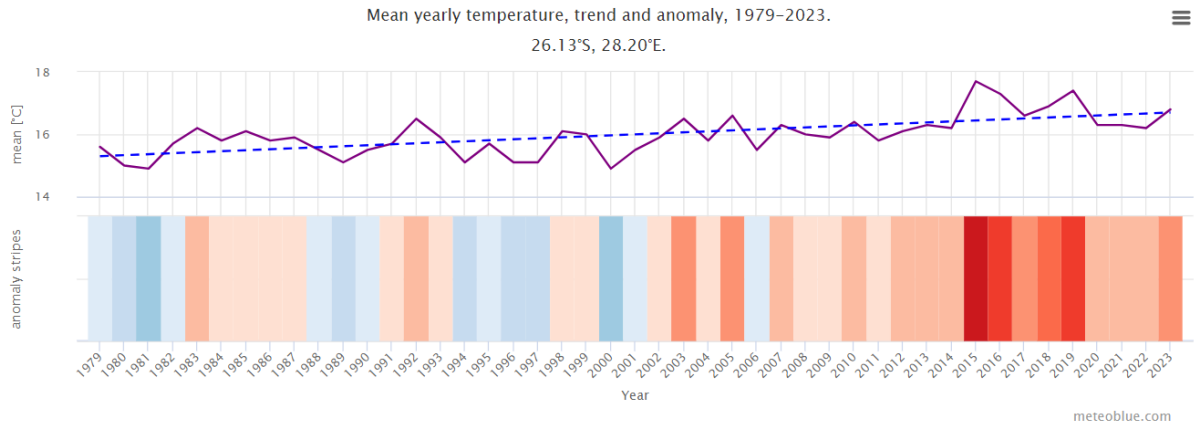


Figure 15: Annual average temperature (top panel) and temperature anomaly (lower panel) between 1979 and 2023 (meteoblue AG, 2024)

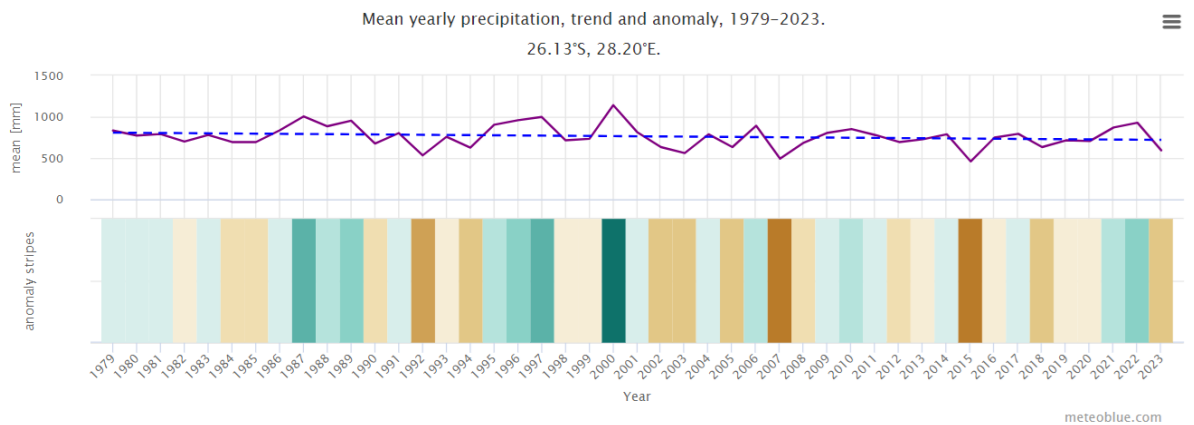


Figure 16: Annual average rainfall (top panel) and rainfall anomaly (lower panel) between 1979 and 2023 (meteoblue AG, 2024)

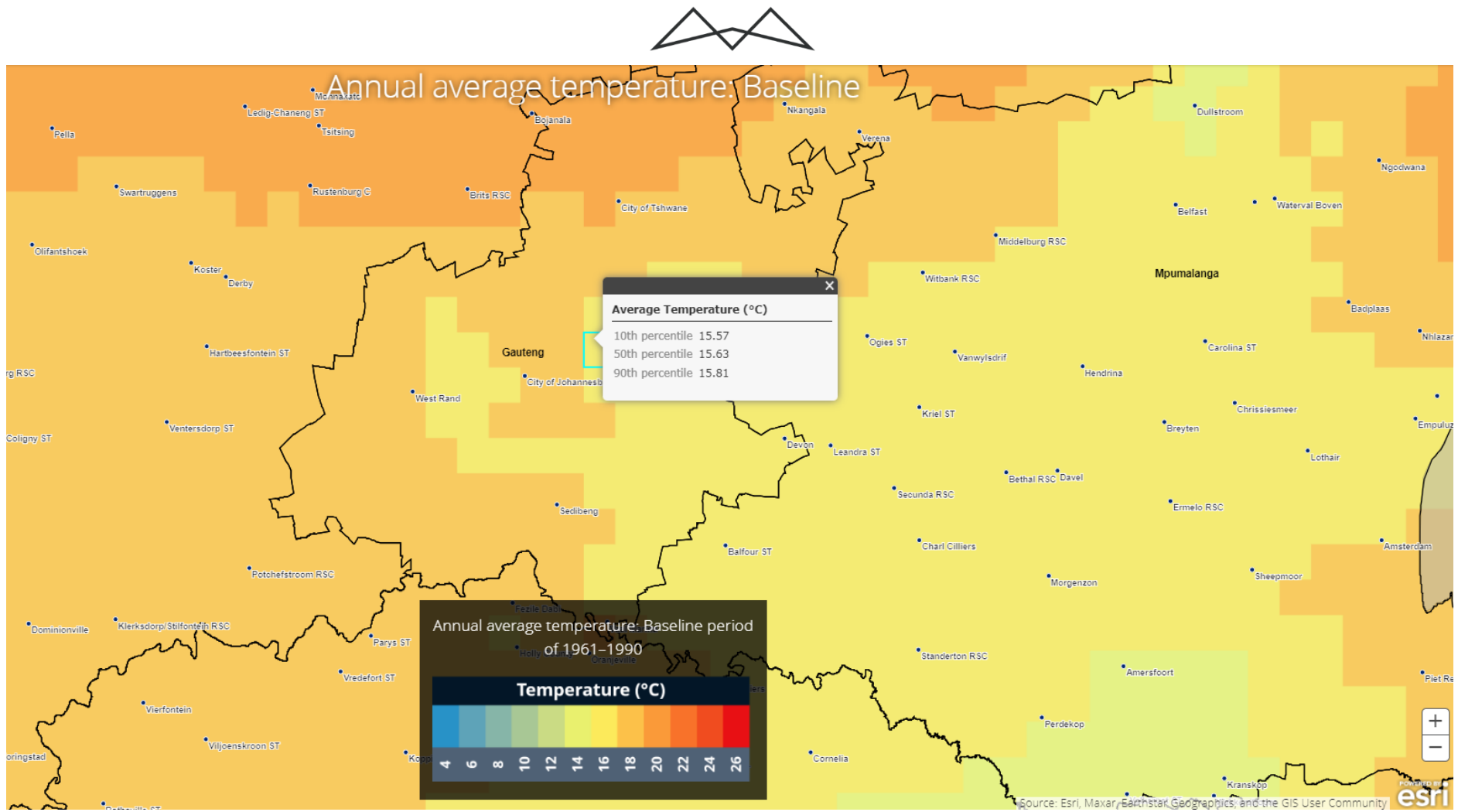


Figure 17: Baseline (1961 to 1990) annual average temperature for the project area (CSIR, 2019)

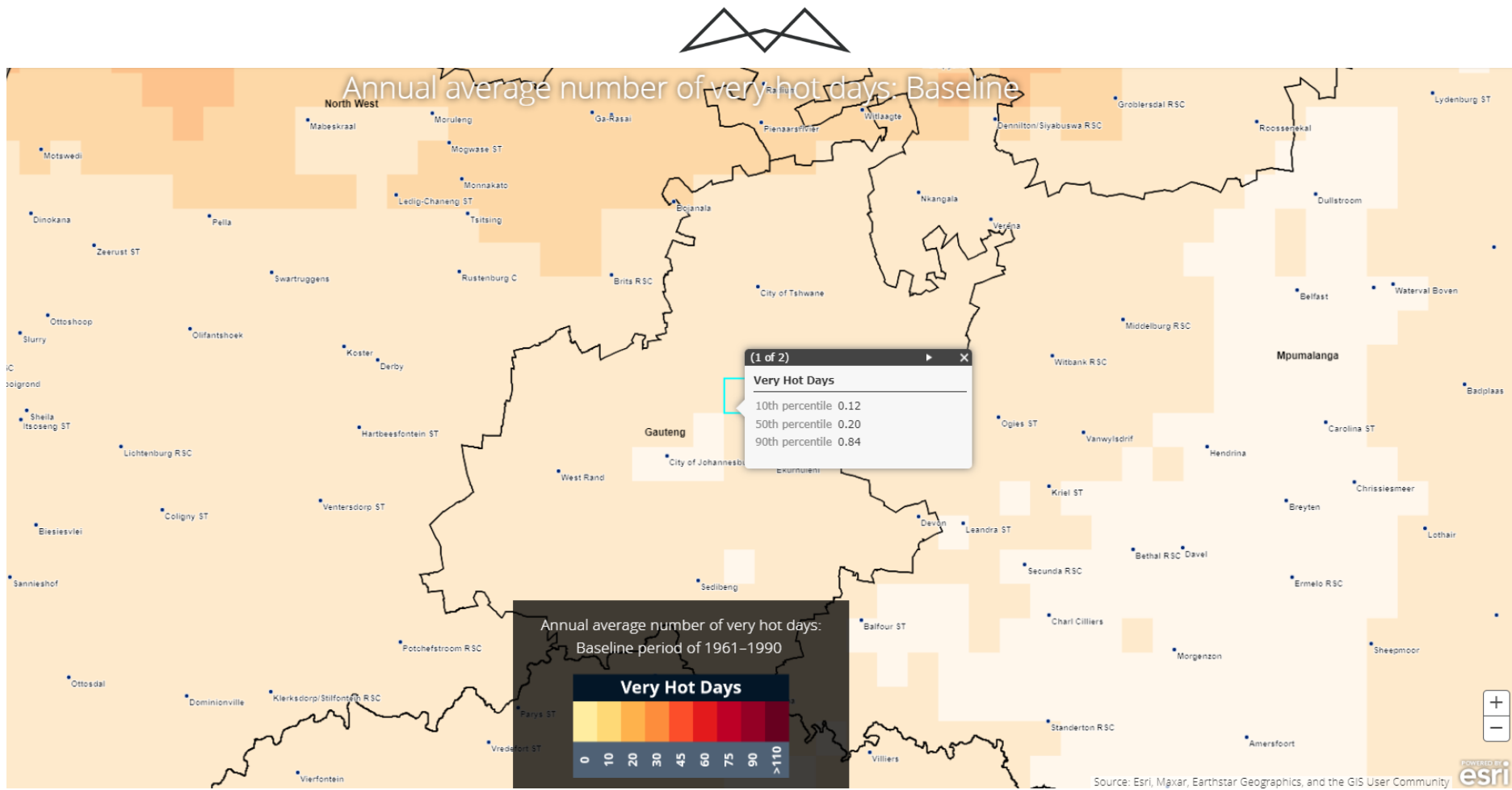


Figure 18: Baseline (1961 to 1990) number of very hot days (>35°C) annually for the project area (CSIR, 2019)

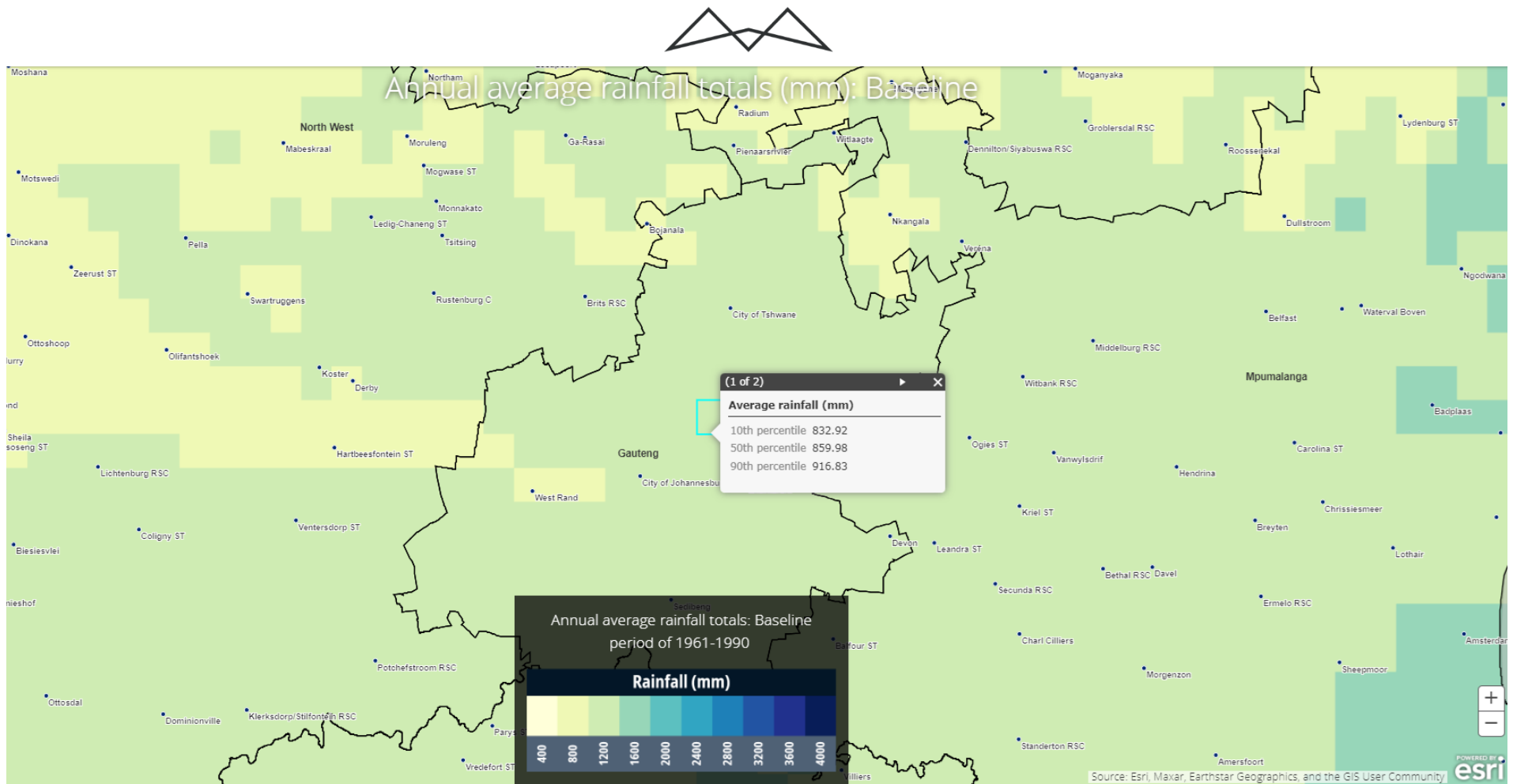


Figure 19: Baseline (1961 to 1990) annual average rainfall for the project area (CSIR, 2019)

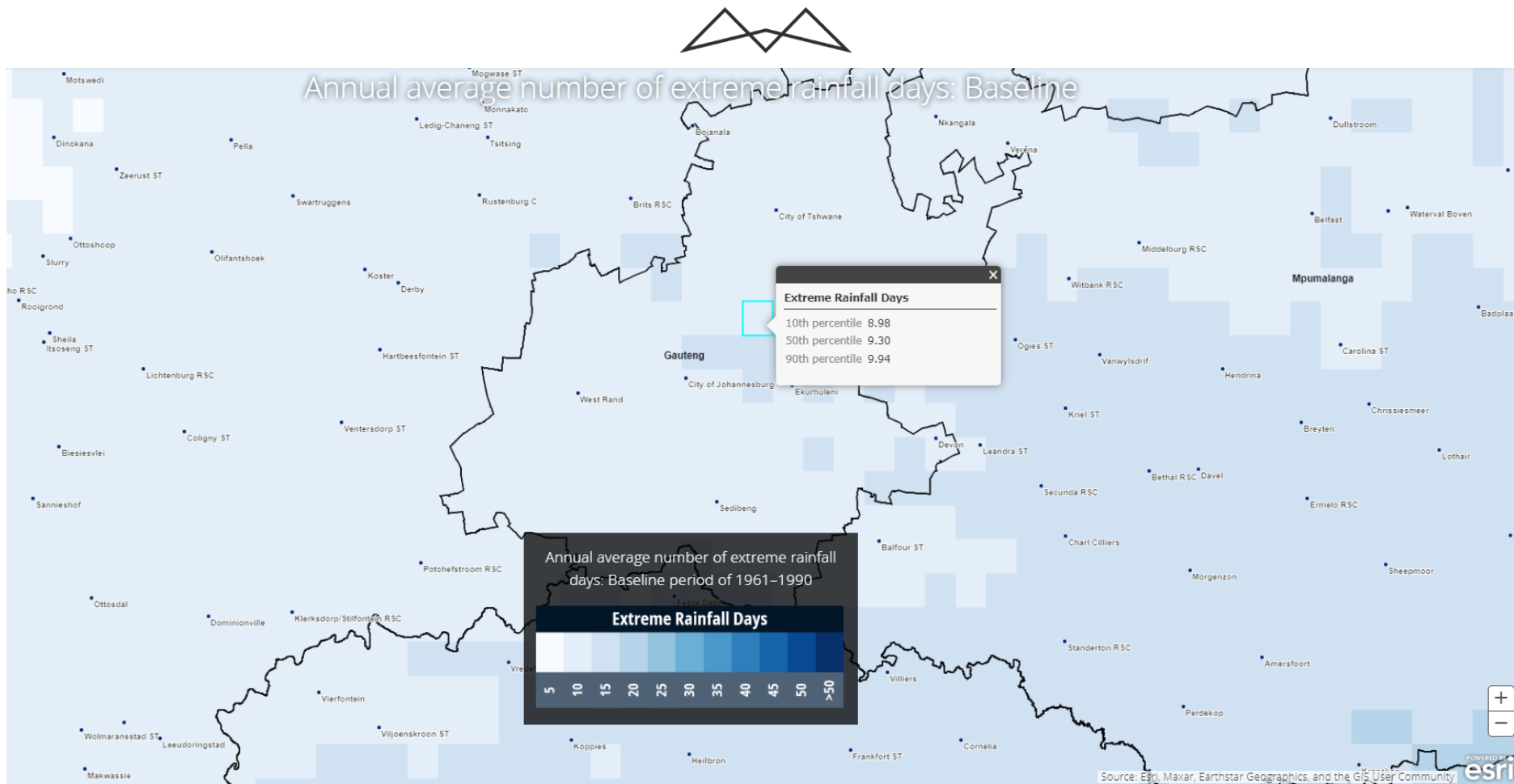


Figure 20: Baseline (1961 to 1990) annual average number of extreme rainfall days (>20 mm in <24 hours) for the project area (CSIR, 2019)



9.3 BASELINE NOISE ENVIRONMENT

Survey sites were selected after careful consideration of future activities, accessibility, potential noise sensitive receptors, and safety restrictions. A total of 5 survey sites was selected for the survey conducted in February 2024. The locations of the survey sites, with coordinates, are provided in Table 18 .

Table 18: Location of the noise survey sites.

Site	Latitude	Longitude
1	26.105364°S	28.190997°E
2	26.111805°S	28.189483°E
3	26.114337°S	28.199879°E
4	26.124442°S	28.193131°E
5	26.116567°S	28.196581°E

The first noise survey campaign was undertaken on the 5th and 6th of February 2024. The survey results are summarised in Table 19 and visually presented in Figure 21 (day-time results) and Figure 22 (night-time results).

The acoustic climate in the area is mainly influenced by birds, insects, traffic, community and industrial activity. Day-time noise survey results indicate that the acoustic climate in the study area indicate levels typical of sub-urban districts (Site 3 and Site 4), urban districts (Site 1) and urban district with business premises or main road (Site 2 and Site 5). Night-time noise survey results indicate that the acoustic climate in the study area indicate levels typical of urban district with business premises or main road (Site 1, Site 2, Site 3 and Site 4), and industrial districts (Site 5). The IFC noise guidelines for residential areas are exceeded at Site 5 for day-time and Site 1, Site 3, Site 4 and Site 5 for night-time.

The main meteorological parameters affecting the propagation of noise include wind speed, wind direction and temperature. These along with other parameters such as relative humidity, air pressure, solar radiation and cloud cover affect the stability of the atmosphere and the ability of the atmosphere to absorb sound energy.

Wind speed increases with altitude. This results in the ‘bending’ of the path of sound to ‘focus’ it on the downwind side and creating a ‘shadow’ on the upwind side of the source. Depending on the wind speed, the downwind level may increase by a few dB but the upwind level can drop by more than 20 dB (Brüel & Kjær Sound & Vibration Measurement A/S, 2000). It should be noted that at wind speeds of more than 5 m/s, ambient noise levels are mostly dominated by wind generated noise.

Meteorological data from the OR Tambo SAWS meteorological station, for the period 2020 to 2022, was used for the baseline assessment. The measured data set indicates wind flow primarily from the northwestern sector. During the day the predominant wind direction is from the west-northwest with the predominant wind direction during the night from the north. On average, noise impacts are expected to be more notable to the southeast during the day and to the south during the night. Temperature gradients in the atmosphere create effects that are uniform in all directions from a source. On a sunny day with no wind, temperature decreases with altitude and creates a ‘shadowing’ effect for sounds. On a clear night, temperatures may increase with altitude thereby ‘focusing’ sound on the ground surface. Noise impacts are therefore generally more notable during the night.

Noise reduction caused by a barrier (i.e., natural terrain, installed acoustic barrier, building) feature depends on two factors namely the path difference of a sound wave as it travels over the barrier compared with direct transmission to the receiver and the frequency content of the noise (Brüel & Kjær Sound & Vibration Measurement A/S, 2000). Sound reflected by the ground interferes with the directly propagated sound. The effect of the ground is different for acoustically hard (e.g., concrete or water), soft (e.g., grass, trees or vegetation) and mixed surfaces. Ground attenuation is often calculated in frequency bands to take into account the frequency content of the noise source and the type of ground between the source and the receiver (Brüel & Kjær Sound & Vibration Measurement A/S, 2000). Based on observations made during the visit to site, ground cover was found to be acoustically hard.



Table 19: Project baseline environmental noise survey results summary

Sampling point	Visual and acoustic observations	General weather conditions	Time of day	Start date and time	Duration	L _{AFmax} (dBA)	L _{AFmin} (dBA)	L _{Aeq} (dBA)	L _{ALeq} (dBA)	L _{A90} (dBA)	Ct	L _{Aeq} (dBA) for Comparison to IFC Noise Level Guidelines ^(a)	IFC Noise Level Guidelines (dBA)
Site 1	Survey site located at the residential area of Esther Park. Noise sources include birds, dogs, community activity and vehicles.	Winds of 4 m/s (S); 29°C; 34% humidity; 75% cloud cover	Day	2024/02/05 18:08	00:20:13	79.4	36.9	56.1	51.7	39.6	0.0	55.3	55
		Winds of 1 m/s (S); 25°C; 34% humidity; 10% cloud cover	Day	2024/02/06 20:22	00:20:13	75.2	41.8	54.3	51.5	49.9	0.0		
		Winds of 3 m/s (SSE); 18°C; 77% humidity; 10% cloud cover	Night	2024/02/05 23:53	00:20:04	62.5	38.2	51.4	59.0	47.7	0.0	51.0	45
		No wind; 23°C; 40% humidity; 0% cloud cover	Night	2024/02/06 22:03	00:20:07	69.2	34.9	50.5	51.8	38.6	0.0		
Site 2 (industrial site)	Survey site located at the Sebenza industrial area west of the Kelvin Power Station, ~6m from the Lovato Road. Noise sources include birds, insects, dogs, community activity,	Winds of 4 m/s (S); 27°C; 39% humidity; 75% cloud cover	Day	2024/02/05 18:35	00:20:10	81.9	43.6	59.7	70.3	46.8	0.0	60.6	70
		Winds of 1 m/s (W); 29°C; 28% humidity; 10% cloud cover	Day	2024/02/06 18:09	00:20:01	79.7	40.6	61.4	50.0	44.0	0.0		
		Winds of 2 m/s (S); 19°C; 65% humidity; 30% cloud cover	Night	2024/02/05 23:25	00:20:08	67.0	46.4	50.9	64.9	48.1	0.0	51.0	70
		Winds of 0.4 m/s (S); 22°C; 42% humidity; 0% cloud cover	Night	2024/02/06 22:35	00:20:02	81.8	41.1	51.0	51.5	43.0	0.0		



Sampling point	Visual and acoustic observations	General weather conditions	Time of day	Start date and time	Duration	L _{AFmax} (dBA)	L _{AFmin} (dBA)	L _{Aeq} (dBA)	L _{AFeq} (dBA)	L _{A90} (dBA)	Ct	L _{Aeq} (dBA) for Comparison to IFC Noise Level Guidelines ^(a)	IFC Noise Level Guidelines (dBA)
	vehicles and Gautrain.												
Site 3	Survey site located at the residential area of Cresslawn. Noise sources include insects, dogs, music, community activity, air traffic and vehicles. Vehicles from the M39 and the Kelvin Power Station were audible throughout the survey.	Winds of 4 m/s (SE); 26°C; 39% humidity; 75% cloud cover	Day	2024/02/05 19:02	00:20:04	75.4	43.4	53.6	51.4	46.0	0.0	52.4	55
		Winds of 1 m/s (S); 27°C; 31% humidity; 0% cloud cover	Day	2024/02/06 19:24	00:20:01	74.6	42.9	50.7	58.6	45.4	0.0		
		No wind; 22°C; 52% humidity; 20% cloud cover	Night	2024/02/05 22:00	00:20:03	69.9	43.2	49.7	56.7	45.1	0.0	48.7	45
		No wind; 22°C; 42% humidity; 0% cloud cover	Night	2024/02/06 23:03	00:20:02	57.9	41.4	47.5	50.5	43.9	0.0		
Site 4	Survey site located at the residential area of Croydon, ~2m from	Winds of 3 m/s (SE); 25°C; 44% humidity; 75% cloud cover	Day	2024/02/05 19:30	00:18:10	73.5	42.3	52.1	53.6	44.6	0.0	52.3	55
		Winds of 1 m/s (W); 28°C; 29% humidity; 0% cloud cover	Day	2024/02/06 18:56	00:20:01	73.9	38.9	52.4	51.5	41.8	0.0		



Sampling point	Visual and acoustic observations	General weather conditions	Time of day	Start date and time	Duration	L _{AFmax} (dBA)	L _{AFmin} (dBA)	L _{Aeq} (dBA)	L _{AEq} (dBA)	L _{A90} (dBA)	Ct	L _{Aeq} (dBA) for Comparison to IFC Noise Level Guidelines ^(a)	IFC Noise Level Guidelines (dBA)
	Toermalyn Road. Noise sources include insects, dogs and vehicles.	No wind; 21°C; 60% humidity; 10% cloud cover	Night	2024/02/05 22:28	00:20:05	73.9	35.3	46.9	53.1	37.3	0.0	48.0	45
		No wind; 19°C; 59% humidity; 0% cloud cover	Night	2024/02/06 23:30	00:20:04	68.4	36.2	48.8	55.4	39.1	0.0		
Site 5	Survey site located to the east of the Kelvin Power Station. Noise sources include insects, Kelvin Power Station cooling towers and boiler house.	Winds of 4 m/s (N); 22°C; 50% humidity; 75% cloud cover	Day	2024/02/05 21:32	00:20:04	66.7	58.3	60.1	60.2	59.1	0.0	60.2	55
		Winds of 1 m/s (SW); 26°C; 33% humidity; 0% cloud cover	Day	2024/02/06 19:53	00:20:00	66.0	57.9	60.3	63.6	59.1	0.0		
		Winds of 2 m/s (S); 21°C; 56% humidity; 10% cloud cover	Night	2024/02/05 22:58	00:20:07	66.3	56.5	58.8	61.3	57.6	0.0	59.4	45
		Winds of 0.4 m/s (SW); 22°C; 42% humidity; 0% cloud cover	Night	2024/02/06 23:57	00:20:35	67.6	58.0	59.9	62.3	58.9	0.0		

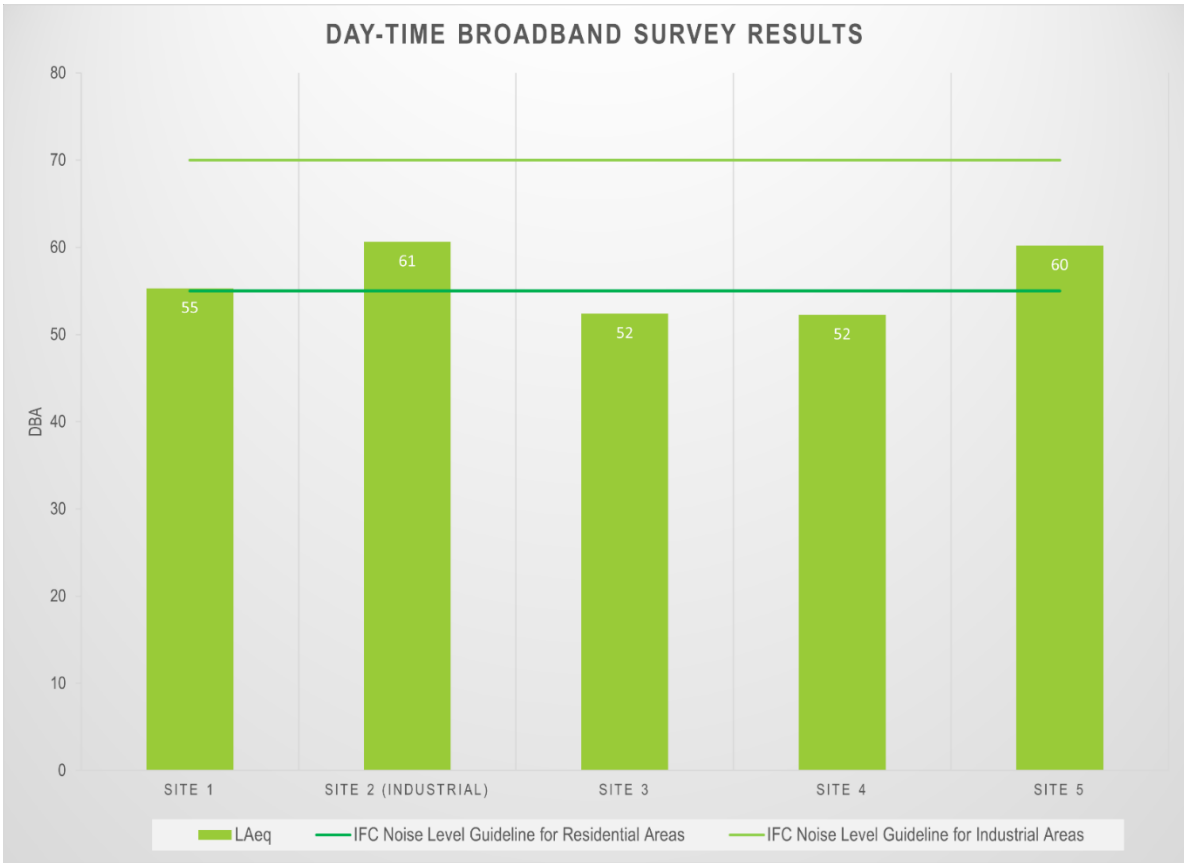


Figure 21: Day-time broadband survey results

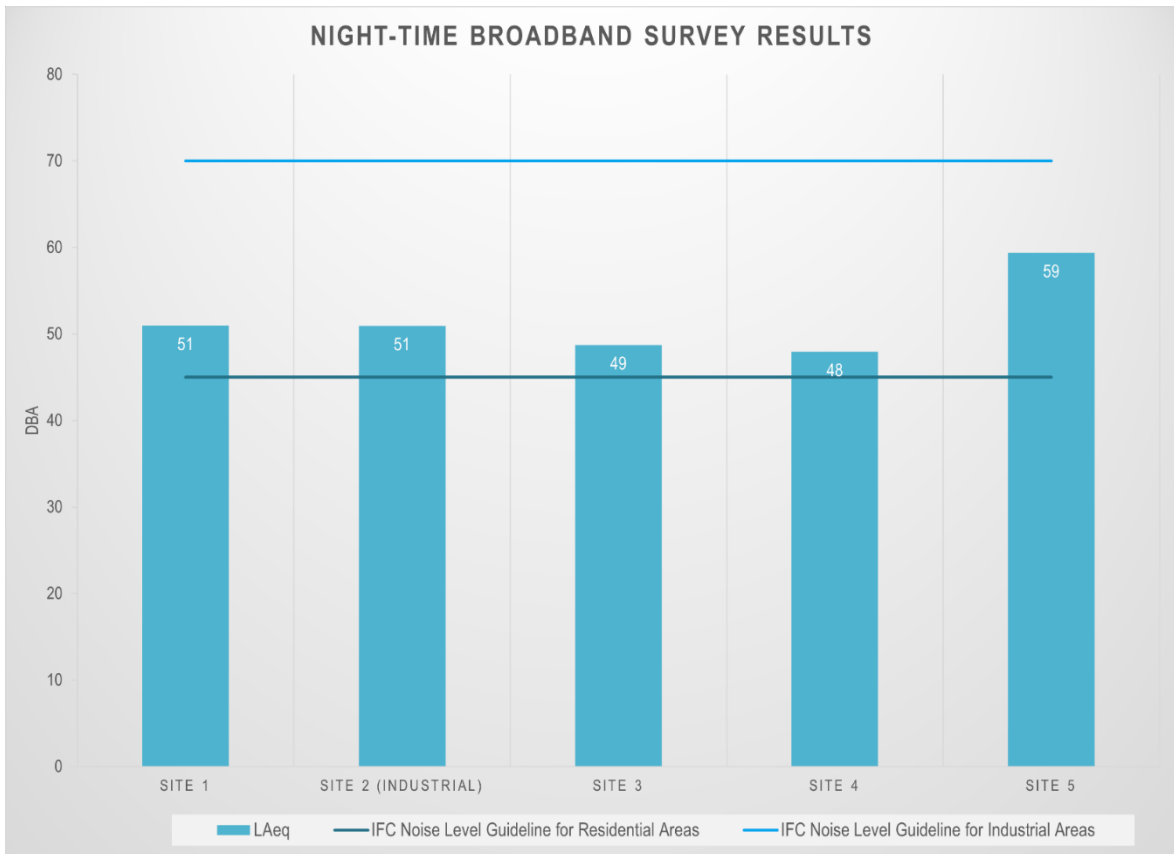


Figure 22: Night-time broadband survey results



9.4 TOPOGRAPHY AND GEOLOGY

A topography map for the study area is provided in Figure 23. The site area gently slopes from east to west with a mean altitude of approximately 1670 mamsl. In terms of geology the site is underlain mostly by granodiorite and mafic and ultramafic rocks (Figure 24).

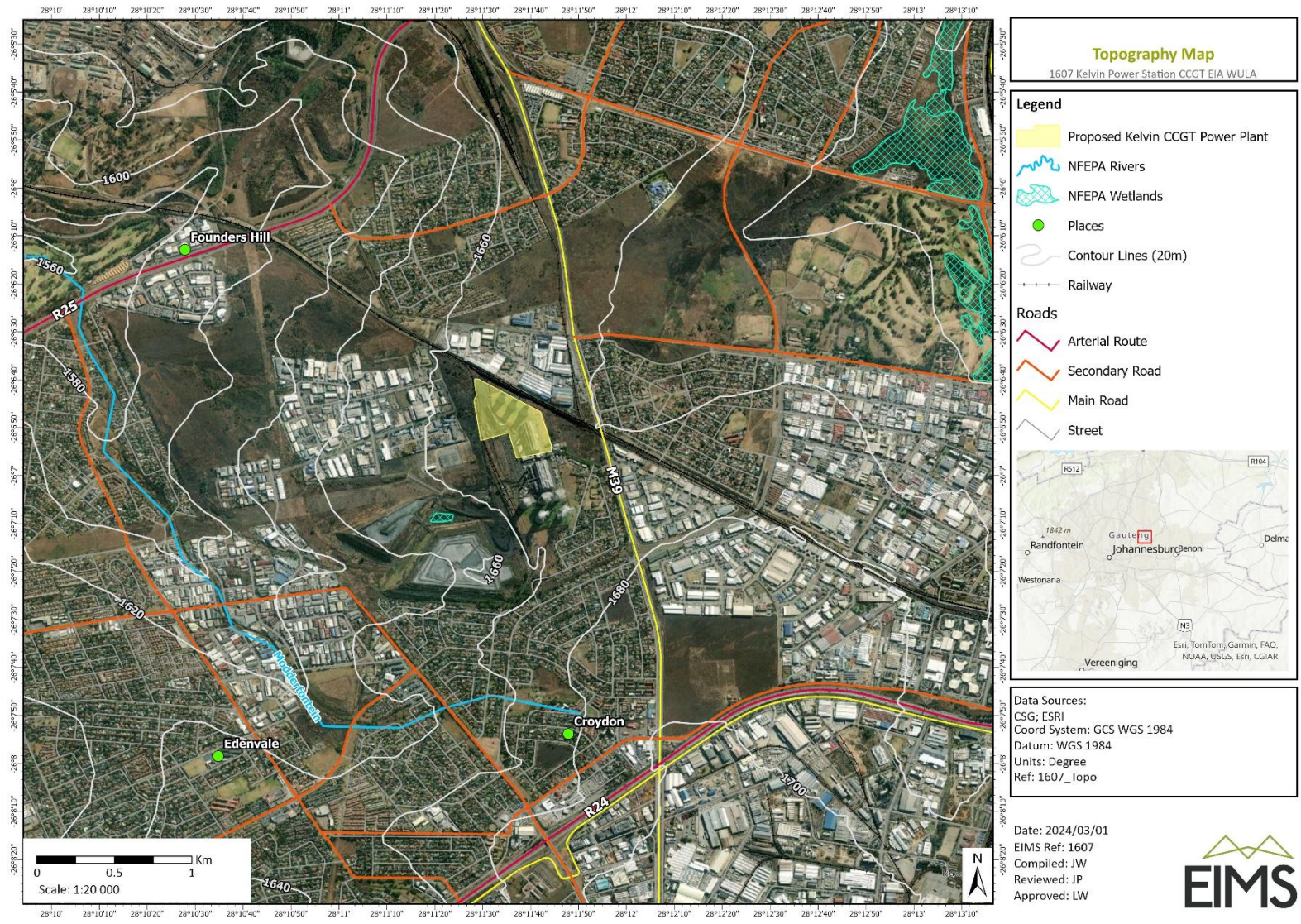


Figure 23: Topography map

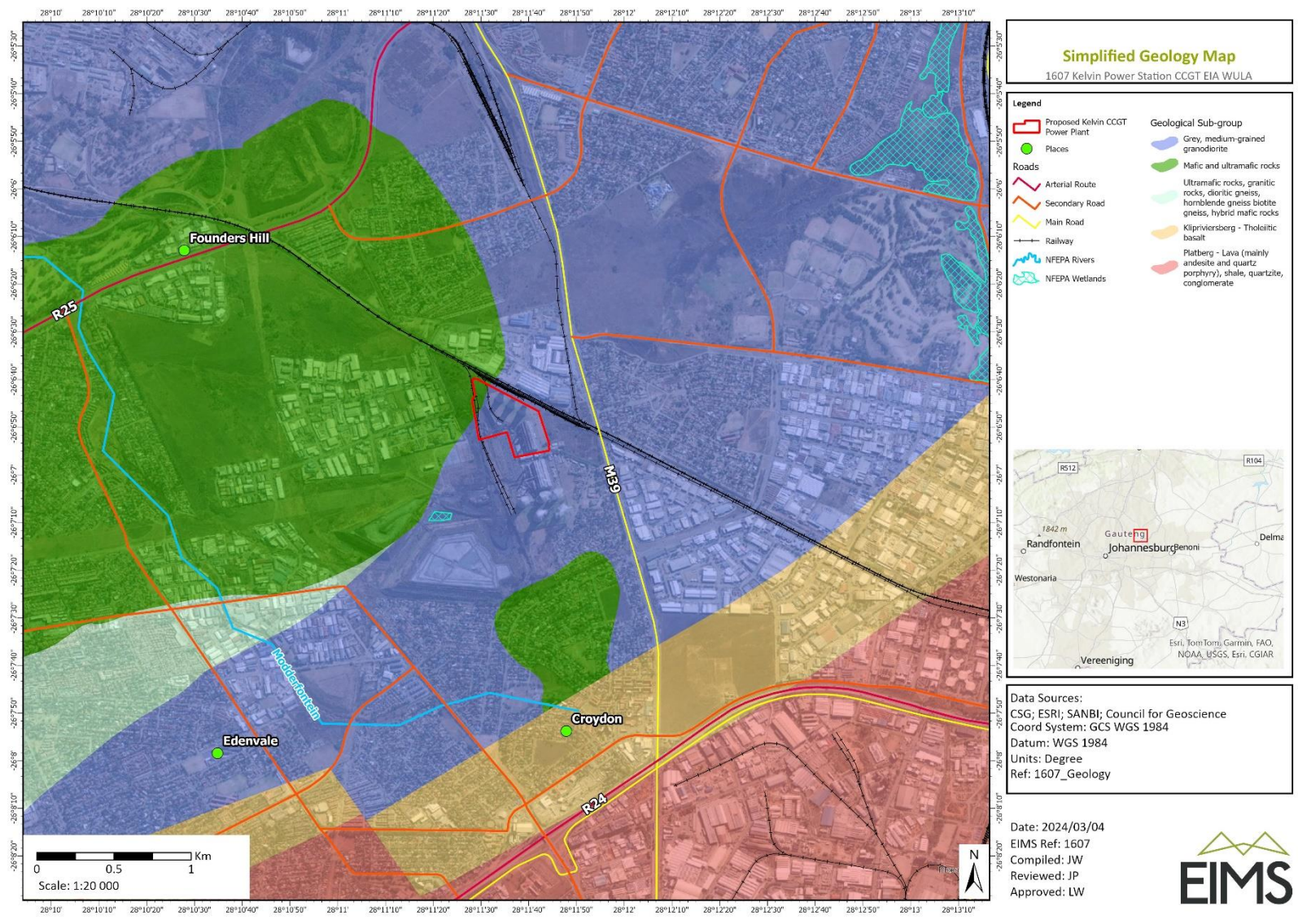


Figure 24: Geology Map



9.5 SOIL AND LAND CAPABILITY

The site falls within an area defined by Haplic Lixisols – red, yellow, massive or weakly structured soils with low to medium base status⁵ and is considered arable land. Refer to Figure 26 for a soils map of the area and Figure 27 for the land capability map. Although the soil will be disturbed as a result of the construction, production or decommissioning phases, the impact on soil is still considered low at this stage as the area within the plant is a vacant area within the KPS property and is not planned to be used for agricultural purposes or the planting of indigenous plant species. The project is located within land of capability class 12, i.e. high land capability.

The DFFE screening tool indicates the site falls within an area of mostly high agricultural sensitivity. This will be confirmed by the soil specialist during the EIA phase once a specialist soils compliance statement has been completed.

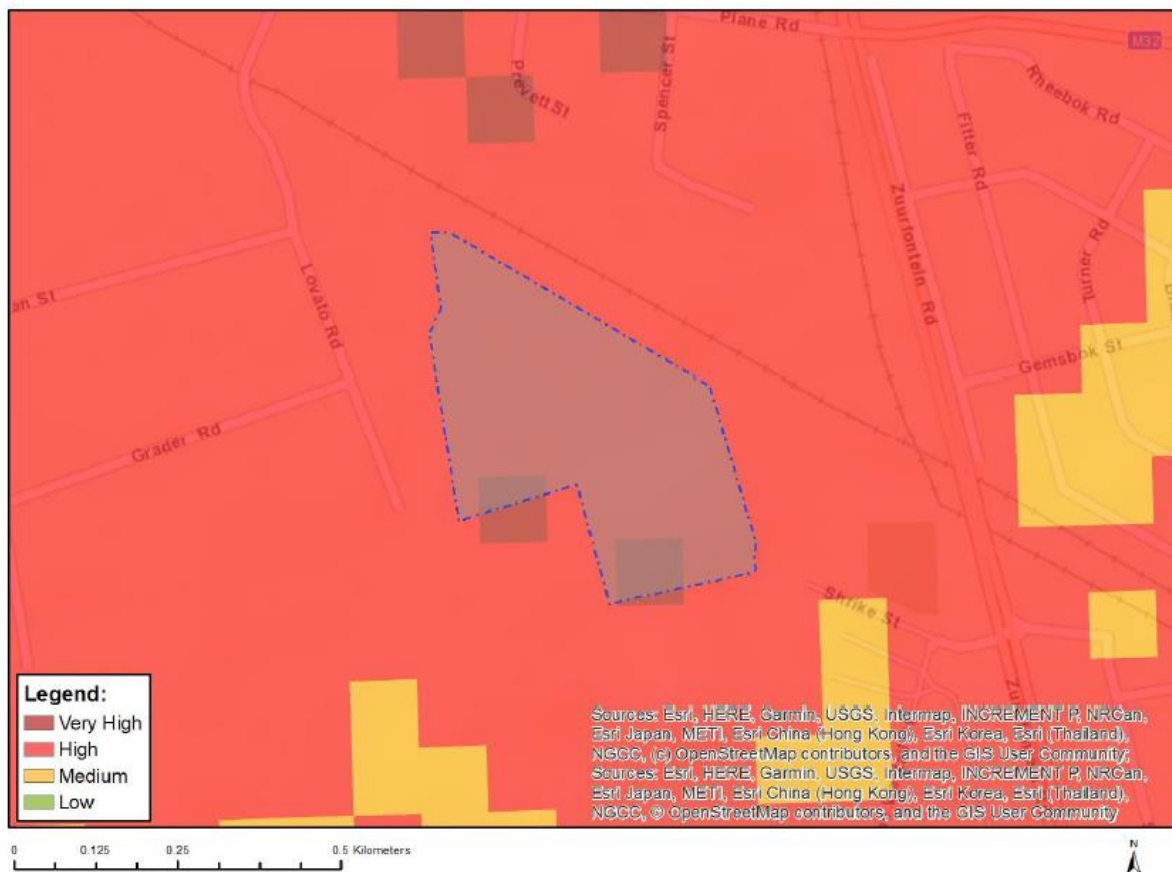


Figure 25: DFFE screening tool map of relative agricultural sensitivity

⁵ Base status is a ratio relating the major nutrient cations (Ca, Mg, K and Na) to the clay percentage in the soil.

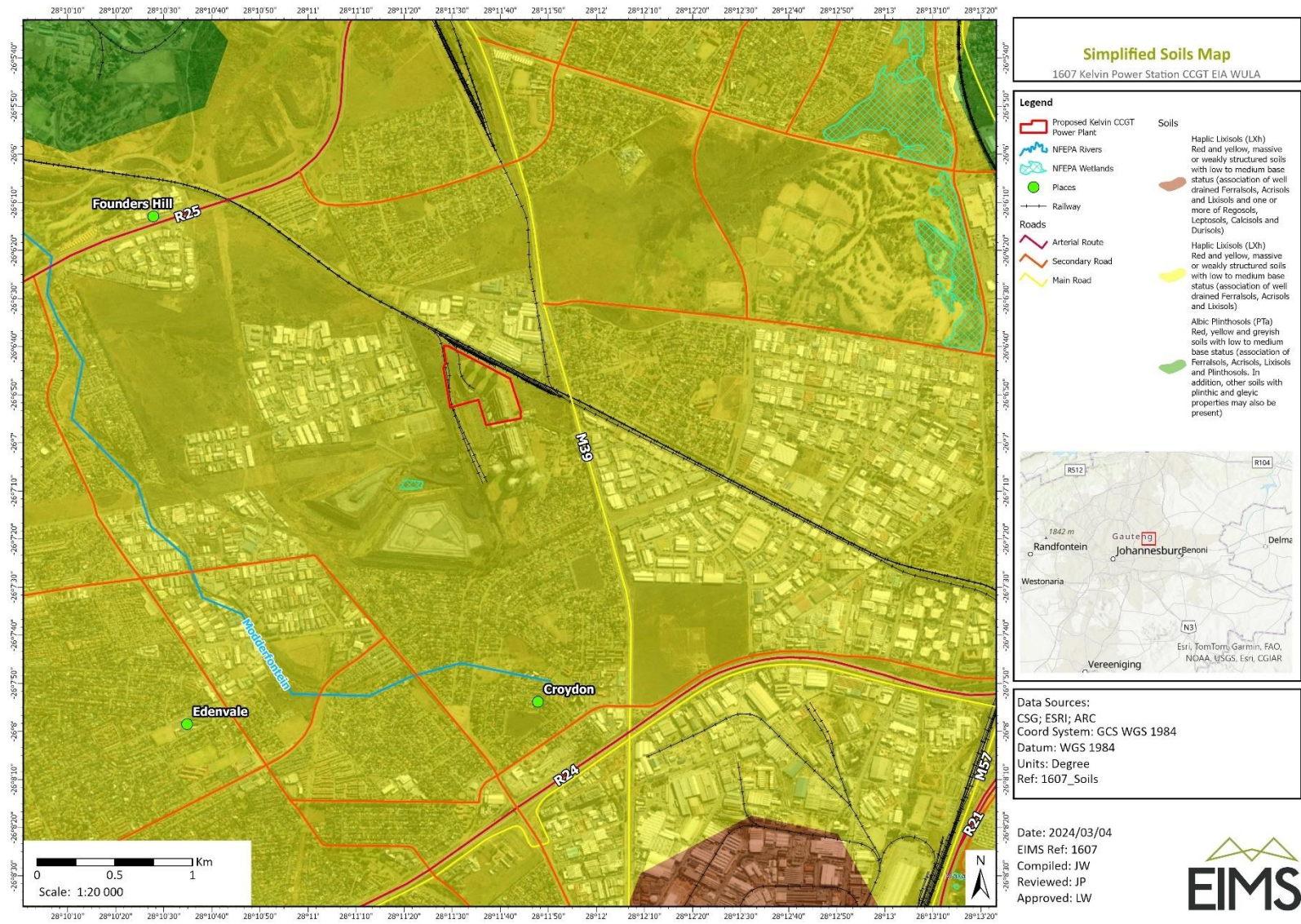


Figure 26: Soils map

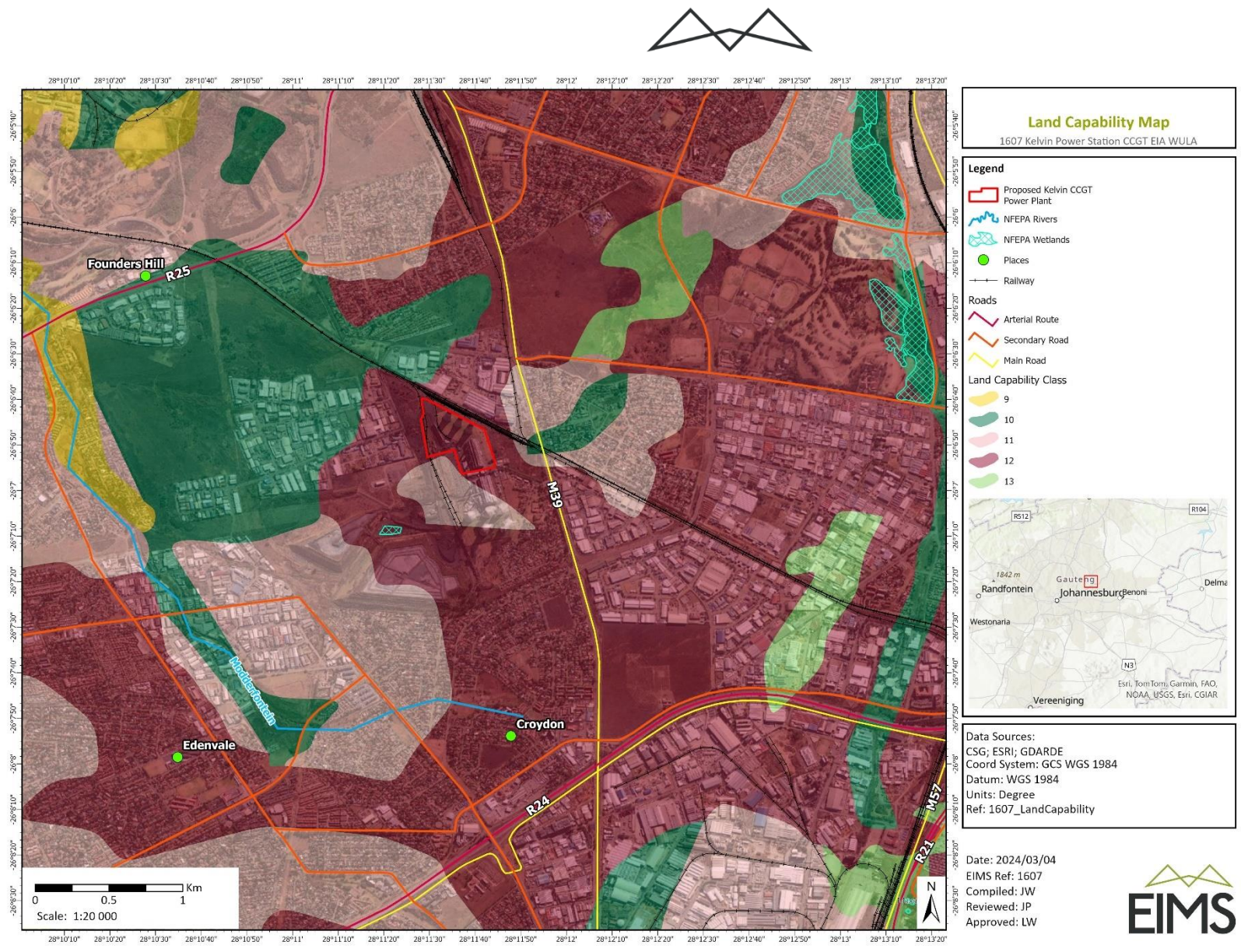


Figure 27: Land capability map



9.6 CULTURAL AND HERITAGE RESOURCES

The Kelvin Power Station consists of two independent Stations, namely A-Station and B -Station, with related infrastructure. The original natural and historical landscape has been completely altered over the years since the Power Station was developed and had been in use, and as a result, if any significant cultural heritage (archaeological and/or historical) sites, features or material did exist here in the past it would have been completely destroyed or extensively disturbed as a result. Some of the structures and material related to the Power Station (and in this case A-Station) is however older than 60 years of age and has some cultural heritage (historical) significance. The site proposed for the CCGT plant is the old A-Station site for which approval for decommissioning of the stie has already been obtained, which included a heritage assessment.

Much of the machinery and technology associated with A-Station, even if out of date and obsolete, forms part of this history and the way electrical power was generated in the past. This needs to be preserved in some form after the A-Station has been finally decommissioned and demolished. It however has to be noted here that although B Station is slightly younger than A-Station, a large part of the original Kelvin Power Station will be left intact and therefore be preserved as part of the landscape.

9.7 SURFACE WATER

The Kelvin site is situated on the boundary of two quaternary catchments, A21C and A21A, with 97% of the site in quaternary catchment A21C, the Jukskei River catchment. An unnamed tributary drains north-west for approximately 1.1km to confluence with the Modderfonteinspruit from the catchment of the ash dams where effluent is discharged. The Modderfonteinspruit confluences with the Jukskei River which drains in a north westerly direction and confluences with the Crocodile River approximately 35 km downstream. The station is situated within an industrial area, however it is also close to a number of residential areas. In addition, there are large areas of Alexandra, located downstream, where it is understood that informal use of water from the Jukskei River occurs. A-station, the area now proposed for the CCGT plant, is located in an area where there are no water resources that would be directly affected by runoff. Drainage from this section is currently via stormwater drains that drain directly to Main Channel which ultimately discharges to Modderfonteinspruit. Kelvin has implemented a surface water monitoring programme that includes daily monitoring of the effluent and weekly monitoring at the effluent discharge point into the unnamed tributary as well as at points up and downstream of this in the Modderfonteinspruit.

The station is situated within an industrial area, however it is also close to a number of residential areas. In addition, there are large areas of Alexandra, located downstream, where it is understood that informal use of water from the Jukskei River occurs. Catchment A21C is 75 961 ha and the part of the Kelvin site contributing to this catchment is 154.7 ha (or 0.2%) and Catchment A21A is 48 189 ha and the portion of the Kelvin site contributing to this catchment is 5.4 ha (or 0.01%). The site is at an elevation of between 1620 and 1680 mamsl with a gentle slope of approximately 0.03 (3% or 3 meters of elevation for every 100m).

The site falls within Integrated Unit of Analysis, IUA 1: Upper Crocodile/ Hennops/ Hartbeespoort, upstream of Hartbeespoort Dam and Resource Units 1.1 (Upper Hennops and Rietvlei Rivers to inflow of Rietvlei Dam, and dolomite aquifer systems) and 1.7 (Jukskei, Klein Jukskei and Modderfonteinspruit). This IUA has been classified as a Class III river. In respect of the classification of rivers, this means that it is a river that is highly used and configuration of ecological categories of that water resource are highly altered from the predevelopment condition. Refer to Figure 28 for a surface water map of the area.

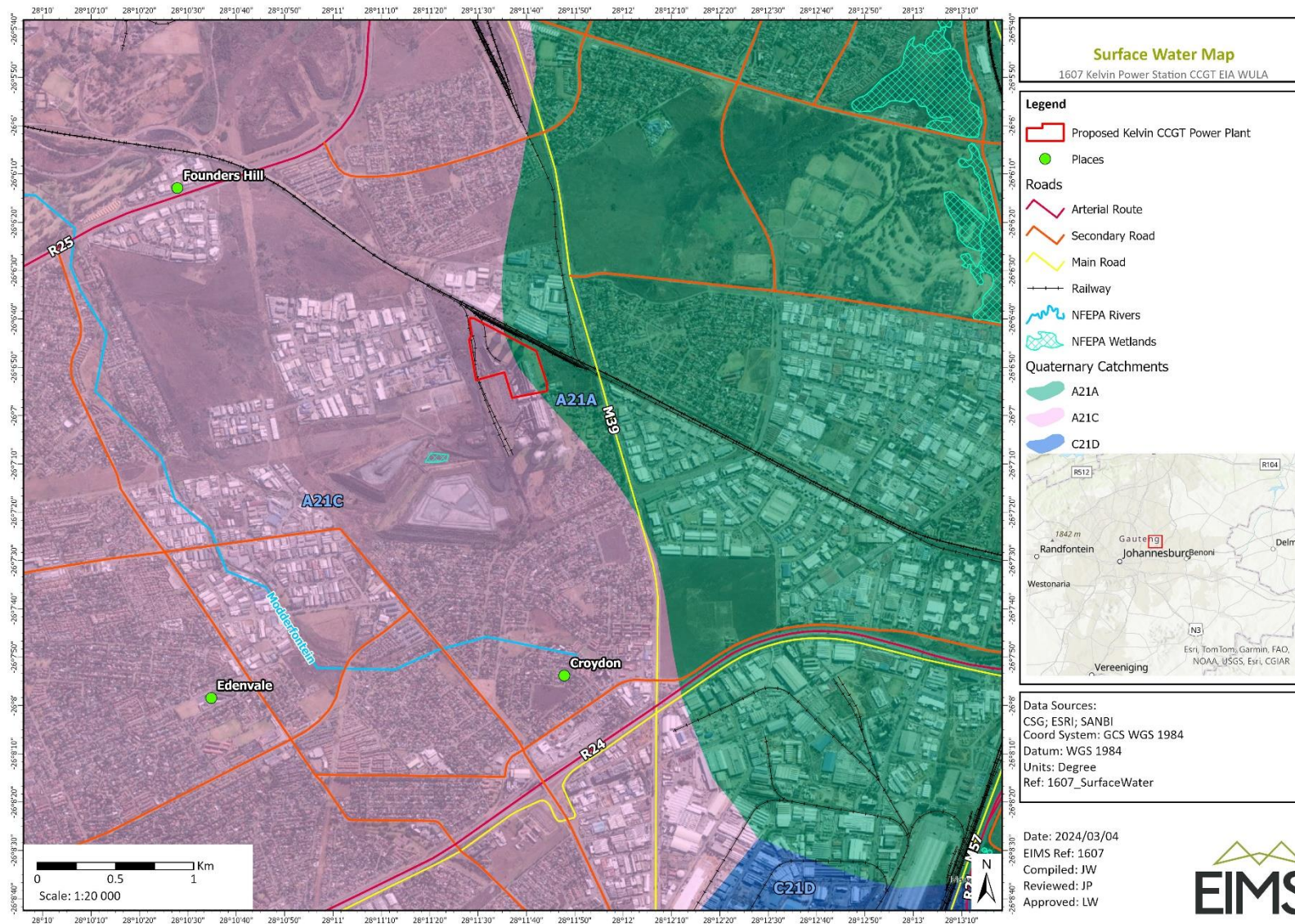


Figure 28: Surface Water features in the study area



9.8 TERRESTRIAL BIODIVERSITY AND VEGETATION

The site is located within the existing Kelvin Power Station property, at the site for the decommissioned A-Station. Very little natural vegetation is present at the site. The site falls within an area of Carltonville Dolomite Grassland with a conservation status of “least concern”, however the site also falls within an area of high terrestrial animal sensitivity as identified in the DFFE screening tool (Figure 29). This will be confirmed by the ecology specialist during the EIA phase once a specialist terrestrial ecology compliance statement has been completed. Refer to Figure 31 for a vegetation map of the area.

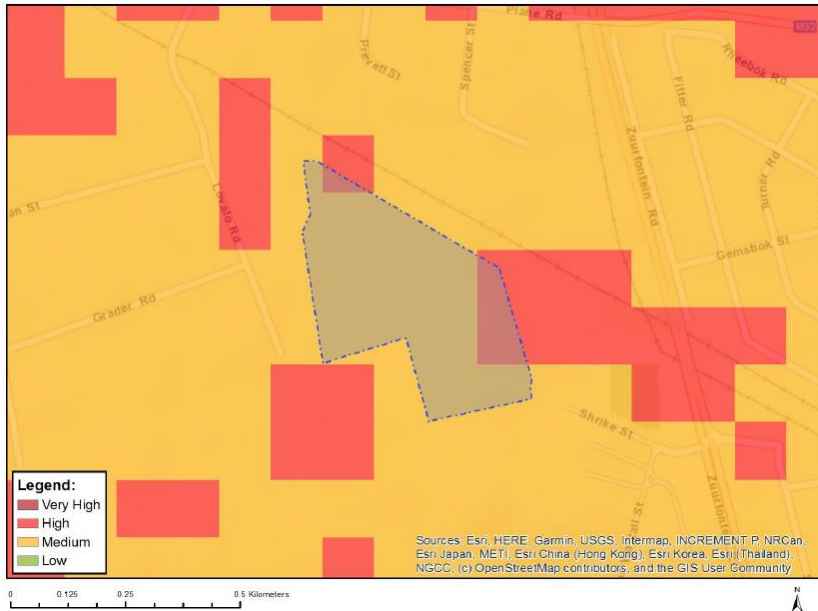


Figure 29: DFFE screening tool map of animal sensitivity

Photos showing the general site area and vegetation in and around the site are included in Figure 30



Figure 30: Photos showing vegetation status at the A-Station site proposed for the CCGT plant.

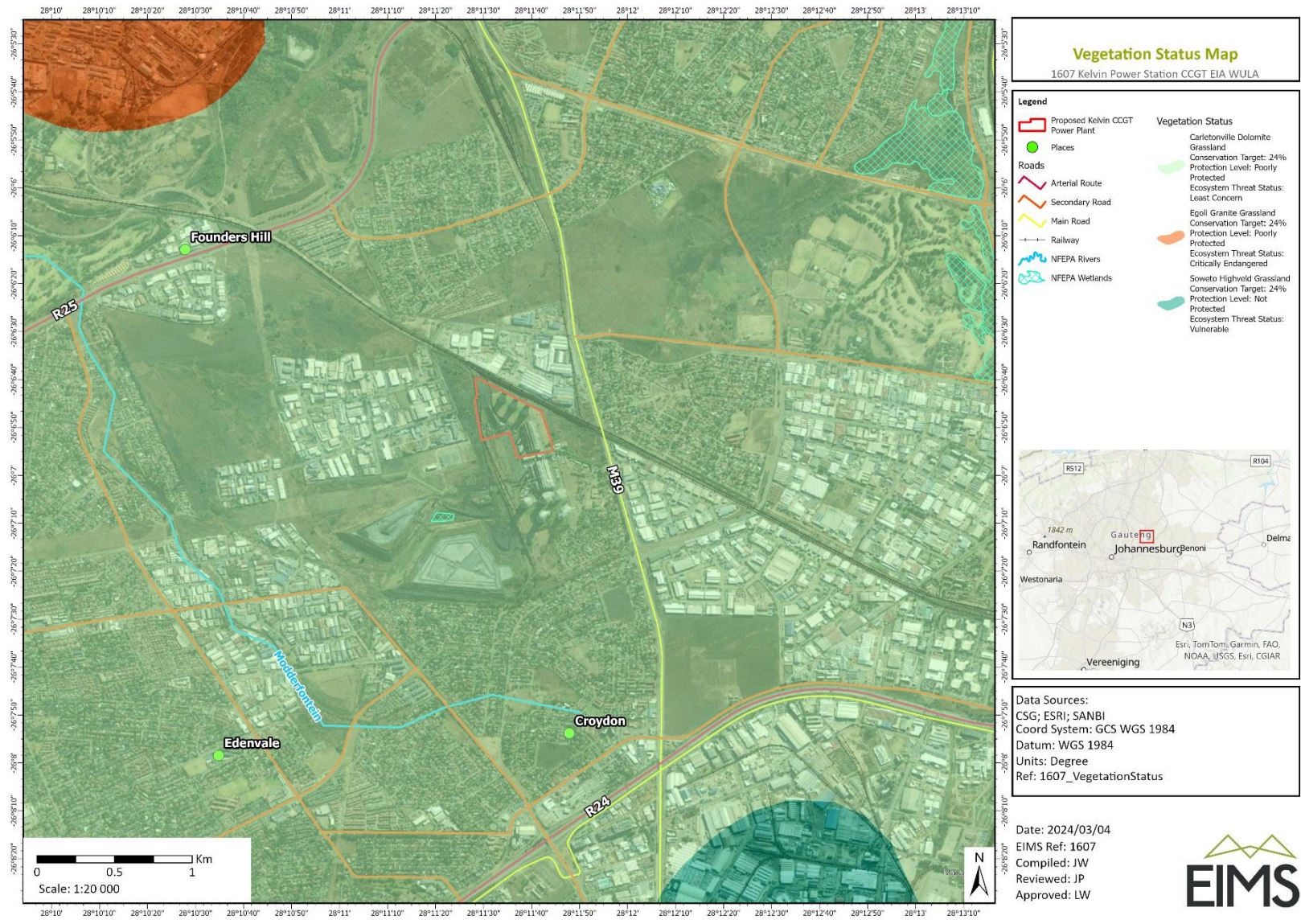


Figure 31: Vegetation map of the study area



9.9 SOCIAL AND DEMOGRAPHICS

The proposed site for the project is located in Ward 17 of the City of Ekurhuleni Metropolitan Municipality that is located in the Gauteng Province. Wards 18 and 104 of the City of Ekurhuleni Metropolitan Municipality and Ward 32 of the City of Johannesburg are in close proximity of the site.

The City of Ekurhuleni Metropolitan Municipality is located in the Gauteng Province and covers an extensive area from Germiston in the west and Nigel and Springs in the east. It is one of the most densely populated areas on both the province and the country (www.municipalities.co.za). The area accounts for nearly a quarter of Gauteng's economy. The municipal area consists of 112 wards. Cities and towns in the municipal area includes Alberton, Bedfordview, Benoni, Birchleigh, Boksburg, Brakpan, Clayville, Daveyton, Dunnottar, Edenvale, Geduld, Germiston, Kathlehong, Kempton Park, Kwa-Thema, Machenzievillie, Nigel, Olifantsfontein, Springs, Tembisa, Tokoza, Vosloorus and Vorsterkroon. The municipality covers an area of 1 975km² and the main economic sectors are Manufacturing, Finance and Business services, Community services, Trade, Transport, Construction, Electricity, and Mining.

CoE is home to the largest airport in South Africa. Ekurhuleni is Gauteng's first aerotropolis. This is a metropolis with an airport at its centre. O.R. Tambo International Airport has two terminals handling domestic and international flights. Terminal A handles international traffic and Terminal B domestic flights. The airport services airlines from all five continents and plays a vital role in serving the local, regional, intra-, and inter-continental air transport needs of South Africa and sub-Saharan Africa. It is the biggest and busiest airport in Africa.

According to the Census 2022, the population of South Africa is approximately 62 million and has shown an increase of about 19.8% since 2011. The household density for the country is estimated on approximately 3.48 people per household, indicating an average household size of 3-4 people for most households, which is down from the 2011 average household size of 3.58 people per household. Smaller household sizes are in general associated with higher levels of urbanisation.

The greatest increase in population since 2011 has been in the Ekurhuleni MM (Table 20). The increase in population on provincial, regional, and local level was higher than on national level, except in the City of Johannesburg MM. Population density refers to the number of people per square kilometre and the population density on a national level has increased from 42.45 people per km² in 2011 to 50.81 people per km² in 2022. In the study area the population density has increased since 2011 with the highest density in the City of Johannesburg MM.

Table 20: Population density and growth estimates (sources: Census 2011, Census 2022)

Area	Size in km ²	Population 2011	Population 2022	Population density 2011	Population density 2022	Growth in population (%)
Gauteng Province	18,178	12,272 263	15,099,422	675.12	830.64	23.04
Ekurhuleni MM	1,976	3,178 470	4,066,691	1,608.54	2,058.04	27.94
City of Johannesburg MM	1,643	4,434,631	4,803.262	2,699.11	2,923.47	8.31

The number of households in the study area has increased on all levels (Table 21). The proportionate increase in households were greater than the increase in population on all levels and exceeded the growth in households of 12.3% on a national level. The average household size has shown a decrease on all levels, which means there are more households, but with less members.

Table 21: Household sizes and growth estimates (sources: Census 2011, Census 2022)

Area	Households 2011	Households 2022	Average household size 2011	Average household size 2022	Growth in households (%)
Gauteng Province	3,908,826	5,318,665	3.14	2.84	36.07
Ekurhuleni MM	1,015,398	1,421,003	3.13	2.86	39.95



Area	Households 2011	Households 2022	Average household size 2011	Average household size 2022	Growth in households (%)
City of Johannesburg	1,434,715	1,841,917	3.09	2.61	28.38

The total dependency ratio is used to measure the pressure on the productive population and refer to the proportion of dependents per 100 working-age population. As the ratio increases, there may be an increased burden on the productive part of the population to maintain the upbringing and pensions of the economically dependent. A high dependency ratio can cause serious problems for a country as the largest proportion of a government's expenditure is on health, social grants and education that are most used by the old and young population.

Census 2022 shows that since 2011 the dependency ratios have decreased on all levels, with the highest total dependency ratio in the Ekurhuleni MM (Table 22). The decrease is most likely due to an increase in people of working age and a decrease in Youth. The same trend applies to the youth and employment dependency ratios. Employed dependency ratio refers to the proportion of people dependent on the people who are employed, and not only those of working age. The aged dependency ratio showed an increase in all areas since 2011. Census 2022 has not yet released employment data to enable calculation of the employment dependency ratios for comparative purposes.

Table 22: Dependency ratios (source: Census 2011, Census 2022).

Area	Total dependency	Youth dependency	Aged dependency	Employed dependency*
Gauteng	38,97	32,94	6,03	63,60
Gauteng '22	38,86	31,30	7,55	
Ekurhuleni MM	39,44	33,89	5,55	64,55
Ekurhuleni MM '22	37,31	30,38	6,93	
Ward 17	33,18	26,27	6,91	48,15
Ward 18	38,61	25,81	12,80	45,55
Ward 104	38,56	30,26	8,31	48,11
City of Johannesburg MM	37,62	31,92	5,69	61,75
City of Johannesburg MM '22	36,82	30,01	6,82	
Ward 32	38,24	33,32	4,92	47,74

* Employment data for Census 2022 not yet released

Poverty is a complex issue that manifests itself in economic, social, and political ways and to define poverty by a unidimensional measure such as income or expenditure would be an oversimplification of the matter. Poor people themselves describe their experience of poverty as multidimensional. The South African Multidimensional Poverty Index (SAMPI) (Statistics South Africa, 2014) assess poverty on the dimensions of health, education, standard of living and economic activity using the indicators child mortality, years of schooling, school attendance, fuel for heating, lighting, and cooking, water access, sanitation, dwelling type, asset ownership and unemployment.

The poverty headcount refers to the proportion of households that can be defined as multi-dimensionally poor by using the SAMPI's poverty cut-offs (Statistics South Africa, 2014). The poverty headcount has increased in the Ekurhuleni MM between 2011 and 2016 (Table 23), indicating an increase in the number of multi-dimensionally poor households in the Ekurhuleni MM. Census 2022 has not yet released data on poverty.

The intensity of poverty experienced refers to the average proportion of indicators in which poor households are deprived (Statistics South Africa, 2014). The intensity of poverty has increased on all levels. The intensity of poverty and the poverty headcount is used to calculate the SAMPI score. A higher score indicates a very poor community that is deprived on many indicators. The SAMPI score on a local level has increased significantly between 2011 and 2016. It is anticipated that the scores would have increased even more since 2016 due to the aftermath of the Covid-19 pandemic.



Table 23: Poverty and SAMPI scores (sources: Census 2011 and Community Survey 2016).

Area	Poverty headcount 2011 (%)	Poverty intensity 2011 (%)	SAMPI 2011	Poverty headcount 2016 (%)	Poverty intensity 2016 (%)	SAMPI 2016
Gauteng Province	4,8	43,8	0,021	4,6	44,1	0,020
Ekurhuleni MM	6,4	44,5	0,028	6,6	44,7	0,030
City of Johannesburg MM	3,7	43,3	0,016	3,5	44,1	0,015

9.9.1 POPULATION COMPOSITION, AGE, GENDER AND HOME LANGUAGE

On provincial and municipal level, the majority of the population belong to the Black population group (Figure 32), but on a ward level the profile is heterogeneous. In Ward 18 of the Ekurhuleni MM the majority of the people belonged to the White population group in 2011.

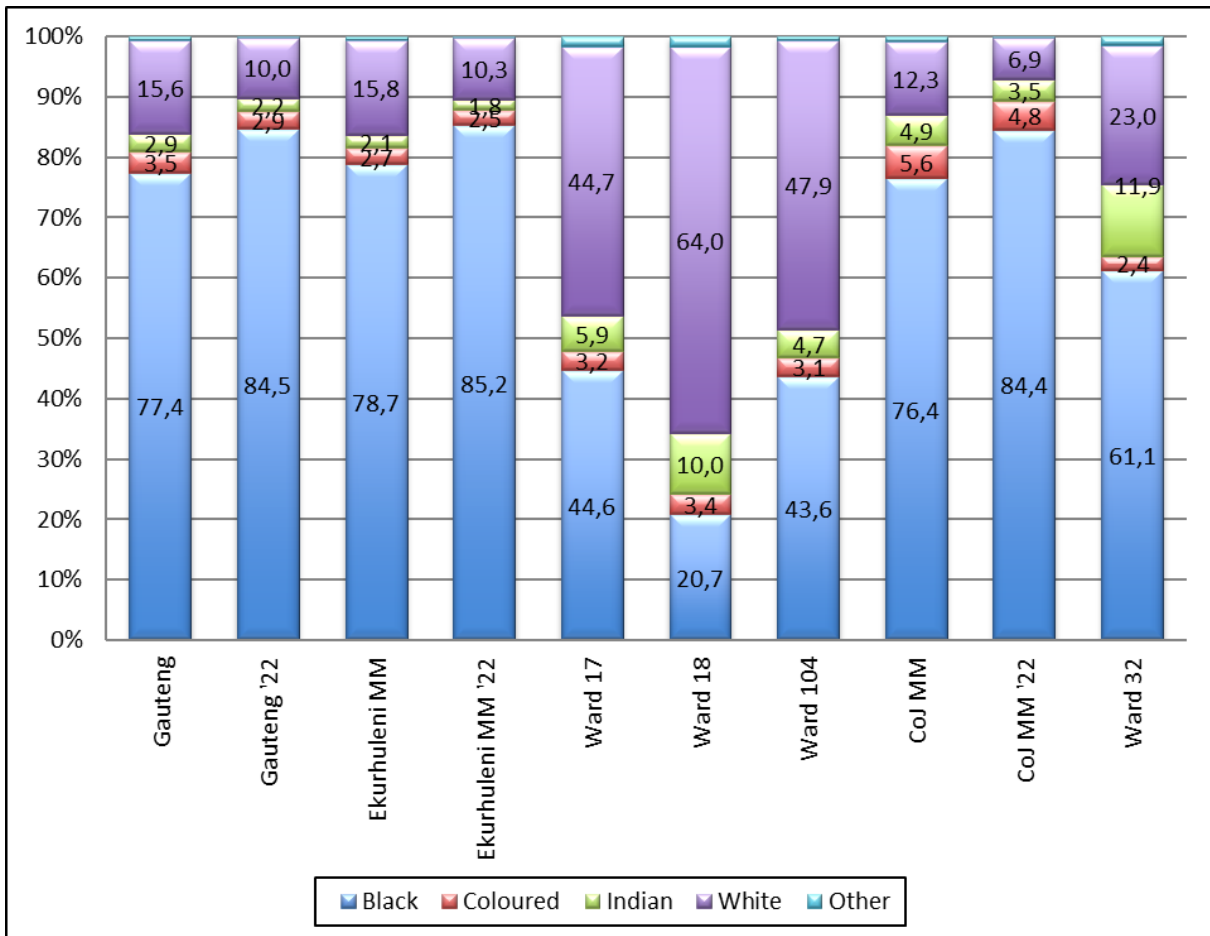


Figure 32: Population distribution (shown in percentage, source: Census 2011, Census 2022)

The average age is very similar on municipal and provincial level (Table 24), with a slightly lower average age in the Ekurhuleni MM. Ward 18 of the Ekurhuleni MM had the highest average age in 2011. Census 2022 shows that the average age has increased slightly on all levels, indicating less Youth and more people of working age.

Table 24: Average age (source: Census 2011, Census 2022).

Area	Average Age (in years) - 2011	Average Age (in years) - 2022
Gauteng	29,31	30,97
Ekurhuleni MM	28,97	30,88
Ward 17	31,25	
Ward 18	35,03	



Area	Average Age (in years) - 2011	Average Age (in years) - 2022
Ward 104	31,76	
City of Johannesburg MM	29,20	30,79
Ward 32	28,49	

The age distribution of the areas under investigation shows an increase on all levels in the population aged 35 - 64 years (Figure 33).

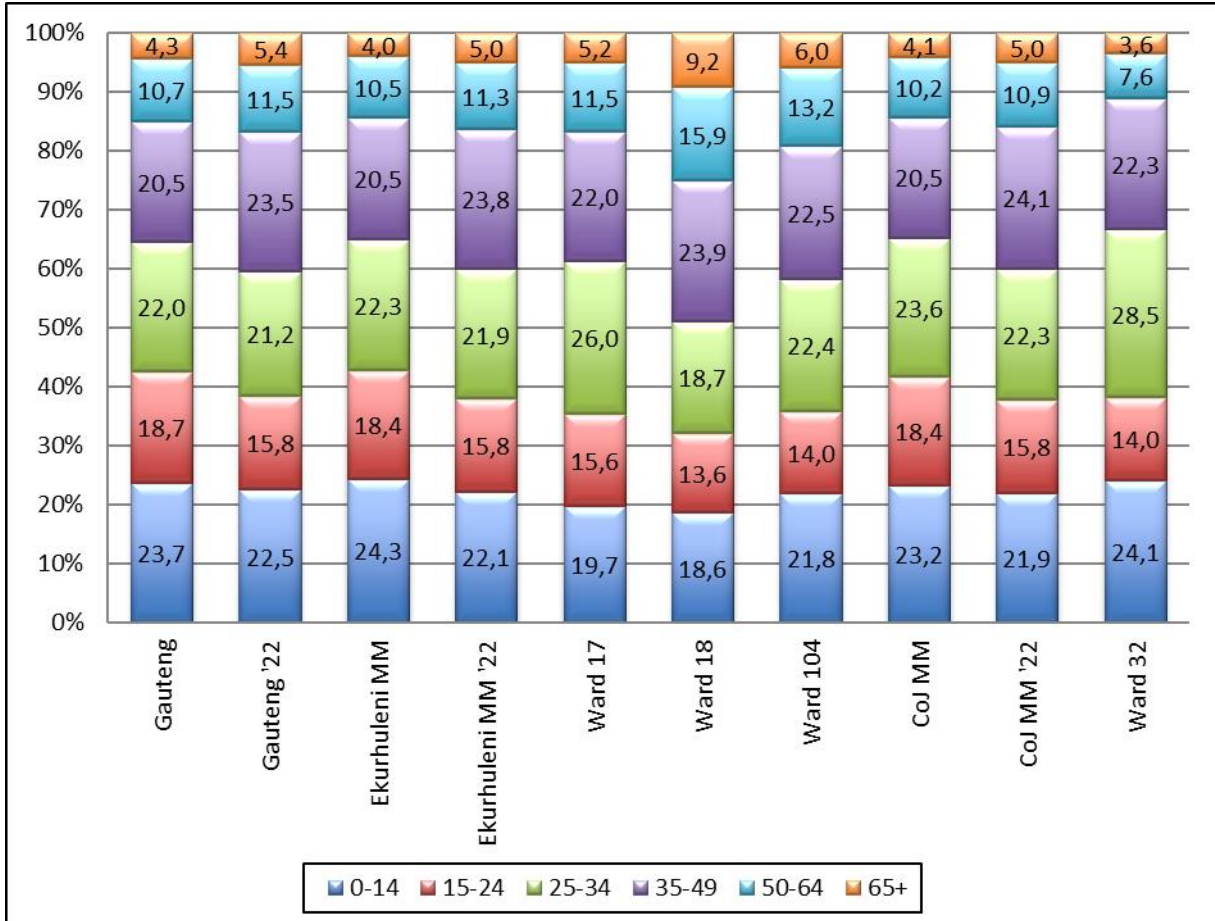


Figure 33: Age distribution (shown in percentage, source: Census 2011, Census 2022)

9.9.2 GENDER DISTRIBUTION

The gender distribution on provincial and municipal level is more or less equal (Figure 34), but in Wards 17 and 18 of the Ekurhuleni MM there is a slight bias towards females.

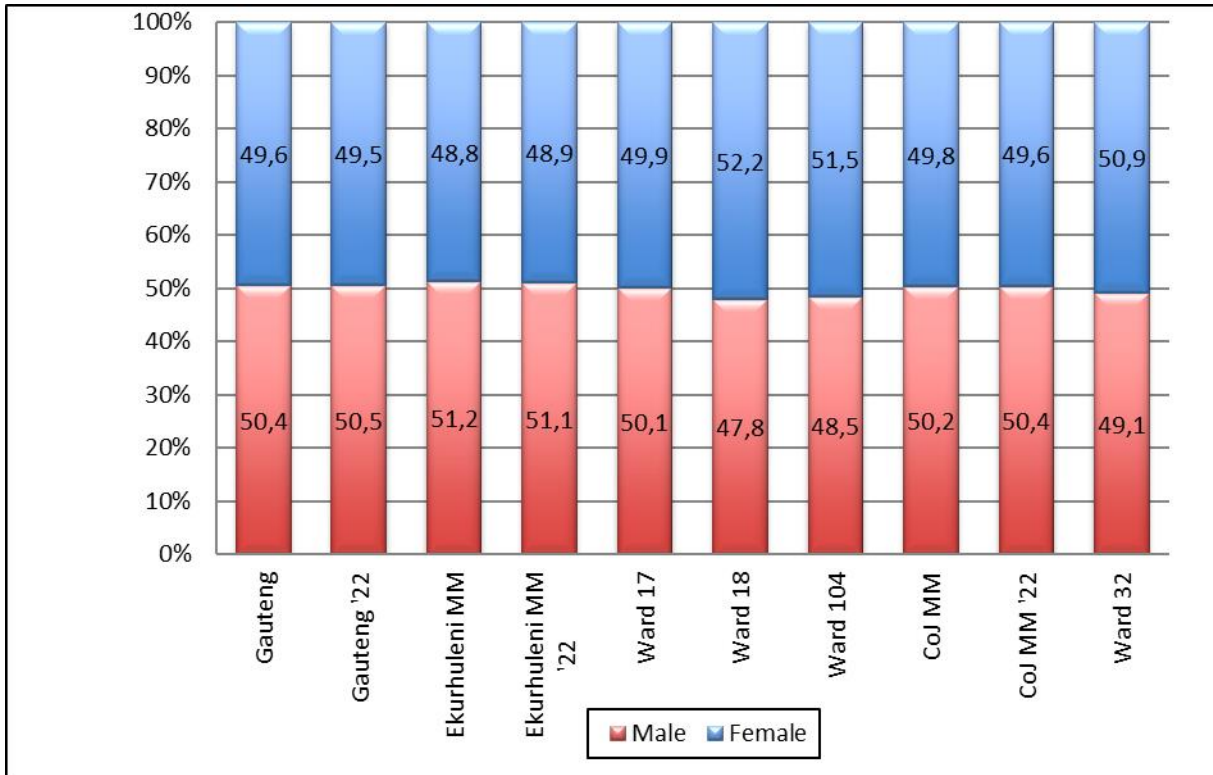


Figure 34: Sex distribution (shown in percentage, source: Census 2011, Census 2022)

9.9.3 LANGUAGE

The language profiles on provincial, municipal and ward level are varied (Figure 35) In Wards 17 and 18 of the Ekurhuleni MM and Ward 104 of the City of Johannesburg MM the highest proportion of people indicated English as their home language. Home language should be taken into consideration when communicating with the local communities and based on the profile of the area communication should take place in English.

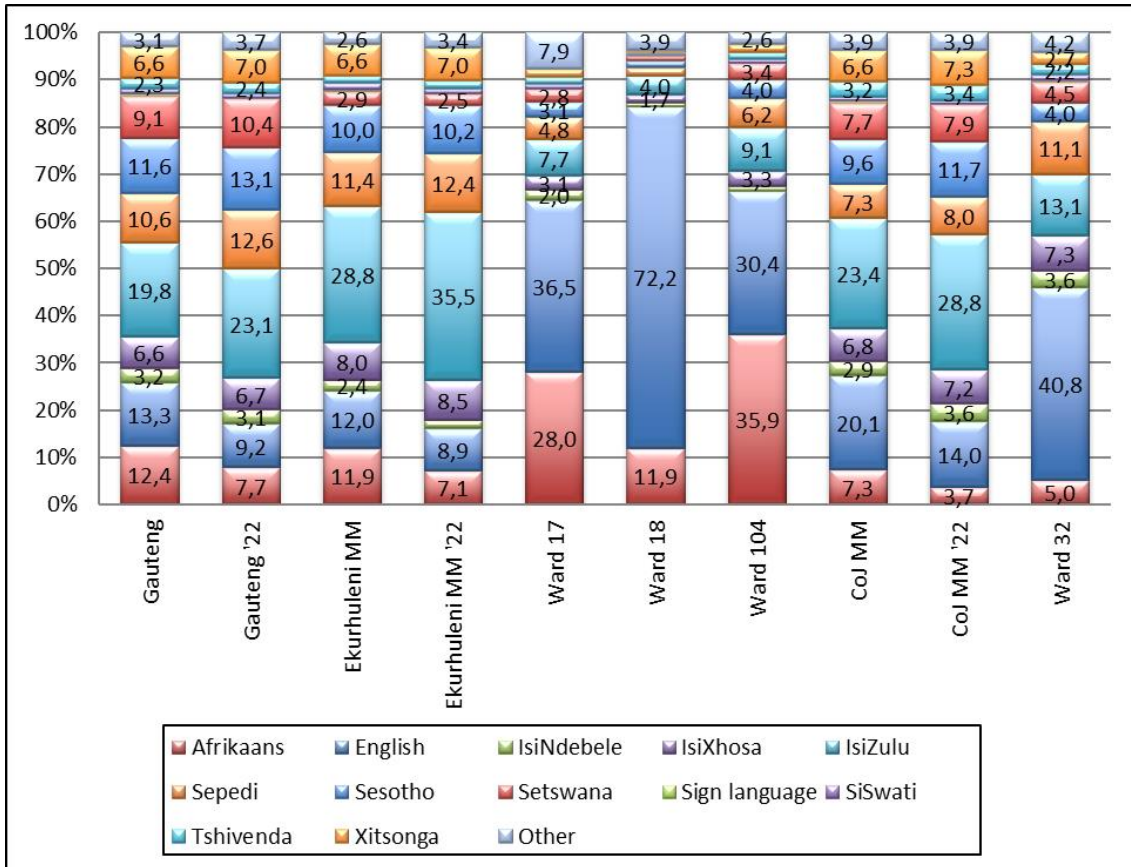


Figure 35: Language distribution (shown in percentage, source: Census 2011, Census 2022)

9.9.4 EDUCATION

Figure 36 shows the education profiles for the areas under investigation for those aged 20 years or older. The proportion of people that completed Grade 12 on provincial and municipal level has increased between 2011 and 2022, while the proportion of people who completed education higher than Grade 12 has decreased.

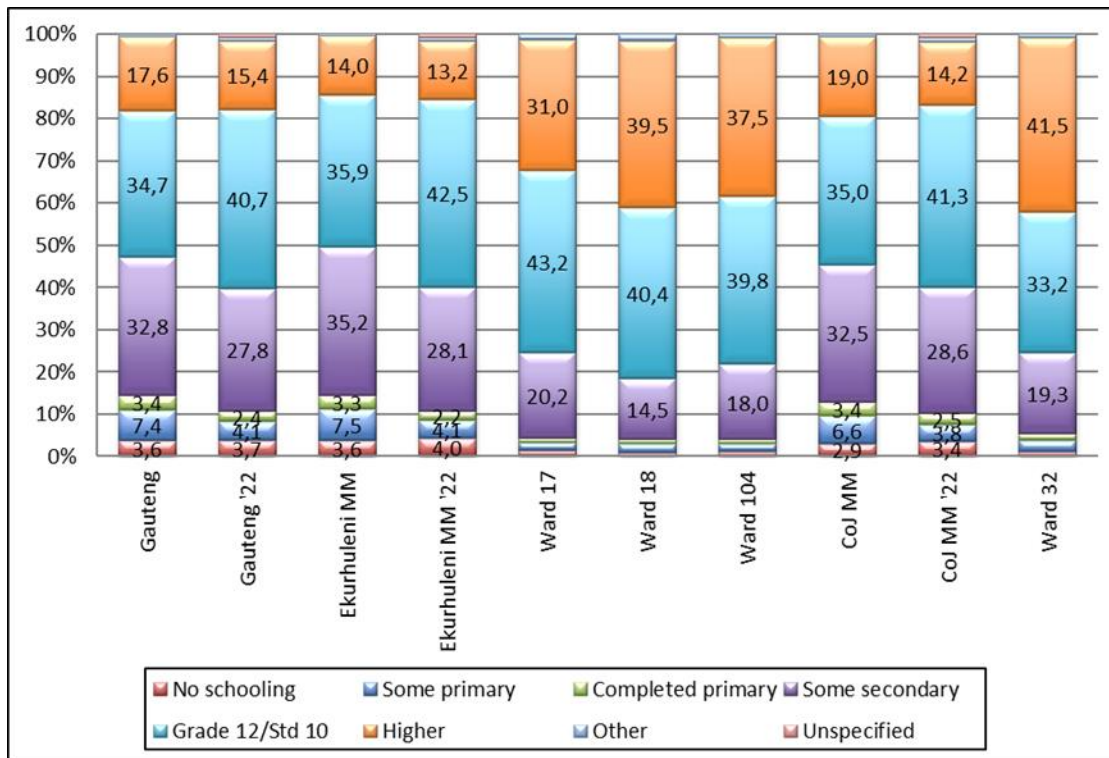


Figure 36: Education profiles (those aged 20 years or older, shown in percentage, source: Census 2011, Census 2022)

9.9.5 EMPLOYMENT

Census 2022 has not yet released employment data. Census 2011 shows relatively high levels of employment in the area, with the highest proportions of employed people in Ward 18 of the Ekurhuleni MM (Figure 37). It must be noted that these proportions might have decreased since 2011 due to the impact of Covid 19 pandemic and the continual loadshedding implemented by Eskom. The majority of the employed people in the areas under investigation work in the formal sector (Figure 38).

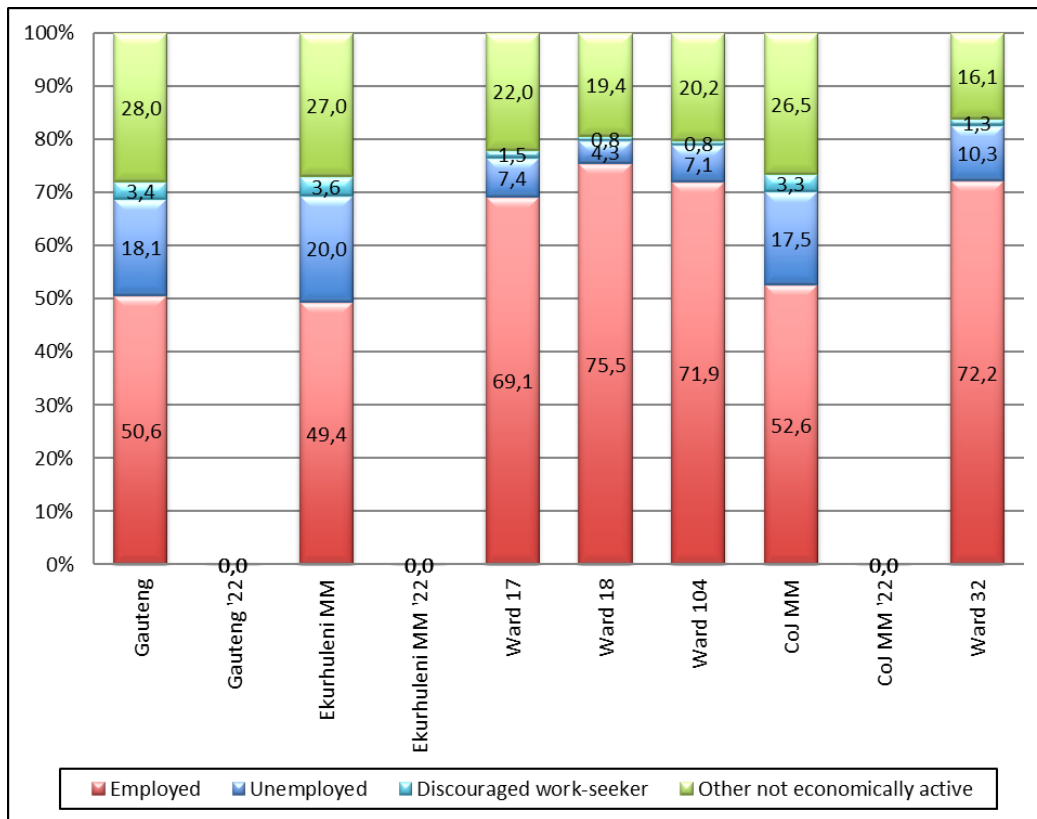


Figure 37: Labour status (those aged between 15 - 65 years, shown in percentage, source: Census 2011)

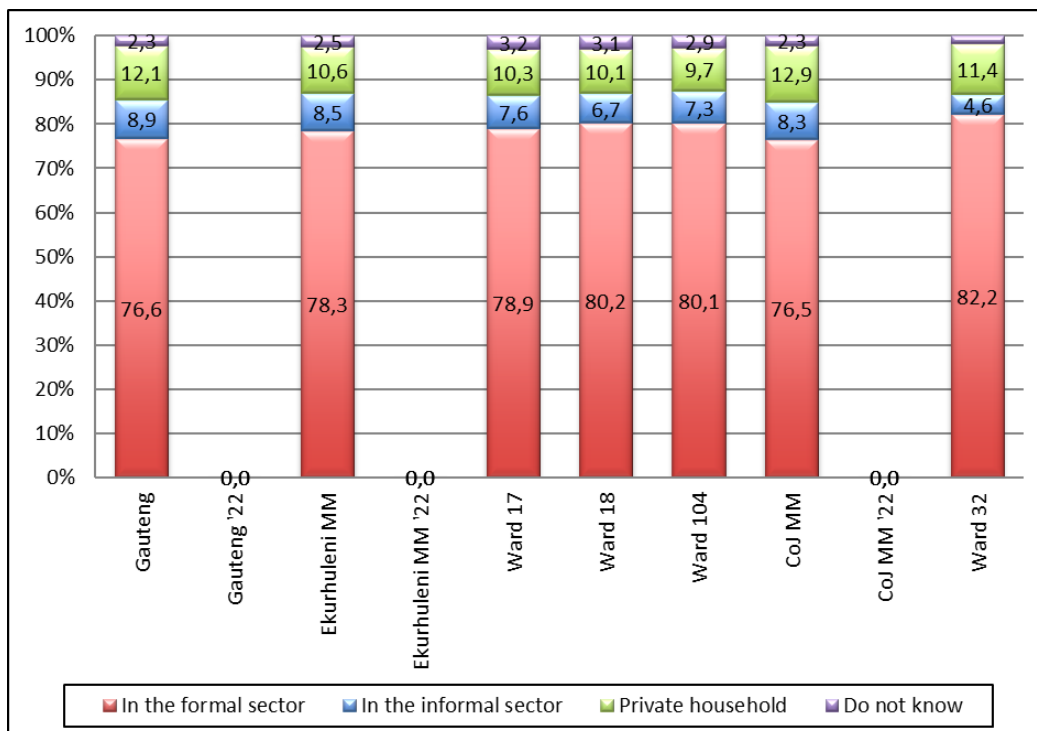


Figure 38: Employment sector (those aged between 15 - 65 years, shown in percentage, source: Census 2011)



9.9.6 HOUSEHOLD INCOME

Census 2022 has not yet released data on household income. In 2011 Ward 17 of the Ekurhuleni had the highest proportion of households (18.37%) with an average household income of R19 600 or less (Figure 39). Statistics South Africa (2022) has calculated the Food Poverty Line (FPL) as R663 per capita per month for 2022 where the FPL is the Rand value below which individuals are unable to purchase or consume enough food to supply them with the minimum per-capita-per-day energy requirement for good health. The FPL is one of three poverty lines, the others being the upper bound poverty line (UBPL) and the lower bound poverty line (LBPL). The LBPL and UBPL both include a non-food component. Individuals at the LBPL do not have enough resources to consumer or purchase both adequate food and non-food items and are forced to sacrifice food to obtain essential non-food items, while individuals at the UBPL can purchase both adequate food and non-food items. The LBPL was R945 per capita per month in 2022 and the UBPL R1 417 per capita per month respectively. In 2011 a household with four members needed an annual household income of approximately R17 000 to be just above the FPL.

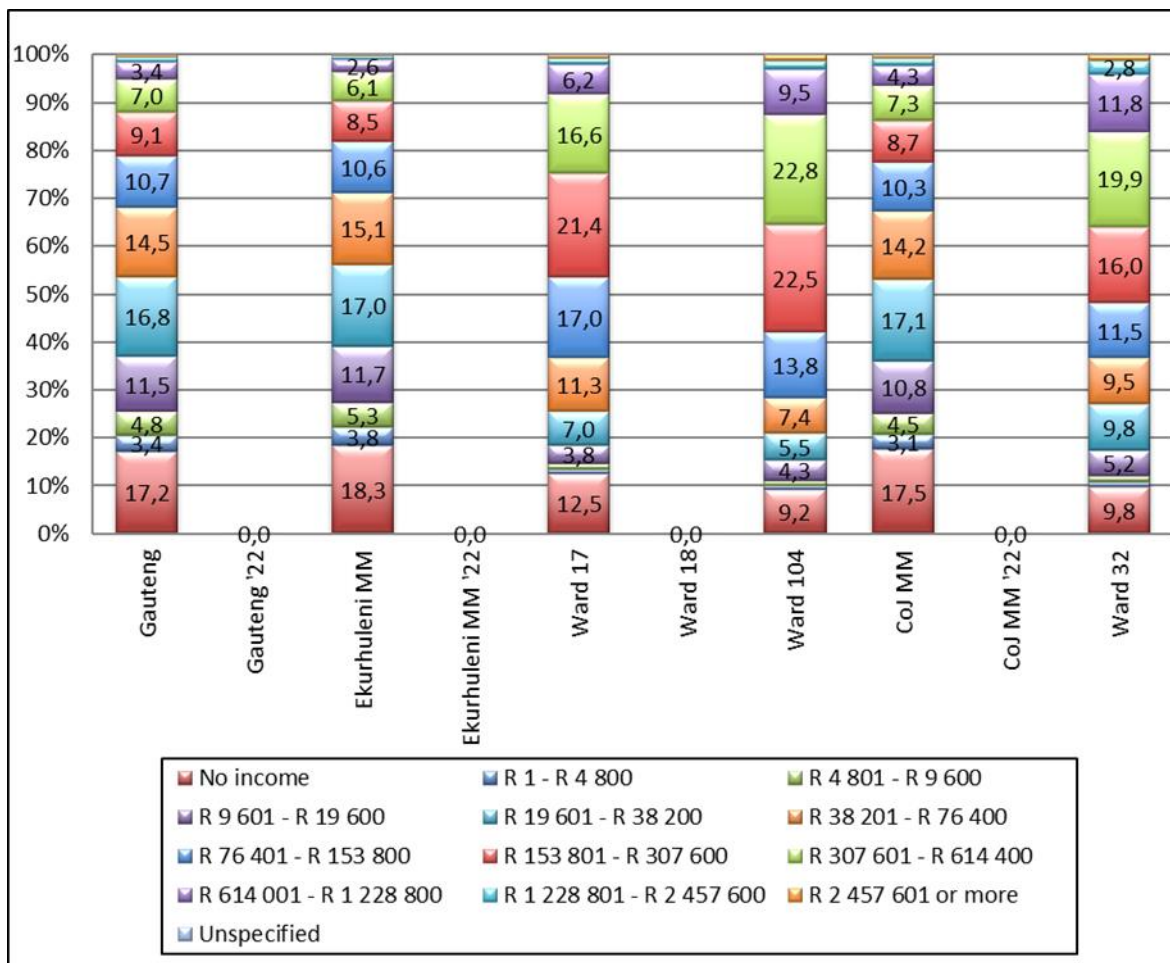


Figure 39: Annual household income (shown in percentage, source: Census 2011)

9.9.7 HOUSING

Census 2022 released limited data related to housing. Census 2011 shows that on a ward level all the households live in areas classified urban. Most households live in formal residential areas (Figure 40), with the highest proportion of households (6.8%) living in commercial areas in Ward 17 of the Ekurhuleni MM.

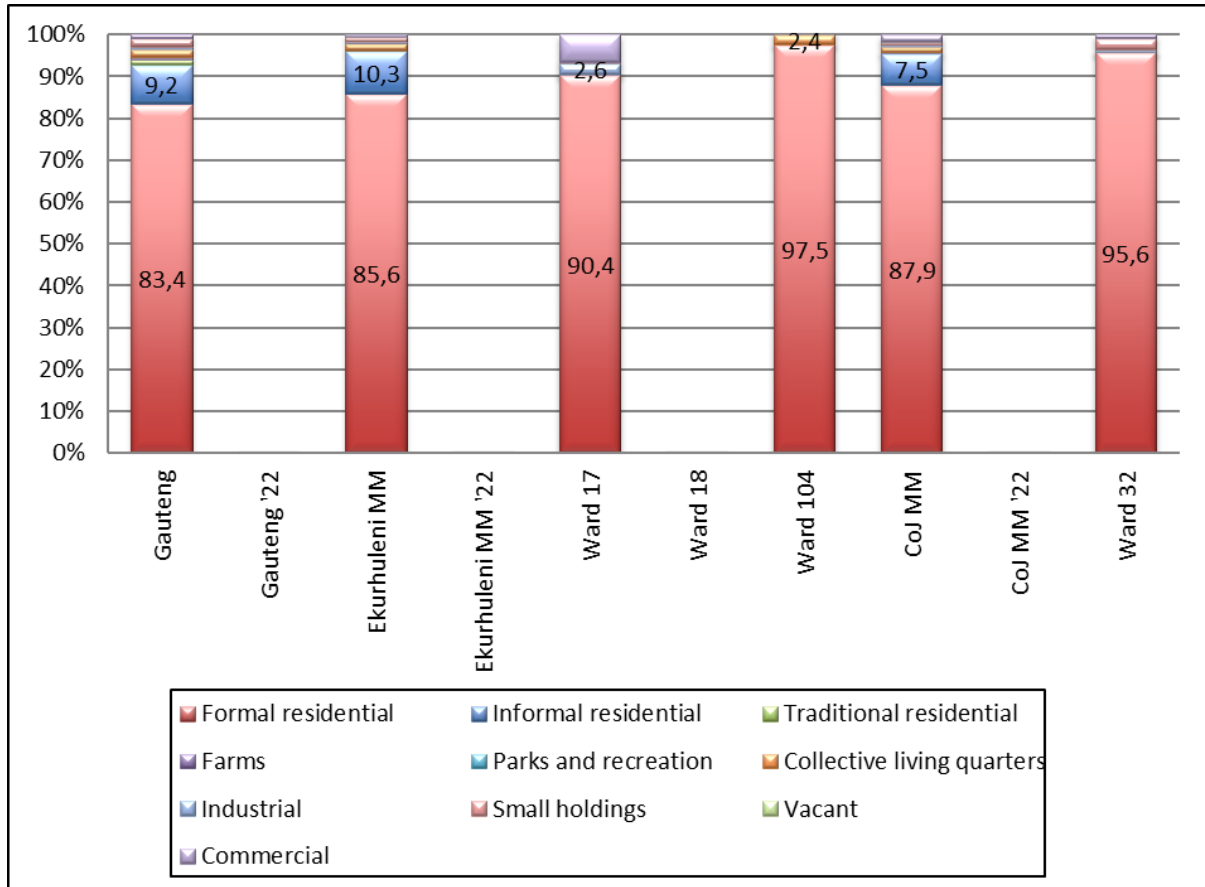


Figure 40: Enumeration area types (persons, shown in percentage, source: Census 2011)

Most of the dwellings in the area are houses or brick/concrete block structures that are on a separate yard, stand or farm (Figure 41). Ward 17 of the Ekurhuleni MM had a high proportion of households living in informal dwellings while Wards 18 and 104 of the Ekurhuleni MM and Ward 32 of the City of Johannesburg MM had high proportions of households living in townhouse complexes. Census 2022 indicates that proportion of households living in formal dwellings have increased since 2011.

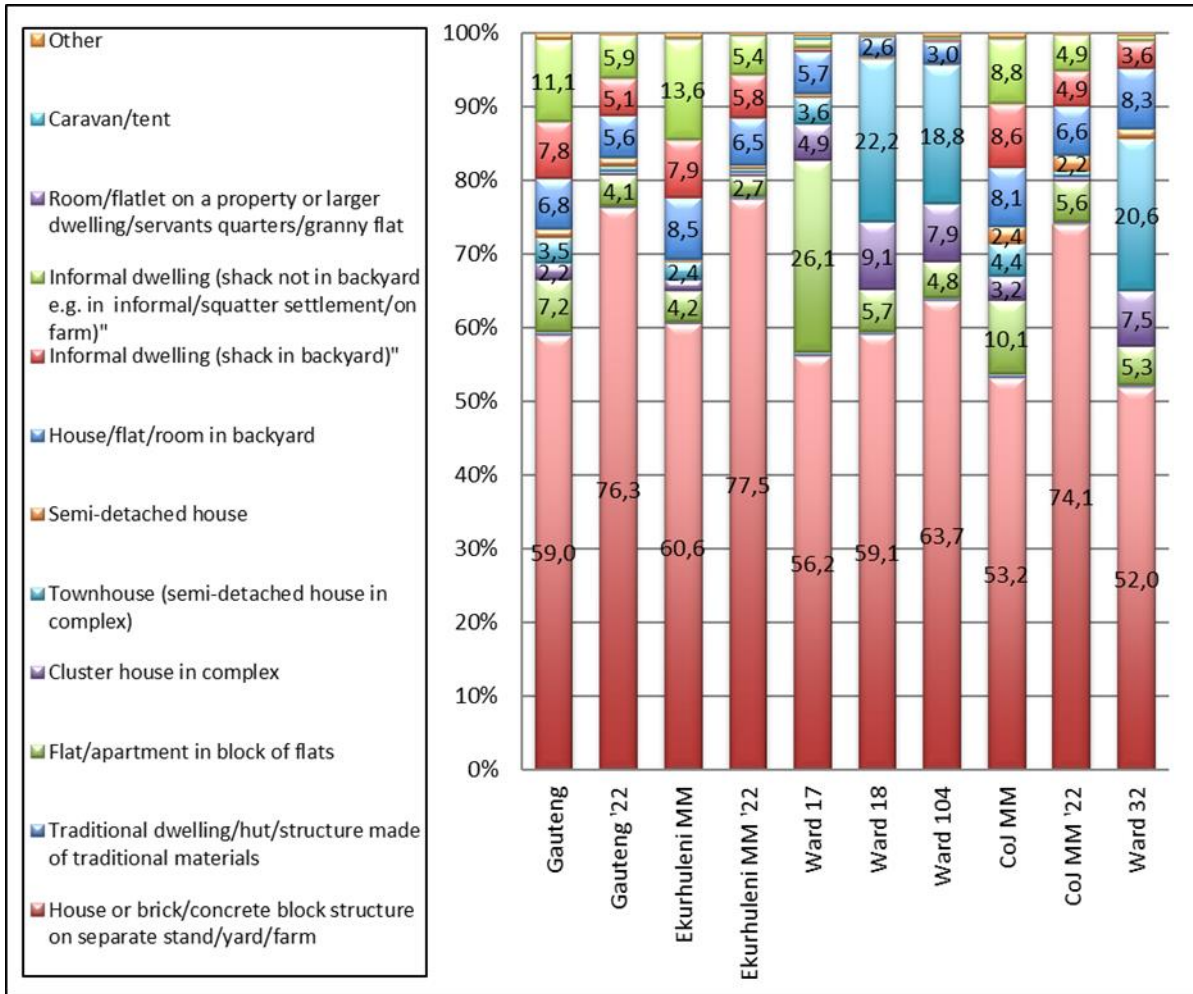


Figure 41: Dwelling types (shown in percentage, source: Census 2011, Census 2022)

In Ward 17 of the Ekurhuleni MM and Ward 32 of the City of Johannesburg MM most households in 2011 indicated that they rent their dwellings, while in Wards 18 and 104 of the Ekurhuleni MM most households indicated that they own their dwellings but had not paid it off in full yet. Census 2022 shows an increase of households renting their dwellings. In 2011 most households consisting of one to two members. Census 2022 shows a decrease in households consisting of one to two members since 2011.



9.9.8 ACCESS TO WATER AND SANITATION

Census 2022 shows that the proportion of households that has access to water from a local or a regional water scheme (Figure 42) has increased since 2011. More than 90% of households get their water from a local or regional water scheme.

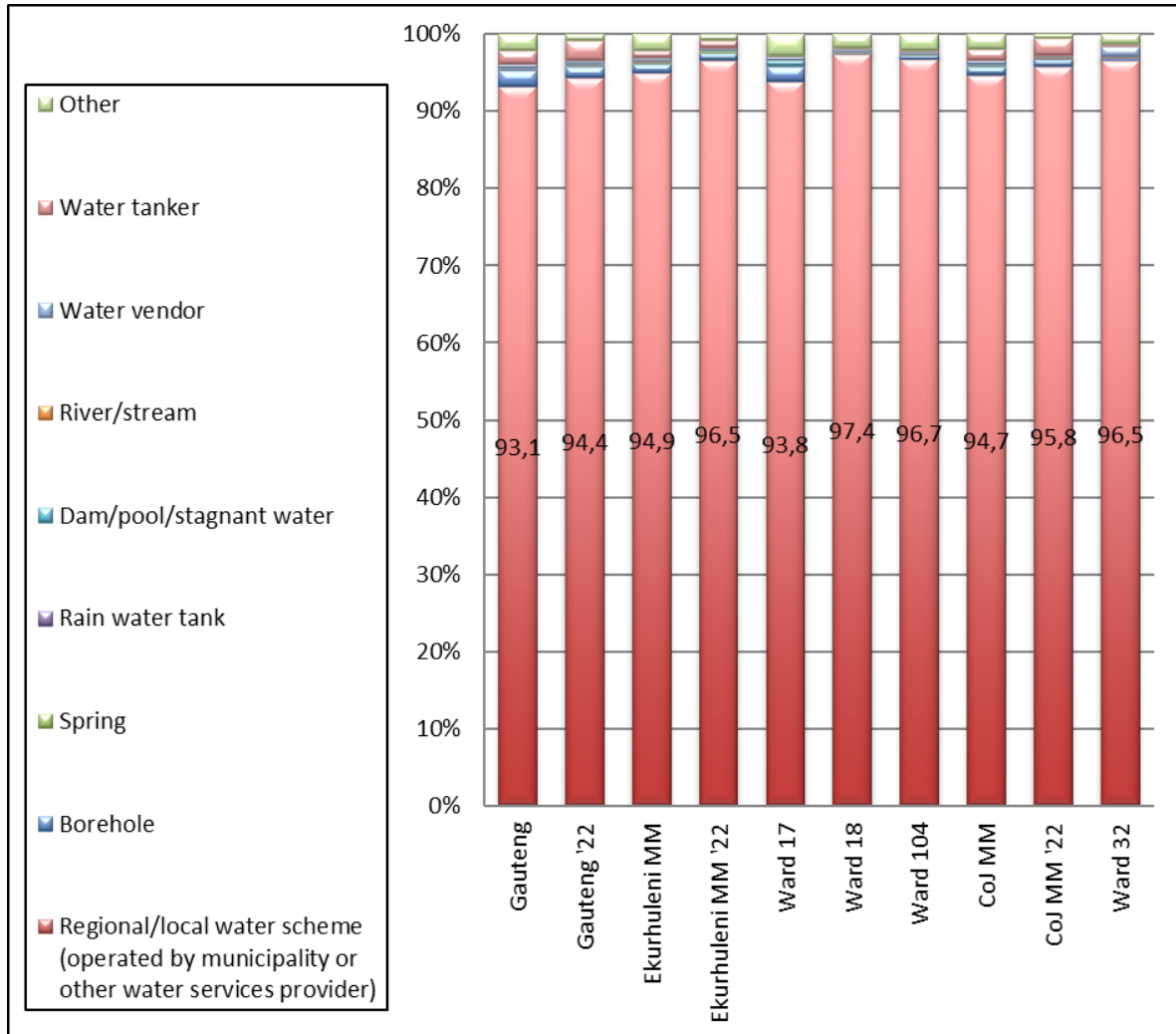


Figure 42: Water source (shown in percentage, source: Census 2011, Census 2022)

Access to piped water, electricity and sanitation relate to the domain of Living Environment Deprivation as identified by Noble et al (2006). Census 2011 shows on a ward level most households have access to piped water inside their dwellings, with the lowest incidence in Ward 32 of the City of Johannesburg MM (Figure 43). Census 2022 shows that access to piped water inside the dwelling has increased since 2011.

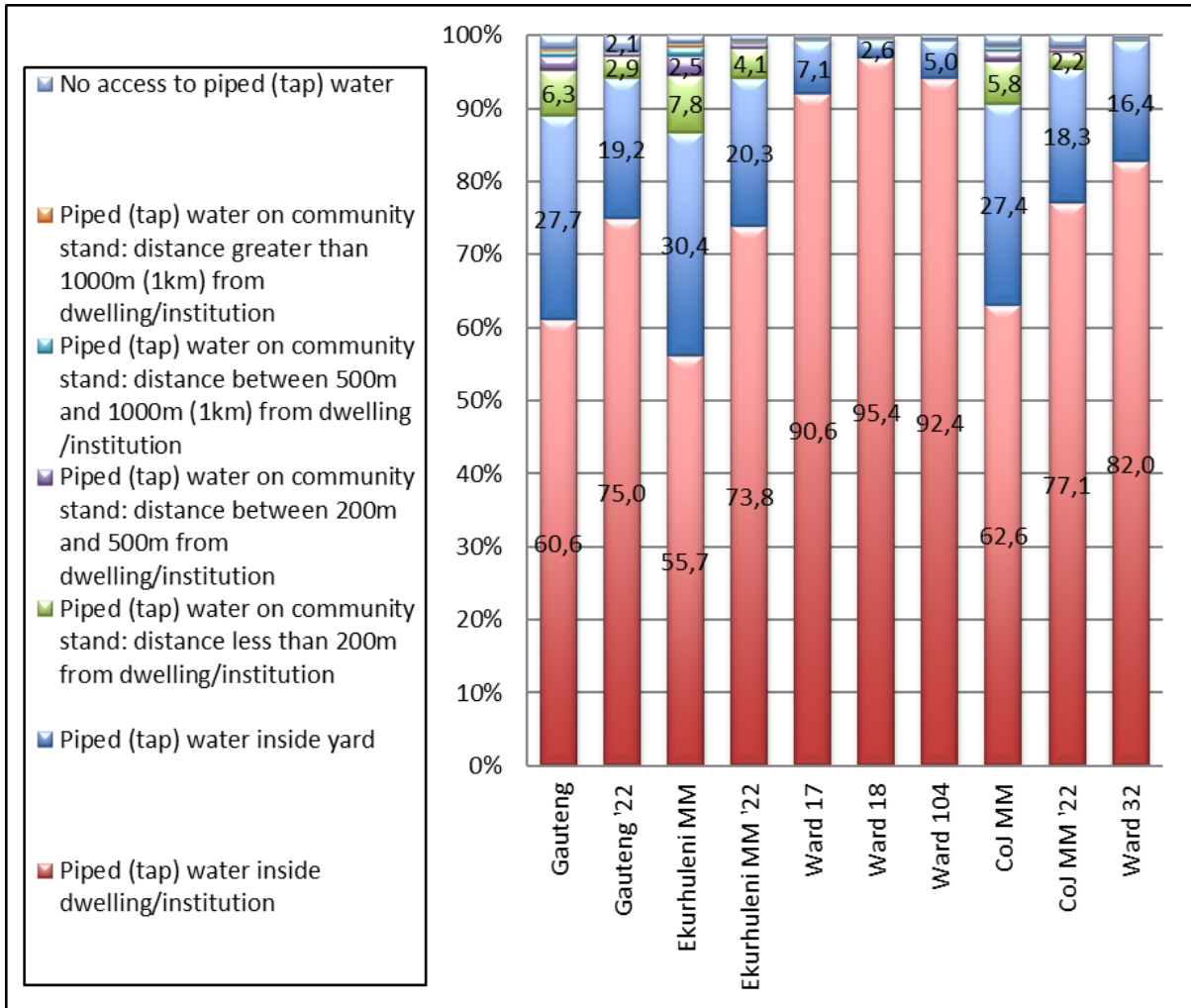


Figure 43: Piped water (shown in percentage, source: Census 2011, Census 2022)

Census 2011 shows that on a ward level most households have access to flush toilets that are connected to a sewerage system (Figure 44). Census 2022 shows a great increase in access to flush toilets connected to a sewerage system on provincial, district and local level.

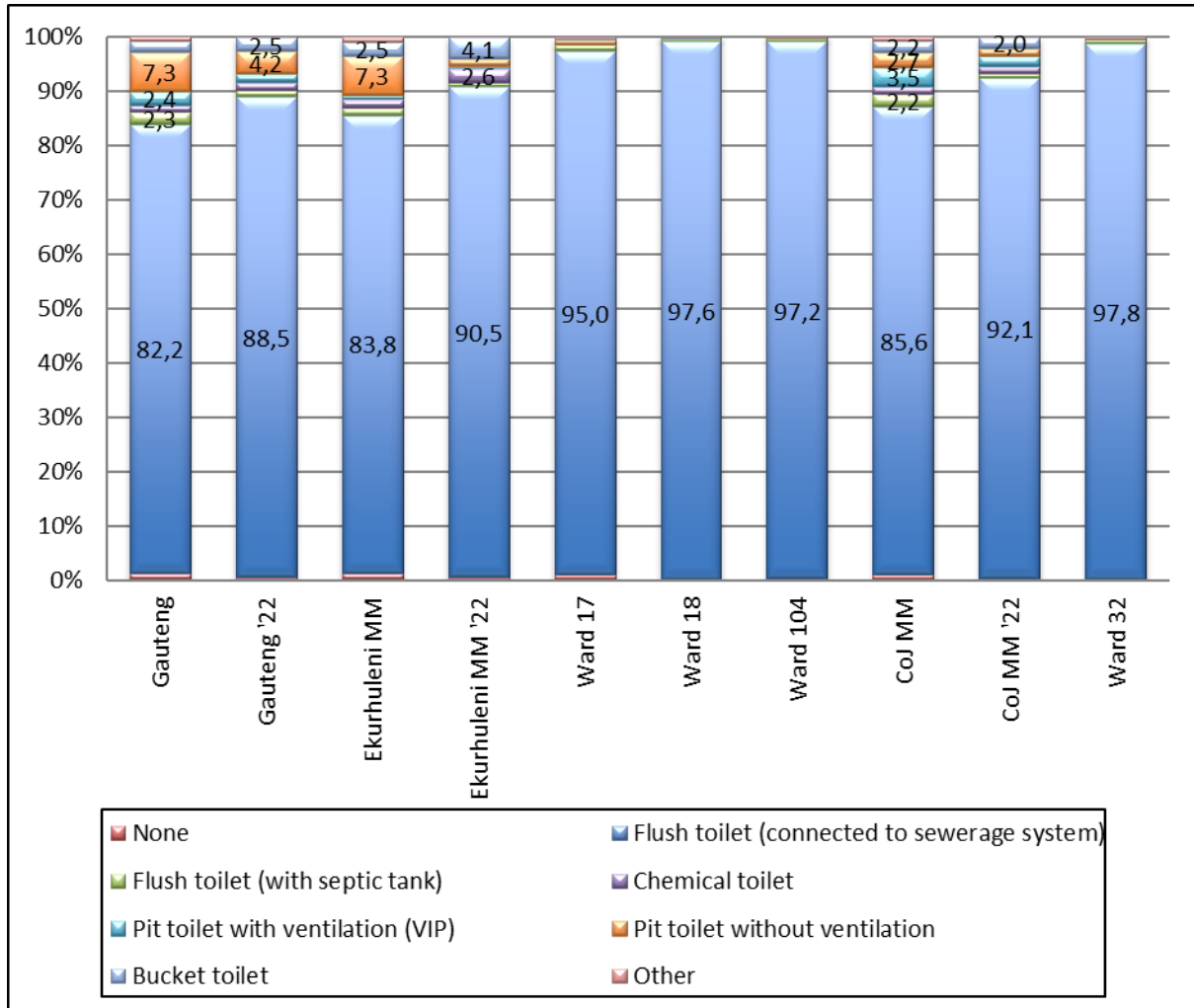


Figure 44: Sanitation (shown in percentage, source: Census 2011, Census 2022)

9.9.9 ENERGY

Electricity is seen as the preferred lighting source (Noble *et al*, 2006) and the lack thereof should thus be considered a deprivation. Even though electricity as an energy source may be available, the choice of energy for cooking may be dependent on other factors such as cost. More than 90% of households on a ward level had access to electricity as energy source for lighting in 2011. Candles are the second most used source of energy for lighting. Census 2022 shows that the proportion of households with access to electricity as an energy source for lighting has increased since 2011 on provincial, district and local level (Figure 45).

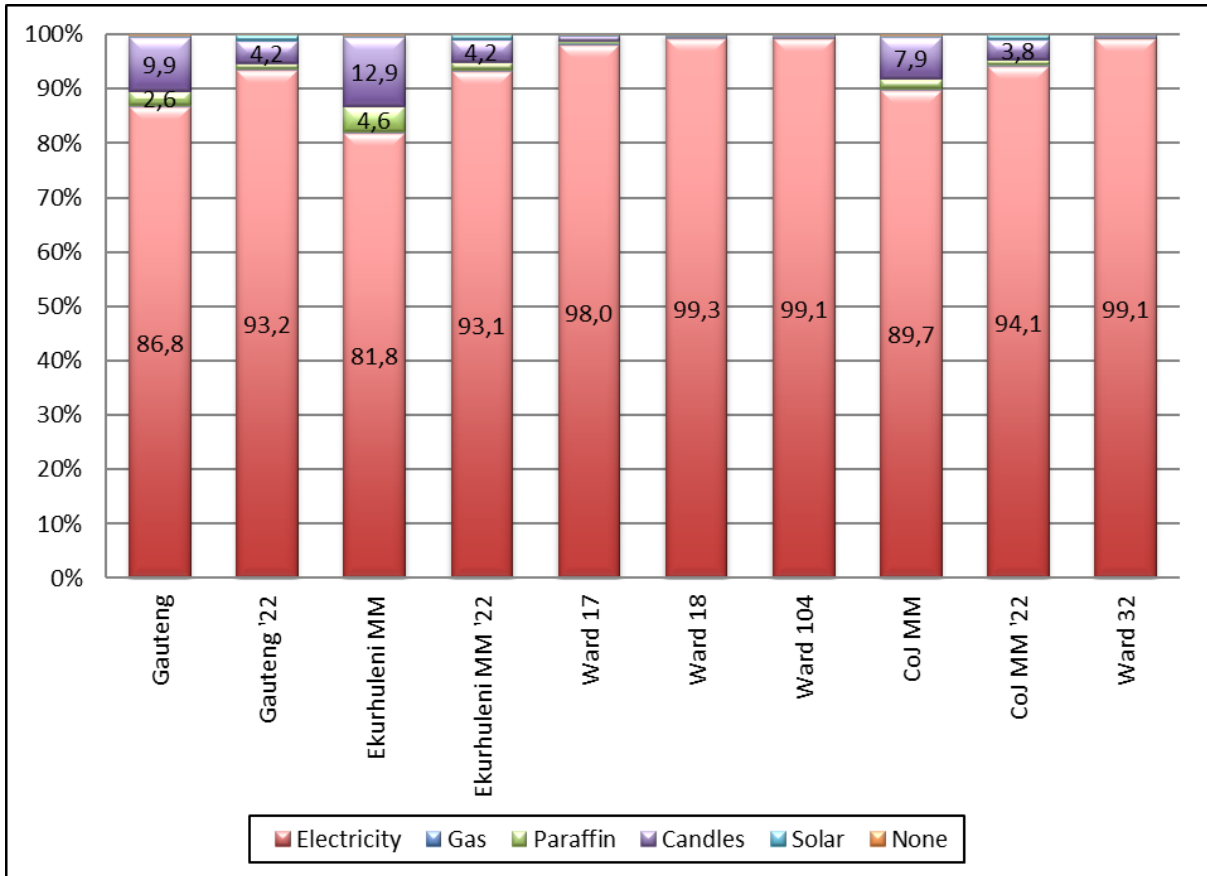


Figure 45: Energy source for lighting (shown in percentage, source: Census 2011, Census 2022)



10 ENVIRONMENTAL IMPACT ASSESSMENT

This section aims to identify and do a preliminary assessment on the potential environmental impacts associated with the proposed CCGT facility. This impact assessment will be used to guide the identification and selection of preferred alternatives, and management and mitigation measures, applicable to the proposed activities. The preliminary assessment will also serve to focus the subsequent EIA phase on the key issues and impacts.

10.1 PROCEDURE

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

10.1.1 DETERMINATION OF ENVIRONMENTAL RISK

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

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

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

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in Table 25 below.

Table 25: Criteria for Determining Impact Consequence.

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



	4	Long term (15-65 years), the impact will cease after the operational life span of the project)
	5	Permanent (>65 years), no mitigation measure of natural process will reduce the impact after construction)
Magnitude/ Intensity	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected)
	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected)
	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way, moderate improvement for +ve impacts)
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease, high improvement for +ve impacts)
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease, substantial improvement for +ve impacts)
Reversibility	1	Impact is reversible without any time and cost.
	2	Impact is reversible without incurring significant time and cost.
	3	Impact is reversible only by incurring significant time and cost.
	4	Impact is reversible only by incurring prohibitively high time and cost.
	5	Irreversible Impact.

Once the C has been determined, the ER is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/ scored as per Table 26.

Table 26: Probability Scoring.

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

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

$$ER = C \times P$$



Table 27: Determination of Environmental Risk.

Consequence	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
		Probability				

The outcome of the environmental risk assessment will result in a range of scores, ranging from 1 through to 25. These ER scores are then grouped into respective classes as described in Table 4.

Table 28: Environmental Risk Scores.

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

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

10.1.2 IMPACT PRIORITISATION

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

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

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

Table 29: Criteria for Determining Prioritisation.

Cumulative Impact (CI)	Low (1)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.
	Medium (2)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.



	High (3)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/ definite that the impact will result in spatial and temporal cumulative change.
Irreplaceable Loss of Resources (LR)	Low (1)	Where the impact is unlikely to result in irreplaceable loss of resources.
	Medium (2)	Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.
	High (3)	Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criteria represented in Table 5. The impact priority is therefore determined as follows:

$$Priority = CI + LR$$

The result is a priority score which ranges from 2 to 6 and a consequent PF ranging from 1 to 1.5 (Refer to Table 30).

Table 30: Determination of Prioritisation Factor.

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

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

Table 31: Final Environmental Significance Rating.

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



Significance Rating	Description
>0, <9	Low positive (i.e. where this impact would not have a direct influence on the decision to develop in the area).
≥9, ≤17	Medium positive (i.e. where the impact could influence the decision to develop in the area).
>17	High positive (i.e. where the impact must have an influence on the decision process to develop in the area).

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

10.2 IDENTIFICATION AND PRELIMINARY ASSESSMENT OF IMPACTS

Potential environmental impacts were identified during the Scoping phase. These impacts were identified by the EAP, the appointed specialists, as well as information received from the public. Section 10.2 provides the list of preliminary impacts identified during scoping, some of which will be further assessed in the EIA phase. Moreover Table 32 presents the combined details of the preliminary impact assessment calculations undertaken towards determining the pre- and post-mitigation impact significance, as well as the final significance scores.

Without proper mitigation measures and continual environmental management, most of the identified impacts may potentially become cumulative, affecting areas outside of their originally identified zone of impact. The potential cumulative impacts have been identified, evaluated, and mitigation measures suggested which will be updated during the detailed EIA phase level of investigation. When considering cumulative impacts, it is vitally important to bear in mind the scale at which different impacts occur. There is potential for a cumulative effect at a broad scale, as well as finer scale effects occurring in the area surrounding the activity. The main impacts which have a cumulative effect on a regional scale are related to the transportation vectors that they act upon. At a finer scale, there are also impacts that have the potential to result in a cumulative effect, although due to the smaller scale at which these operate, the significance of the cumulative impact is lower in the broader context.

10.2.1 PLANNING PHASE IMPACTS

10.2.1.1 IMPACTS ON EXISTING INFRASTRUCTURE AND SERVICES

During the planning phase, existing infrastructure and services in and around the proposed location for the CCGT could be impacted on by the proposed activities. Construction could lead to the destruction of existing infrastructure. Overuse or pollution of water sources within the study area could negatively effect on surrounding land users. The significance of the impact, however, is rated as low negative before and after mitigation as the proposed activities are located within the KPS plant area and is surrounded by power station infrastructure only. The only infrastructure potentially affected would be the infrastructure present at power station.

(i) Mitigation measures

- Identify all infrastructure and services within proximity of the proposed facility during the planning phase and attempt to plan around the identified infrastructure and services as far as reasonably possible.
- Communicate with surrounding land users to help identify existing infrastructure and services within the area.



(ii) Cumulative Impacts

- Destruction of existing infrastructure or obstruction of existing services during construction could impact on surrounding land users within the vicinity of the proposed CCGT plant.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss on existing infrastructure or services are foreseen as a result of the proposed activity. If existing infrastructure is damaged or services hindered, it will incur a cost to the applicant.

10.2.1.2 IMPACTS DUE TO COMMUNICATION INEFFICIENCY

Communication is important as to notify I&APs about the proposed project and activities. It will give them clarity on how their livelihoods or businesses could possibly be impacted on by the proposed activities. Open and clear communication will allow I&APs to comment on any queries or concerns that they might have as well as to inform the EIA. Communication will also allow the local community of possible vacancies. If communication is not transparent it could lead to uninformed decisions by the applicant, uprisings by an unhappy community and an incomplete EIA which could lead to an ungranted Environmental Authorisation. The impact significance is rated as being medium negative before mitigation, but low negative if the mitigation measures are applied.

(i) Mitigation measures

- Clear and transparent communication with the authorities and all affected and surrounding I&APs about the proposed project and activities as well as possible vacancies.
- Keep a register with any complaints from stakeholders/ I&APs and address them appropriately.

(ii) Cumulative Impacts

- Non-transparent communication could lead to bad decision making which might affect livelihoods in the surrounding community.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected as a result of communication inefficiency during the planning phase.

10.2.2 CONSTRUCTION PHASE IMPACTS

10.2.2.1 AIR QUALITY IMPACTS DURING CONSTRUCTION

The main impacts to be expected during the construction phase arise from the movement of construction vehicles, the excavation of material and the handling of excavated material during the construction activities. The engines of construction vehicles have internal combustion related emissions, while dust is generated by the movement of material and entrainment from roads by vehicle movement. The magnitude of the impact will depend on:

- The volume and nature of material to be removed during site clearing, the rate at which it is removed, the distance to disposal, the vehicle type used and the ultimate disposal of the cover material.
- The location, size and nature of temporary and permanent stockpiles.
- The delivery mode of construction material and plant components to site.

Dust will be generated as a result of movement of heavy machinery and vehicles on-site during construction. The impact significance was rated as being low negative before and after mitigation.

(i) Mitigation measures

- Haul vehicles carrying potentially dusty material should be covered with a tarp to prevent dust.
- Dust suppression techniques must be implemented on all exposed surfaces during periods of high wind.
- The minimum amount of vegetation and topsoil should be removed from site.



(ii) Cumulative Impacts

- No cumulative impacts are expected as a result of air quality impacts during construction.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected as a result of dust generation during construction.

10.2.2.2 NOISE GENERATION

Noise will be generated during the construction phase as a result of construction vehicles and heavy machinery working on-site. Noise relating to the construction phase of this project can be described as a nuisance rather than having environmental or health implications. The impact significance is rated as low negative before and after mitigation, as the proposed activities will take place within the Kelvin Power Station area where which is already subject to existing noises from the existing power generation processes. Potential sensitive receptors within the project area, include residential areas, i.e. Esther Park, Edleen, Cresslawn, Croydon, Illiondale, and Edenvale.

(i) Mitigation measures

- Ensure that all construction vehicles and equipment are in a good working condition as to not generate unnecessary noise.
- The provisions of the South African National Standards (SANS) 10103 (The measurement and rating of environmental noise with respect to annoyance and to speech communication), must be complied with.
- The Environment Conservation Act (Act 73 of 1989) (ECA), Section 25 of the Act and the Noise Regulations (GNR 154 of 1992) promulgated under this section, are still in effect. These regulations serve to control noise and general prohibitions relating to noise impact and nuisance. These regulations need to be complied with.
- Noisy operations such as rock-breaking should be restricted to daytime hours.

(ii) Cumulative Impacts

- No cumulative impacts are expected as a result of noise during the construction phase.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected as a result of noise during the construction phase.

10.2.2.3 IMPACT ON HEALTH AND SAFETY

During construction, a substantial amount of earthworks will be required at the site in order to level the ground for the positioning of the plant. These activities will result in the generation of dust, which will affect people working or living in close proximity to the site. Construction workers will also be exposed to health and safety risks on site and these risks must be addressed during construction, by compliance with required health and safety procedures and standards, particularly the Occupational Health and Safety Act 85 of 1993, and associated Construction Regulations promulgated in terms thereof.

(i) Mitigation measures

- Compliance with required health and safety procedures and standards. The project will comply with all applicable South African legislation in terms of health and safety, and worker rights, which will include access to workmans compensation for loss of income resulting from an onsite incident.
- The project will provide of Personal Protective Equipment (PPE), training and monitoring as well as ongoing safety checks and safety audits.
- Contractors should wear some form of identification that will make them easily recognizable as representatives from Kelvin Power Station. KPS should liaise with the community police forums to draft an action plan against potential crime.



- Workers will be provided with primary health care and basic first aid at construction camps /worksites.
- (ii) Cumulative Impacts
 - No cumulative health and safety impacts are expected on during the construction phase.
- (iii) Irreplaceable loss of Resources
 - No irreplaceable loss of resources is expected during the construction phase.

10.2.2.4 CLIMATE CHANGE IMPACTS

During its construction phase the project will emit Greenhouse Gasses (GHGs), the quantities of which will be estimated during the EIA phase of the project.

- (i) Mitigation measures
 - Maintenance of equipment.
 - Implement mitigation measures proposed by air quality specialist in the EIA phase.
- (ii) Cumulative Impacts
 - Climate change impacts will be cumulative with other GHG emissions for other projects in the region and in the country .
- (iii) Irreplaceable loss of Resources
 - No irreplaceable loss of resources is expected as a result of climate change impacts during construction.

10.2.2.5 IMPACT ON SOIL

The impact on soil during construction is considered to be low negative before and after mitigation. The location of the site is within the existing Kelvin Power Station area and is almost entirely surrounded by existing infrastructure. Therefore it is not feasible for the site to be used for agricultural purposes while the power station is still in operation.

- (i) Mitigation measures
 - Bunded (surface sealed with plastic or other impermeable material) areas should be established for:
 - The storage of fuels, oils and hydraulics;
 - The storage of raw materials, such as sand, stone and cement; and
 - Vehicle maintenance.
 - All servicing/ maintenance of construction vehicles that could cause harm to the environment must be done off-site. No servicing of construction vehicles is allowed on site, except for minor repairs to prevent further environmental pollution or damage.
 - All working fronts must be provided with a spill containment kit to contain and collect spills.
 - Any evidence of erosion, scouring, sedimentation, and/or undercutting must be rectified and rehabilitated immediately.
 - Should erosion become a problem during construction, then diversion berms and drains should be constructed to divert run-off away from exposed areas.
 - A detailed Stormwater Management Plan (SWMP) needs to be prepared.
 - Adequate stormwater drainage and management is required to prevent soil erosion.
- (ii) Cumulative Impacts
 - No cumulative impacts are expected as a result of impact on soil during the construction phase.
- (iii) Irreplaceable loss of Resources



- No irreplaceable loss of resources is expected as a result of impact on soil during the construction phase.

10.2.2.6 IMPACT ON TERRESTRIAL BIODIVERSITY

The project area has been transformed/disturbed from its original state by the current power plant operations. The project area is a brownfields site and is not located within any sensitive CBA or ESA areas. Sensitive species of plants and animals are unlikely to occur within in the project area. There is minimal vegetation in the area almost none of the vegetation is in a natural state.

(i) Mitigation measures

- Where possible, existing access routes and walking paths must be made use of.
- Any materials may not be stored for extended periods of time and must be removed from the project area once the construction/closure phase has been concluded. No storage of vehicles or equipment will be allowed outside of the designated project areas.
- The areas to be developed must be specifically demarcated to prevent movement of staff or any individual into the surrounding environments and signs must be put up to enforce this.
- The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprint of the roads must be kept to prescribed widths.
- An alien management plan must be implemented.

(ii) Cumulative Impacts

- No cumulative impacts are expected on flora and fauna during the construction phase.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected during the construction phase.

10.2.2.7 IMPACT ON TRAFFIC

During construction there is unlikely to be material impacts to the existing road traffic networks for the site. Construction transport related to the large power station components could result in a number of traffic related issues however impacts associated with abnormal loads and construction employees are not considered significant for the project.

(i) Mitigation measures

- Obtain relevant permits prior to transporting heavy equipment to the site.
- The appointed contractor must liaise closely with the relevant traffic authorities regarding the movement of 'abnormal vehicles' and must adhere to traffic authorities' procedures for 'abnormal vehicle' movement.
- Heavy vehicles should travel during off peak times and should be clearly marked. Relevant mitigation proposed in the biophysical studies should be adhered to.

(ii) Cumulative Impacts

- Traffic impacts will be cumulative with existing traffic in the affected areas during the construction phase.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected due to traffic related impacts.



10.2.2.8 IMPACT ON HERITAGE AND PALAEOLOGICAL RESOURCES

Impact significance on heritage and palaeontological resources during construction were identified as being low negative before and after mitigation. An archaeological assessment was undertaken in 2021 which covers the area under investigation for the CCGT. A number of known cultural heritage (archaeological and historical) sites exist in the larger geographical area within which the study area falls. The only site of cultural heritage (archaeological and/or historical) origin or significance identified during the 2021 assessment in the study area was the Power Station and related infrastructure itself.

(i) Mitigation measures

- If unearthed, under no circumstances shall any heritage, archaeological or paleontological artefact/feature be removed, destroyed or interfered with by anyone on the site, unless such removal has been authorised by the heritage authorities.
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or paleontological artefacts as set out in the NHRA (Act No 25 of 1999) Section 51 (1).

(ii) Cumulative Impacts

- No cumulative impacts are expected as a result of impacts on heritage and palaeontological resources during construction.

(iii) Irreplaceable loss of Resources

- Although unlikely, if any palaeontological resources are unearthed and destroyed, it will be irreplaceable.

10.2.2.9 SOCIAL IMPACTS

Employment creation was identified as having a medium positive impact significance before and after mitigation during the construction phase. Construction vehicles, industrial instrumentation and operators of these vehicles and equipment will be required during construction phase. Although certain aspects of the construction of the proposed plant are technically specialised, there remain opportunities for local contractors to become involved in components of construction, which are less plant-specific. The use of local contractors increases the number of employment opportunities for local people during the construction phase. Approximately 500 temporary job opportunities are to be created during the construction phase of the project. The project would also aid in preventing power outages in the region and the country by adding to the power generation capacity in the country. A further impact associated with an influx of jobseekers is the potential for social tension, and increased competition for employment. The distribution of employment opportunities between locals and in-migrants often leads to tension and conflict, especially when locals perceive the migrants to be taking their jobs. Other social impacts include:

- Opportunities for local contractors.
- Increased potential for Corporate Social Investment.
- Potential health impacts.
- Increased spread of HIV/AIDS.

(i) Mitigation measures

- Employ people from the surrounding local communities as far as reasonably possible.
- Kelvin Power Station's current employment protocols will be reviewed to ensure it complies with international best practice. If needed, changes to the protocols will be recommended. Jobs should be advertised in a way that is accessible to all members of society and labour desks should be established in accessible areas.



- The proponent should manage expectations and there should be a central place, such as the entrance of the Kelvin Power Station, where people can submit their applications, or an e-mail address or WhatsApp number where people could submit their queries to. This could form part of a grievance mechanism where people could submit any issues regarding the development, especially in the construction phase.
 - Utilise existing community structures if available, to act as a communication link between the local community and the applicant for informing the local community of job opportunities and informing the Applicant of possible contractors in the local community.
 - No alcohol and drugs policy during working time or at times that will affect ability to work.
 - Disciplinary measures for infringement of the Code and company rules. If workers are found to be in contravention of the Code of Conduct, which they signed at the commencement of their contract, they will face disciplinary procedures that could result in dismissal.
 - Develop and implement an HIV/AIDS policy awareness raising for all workers directly related to the Project.
- (ii) Cumulative Impacts
- Social impacts would be cumulative with the existing social impacts in the region.
- (iii) Irreplaceable loss of Resources
- No irreplaceable loss of resources is expected.

10.2.2.10 WASTE MANAGEMENT IMPACTS

Waste management impacts were rated as having a low negative significance before and after mitigation. Domestic waste, construction waste and sewage are all waste types that need to be considered during construction.

- (i) Mitigation measures
- The Contractor should inform all site staff to the use of supplied ablution facilities and under no circumstances shall indiscriminate excretion and urinating be allowed other than in supplied facilities.
 - No waste releases into the environment should be permitted.
 - The toilets shall be of a neat construction and shall be provided with doors and locks and shall be secured to prevent them from falling over.
 - The contractor shall always supply toilet paper at all toilets. Toilet paper dispensers shall be provided in all toilets.
 - A dedicated waste collection and storage facility must be prepared, and this should be emptied and collected wastes disposed of on a regular basis. Wastes must be disposed of at suitably licensed waste disposal facilities.
 - Contaminated water, and effluents must be prevented from entering the local environment (soil and water), adequately stored in protected and where necessary bunded areas, and disposed of at a suitably licensed disposal facility.
 - Vermin / weatherproof bins must be provided in enough numbers and capacity to store domestic waste. These bins must be kept closed to reduce odour build-up and emptied regularly to avoid overflowing and other associated nuisances.
 - Each active site must be checked daily to ensure that the site is free from litter and unnecessary wastes.
 - Hazardous substances, if applicable, must be stored in a secure location, isolated from direct contact with the soils and covered where necessary.



- No waste is to be left on site whether it is biodegradable or not. Unutilised materials are to be removed once decommissioning has ended.
- (ii) Cumulative Impacts
- No cumulative impacts are expected as a result of waste management impacts during decommissioning.
- (iii) Irreplaceable loss of Resources
- No irreplaceable loss of resources is expected as a result of waste management impacts during decommissioning.

10.2.3 OPERATIONAL PHASE IMPACTS

10.2.3.1 AIR QUALITY IMPACTS

Emissions associated with the operational phase of the proposed plant are mostly restricted to the stack emissions. During operation, the plant may produce NO_x, SO₂, CO and particulates, which are potentially harmful. In order to protect human health, air quality standards have been established and emissions below these standards are considered to have a negligible impact on the health of communities. There are a number of sensitive receptors in close proximity to the site. Incomplete combustion and unstable combustion temperatures may result in higher-than-normal PM, CO, NO_x and VOC emissions. SO₂ emissions should not be affected. Additional VOC emissions because of the fuel leaks may occur but are unlikely. The frequency of the impact will be constant, as the power plant will operate 24 hrs a day, 7 days a week. Incomplete combustion and unstable combustion temperatures may result in higher-than-normal PM, CO, NO_x and VOC emissions. SO₂ emissions should not be affected. Additional VOC emissions because of the fuel leaks may occur but are unlikely.

- (i) Mitigation measures
- Maintenance of equipment.
 - Implement mitigation measures proposed by air quality specialist in the EIA phase.
 - Develop and implement a Grievance Mechanism to address stakeholder concerns related to the Project in a timely manner.
- (ii) Cumulative Impacts
- Cumulative concentrations due to baseline air pollutant levels.
- (iii) Irreplaceable loss of Resources
- No irreplaceable loss of resources is expected as a result of air quality impacts during operation.

10.2.3.2 CLIMATE CHANGE IMPACTS

During its operation phase the project will emit Greenhouse Gasses (GHGs), the quantities of which will be estimated during the impact assessment phase of the project.

- (i) Mitigation measures
- Maintenance of equipment.
 - Implement mitigation measures proposed by air quality specialist in the EIA phase.
- (ii) Cumulative Impacts
- Climate change impacts will be cumulative with other GHG emissions for other projects in the region and in the country.
- (iii) Irreplaceable loss of Resources
- No irreplaceable loss of resources is expected as a result of climate change impacts during operation.



10.2.3.3 NOISE IMPACTS

The CCGT will introduce additional noise sources. Equipment such as the gas and steam turbines, air filters, gas compressor, generator, fans and heat recovery equipment will create a significant noise impact. The design of the proposed plant is to incorporate all the necessary acoustic design aspects required in order that the overall generated noise level from the new installation complies with SANS 10103. All appropriate measures must be taken to minimise the noise impacts associated with the development. Potential sensitive receptors within the project area, include residential areas, i.e. Esther Park, Edleen, Cresslawn, Croydon, Illiondale, and Edenvale.

(i) Mitigation measures

- Maintenance of equipment.
- Operation procedures to reduce occurrence and magnitude of noise impacts.
- Install noise abatement measures for noisy equipment.
- Comply with relevant noise control regulations.
- Perimeter noise measurements.

(ii) Cumulative Impacts

- Noise impacts will be cumulative with the existing noise from the power station.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected as a result of noise impacts during operation.

10.2.3.4 IMPACT ON HEALTH AND SAFETY

The Impact on health and safety during the operation phase was identified as being moderate negative before and after mitigation. All employees need to be subject to a safe and healthy working environment and the power station already has existing health and safety protocols in place. The main hazard associated with gas turbines is a gas leak and the accumulation of combustible gas in a confined location, which has the potential to create an explosion or fire if ignited.

(i) Mitigation measures

- The speed limit on private/ unregulated roads (access roads) of haul trucks should be limited to 30km/h and all traffic rules on regulated roads should be adhered to.
- Employees must be made aware of their specific responsibilities in terms of the environmental impacts i.e. controlling noise levels, reducing dust, etc.
- Employees must be made aware that no alcohol/drugs are allowed on site and no workers under the influence are permitted on site.
- Employees must be made aware that no fires will be permitted on site.
- The required PPE shall always be worn on site.
- Access to the site should be controlled.
- Complete MHI Risk assessment.
- A detailed Process Hazard Analysis such as a Hazop study should be completed prior to construction of the Project, with all potential hazards identified, including fuel and any other substances, and sufficient mitigation suggested for safe operation.
- A leak detection system is to be considered for the pipelines.

(ii) Cumulative Impacts

- No cumulative impacts are expected as a result of health and safety impacts during production.



(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected as a result of health and safety impacts during production.

10.2.3.5 VISUAL IMPACT

The facility may be visible from several existing roads in the area. The closest residential areas are located 0,5 km away and the facility is expected to be visible from these areas. The facility is located within the power station and is surrounded by existing infrastructure therefore the overall visual impact of the proposed CCGT plants holds a low overall visual impact. The CCGT plant will also be replacing coal power plant infrastructure already in place at the A-Site, which is to be demolished prior to construction of the CCGT plant. When taking this into account the visual impact associated with the new CCGT plant would be negligible.

(i) Mitigation measures

- To reduce the visual impact of the plant in the operational phase, plant buildings and structures should be painted with colours that are not visually intrusive.
- Light fixtures must be installed that provide precisely directed illumination to reduce light “spillage” beyond the immediate surrounds of the power plant and avoid high pole top security lighting along the periphery of the site.
- The Contractor will be required to landscape certain areas requiring rehabilitation.

(ii) Cumulative Impacts

- Visual impacts will be cumulative with existing visual impacts from the power station.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is anticipated as a result of social impacts.

10.2.3.6 SOCIAL IMPACTS

Employment creation will be a high positive impact on the local community before and after mitigation (enhancement). Approximately 100 employment opportunities (50 skilled and 50 unskilled) will be made available during the operational phase. The Project may cause nuisance of the communities in the area due to noise, dust and vibration.

(i) Mitigation measures

- Employ people from the surrounding local communities as reasonably possible. Criteria will be set for prioritising local residents and then other South Africans as part of the recruitment process.
- Utilise existing community structures if available, to act as a communication link between the local community and the applicant for informing the local community of job opportunities.
- Training plans will be developed according to each permanent employee’ work agreement and relevant to their job description.
- The applicant must implement a grievance procedure to ensure fair and prompt resolution of problems arising from the project.

(ii) Cumulative Impacts

- The creation of employment opportunities will assist in reducing unemployment as well as positively contribute to certain livelihoods in the community through income generation.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is anticipated as a result of social impacts.



10.2.3.7 GENERATION OF ELECTRICITY

The project will generate approximately 600MW of electricity. The proposed project involves diversification of electricity production fuel sources, improved efficiency in electricity production and a decrease in the quantity of fossil fuel burned and GHG emissions when compared to coal fired power generation. This is in line with Government's commitment to reduce the country's emissions and provide much-needed additional electricity and can therefore be seen as making a contribution to improving the sustainability of development in South Africa and reduce load-shedding.

(i) Mitigation measures

- None required

(ii) Cumulative Impacts

- No cumulative impacts are expected as a result of electricity generation.

(iii) Irreplaceable loss of Resources.

- No irreplaceable loss of resources is expected due to electricity generation.

10.2.3.8 WASTE MANAGEMENT IMPACTS

Waste management impacts were rated as having a low negative significance before and after mitigation. Hazardous wastes, Domestic waste and sewage are waste types that need to be considered during operation. Very little waste material is generated by a gas fired CCGT plant. Waste would generally fall into the following categories:

- Used gas turbine air intake filters (typically replaced annually);
- Used ion exchange resins (typically replaced at 5 year intervals);
- Used Reverse Osmosis membranes (if an RO plant is used);
- Separated oil / sludge from oil / water separators;
- Used lubricating oil;
- Used oil or chemical containers; and
- General office waste.

(i) Mitigation measures

- No waste releases into the environment should be permitted.
- A dedicated waste collection and storage facility must be prepared, and this should be emptied and collected wastes disposed of on a regular basis. Wastes must be disposed of at suitably licensed waste disposal facilities.
- Contaminated water, and effluents must be prevented from entering the local environment (soil and water), adequately stored in protected and where necessary bunded areas, and disposed of at a suitably licensed disposal facility.
- Vermin / weatherproof bins must be provided in enough numbers and capacity to store domestic waste. These bins must be kept closed to reduce odour build-up and emptied regularly to avoid overflowing and other associated nuisances.
- Each active area must be checked daily to ensure that the site is free from litter and unnecessary wastes.
- Fuel storage tanks and permanent fuel storage tanks must be bunded (110% of total capacity of storage tank) in order to contain any possible spills and to prevent any infiltration of fuel into the ground.
- Hazardous substances must be stored in a secure location, isolated from direct contact with the soils and covered where necessary.



(ii) Cumulative Impacts

- No cumulative impacts are expected as a result of waste management impacts during production.

(iii) Irreplaceable loss of Resources.

- No irreplaceable loss of resources is expected as a result of waste management impacts during production.

10.2.3.9 STORMWATER IMPACTS

Stormwater runoff after a rainfall event needs to be managed on site. This impacted was rated as medium negative before mitigation and low negative after mitigation.

(i) Mitigation measures

- A detailed SWMP needs to be prepared.

(ii) Cumulative Impacts

- No cumulative impacts are expected as a result of stormwater during operations.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected as a result of stormwater during production.

10.2.3.10 IMPACT ON TERRESTRIAL BIODIVERSITY

Operation of the CCGT could have impacts on terrestrial biodiversity. Erosion, dust, fire, alien vegetation introduction and proliferation as well as poor waste management resulting in increase in pest numbers could impact on flora and fauna. The significance of these impacts is considered to be of low significance because the area has been altered from its original state however the project can still affect species in the surrounding area.

(i) Mitigation measures

- A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. Appropriately contain any generator diesel storage tanks, machinery spills (e.g. accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them leaking and entering the environment.
- It should be made an offence for any staff to take/ bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.
- A fire management plan needs to be compiled and implemented to restrict the impact fire might have on the surrounding areas.
- Any individual of the protected plants that was observed needs a relocation or destruction permit in order for any individual that may be removed or destroyed due to the development. Preferably, the plants can be relocated within the property without a permit or otherwise left unharmed.

(ii) Cumulative Impacts

- No cumulative impacts are expected on flora and fauna during the operations phase.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of biodiversity resources is expected during operations.

10.2.4 DECOMMISSIONING PHASE IMPACTS

Please note that the holder of the Environmental Authorisation (EA), if granted, will have to apply for a separate EA for the decommissioning phase as required under Listing Notice 1, Activity 31 of the NEMA as amended. This will necessitate the need to reassess and consider the below mentioned, and any additionally identified impacts at such time when decommissioning is considered. A detailed decommissioning and rehabilitation plan must be



developed prior to decommissioning the CCGT gas fired power plant and associated infrastructure. This plan should include, but not be limited to, management of socio-economic aspects such as employment loss, removal, re-use and recycling of materials and vegetative rehabilitation to prevent erosion.

10.2.4.1 AIR QUALITY IMPACTS

The nature of emissions from decommissioning activities is highly variable in terms of temporal and spatial distribution and is also transient. Fugitive dust emissions are mostly generated by decommissioning and rehabilitation activities. Some dust will be generated as a result of movement of heavy machinery and vehicles on-site during decommissioning. The nature of emissions from decommissioning activities is highly variable in terms of temporal and spatial distribution and is also transient. Fugitive dust emissions are mostly generated by decommissioning and rehabilitation activities.

(i) Mitigation measures

- As per Section 10.2.2.1 above (construction phase dust generation)

(ii) Cumulative Impacts

- No cumulative impacts are expected as a result of dust generation during construction.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected as a result of dust generation during construction.

10.2.4.2 NOISE GENERATION

Noise will be generated during the decommissioning phase as a result of vehicles working on-site. Noise relating to the decommissioning phase of this project can be described as a nuisance rather than having environmental or health implications. The impact significance is rated as low negative before and after mitigation, as the proposed activities will take place within the power station area, which is subject to existing noises from power station activities. Potential sensitive receptors within the project area, include residential areas, i.e. Esther Park, Edleen, Cresslawn, Croydon, Illiondale, and Edenvale.

(i) Mitigation measures

- As per section 10.2.2.2 above (construction phase noise generation).

(ii) Cumulative Impacts

- No cumulative impacts are expected as a result of noise during the decommissioning phase.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected as a result of noise during the decommissioning phase.

10.2.4.3 WASTE MANAGEMENT IMPACTS

Waste management impacts were rated as having a low negative significance before and after mitigation. Domestic waste, construction waste and sewage are all waste types that need to be considered during decommissioning.

(i) Mitigation measures

- As per Section 10.2.4.3 above (construction phase waste management impacts).

(ii) Cumulative Impacts

- No cumulative impacts are expected as a result of waste management impacts during decommissioning.

(iii) Irreplaceable loss of Resources

- No irreplaceable loss of resources is expected as a result of waste management impacts during decommissioning.



10.2.4.4 CLIMATE CHANGE IMPACTS

During its decommissioning phase the project will emit Greenhouse Gasses (GHGs), the quantities of which will be estimated during the impact assessment phase of the project.

- (i) Mitigation measures
 - Maintenance of equipment.
 - Implement mitigation measures proposed by air quality specialist in the EIA phase.
- (ii) Cumulative Impacts
 - Climate change impacts will be cumulative with other GHG emissions for other projects in the region and in the country.
- (iii) Irreplaceable loss of Resources
 - No irreplaceable loss of resources is expected as a result of climate change impacts during decommissioning.

10.2.4.5 JOB LOSSES

As a result of the facilities closing down and being decommissioned, employees that worked during the production phase of this project no longer be able to hold their working position at the facility. This impact was rated with a moderate negative significance before and after the mitigation.

- (i) Mitigation measures
 - Ensure contributions are made for employees to the Unemployment Insurance Fund (UIF).
- (ii) Cumulative Impacts
 - Employees that had a position at the facility will have to go without a working income until they can find another position.
 - Contribution to unemployment within the local municipality due to decommissioning.
- (iii) Irreplaceable loss of Resources
 - No irreplaceable loss of resources is expected as a result of job losses during decommissioning.

10.2.5 NO-GO ALTERNATIVE

The no-go alternative option means 'do nothing' or the option of not undertaking the proposed CCGT plant project or any of its activities, consequently leading to the continuation of the current land-use, which is leaving the location as open space within the power plant area. As such, the 'do nothing' alternative or keeping the current status quo of an empty open space with no activities occurring on-site also provides the baseline against which the impacts of all other alternatives were compared. The no-go alternative would also mean the potential positive impacts associated with electricity generation and job creation would not be realized.

10.2.6 OVERALL PREFERRED ALTERNATIVE

Layout alternatives are the only reasonable alternatives considered for the proposed project. The level of detail regarding layouts will only be made available in the EIA phase. Therefore, no preferred layout alternatives are discussed or proposed in this scoping report. At this stage no overall preferred alternatives have been nominated.

10.3 SUMMARY OF PRELIMINARY IMPACTS

A summary of all the identified preliminary impacts, their associated phase, as well as their impact calculations and significance are presented in Table 32 below.



Table 32: Identified preliminary impacts

Impact	Alternative	Phase	Pre-Mitigation							Post Mitigation							Priority Factor Criteria				
			Nature	Extent	Duration	Magnitude	Reversibility	Probability	Pre-mitigation ER	Nature	Extent	Duration	Magnitude	Reversibility	Probability	Post-mitigation ER	Confidence	Cumulative	Irreplaceabl	Priority Factor	Final score
Impacts on Existing Infrastructure and Services	Alternative 1	Planning	-1	1	2	2	3	2	-4	-1	1	2	1	2	2	-3	Medium	2	1	1,13	-3,375
Impacts Due to Communication Inefficiency	Alternative 1	Planning	-1	3	4	4	3	3	-10,5	-1	3	2	2	2	-4,5	Medium	2	1	1,13	-5,0625	
Impacts on Soils	Alternative 1	Construction	-1	2	2	1	3	3	-6	-1	2	2	1	3	-6	Medium	1	1	1,00	-6	
Impacts on Soils	Alternative 1	Operation	-1	2	3	1	3	3	-6,75	-1	2	3	1	3	-6,75	Medium	1	2	1,13	-7,59375	
Impacts on Soils	Alternative 1	Decommissioning	-1	2	2	1	3	3	-6	-1	2	2	1	3	-6	Medium	1	1	1,00	-6	
Ambient Air Quality Impacts	Alternative 1	Construction	-1	3	2	2	1	3	-6	-1	3	2	2	1	-4	Medium	1	1	1,00	-4	
Ambient Air Quality Impacts	Alternative 1	Operation	-1	3	4	2	1	3	-7,5	-1	2	4	3	1	-5	Medium	3	1	1,25	-6,25	
Ambient Air Quality Impacts	Alternative 1	Decommissioning	-1	3	2	3	1	3	-6,75	-1	3	2	3	1	-4,5	Medium	1	1	1,00	-4,5	
Noise Impacts	Alternative 1	Construction	-1	3	2	3	2	4	-10	-1	3	2	3	2	-7,5	Medium	1	1	1,00	-7,5	
Noise Impacts	Alternative 1	Operation	-1	3	4	3	3	3	-9,75	-1	3	4	2	3	-9	Medium	1	1	1,00	-9	
Noise Impacts	Alternative 1	Decommissioning	-1	3	2	3	2	4	-10	-1	3	2	3	2	-7,5	Medium	1	1	1,00	-7,5	
Climate Change Impacts	Alternative 1	Construction	-1	4	2	2	2	3	-7,5	-1	4	2	2	2	-7,5	Low	1	2	1,13	-8,4375	
Climate Change Impacts	Alternative 1	Operation	-1	5	4	4	3	3	-12	-1	5	4	3	-11,25	Low	2	2	1,25	-14,0625		
Climate Change Impacts	Alternative 1	Decommissioning	-1	4	2	2	2	3	-7,5	-1	4	2	2	2	-7,5	Low	1	2	1,13	-8,4375	
Heritage Impacts (incl impacts on fossils)	Alternative 1	Construction	-1	2	5	2	2	1	-2,75	-1	2	5	1	2	-2,5	Medium	1	2	1,13	-2,8125	
Waste Management Impacts	Alternative 1	Construction	-1	2	2	3	3	3	-7,5	-1	2	2	2	3	-6,75	Medium	2	2	1,25	-8,4375	
Waste Management Impacts	Alternative 1	Operation	-1	2	4	3	3	3	-9	-1	2	4	2	3	-8,25	Medium	1	1	1,00	-8,25	
Waste Management Impacts	Alternative 1	Decommissioning	-1	2	2	3	3	3	-7,5	-1	2	2	2	3	-6,75	Medium	2	2	1,25	-8,4375	
Impact on Health and Safety	Alternative 1	Construction	-1	2	2	4	3	3	-8,25	-1	2	2	3	2	-5	Medium	1	3	1,25	-6,25	
Impact on Health and Safety	Alternative 1	Operation	-1	2	4	4	3	3	-9,75	-1	2	4	3	2	-6	Medium	1	3	1,25	-7,5	
Impacts on Terrestrial Biodiversity	Alternative 1	Construction	-1	3	2	2	3	3	-7,5	-1	3	2	1	3	-6,75	Medium	2	2	1,25	-8,4375	
Impacts on Terrestrial Biodiversity	Alternative 1	Operation	-1	3	4	2	3	3	-9	-1	3	4	1	3	-8,25	Medium	2	2	1,25	-10,3125	
Visual Impacts	Alternative 1	Operation	-1	3	4	1	3	4	-11	-1	3	4	1	3	-8,25	Medium	3	1	1,25	-10,3125	
Employment Creation	Alternative 1	Construction	1	3	4	1	3	4	11	1	3	4	2	3	12	Medium	1	1	1,00	12	
Employment Creation	Alternative 1	Operation	1	3	4	2	3	3	9	1	3	4	3	3	9,75	Medium	1	1	1,00	9,75	
Job Losses	Alternative 1	Decommissioning	-1	3	4	2	3	5	-15	-1	3	4	1	3	-13,75	Medium	1	1	1,00	-13,75	
Generation of electricity	Alternative 1	Operation	1	5	4	4	2	5	18,75	1	5	4	4	2	18,75	Medium	1	1	1,00	18,75	
Indirect social impacts	Alternative 1	Construction	-1	3	3	3	2	3	-8,25	-1	3	3	2	2	-7,5	Medium	2	1	1,13	-8,4375	
Indirect social impacts	Alternative 1	Operation	-1	3	4	3	2	3	-9	-1	3	4	2	2	-8,25	Medium	2	1	1,13	-9,28125	
Indirect social impacts	Alternative 1	Decommissioning	-1	3	3	3	2	3	-8,25	-1	3	3	2	2	-7,5	Medium	2	1	1,13	-8,4375	



11 SENSITIVITY MAPPING

Environmental sensitivity mapping provides a strategic overview of the environmental, cultural and social assets in a region. The sensitivity mapping technique integrates numerous datasets (base maps and shapefiles) into a single consolidated layer making use of Geographic Information System (GIS) software and analysis tools. Environmental sensitivity mapping is a rapid and objective method applied to identify areas which may be particularly sensitive to development based on environmental, cultural and social sensitivity weightings – which is determined by specialists' input within each respective field based on aerial or ground-surveys. Therefore, the sensitivity mapping exercise assists in the identification of sensitive areas within and surrounding the proposed CCGT plant area. At this stage the sensitivity/ composite map will only consist of desktop information as detailed specialist investigations will only be undertaken during the EIA phase.

This sensitivity mapping approach allows for the proposed activities to be undertaken whilst protecting identified sensitive environmental areas/ features. Furthermore, environmental sensitivity is used to aid in decision-making during consultation processes, forming a strategic part of Environmental Assessment processes. Refer to Figure 46 for the preliminary scoping combined sensitivity/ composite map for the project.

It is clear from the figure below that there are limited biophysical sensitivities in the project area. The key sensitivities will be the potentially sensitive air quality and noise receptors nearby the project area which include residential areas within 5km of the project stie, i.e. Esther Park, Edleen, Cresslawn, Kelvin Estate, Croydon, Eden Glen and Illiondale as well as residential areas within 10 km from the project site which include Edenvale, Kempton Park, and Lethabong as well as OR Tambo International Airport. The identified preliminary sensitivities be further assessed during the EIA phase, and a final combined sensitivity map produced which will inform the selection of the preferred location and layout alternatives for the proposed project.

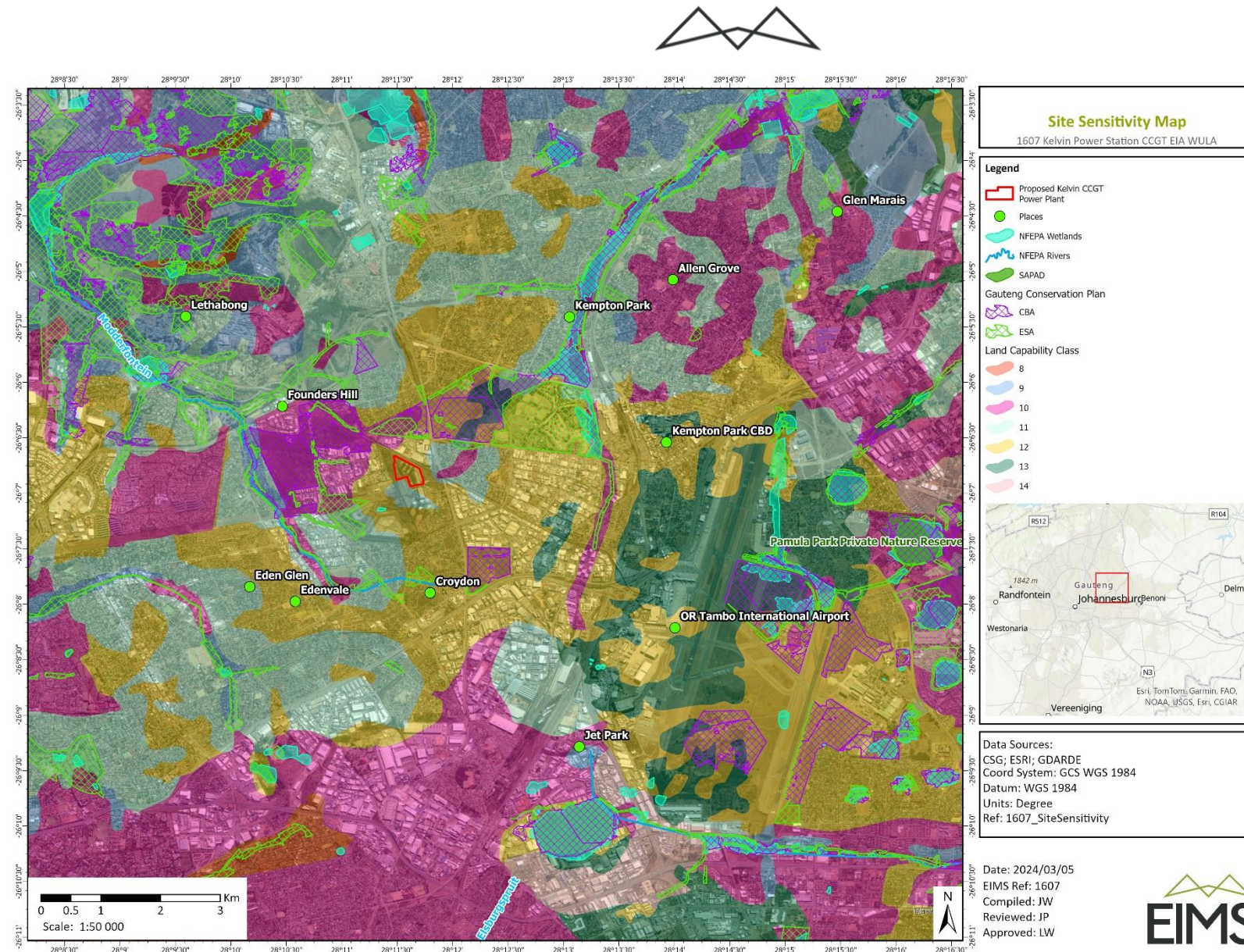


Figure 46: Scoping Phase sensitivity map



12 PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASSESSMENT

The section below outlines the proposed plan of study which will be conducted for the various environmental aspects during the EIA phase. It is also important to note that the plan of study will also be guided by comment obtained from I&APs and other stakeholders during the Scoping Report public review period.

12.1 DESCRIPTION OF ALTERNATIVES TO BE CONSIDERED

The alternatives considered and discussed in Section 7 of this Scoping Report, which include location, process, technology and activity alternatives, have culminated into the identification of feasible development alternatives to be addressed further in the EIA phase of this EIA process. The feasible development alternatives to be further assessed in the EIA phase are presented below.

12.1.1 LOCATION ALTERNATIVES

Kelvin owns the remainder of portion 391 (RE/391) of farm Zuurfontein (33) on which the proposed development is proposed. The proposed CCGT plant is to be located where the coal fired A-station, currently undergoing a decommissioning process, is located as this property was previously used for power generation and is continuously generating power with the currently operational B-station. As such, no alternative properties were considered for this development.

12.1.2 LAYOUT ALTERNATIVES

The sensitivity planning approach as described in Section 11 of this report will guide the final layout position of the various infrastructure.

12.1.3 TECHNOLOGY ALTERNATIVES

A pre-feasibility study was undertaken for the development of a gas power plant with a power output of up to 600 MW. Various gas turbine technologies and configurations were considered. The gas turbine technologies that were considered included the F, H and J class gas turbines. A recommendation on the type of engine to be utilised for the CCGT was made based on high power outputs and efficiency. The CCGT technology that was determined to be the most suitable for the proposed development was H-class gas turbine. This aspect will be addressed further in the EIA however no feasible technology alternatives could be identified at this stage that would directly impact the significance of any of the identified impacts.

12.1.4 ACTIVITY AND PROCESS ALTERNATIVES

The applicant has identified the use of gas as the preferred option for generation of electricity through their initial pre-feasibility assessments. Therefore no other activity alternatives apart from the preferred activity will be further assessed during the EIA phase. No other process alternatives will be considered for the proposed project due to all the factors discussed in Section 7. The No-Go or 'do nothing' option, however, will be further assessed as it is the same as keeping the current *status quo* of the site, and therefore provides the baseline against which the impacts of other alternatives should be compared.

12.2 DESCRIPTION OF THE ASPECTS TO BE ASSESSED AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT PHASE

No detailed specialist studies were undertaken during scoping. Specialist studies will be undertaken for the EIA phase. The following aspects will be assessed further during the EIA phase specialist investigations to be undertaken:

- Air Quality Assessment;
- Noise Assessment;
- Socio-economic Assessment;
- Climate Change Assessment;



- Heritage and Palaeontology Assessment; and
- Major Hazardous Installation Risk Assessment.
- Soils Compliance Statement.
- Terrestrial Ecological Compliance Statement.



Table 33: Details of specialists input during the EIA phase.

Aspect	Company Responsible	Scope of Work / Terms of Reference
Air Quality Assessment	Airshed Planning Professionals	<p>The impact assessment phase of study will include the following:</p> <ul style="list-style-type: none"> • The compilation of an emissions inventory, comprising the identification and quantification of potential sources of • emissions due to the project; Dispersion simulations of all potential pollutants from the project for applicable averaging periods; • Evaluation of potential for human health impacts; and, • Determination of environmental risk according to stipulated impact assessment methodology
Noise Assessment	Airshed Planning Professionals	<p>The following will be included in the environmental noise impact assessment study:</p> <ul style="list-style-type: none"> • Compilation of project source term; • Attenuation modelling of all potential noise sources due to project operations; • Evaluation of potential noise impacts on human receptors due to project activities; and, • Determination of environmental noise risk according to the EIMS stipulated Impact Assessment methodology.
Socio-economic Assessment	Equispectives	<p>The following methodology is proposed:</p> <ul style="list-style-type: none"> • The study will commence with a baseline description of the study area that will include a review of available literature. This will include relevant legislation and existing provincial and municipal documents and studies, as well as any additional literature that is deemed to be applicable to the study. This study will focus on the local and regional level. • Necessary demographic data will be obtained from Stats SA and other available official documents. • A stakeholder identification and analysis will be conducted to inform the impact assessment and assist with planning the fieldwork. Fieldwork will be used to obtain additional information and communicate with key stakeholders.



Aspect	Company Responsible	Scope of Work / Terms of Reference
		<ul style="list-style-type: none"> • Stakeholders typically include social structures such as ward councillors, municipal representatives, landowners, community representatives, farmer’s associations, forums and political leaders, amongst others. Vulnerable stakeholders will be identified and consulted with in an appropriate manner. • Information will be obtained via focus groups, formal and informal interviews, observation, immersions, in the-moment discussion groups, the Internet and literature reviews. Notes will be kept of all interviews and focus groups. • An interview schedule might be used instead of formal questionnaires. An interview schedule consists of a list of topics to be covered, but it is not as structured as an interview. It provides respondents with more freedom to elaborate on their views. • The final report will focus on current conditions, providing baseline data. Each category will discuss the current state of affairs, but also investigate the possible impacts that might occur in future. • Recommendations for mitigation will be made at the end of the report. • The study will have a participatory focus. This implies that the study will focus strongly on including the local community and key stakeholders. Participatory methods will be used to identify local economic development projects. • Impacts will be rated according to the prescribed impact tables and risks will be calculated using social risk assessment methods. • Information obtained through the stakeholder engagement process will inform the writing of the report and associated documents.
Climate Change Assessment	Airshed Planning Professionals	<p>The impact assessment will include the following information:</p> <ul style="list-style-type: none"> • An estimation of the CO₂-equivalent emissions from the project, associated fuel use, vegetation clearing activities (if applicable), and electricity use; • Estimate the impact of the project on national greenhouse gas emissions; • Evaluation the potential impact of global climate change on the project by identifying potential physical risks to the project, employees, and communities; • Provide the potential risk of climate change on the project and the risk of the project on climate change;



Aspect	Company Responsible	Scope of Work / Terms of Reference
		<ul style="list-style-type: none"> • Determination of environmental risk according to stipulated Impact Assessment methodology and, • Recommendation of mitigation and management measures, where applicable. <p>The climate change impact assessment report will consider Scope 1 emissions, which are the emissions directly attributable to the proposed project, Scope 2 emissions, which are the emissions associated with bought-in electricity over the lifetime of the project, and Scope 3 emissions (as far as is reasonable and practically possible), which consider the “embedded” carbon in bought-in materials and downstream emissions.</p>
Major Hazardous Installation Study	RISCOM	<p>The scope of the risk assessment will include:</p> <ul style="list-style-type: none"> • Review of revised designs of proposed processing units, inventories, routing and transport conditions for all alternatives; • Development of accidental spill and fire scenarios for the facility; • Using generic failure rate data (for tanks, pumps, valves, flanges, pipework, gantry, couplings and so forth), determination of the probability of each accident scenario; • For each incident developed, determination of consequences (such as thermal radiation, domino effects, toxic-cloud formation and so forth); • For scenarios with off-site consequences (greater than 1% fatality off-site), calculation of maximum individual risk (MIR), taking into account all generic failure rates, initiating events (such as ignition), meteorological conditions and lethality. • Assessing the risk assessment to the criteria of SANS 1641; and commenting on suitability of the project; • Suggest mitigation, if possible, for successful implementation. <p>This information will then be used to identify any shortcomings and to rank the risks for possible risk reduction programmes. The results of the assessment will be tabled in a document addressing some or all of the topics listed in the MHI regulations and would not be adequate for submission as a MHI risk assessment. It should also be noted that the risk assessment will not constitute an environmental risk assessment covering topics such as pollution.</p>
Heritage and Palaeontology	PGS Heritage	SAHRA will be consulted to determine if a new HIA is required for the CCGT plant. Assuming a new HIA is required the following will be undertaken:



Aspect	Company Responsible	Scope of Work / Terms of Reference
		<p>1) Desktop Study</p> <p>An archaeological and historical desktop study will be undertaken by utilising the previous studies conducted. This will be augmented by an assessment of old topographical maps and previous archaeological and heritage impact assessments undertaken for the study area and surroundings.</p> <p>2) Fieldwork</p> <p>An experienced fieldwork team inclusive of heritage specialists and architectural historian from PGS will undertake an archaeological and heritage site survey to identify the heritage resources within the study area. Tracklogs will be recorded, and the locations of all heritage resources identified during the fieldwork will be documented using a hand-held GPS. Furthermore, the documentation will reflect a brief qualitative description and statement of significance for each site and includes a photographic record of all the sites.</p> <p>3) Report</p> <p>A Heritage Impact Assessment will be written inclusive of sub-specialist studies.</p> <ul style="list-style-type: none"> • Assessment of the significance of the proposed development during the Pre-construction, Construction, Operation, • Decommissioning Phases (according to MSA's impact rating methodology); • Comparative assessment of alternatives (infrastructure alternatives will be provided); • Recommend mitigation measures in order to minimise the impact of the proposed development; • Design and material guidelines irt heritage design if required, and • Implications of specialist findings for the proposed development (e.g. permits, licenses etc

In addition to the above specialist compliance statements for soil / agriculture and terrestrial biodiversity will also be provided in the EIA phase, as identified in the DFFE screening tool requirements.



12.3 PROPOSED METHOD OF ASSESSING ENVIRONMENTAL ASPECTS

The same method of assessing impact significance as was used during the Scoping phase will be applied during the EIA phase. This methodology is described in detail in Section 10 of this Scoping Report.

12.4 PROPOSED METHOD FOR ASSESSING SIGNIFICANCE

The significance of environmental impacts will be rated before and after the implementation of mitigation measures. These mitigation measures may be existing measures or additional measures that may arise from the impact assessment and specialist input. The impact rating system considers the confidence level that can be placed on the successful implementation of the mitigation. The proposed method for the assessment of environmental issues is set out in the Section 10. This assessment methodology enables the assessment of environmental issues including: the severity of impacts (including the nature of impacts and the degree to which impacts may cause irreplaceable loss of resources), the extent of the impacts, the duration and reversibility of impacts, the probability of the impact occurring, and the degree to which the impacts can be mitigated.

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

12.5 PROPOSED METHOD OF PUBLIC PARTICIPATION

An overview of the proposed public participation process to be followed for the EIA phase is provided below. The commenting periods that will be provided to the I&APs (and the competent authorities) will be thirty (30) days long. Two commenting periods are provided for during this EIA process, these will be during the review period of the:

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

All comments received during the initial notification and call to register have been included in this Scoping Report, and comments received during the Scoping Report comment period will be included in the finalised Scoping Report for submission to the competent authority. The details pertaining to the review of the EIA Report and EMPr, the venue where the report will be placed for review, as well as the duration of the comment period, will be determined at a later date and communicated to all registered I&AP.

12.5.1 STEPS TO BE TAKEN TO NOTIFY INTERESTED AND AFFECTED PARTIES

I&APs were notified of the proposed application via registered letters, emails and facsimiles. The Public Participation Process has been and will continue to be undertaken in accordance with the NEMA EIA Regulations (2014, as amended). A minimum of 30 days was provided to the public to register as I&APs and provide initial comments on the project, a further 30 days is being provided for to comment on the Scoping Report. The information submitted by I&APs will be utilised during the Impact Assessment and compilation of the EIA Report and associated EMPr. Upon acceptance of the Scoping Report by the competent authority, the EIA phase will commence. An EIA Report will be compiled presenting the findings of the EIA phase, this report will be made available for public review and comment for a further 30 days.

Feedback from I&APs has been and will be solicited through the following means:

- Registered letters;
- Facsimile and e-mails; and
- Any other communication with EIMS, which includes SMS’s.

12.5.2 DETAILS OF ENGAGEMENT PROCESS TO BE FOLLOWED

I&APs will be afforded the following opportunities to participate in the project:



- I&APs have been requested via written notifications distributed to provide their views, queries and / or comments on the project;
- The EIA Report and EMPr will be available for comment for a period of 30 days at the same public places in the project area that the Scoping Report was made available. Furthermore, copies of the said report sent to stakeholders who request a copy and placed on the EIMS website: www.eims.co.za/public-participation/

All comments and issues raised during the Scoping Report 30-day public comment period will be incorporated into the final Scoping Report, and the comments from the EIA Report and EMPr review period will be included in the finalised EIA Report and EMPr to be submitted to the competent authority for decision-making.

12.5.3 DESCRIPTION OF INFORMATION TO BE PROVIDED

The following information will be provided during the EIA phase PPP:

- Sufficient detail of the intended operation to enable communities to assess what impact the activities will have on them;
- Details of the NEMA Regulations that must be adhered to;
- Date by which comment, concerns and objections must be forwarded through to both EIMS and/ or the competent authority respectively; and
- Contact details of the EAP.

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

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

- Detailed specialist studies;
- Public consultation:
 - Notification of the availability of the EIA Report for review and comment to all registered I&APs;
 - Informing registered I&APs of the project progress;
- Authority consultation:
 - Consultation with the competent authorities; and
 - Other relevant/ commenting authorities' consultation to provide authorities with project related information and obtain their feedback.
- Document compilation:
 - The EIA Report and associated EMPr will be compiled in line with the requirements of Appendix 3 and 4 of the NEMA EIA Regulations (2014, as amended);
 - The EIA Report and EMPr will be made available for public comment for a period of 30 days; and
 - The EIA Report and EMPr will be finalised and submitted to the competent authority.

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

All comments received by I&APs will be taken into consideration and will inform the high-level mitigation measures. Detailed mitigation measures will be further developed as part of the EIA phase. The potential impacts



identified during the Scoping phase will further be assessed in terms of the mitigation potential, taking into consideration the following:

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

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



13 ASSUMPTIONS AND LIMITATIONS

Certain assumptions, limitations, and uncertainties are associated with the Scoping Phase. This report is based on information that is currently available and, as a result, the following limitations and assumptions are applicable:

- The scoping process and report is based on the technical information and process description provided by the client;
- The Scoping Report is based on a project description taken from drawings and design specifications for the proposed CCGT plant that have not yet been finalised, and which are likely to undergo a number of iterations and refinements before they can be regarded as definitive. A project description based on the updated design will be provided in the EIA phase;
- It is worth noting that the supplier of gas has not been identified yet. The assumption is that the supply of gas will be stable and long term;
- The description of the baseline environment has been obtained from desktop analysis, previous specialist studies completed for the A-Station decommissioning project and desktop screening reports completed by the specialist team for the project; and
- Some levels of confidence for the impact assessment section (Chapter 10) are considered low until detailed specialist input is obtained in the EIA phase.



14 UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

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

Signature of the EAP

Date: 8 March 2024

15 UNDERTAKING REGARDING LEVEL OF AGREEMENT

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

Signature of the EAP

Date: 8 March 2024



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Appendix A: EAP CV

Appendix B: Maps

Appendix C: Public Participation Information

Appendix D: Copy of EA application form

Appendix E: DFFE Screening Tool and Site Screening Verification Report