APPENDIX M

SITE SENSITIVITY VERIFICATION REPORT

PROPOSED 750MW COMBINED CYCLE GAS TURBINE POWER PLANT IN RICHARDS BAY, CITY OF UMHLATHUZE LOCAL MUNICIPALITY, KING CETSHWAYO DISTRICT MUNICIPALITY, KWAZULU-NATAL

SITE SENSITIVITY VERIFICATION REPORT

MARCH 2026



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Title and Approval Page

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Report Title:	Site Sensitivity Verification Report
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1 BACKGROUND

Mabasa Energy and Fuels (Pty) Ltd (the "Applicant") intends to bid for the Gas Independent Power Producers Procurement Programme (GASIPPPP) Bid Window 1 and has proposed the development of a 750MW Combined Cycle Gas Turbine Power Plant (the "Plant") in Richards Bay. The earmarked site is located on Erf 16673 in Phase 1F of the Richards Bay Industrial Development Zone (RBIDZ). which falls within the City of uMhlathuze (CoU) Local Municipality in KwaZulu-Natal (KZN) (the "Project").

A Scoping and Environmental Impact Reporting (S&EIR) Process is being undertaken according to the Environmental Impact Assessment (EIA) Regulations of 2014, as amended, to apply for Environmental Authorisation for the Project in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA). Nemai Consulting (Pty) Ltd was appointed by the Applicant as the independent Environmental Assessment Practitioner (EAP) to undertake the S&EIR Process.

2 INTRODUCTION

The Protocols for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes ("the Protocols") were published in Government Gazette No. 43110 on 20 March 2020 and Government Gazette No. 43855 on 30 October 2020, in terms of Sections 24(5)(a) and (h) and 44 of the NEMA.

After 9 May 2020, compliance to the Protocols became mandatory for every new application for Environmental Authorisation submitted. According to the Protocols, the EAP must verify the current use of the site in question and potential environmental sensitivity, as identified by the National Web-Based Environmental Screening Tool ("Screening Tool") to determine the need for specialist inputs in relation to the themes included in the Protocols.

This document serves as the Site Sensitivity Verification (SSV) Report for the proposed Project. It aims to comply with the SSV section within the Protocols. The Screening Report generated by the Screening Tool is appended to the Application Form.

3 FINDINGS OF THE SCREENING TOOL

The National Sector Classification that was selected during the running of the Screening Tool was as follows: *Utilities Infrastructure*|*Electricity*|*Generation*|*Non Renewable*|*Hydrocarbon*|*Petroleum.*

Table 1 below lists the sensitivities for the various environmental themes relevant to the project area, as determined by the Screening Tool. Only the highest environmental sensitivities are indicated.

Table 1: Sensitivities for environmental themes (Screening Tool)

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme	X			
Animal Species Theme		X		
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme				X
Civil Aviation Theme		X		
Defence Theme				X
Paleontology Theme				X
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			

The verification of the site sensitivity of the Screening Tool's themes is provided in the Section to follow. It is noted that the Screening Tool did not generate sensitivity maps for some features (including Landscape/Visual, Hydrology, Noise, Traffic, Geotechnical, Climate Change, Health, Socio-Economic and Air Quality). Nonetheless, the SSV of these features is captured in Section 4.10 below.

The specialist studies identified by the Screening Tool as well as the relevance of these studies to the Project following SSV are captured in Table 5 below. The Scoping Report contains further information pertaining to the environmental themes.

4 SITE SENSITIVITY VERIFICATION

4.1 Agriculture Theme

According to the Screening Tool, the site occurs in areas of high and very high sensitivity in terms of the Agricultural Theme (see Figure 1 below). The sensitivity is based on the land capability, which ranges from moderate to high, high, high to very high, and very high.

The SSV undertaken by the Agricultural Specialist (Gouws, 2024) (see Appendix A) did not agree with this sensitivity determined by the Screening Tool for the following reasons:

- The site is within a Security Control Areas, which is an industrial area and zoned as such. There is no access to the site that will allow for cultivation or any other agricultural use;
- A large proportion of the site is water saturated and, therefore, no suitable for farming purposes; and
- The soil consists of windblown alluvial sand. It is coarse grained sand, low in plant nutrients and has a low cation exchange capacity, which makes the soil unable to retain plant nutrients from leaching. This is a prerequisite for successful long term crop production.

Based on the findings of the SSV, an Agricultural Compliance Statement will be compiled.

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
x			

Sensitivity Features:

Sensitivity	Feature(s)
High	Land capability;09. Moderate-High/10. Moderate-High
Very High	Land capability;11. High/12. High-Very high/13. High-Very high/14. Very high/15. Very high

Figure 1: Relative Agriculture Theme Sensitivity (Screening Tool)

4.2 Animal Species Theme

The sensitivity of the Animal Species Theme in relation to the site, as determined by the Screening Tool, is presented in Table 2 below. The findings of the SSV by the Terrestrial Ecologist (de Beer *et al*., 2024) (see Appendix B) are also captured in this table.

Table 2: Animal Species Theme Sensitivity and SSV Findings (CR = Critically Endangered, EN = Endangered and VU = Vulnerable)

Theme	Sensitivity - Screening Tool	SSV
Animal Species	The entire study area occurs within a **high sensitivity** (see Figure 2 below).	During the site visit, it was determined that large portions of the site had previously been transformed or degraded. However, natural (untransformed) vegetation was still present. A detailed Animal Species Specialist Assessment report must be compiled and will outline the faunal habitat and diversity within the study area and provide a motivation for the sensitivities determined and their alignment with the outcomes of the Screening Tool.

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Circaetus fasciolatus
High	Aves-Podica senegalensis
High	Aves-Circus ranivorus
High	Aves-Stephanoaetus coronatus
High	Aves-Polemaetus bellicosus
High	Aves-Geokichla guttata
Medium	Amphibia-Hyperolius pickersgilli
Medium	Aves-Nettapus auritus
Medium	Aves-Terathopius ecaudatus
Medium	Aves-Balearica regulorum
Medium	Aves-Halcyon senegaloides
Medium	Mammalia-Lycaon pictus
Medium	Sensitive species 8
Medium	Reptilia-Crocodylus niloticus
Medium	Reptilia-Pelusios rhodesianus
Medium	Invertebrate-Arytropteris basalis
Medium	Invertebrate-Pomatonota dregii

Figure 2: Relative Animal Species Theme Sensitivity (Screening Tool)

4.3 Plant Species Theme

The sensitivity of the Plant Species Theme in relation to the site, as determined by the Screening Tool, is presented in Table 3 below. The findings of the SSV by the Terrestrial Ecologist (de Beer *et al*., 2024) (see Appendix B) are also captured in this table.

Table 3: Plant Species Theme Sensitivity and SSV Findings (CR = Critically Endangered, EN = Endangered and VU = Vulnerable)

Theme	Sensitivity - Screening Tool	SSV
Plant Species	The northern and central sections of project area occur within a **medium sensitivity class** (see Figure 3 below). A small section in the south-eastern section of the study area is in a **low sensitivity class**.	During the initial site visit it was determined that most of the site is in a degraded state. However, natural (untransformed) vegetation was present. A detailed Plant Species Specialist Assessment report must be compiled and will provide a motivation for the sensitivities determined and their alignment with the outcomes of the Screening Tool.

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Medium	Sensitive species 1252
Medium	Thesium polygaloides
Medium	Sensitive species 89
Medium	Freesia laxa subsp. azurea
Medium	Fimbristylis aphylla
Medium	Emplectanthus cordatus
Medium	Pachycarpus concolor subsp. arenicola
Medium	Nidorella tongensis
Medium	Senecio ngoyanus
Medium	Cassipourea gummiflua var. verticillata
Medium	Oxygonum dregeanum subsp. streyi
Medium	Pavonia dregei
Medium	Sensitive species 649
Medium	Sensitive species 191

Figure 3: Relative Plant Species Theme Sensitivity (Screening Tool)

4.4 Terrestrial Biodiversity Theme

The sensitivity of the Terrestrial Biodiversity Theme in relation to the site, as determined by the Screening Tool, is presented in Table 4 below. The findings of the SSV by the Terrestrial Ecologist (de Beer *et al*., 2024) (see Appendix B) are also captured in this table.

Table 4: Terrestrial Biodiversity Theme Sensitivity and SSV Findings

Theme	Sensitivity - Screening Tool	SSV
Terrestrial Biodiversity	The entire extent of project area is within a very high sensitivity area (see Figure 4 below).	During the initial site visit it was determined that several historic and current pressures on the vegetation within the study area were present. However, some sections of seemingly intact vegetation remained. As such, a detailed site assessment of all terrestrial biodiversity aspects is required. The detailed Terrestrial Biodiversity Specialist Assessment report will outline the habitat and ecological drivers (or lack thereof) within the study area and provide clear motivations for disputing or verifying the very high sensitivity outcome of the screening tool.

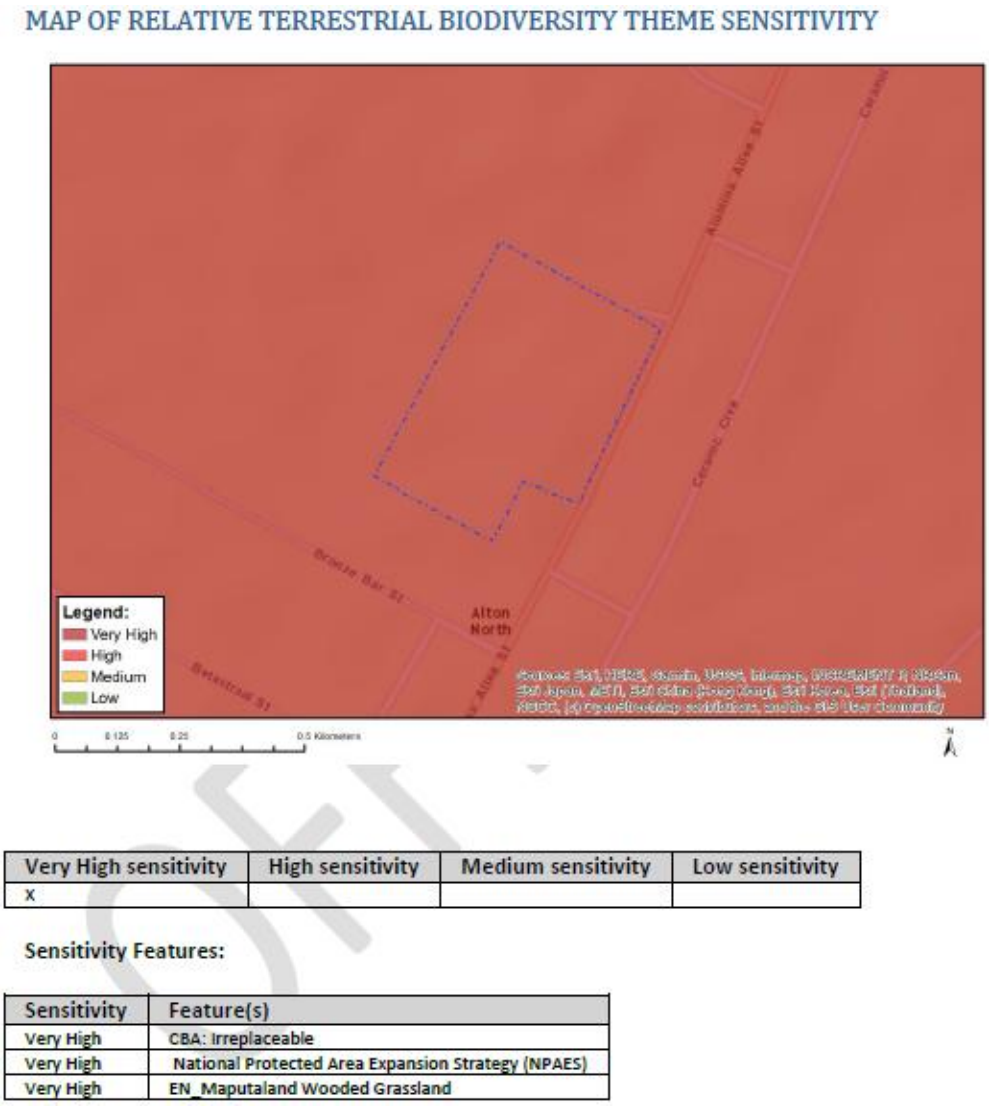


Figure 4: Relative Terrestrial Biodiversity Theme Sensitivity (Screening Tool)

4.5 Aquatic Biodiversity Theme

According to the Screening Tool, the site occurs in areas of very high and low sensitivity in terms of the Aquatic Biodiversity Theme (see Figure 5 below). According to the SSV that was undertaken for this theme by an Aquatic Ecologist (Lushozi, 2024) (see Appendix C), the sensitivity rating assigned by the Screening Tool is supported. This relates to the depression wetland on the site, which received authorisation (reference no.: 14/12/16/3/3/2/665) to be infilled by RBIDZ.

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity
Very High	Wetlands_Indian Ocean Coastal Belt Bioregion (Depression)

Figure 5: Relative Aquatic Biodiversity Theme Sensitivity (Screening Tool)

4.6 Archaeological and Cultural Heritage Theme

According to the Screening Tool, the site occurs in an area of low sensitivity in terms of the Archaeological and Cultural Heritage Theme (see Figure 6 below).

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

Figure 6: Relative Archaeological and Cultural Heritage Theme Sensitivity (Screening Tool)

Some key findings of the Heritage SSV that was undertaken for the Project include the following (Kitto, 2024) (see Appendix D):

- An examination of the information depicted on the earliest edition (and subsequent editions) of the historical topographic map sheets was undertaken. The map sheet consulted was the South Africa 2832CA Kwa Mbonambi sheet, Edition 1 1943; Edition 3 1982 and Edition 4 2005. Any heritage structures or features that are 60 years or older would be depicted on the first edition sheet. As can be seen in Figure 7 to Figure 9 below, the 1943 edition 1 map, as well as the subsequent editions obtained (1982 and 2005), depict no heritage features or structures on the site.
- The Heritage Impact Assessment that was undertaken as part of the EIA for the RBIDZ Phase 1F found no significant heritage resources within the greater industrial estate. Several other Heritage Impact Assessment reports for areas in the immediate vicinity of the current project area were also reviewed.

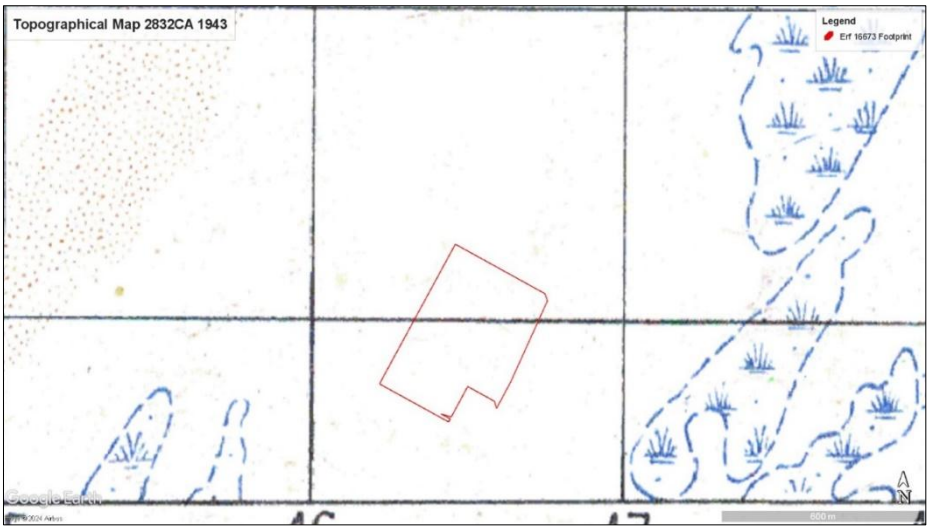


Figure 7: Enlarged view of topographic map 2832CA Ed 1 1943, depicting no heritage structures or features within or in the vicinity of the site (Kitto, 2024)

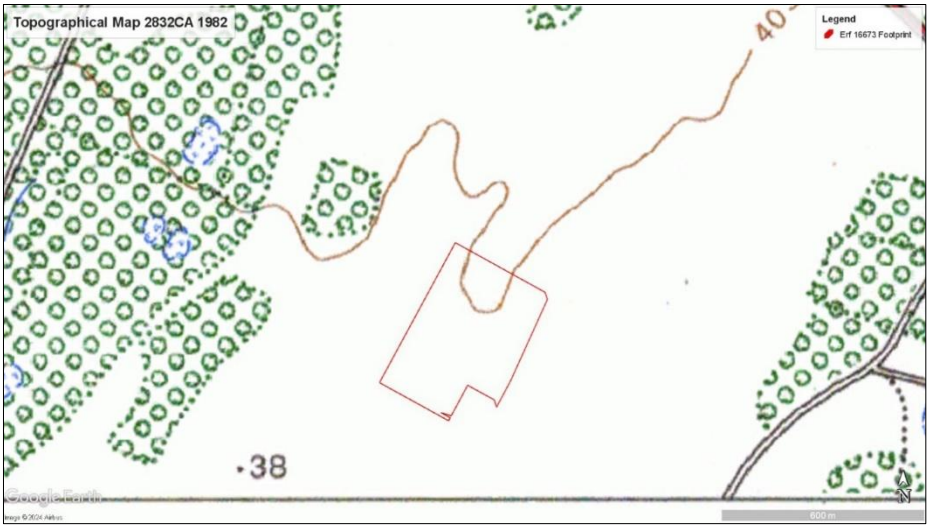


Figure 8: Enlarged view of topographic map 2832CA Ed 3 1982, depicting no heritage structures or features within or in the vicinity of the site (Kitto, 2024)

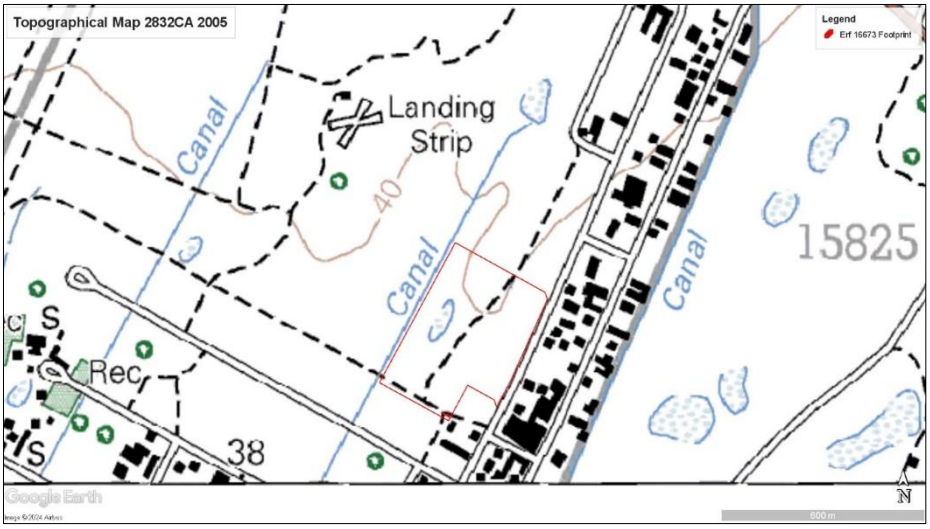


Figure 9: Enlarged view of topographic map 2832CA Ed 4 2005, depicting no heritage structures or features within the project footprint (Kitto, 2024)

4.7 Palaeontology Theme

According to the Screening Tool, the site occurs in an area of low sensitivity in terms of the Palaeontology Theme (see Figure 10 below). The low sensitivity of the site determined by the Screening Tool was confirmed during SSV, which was undertaken by a Palaeontologist (Butler, 2024) (see Appendix E). Hence, only a Desktop Palaeontology Impact Assessment will be undertaken.

MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Features with a Low paleontological sensitivity

Figure 10: Relative Palaeontology Theme Sensitivity (Screening Tool)

4.8 Civil Aviation Theme

According to the Screening Tool, the relative Civil Aviation Theme sensitivity is high (see Figure 11 below). The high sensitivity relates to the occurrence of the site within 8km of a civil aviation aerodrome. The Richards Bay Airport is located more than 5 km to the east of the site (see Figure 12 below). It is noted that the Richards Bay Central Business District, as well as residential and industrial areas, occur between the site and the Richards Bay Airport. Hence, there are existing high buildings and structures between these two areas of interest. The need for a Civil Aviation Study was thus not deemed necessary. The South African Civil Aviation Authority (SACAA) will be engaged as part of the EIA.

MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Within 8 km of other civil aviation aerodrome

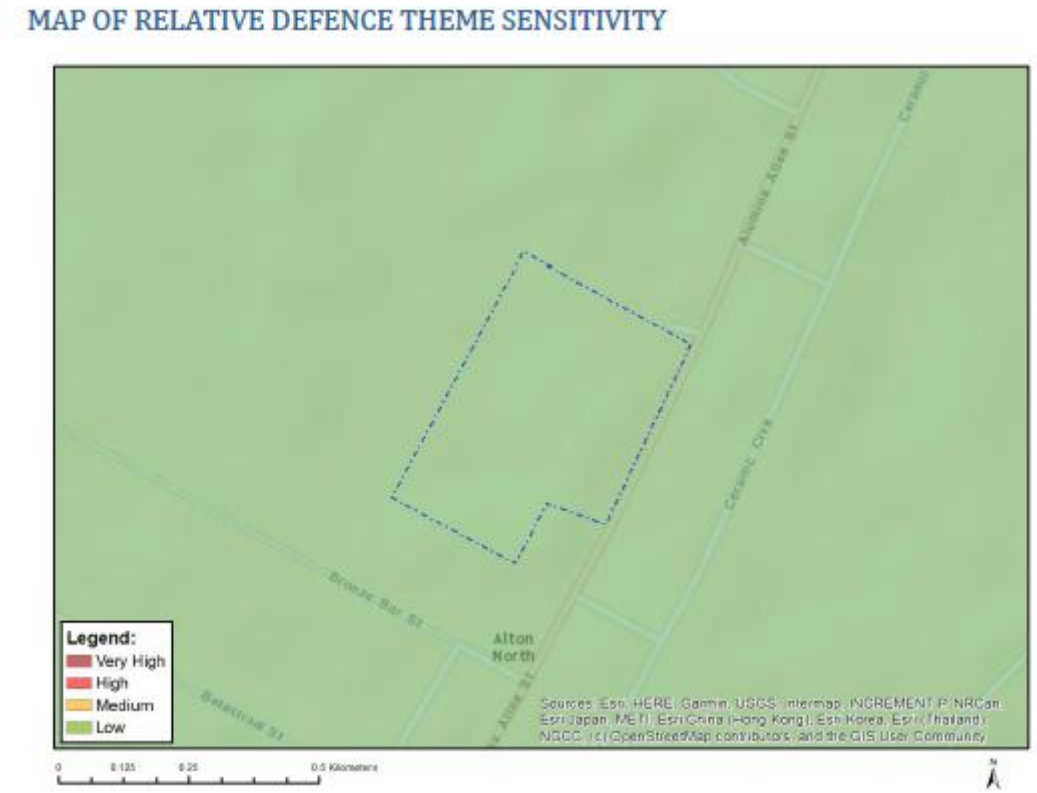
Figure 11: Relative Civil Aviation Theme Sensitivity (Screening Tool)



Figure 12: Aerial view of the distance between the site and Richards Bay Airport (Google Earth™)

4.9 Defense Theme

According to the Screening Tool, the relative Defense Theme sensitivity is low for the project area (see Figure 13 below). Upon interrogation of the surrounding environment, through the site visit and desktop review, no evidence was found of any military or defence operations or installations. The site verification thus supports/confirms the findings of the Screening Tool of low sensitivity for this theme. In terms of the Protocols, where a development site is identified as being of a low sensitivity, no further assessment requirements are identified.



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

Figure 13: Relative Defence Theme Sensitivity (Screening Tool)

4.10 Specialist Studies Triggered

Table 5 below lists the specialist studies that were identified in the Screening Report and notes the relevance of these studies to the Project following SSV.

Table 5: Relevance of specialist studies identified in the Screening Report based on SSV

No.	Specialist Study identified in Screening Report	Relevance to the Project following SSV
1.	**Agricultural Impact Assessment**	According to the Screening Tool, the site occurs in areas of high and very high sensitivity in terms of the Agricultural Theme. Based on the findings of the SSV (Gouws, 2024) (see Appendix A), an Agricultural Compliance Statement will be compiled.
2.	**Landscape/Visual Impact Assessment**	Although the Screening Tool indicates the need for a Visual Impact Assessment, the tool did not indicate visual/landscape sensitivity for the study area. The SSV undertaken by a specialist (van Staden & Erwee, 2024) (see Appendix F) determined that the landscape associated with the study area is similar to its surroundings and the larger region. The study area is situated within the RBIDZ, therefore it is surrounded by industrial development. The field assessment further indicated that the dense wooded grassland vegetation surrounding the study area and within the immediate area as well as the distance from the residential areas, renders no visibility of the proposed development. A Visual Impact Assessment will be undertaken to provide a detailed description of the quality of the landscape, identify possible visual impacts and provide suitable mitigation measures.
3.	**Archaeological and Cultural Heritage Impact Assessment**	According to the Screening Tool, the site occurs in an area of low sensitivity in terms of the Archaeological and Cultural Heritage Theme. The low sensitivity of the site determined by the Screening Tool was confirmed during SSV by the Heritage Specialist (Kitto, 2024) (see Appendix D). Nonetheless, a Heritage Impact Assessment will be undertaken for the Project.
4.	**Palaeontology Impact Assessment**	According to the Screening Tool, the site occurs in an area of low sensitivity in terms of the Palaeontology Theme. The low sensitivity of the site determined by the Screening Tool was confirmed during SSV by the Palaeontologist (Butler, 2024) (see Appendix E). Hence, only a Desktop Palaeontology Impact Assessment will be undertaken.
5.	**Terrestrial Biodiversity Impact Assessment**	According to the Screening Tool, the site occurs in an area of very high sensitivity in terms of the Terrestrial Biodiversity Theme. The SSV undertaken by the Terrestrial Ecologist (de Beer *et al*., 2024) (see Appendix B) determined that several historic and current pressures on the vegetation within the study area were present. However, some sections of seemingly intact vegetation remained. Hence, a Terrestrial Biodiversity Impact Assessment will be undertaken.
6.	**Aquatic Biodiversity Impact Assessment**	According to the Screening Tool, the site occurs in areas of very high and low sensitivity in terms of the Aquatic Biodiversity Theme. The SSV undertaken by an Aquatic Ecologist (Lushozi, 2024) (see Appendix C) supported the sensitivity rating assigned by the Screening Tool, as a depression wetland occurs on the site. Hence, an Aquatic Biodiversity Impact Assessment will be undertaken.
7.	**Hydrology Assessment**	The Screening Tool did not assign any sensitivity to the study area for this theme. However, the SSV undertaken by a specialist (Botha, 2024) (see Appendix G) confirmed the presence of a depression wetland on the site. In addition, a stormwater canal runs parallel to the western side of the site. Hence, a Hydrology Assessment will be undertaken.
8.	**Noise Impact Assessment**	The SSV undertaken by a specialist (De Jager, 2024) (see Appendix H) confirmed the need for a Noise Impact Assessment, based on the nature of the Project.
9.	**Traffic Impact Assessment**	Based on the nature of the Project and its potential impacts, a Traffic Impact Assessment will be undertaken.
10.	**Geotechnical Assessment**	Based on the nature of the Project, a Geotechnical Assessment will be undertaken.

No.	Specialist Study identified in Screening Report	Relevance to the Project following SSV
11.	**Climate Change Impact Assessment**	Based on the nature of the Project and its potential impacts, a Climate Change Impact Assessment will be undertaken.
12.	**Health Impact Assessment**	Based on the nature of the Project and its potential impacts, a Health Impact Assessment will be undertaken.
13.	**Socio-Economic Assessment**	Based on the nature of the Project and its potential impacts, a Socio-Economic Assessment will be undertaken.
14.	**Air Quality Impact Assessment**	The SSV undertaken by a specialist (Zunckel & Raghunandan, 2024) (see Appendix I) confirmed the need for an Air Quality Impact Assessment, based on the nature of the Project.
15.	**Plant Species Assessment**	According to the Screening Tool, the site predominantly occurs in an area of medium sensitivity in terms of the Plant Species Theme. The SSV undertaken by a Terrestrial Ecologist (de Beer *et al*., 2024) (see Appendix B) determined that most of the site is in a degraded state. However, natural (untransformed) vegetation was present. Hence, a Plant Species Assessment will be undertaken.
16.	**Animal Species Assessment**	According to the Screening Tool, the site occurs in an area of high sensitivity in terms of the Animal Species Theme. The SSV undertaken by a Terrestrial Ecologist (de Beer *et al*., 2024) (see Appendix B) determined that large portions of the site had previously been transformed or degraded. However, natural (untransformed) vegetation was still present. Hence, an Animal Species Assessment will be undertaken.

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APPENDIX A

SSV – Agricultural Theme

SITE SENSITIVITY VERIFICATION REPORT:

AGRICULTURE

COMBINED CYCLE GAS TURBINE POWER PLANT IN RICHARDS BAY, WHICH FALLS WITHIN THE CITY OF UMHLATHUZE LOCAL MUNICIPALITY IN KZN SITE

Compiled by Andries Gouws

Compiled for Nemai Green

2 July 2024

1 BACKGROUND

Prior to commencing with a specialist assessment, the current use of the land and the environmental sensitivity of the site under consideration identified by the screening tool must be confirmed by undertaking a site sensitivity verification.

- The site sensitivity verification must be undertaken by an environmental assessment practitioner or a specialist.
- The site sensitivity verification must be undertaken through the use of:
  - a desk top analysis, using satellite imagery (See figure 3);
  - a preliminary on-site inspection (took place on 18 June 2024); and
  - any other available and relevant information.
- The outcome of the site sensitivity verification must be recorded in the form of a report:
  - confirms or disputes the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc. (See sections 2 and 3. The results of the Screening Tool is disputed).
  - contains a motivation and evidence (e.g., photographs) of either the verified or different use of the land and environmental sensitivity (See section 3 and 4 for the verification and recommendation); and
  - is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations (will be submitted accordingly).

2 SENSITIVITY: ENVIRONMENTAL SCREENING TOOL

The sensitivity according to site sensitivity tool is high and very high. See the Screening Tool Results below.

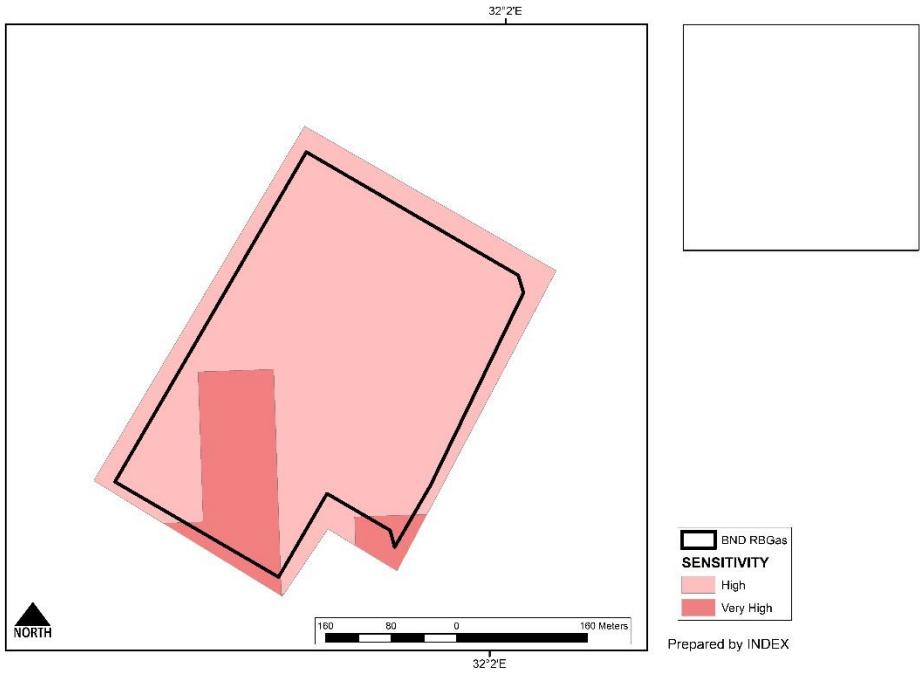


Figure 1. Site sensitivity (sensitivity screening tool)

3 SITE VERIFICATION RESULTS

The site sensitivity verification study found that the sensitivity tool on agriculture is not correct.

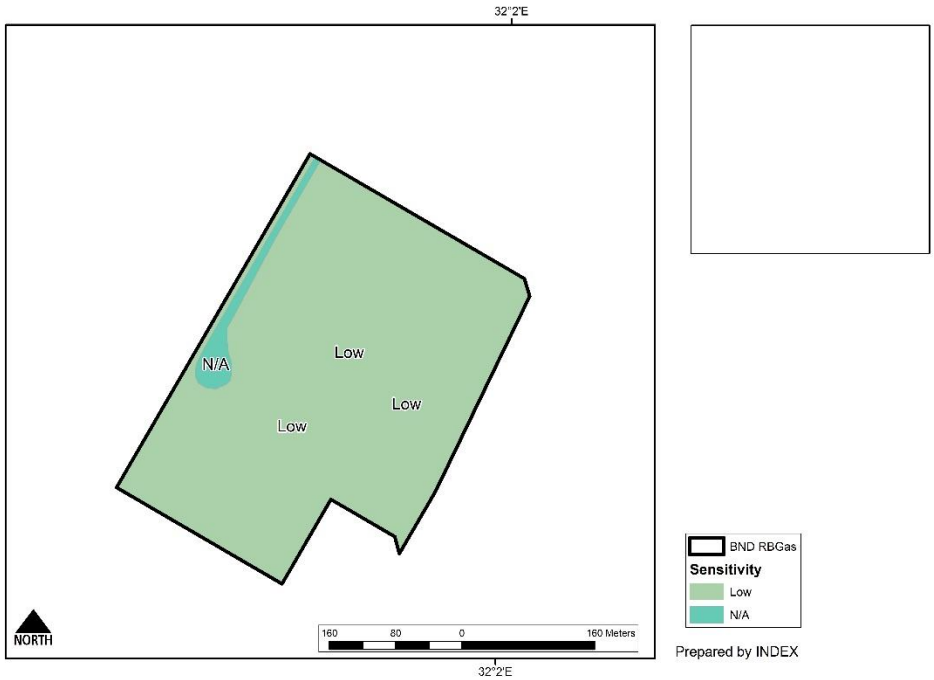


Figure 2. Sensitivity (following site evaluation



Photo 1. Waterlogged land



Photo 2. Namib soil form

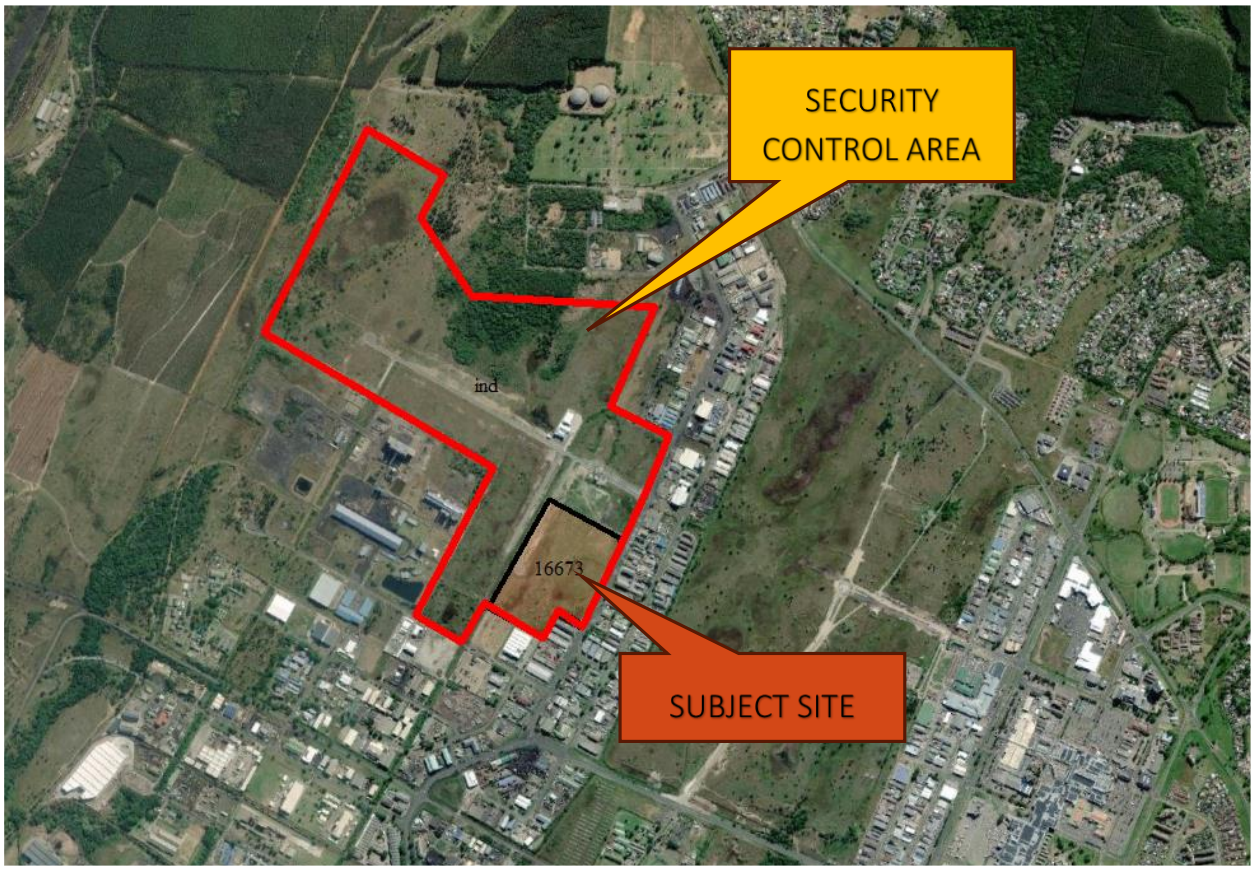


Figure 3. Locality within the Security Control Zone

FINDINGS

1) The site is within a Security Control Areas, which is an industrial area and zoned as such. There is no access to the site that will allow for cultivation or any other agricultural use.
2) A large proportion of the site is water saturated and, therefore, no suitable for farming purposes.
3) The soil consists of windblown alluvial sand. It is coarse grained sand, low in plant nutrients and has a low cation exchange capacity, which makes the soil unable to retain plant nutrients from leaching. This is a prerequisite for successful long term crop production.

Because of the factors indicated above, the sensitivity of the land in terms of agriculture is low. It is our professional opinion that the Screening Tool incorrectly describes the sensitivity of the site a high and very high.

The results are therefore disputed. It is low sensitivity land.

4 RECOMMENDATION

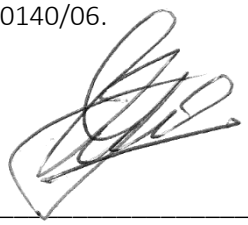
The sensitivity verification assessment in terms of the protocol found that the site has low sensitivity and that a **Compliance Statement** should be compiled.

Table 1. Description of the site

DFFE Screening Sensitivity	Agree / Disagree	Specialist Proposed Sensitivity	Comments
High / very high	Disagree	Low	Both the proximity of the site and the land use potential is not suitable for farming at any level.

5 DETAILS OF THE AUTHOR

This Site Sensitivity Verification was undertaken by Andries Gouws who is registered with INDEX SACNASP: 400140/06.



_____

Andries Gouws

2/07/2024

APPENDIX B

SSV – Animal, Plant & Terrestrial Biodiversity Themes

Scientific Terrestrial Services

Applying science to the real world

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Name: Hennie de Beer
Dr. Mathew Ross (Pr. Sci. Nat)
Christien Steyn (Pr. Sci. Nat)
Date: Monday, 24 June 2024
Ref: STS 24-2034

NEMAI Consulting
147 Bram Fischer Drive
Ferndale,
2194,
South Africa
Email: DonavanH@nemai.co.za

Attention: Mr. Donavan Henning

RE: ANIMAL, PLANT, AND TERRESTRIAL BIODIVERSITY SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED MABASA 750 –MW COMBINED CYCLE GAS TURBINE (CCGT) POWER PLANT IN RICHARDS BAY, IN THE KWAZULU–NATAL PROVINCE.

1 INTRODUCTION

According to the "Protocols for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes ("the Protocols") published in Government Gazette No. 43110 on 20 March 2020 and Government Gazette No. 43855 on 30 October 2020, the Environmental Assessment Practitioner (EAP) must verify the current use of the site in question and its environmental sensitivity as identified by the Screening Tool to determine the need for specialist inputs in relation to the themes included in the Protocols. The Protocols are allowed for in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA"). The Protocols must be complied with for every new application for Environmental Authorisation that is submitted after 9 May 2020.

This document serves as the Animal, Plant, and Terrestrial Biodiversity Site Sensitivity Verification (SSV) Report for the proposed Mabasa 750 MW gas powerplant in Richards Bay in the KwaZulu-Natal Province; hereafter referred to as the "study area".

2 STUDY AREA

The study area is located immediately west of Richard's Bay Central, which is located within the uMhlathuze Local Municipality, an administrative area of the King Cetshwayo District Municipality. The study area is situated 3 kilometres (km) north of the R34 John Ross Highway and 0.5 km southwest of the R619 regional road. Although located within the western outskirts of the urban centre, the study area is considered to be largely developed with the adjacent land use comprising of predominantly industrial zones, residential developments, and various service industries (e.g., petrol stations). Figure 1 below depicts the locality of the study area.

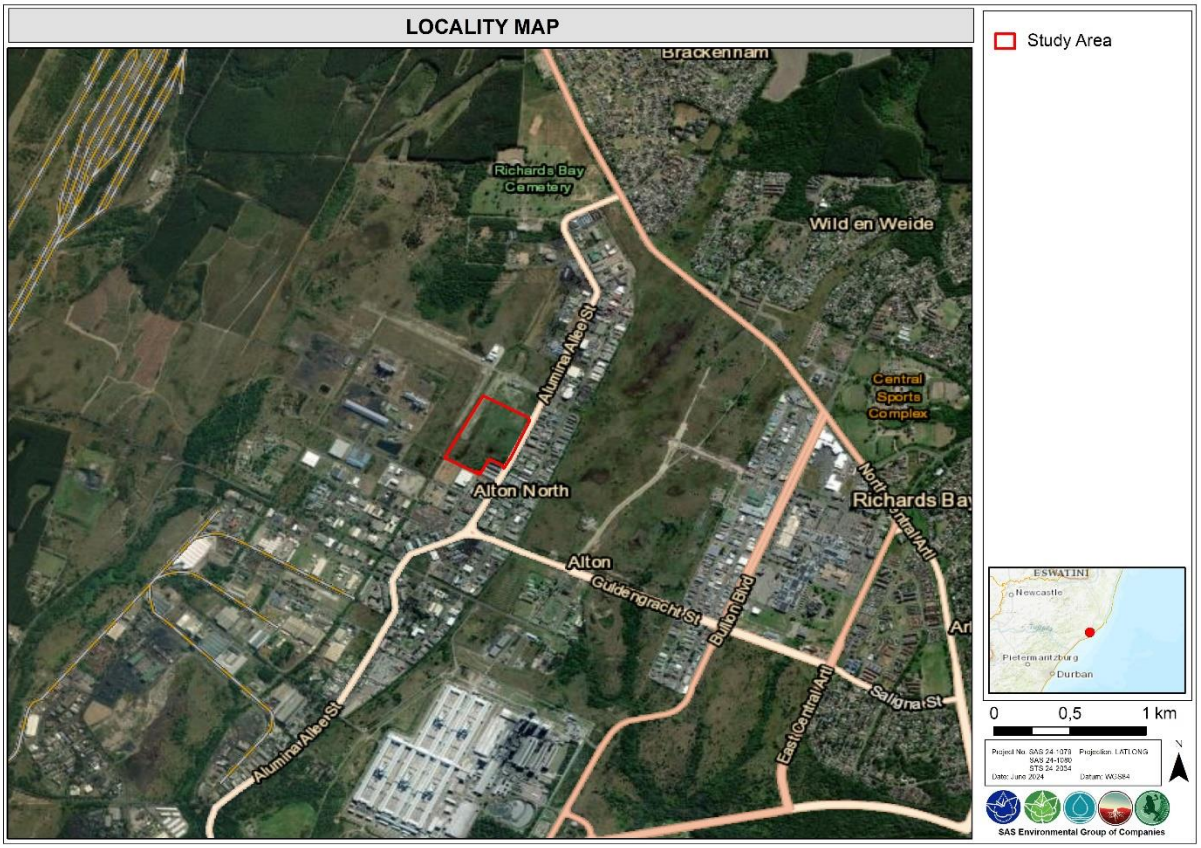

Figure 1: Digital satellite image depicting the location of the proposed Mabasa 750 MW CCGT Power Plant in relation to the surrounding area.

3 MOTIVATION AND PHOTOGRAPHIC EVIDENCE OF EITHER THE VERIFIED OR DISPUTED USE OF THE LAND AND ENVIRONMENTAL SENSITIVITY

The Animal Species, Plant Species, and Terrestrial Biodiversity Themes all indicated that the study area is associated with habitat that is sensitive and important from a terrestrial biodiversity perspective. However, the site inspection was able to:

1) Verify the animal and plant theme sensitivities given that some sections remain largely natural (refer to Figure 2 below) and that these areas are possibly able to support species of conservation concern. Further investigation within a more suitable season is recommended to confirm the presence or absence of such species; and
2) Dispute the sensitivities for all three themes within most of the study area given that several disturbances have occurred that resulted in poor conditions for supporting species of conservation concern (Figure 3).



Figure 2: Sensitive terrestrial habitat areas within the study area from a terrestrial ecological perspective. a.) Small sections of natural vegetation present but are in a degraded state, and b.) Freshwater Ecosystem areas are present within the study area.



Figure 3: Low sensitivity zones within the study area from a terrestrial ecological perspective. a.) Large areas have been mowed within the study area, and b.) Alien and invasive plans are present within the southern section of the study area.

4 SITE SENSITIVITY VERIFICATION

As part of the SSV, a desktop study was conducted, including the following actions:

- Consult all relevant Biodiversity Assessments, including Bioregional Plans and other Conservation Assessments and Plans for the municipality, including the NEMBA List of Threatened Ecosystems, South African National Parks (SANParks) National Priority Areas for Expansion of Terrestrial Areas (NPAES) (DEA 2016), Strategic Water Source Areas (SWSA) (Le Maitre et al. 2018), National Freshwater Ecosystem Priority Areas (NFEPA), areas of Indigenous Forest as identified by the Dept of DFFE, and Important Bird and Biodiversity Area (IBA);
- Identify the biodiversity features of the site, including Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs), corridors, etc;
- Identify the vegetation types using available online information, including VEGMAP (SANBI 2006-2018);
- Identify the threat status and sensitivities of the vegetation types; and
- Compile a list of Animal and Plant Species of Conservation Concern (SCCs) from online databases, including the screening tool and South African National Biodiversity Institute (SANBI) Threatened Species Programme (TSP).

This Animal, Plant, and Terrestrial Biodiversity site sensitivity verification report relates to a Screening Tool Report completed for the site in June 2024. A site visit was conducted by the specialist (13th of June 2024) consisting of a walk-through and respective sampling of Animal, Plant, and Terrestrial Biodiversity of the study area to inform the specialist reports required for the proposed project.

Figure 4 below indicates the Animal Species Theme sensitivity, Figure 5 indicates the Plant Species Theme sensitivities, and Figure 6 indicates the Terrestrial Biodiversity Theme as assigned through the web-based Screening Tool.

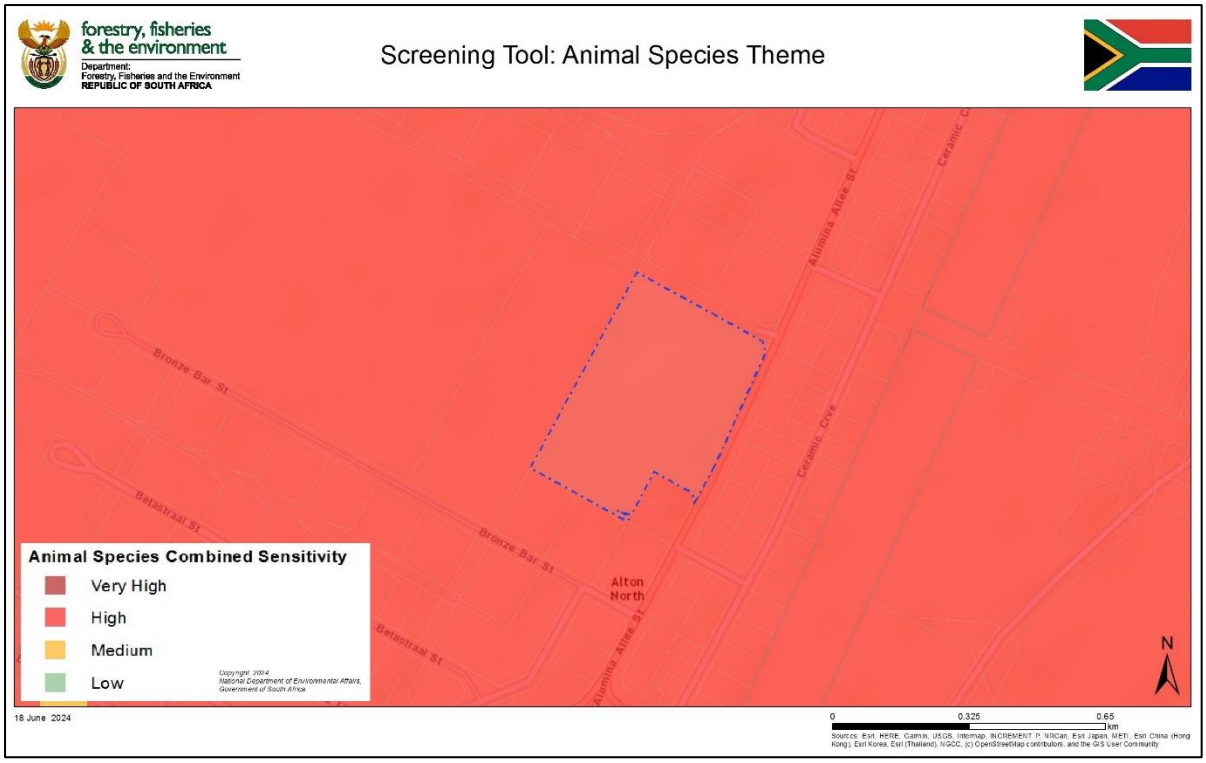

Figure 4: Animal Species Theme sensitivity as assigned through the web-based Screening Tool.

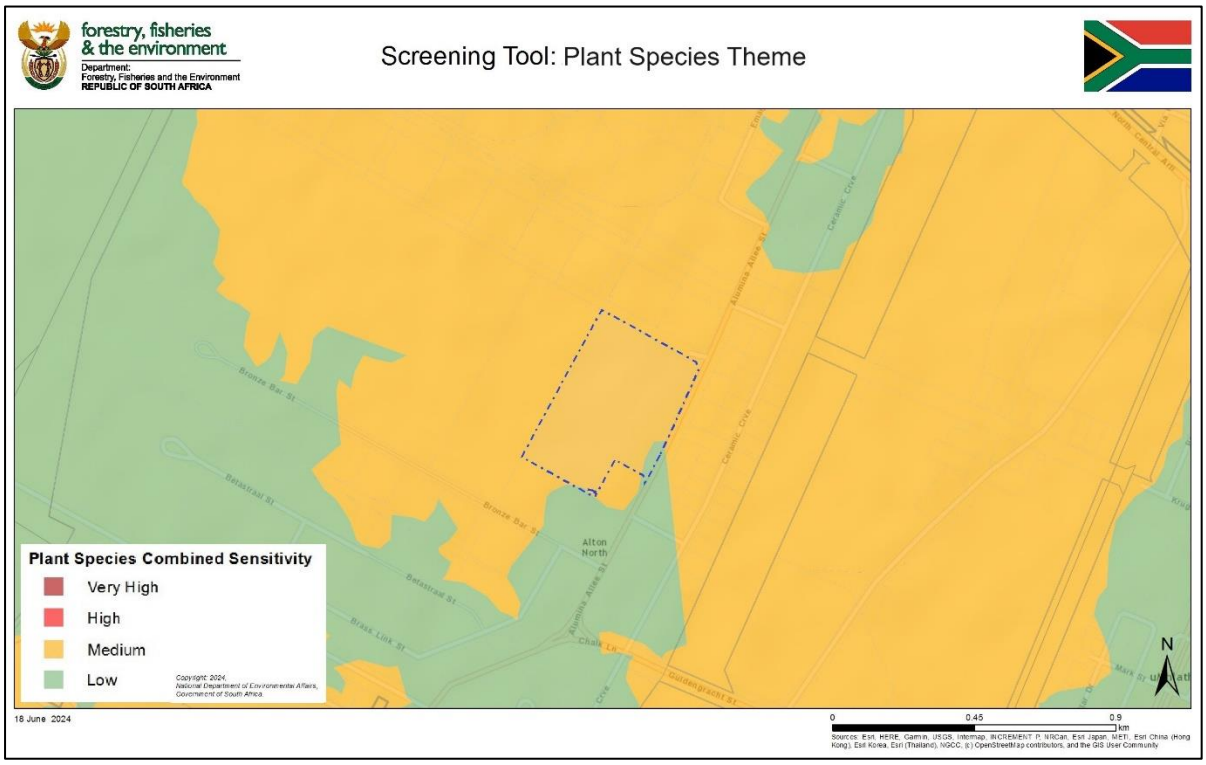

Figure 5: Plant Species Theme sensitivity as assigned through the web-based Screening Tool.

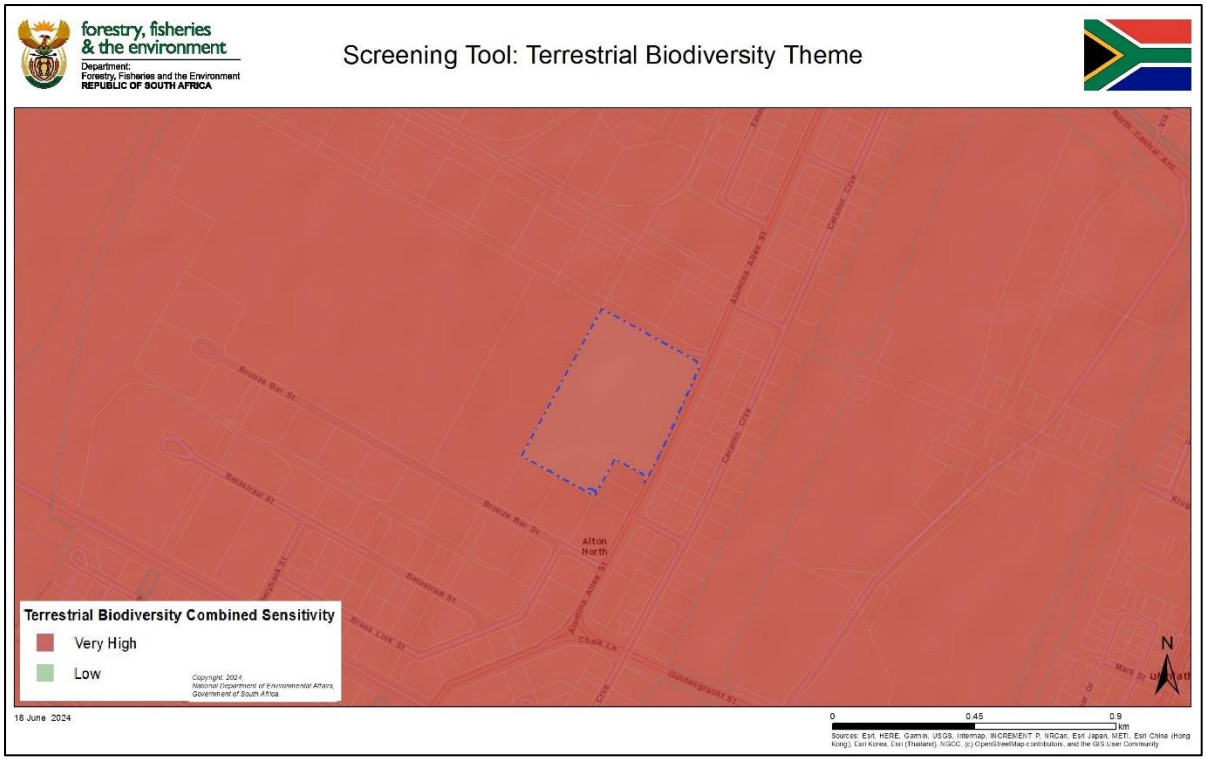

Figure 6: Terrestrial Biodiversity Theme sensitivity as assigned through the web-based Screening Tool.

The table below provides information regarding the outcome of the Screening tool in terms of the Animal, Plant, and Terrestrial Biodiversity theme sensitivities associated with the proposed project as well as a statement (or "response") on the verification or disputing of the screening tool sensitivities for the respective themes.

Table 7: Terrestrial Biodiversity theme sensitivity analysis for the proposed project.

Environmental Theme and triggers	Applicable Protocol	Response
Animal Species Theme Sensitivity Rating as per the Screening Tool Outcome: The entire study area occurs within a **high sensitivity as well as a medium sensitivity class** as per the Screening Tool outcome (Figure 2). The triggered species include: **High (i.e., recent occurrence records for threatened and/or rare endemic species are included in the high sensitivity level):** ➢ *Circaetus fasciolatus* (Southern Banded Snake Eagle) (critically endangered (CR)); ➢ *Circus ranivorus* (African Marsh Harrier) (endangered (EN)); ➢ *Geokichla guttata* (Spotted Ground Thrush) (EN); ➢ *Podica senegalensis* (African Finfoot) (vulnerable (VU)); ➢ *Polemaetus bellicosus* (Martial Eagle) (EN); and ➢ *Stephanoaetus coronatus* (Crowned Eagle) (VU). **Medium (suspected suitable habitat for CR, EN or VU species):** ➢ *Arytropteris basalis* (Flat-necked Shieldback) (VU); ➢ *Balearica regulorum* (Grey Crowned Crane) (EN); ➢ *Crocodylus niloticus* (Nile Crocodile) (VU); ➢ *Halcyon senegaloides* (Mangrove kingfisher) (EN); ➢ *Hyperolius pickersgilli* (Pickersgill's Reed Frog) (EN); ➢ *Lycaon pictus* (African Wild Dog) (EN); ➢ *Nettapus auratus* (African Pygmy Goose) (VU); ➢ *Pelusios rhodesianus* (Variable Hinged Terrapin) (VU); ➢ *Pomatonota dregii* (East Coast Katydid) (VU); ➢ *Terathopius ecaudatus* (Bateleur) (EN); and ➢ Sensitive species 8 (VU). Ground-truthed Sensitivity: The high sensitivity for the Animal Species Theme was not confirmed for the study area. Medium sensitivity for the Animal Species Theme is more appropriate as the preferred habitat for faunal SCC triggered by the Screening Tool is present within the sensitive areas within the study area. Requirement: Terrestrial Animal Species Specialist Assessment.	Government Gazette 45421 dated 10 May 2019 as it relates to the Department of Forestry, Fisheries, and Environment's (DFFE) national environmental screening report required with an application for environmental authorisation as identified in regulation 16(1)(v) of Environmental Impact Assessment (EIA) Regulations: ➢ Government Notice (GN) 1150 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal Species as published in Government Gazette 43855 dated 30 October 2020.	An Animal Species site inspection was conducted by Scientific Terrestrial Services (STS). During the site visit, it was determined that large portions of the site had previously been transformed or degraded (refer to Section 3); however, natural (untransformed) vegetation was still present. To verify the presence or absence of the triggered animal species, a further investigation is required within a more suitable season to support and/or guide the authorisation process required in terms of NEMA. A detailed Animal Species Specialist Assessment report must be compiled and will outline the faunal habitat and diversity within the study area and provide a motivation for the sensitivities determined and their alignment with the outcomes of the screening tool.

Environmental Theme and triggers	Applicable Protocol	Response
Plant Species Theme Sensitivity Rating as per the Screening Tool Outcome: The northern and central sections of study area occur within a **medium sensitivity class** (Figure 3). A small section in the south-eastern section of the study area is in a **low sensitivity class**. Triggered species include: ➢ *Cassipourea g*ummiflua var. *verticillata* (VU); ➢ *Emplectanthus cordatus* (VU); ➢ *Fimbristylis aphylla* (VU); ➢ *Freesia laxa* subsp. *azurea* (VU); ➢ *Nidorella tongensis* (EN); ➢ *Oxygonum dregeanum* subsp. s*treyi* (EN); ➢ *Pachycarpus concolor* subsp. *arenicola* (VU); ➢ *Pavonia dregei* (VU); ➢ *Senecio ngoyanus* (VU); ➢ Sensitive species 89 (VU); ➢ Sensitive species 191 (VU); ➢ Sensitive species 649 (VU); ➢ Sensitive species 1252 (VU); and ➢ *Thesium polygaloides* (VU). Ground-truthed Sensitivity: The medium sensitivity for the Plant Species Theme was confirmed for most of the study area, except for disturbed areas, which would more suitably be rated as a low sensitivity area. Requirement: Terrestrial Plant Species Specialist Assessment Report	Government Gazette 45421 dated 10 May 2019 as it relates to the DFFE's national environmental screening report required with an application for environmental authorisation as identified in regulation 16(1)(v) of EIA Regulations: ➢ GN 1150 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant Species as published in Government Gazette 43855 dated 30 October 2020.	A Terrestrial Plant Species site investigation was conducted by STS. During the initial site visit it was determined that most of the site is in a degraded state (refer to Section 4); however, natural (untransformed) vegetation was present, and a detailed study is thus required within a more suitable season (December to February) for detection of the triggered floral species to support and/or guide the authorisation process required in terms of NEMA. The detailed Terrestrial Plant Species Specialist Assessment report will outline the habitat and conditions within study area and provide a clear motivation for the medium sensitivity outcome of the screening tool.
Terrestrial Biodiversity Theme Sensitivity Rating as per the Screening Tool Outcome: The entire extent of study area is within a **very high sensitivity area** according to the Terrestrial Biodiversity Theme outcome of the Screening Tool (Figure 4). Triggered biodiversity features include the EN Maputaland Wooded Grassland threatened ecosystem, a Critical Biodiversity Area (CBA): Irreplaceable, as well as sections of Priority	Government Gazette 45421 dated 10 May 2019 as it relates to the DFFE's national environmental screening report required with an application for environmental authorisation as identified in regulation 16(1)(v) of EIA Regulations: ➢ GN 320 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity	A Terrestrial Biodiversity site inspection was conducted by STS. During the initial site visit it was determined that several historic and current pressures on the vegetation within the study area were present (refer to Section 4); however, some sections of seemingly intact vegetation remained. As such, a detailed site assessment of all terrestrial biodiversity aspects is required within a more suitable season to support and/or guide the authorisation process required in terms of NEMA.

Environmental Theme and triggers	Applicable Protocol	Response
Focus Areas as per the National Protected Area Expansion Strategy (NPAES). Ground-truthed Sensitivity: The very high sensitivity was not confirmed for the study area as no "pure" form of the EN Maputaland Wooded Grassland threatened ecosystem and remains on site. Small sections of CBA-irreplaceable are still present within the Freshwater Ecosystems where Ecological processes are still functioning. The study area still functions as a migratory corridor for birds, but the fence line present within the study area prevents the migration of mammals and reptiles. Requirement: Terrestrial Biodiversity Specialist Assessment	as published in Government Gazette 43110 dated 20 March 2020.	The detailed Terrestrial Biodiversity Specialist Assessment report will outline the habitat and ecological drivers (or lack thereof) within the study area and provide clear motivations for disputing or verifying the very high sensitivity outcome of the screening tool.

CR = Critically Endangered, EN = Endangered and VU = Vulnerable

5 CONCLUSION

The National Web-Based Environmental Screening Tool highlights the environmental aspects that may be affected by the proposed development. The report provides sensitivity ratings for each of these aspects and includes a list of specialized assessments to be incorporated into the evaluation process.

For this proposed development, this Verification Report focused on the Animal, Plant, and Terrestrial Theme outcomes. The screening tool identified the themes sensitivities as follows Animal species theme (High), Plant species theme (Medium), and Terrestrial biodiversity theme (Very High). This Site Sensitivity Verification Report provides reasons for disputing the screening tool sensitivities. Specialist assessments are recommended for all three themes i.e. Animal Species Theme (preferred habitat for faunal SCC triggered by the Screening Tool is present within the sensitive areas within the study area), Plant Species Theme (Medium sensitivity was confirmed for most of the study area, except for disturbed areas, which would more suitably be rated as a low sensitivity area) and Terrestrial Biodiversity Theme (Small sections of CBA-irreplaceable areas remain within the Freshwater Ecosystems, serving as a bird migratory corridor, but a fence hinders mammal and reptile migration.

Yours Faithfully,

Hennie de Beer
Faunal Ecologist (BTECH Nature Conservation)

Dr. Mathew Ross
Discipline Lead, Principal Aquatic Ecologist, General Ecologist (PhD Aquatic Health)
SACNASP REG.NO**: 005072 (Ecological Science & Aquatic Science)**

Christien Steyn
Senior Terrestrial Plant Ecologist and Discipline Lead (MSc Plant Science).
SACNASP REG.NO**: 127823 (Botanical Science)**

APPENDIX C

SSV – Aquatic Biodiversity Theme

Scientific Aquatic Services

Applying science to the real world

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Name: Nqobile Lushozi
Date: 20 June 2024
Ref: SAS 24-1079

TECHNICAL MEMORANDUM

NEMAI Consulting
147 Bram Fischer Drive
Ferndale,
2194,
South Africa
Email: DonavanH@nemai.co.za

Attention: Mr. Donavan Henning

FRESHWATER ECOSYSTEM SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED MABASA 750MW COMBINED CYCLE GAS TURBINE (CCGT) POWER PLANT IN RICHARDS BAY, IN THE KWAZULU – NATAL PROVINCE.

INTRODUCTION

According to the "Protocols for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes ("the Protocols") published in Government Gazette No. 43110 on 20 March 2020 and Government Gazette No. 43855 on 30 October 2020, the Environmental Assessment Practitioner (EAP) must verify the current use of the site in question and its environmental sensitivity as identified by the Screening Tool to determine the need for specialist inputs in relation to the themes included in the Protocols. The Protocols are allowed for in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended ("NEMA"). The Protocols must be complied with for every new application for Environmental Authorisation that is submitted after 9 May 2020.

This document serves as the Aquatic Biodiversity (Freshwater) Site Sensitivity Verification Report for the proposed Mabasa 750MW gas powerplant in Richards Bay in the KwaZulu – Natal Province.

AREA OF ASSESSMENT

The study area is located immediately west of Richard's Bay Central, which is located within the uMhlathuze Local Municipality, an administrative area of the King Cetshwayo District Municipality. The study area is situated 3 km north of the R34 John Ross Highway and 0.5 km southwest of the R619 regional road. The study area is located within a largely developed area with the immediate surrounding areas comprising predominantly industrial zones, residential developments and various service industries (e.g., petrol stations).



Figure 1: Digital satellite image depicting the location of the proposed Mabasa 750MW gas powerplant and associated investigation area in relation to the surrounding area.

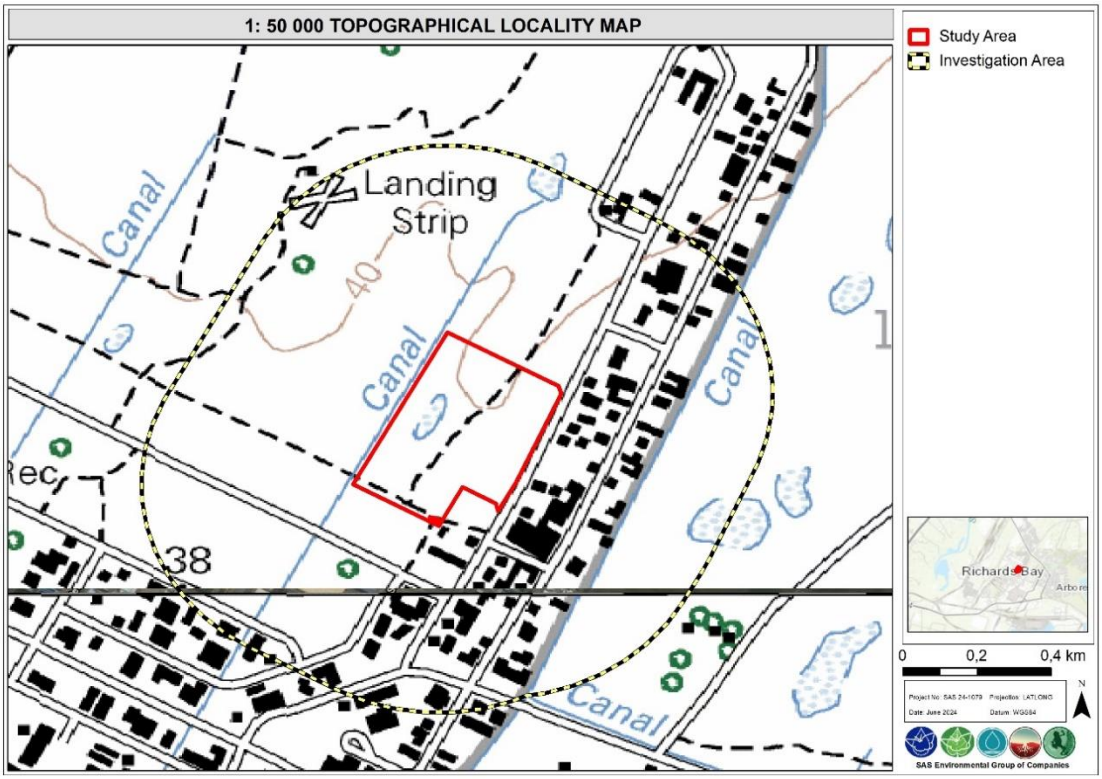


Figure 2: 1: 50 000 topographical locality map indicating the proposed Mabasa 750MW gas powerplant and associated investigation area in relation to the surrounding area.

This Freshwater Ecosystem site sensitivity verification report relates to a Screening Tool Report (STR) completed for the site in June 2024.

Site Verification Methodology

A site visit was conducted on the 13th June 2024 by the specialist to inform the specialist reports required for the proposed project.

Aquatic Biodiversity Site Verification

The table below provides information regarding the outcome of the Screening Tool in terms of the aquatic biodiversity theme sensitivity associated with the proposed project as well as a brief summary of the outcome of the freshwater ecosystem specialist report in response.

Aquatic Biodiversity Theme Sensitivity analysis for the proposed Mabasa 750MW gas powerplant.

Environmental Theme	Applicable Protocol	Response
Aquatic Biodiversity Sensitivity Rating: The majority of the area of assessment and associated investigation area (500m radius of the area of assessment) has been assigned a **very high aquatic biodiversity**	3(b) Protocol for the assessment and reporting of environmental impacts on aquatic biodiversity (GG 45421 of 10/05/2019).	A freshwater ecosystem assessment was conducted by Scientific Aquatic Services (SAS, 2024). During the assessment it was determined that the designation of very high sensitivity to all freshwater features in the

Environmental Theme	Applicable Protocol	Response
sensitivity. This area of very high sensitivity relates to the location of this part of the study and investigation. The following designations have triggered areas of very high sensitivity: ➢ Zululand Coast & Richards Bay GW Fed Estuary Water Source Area (SWSA); ➢ Critical Biodiversity Areas (Irreplaceable); ➢ Presence wetlands and Indian Ocean Coastal Belt Bioregion; and ➢ Wetlands: PES A/B. **Actual Sensitivity: All delineated freshwater ecosystems and associated 32 m non-development buffer – high sensitivity;** **Remainder of study and investigation areas: low sensitivity. (refer to Figure 4 – photographs).**		study area by the DFFE Screening Tool is supported. During the assessment and associated field verification it was determined that the portions of the development site (study area) is of very high aquatic biodiversity (freshwater) sensitivity due to the confirmed presence of wetlands. A detailed study will be required to support both the authorisation process required in terms of NEMA as well as the NWA. The study and associated comprehensive report from a site visit in June 2024 will provide a detailed description of the freshwater ecosystems associated with the proposed project and considered the potential impacts applicable to the freshwater ecosystems and provided suitable mitigation measures to best minimise the potential impact on the freshwater ecosystems.

The Figure 3 below indicates the Aquatic Biodiversity sensitivity as assigned through the web-based Screening Tool and 4 shows the representative photographs of the study area.

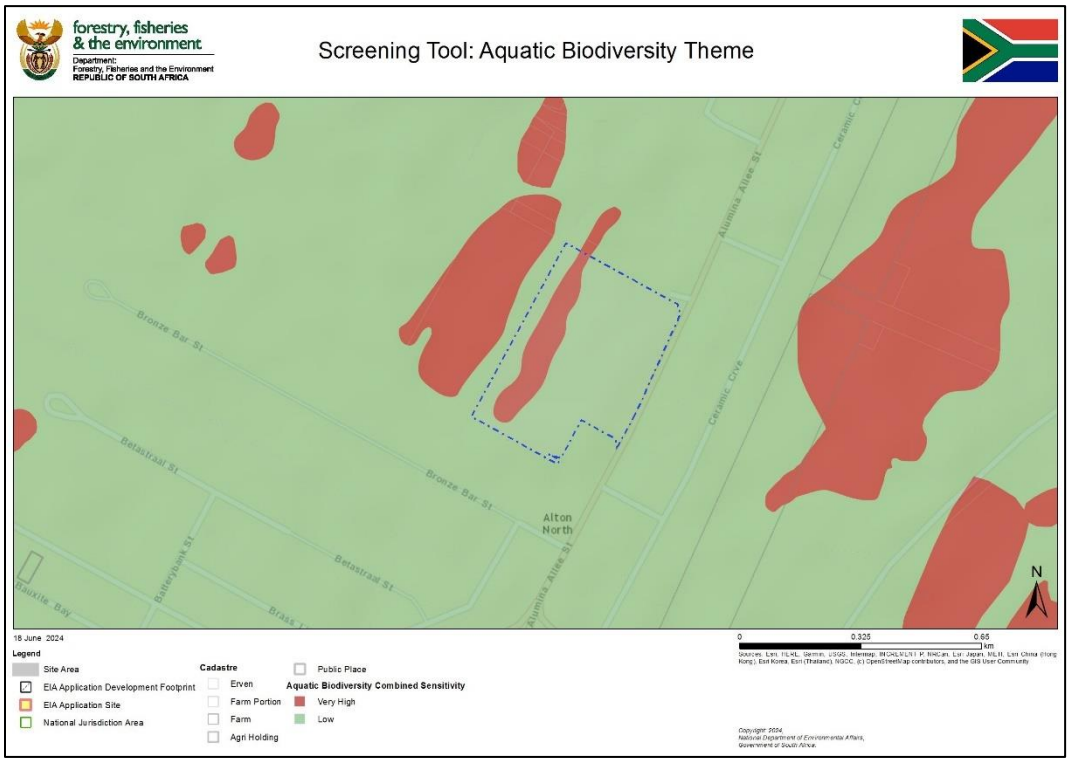


Figure 3: Aquatic Biodiversity sensitivity as assigned through the web-based Screening Tool.

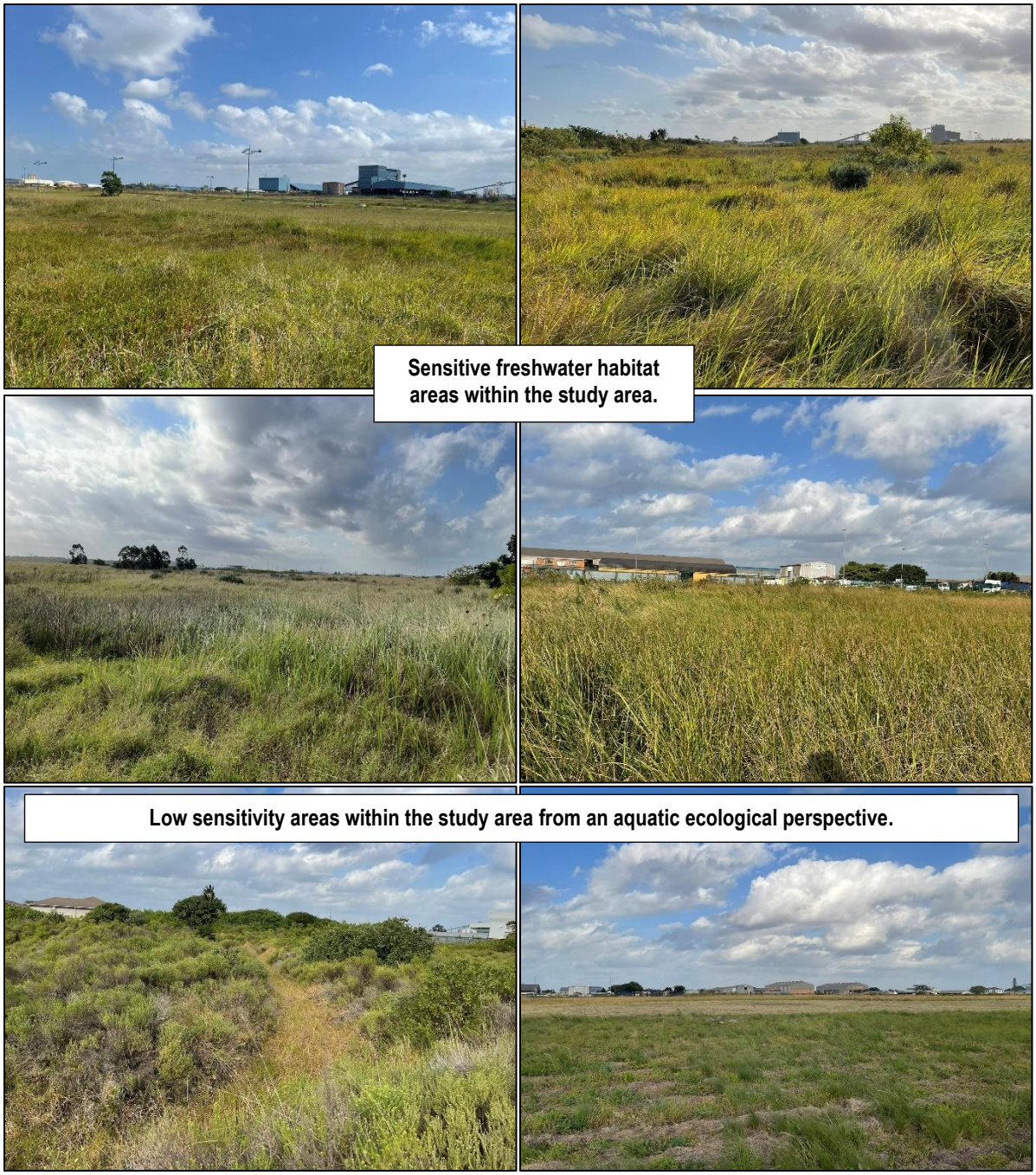


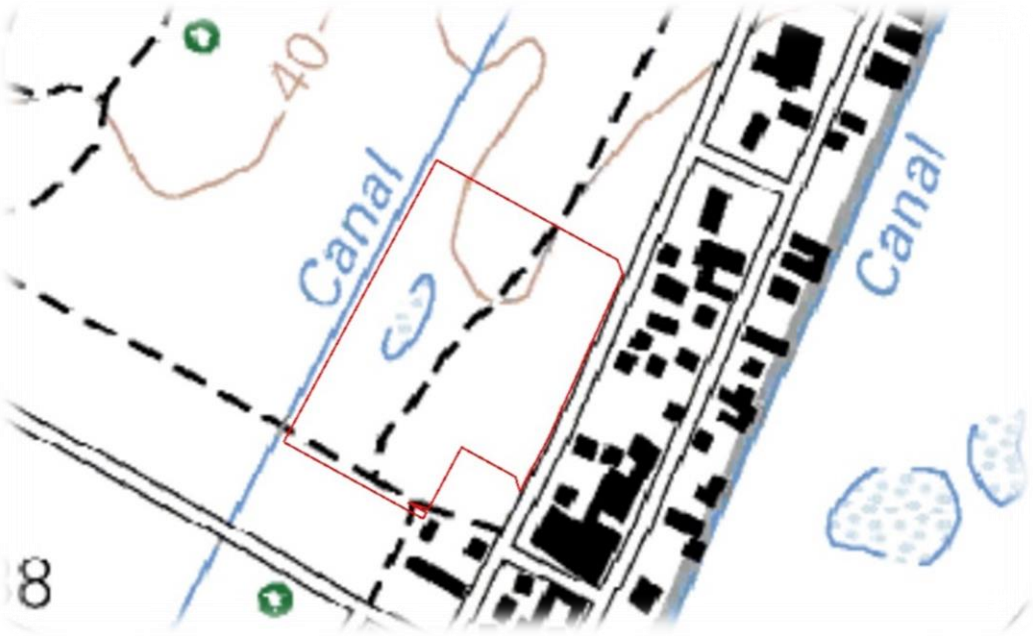
Figure 4: Representative photographs of the study area.

Sincerely,
Nqobile Lushozi (Pr. Sci. Nat.)

APPENDIX D

SSV – Heritage Theme

MABASA ENERGY AND FUELS (PTY) LTD



HERITAGE SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED 750MW COMBINED CYCLE GAS TURBINE POWER PLANT IN RICHARDS BAY, CITY OF UMHLATHUZE LOCAL MUNICIPALITY, KWAZULU-NATAL PROVINCE

20 JUNE 2024

Prepared by:

Jennifer Kitto

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Authors	Qualification	Date	Signature	Version No.
Jennifer Kitto	BA Archaeology and Social Anthropology; BA (Hons) Social Anthropology	20 June 2024		1.0
Prepared for	Nemai Consulting (PTY) Ltd. 147 Bram Fischer Drive, Ferndale Randburg, 2194 NEMAI CONSULTING			

1 INTRODUCTION & PROJECT DESCRIPTION

1.1 Background

Following the promulgation of the Integrated Resource Plan 2019 (IRP 2019), the Minister of Mineral Resources and Energy determined that the procurement of New Generation Capacity is required to ensure energy security and that approximately 3000 (three thousand) megawatts ("MW") would be procured, to be generated from gas. In response, the Department of Mineral Resources and Energy (DMRE) formally invited interested parties in December 2023 to register prospective bids under the first bid window of the Gas Independent Power Producers Procurement Programme (GASIPPPP Bid Window 1). A total of 2000 MW will be procured in this first round from Projects supplying new generation Capacity, Ancillary Services and Energy Output to be produced from gas-fired power generation technology. This GASIPPPP specifically targets land-based electricity generation facilities utilising natural gas, located anywhere within the borders of the Republic of South Africa.

Mabasa Energy and Fuels (Pty) Ltd (the "Applicant") intends to bid for the GASIPPPP and has proposed the development of a 750MW Combined Cycle Gas Turbine Power Plant (the "Plant") in Richards Bay, which falls within the City of uMhlathuze Local Municipality in KZN (**Figure 1**). The earmarked site is located on Erf 16673 in Phase 1F of the Richards Bay Industrial Development Zone (RBIDZ) (**Figure 2**), under a long-term lease agreement.

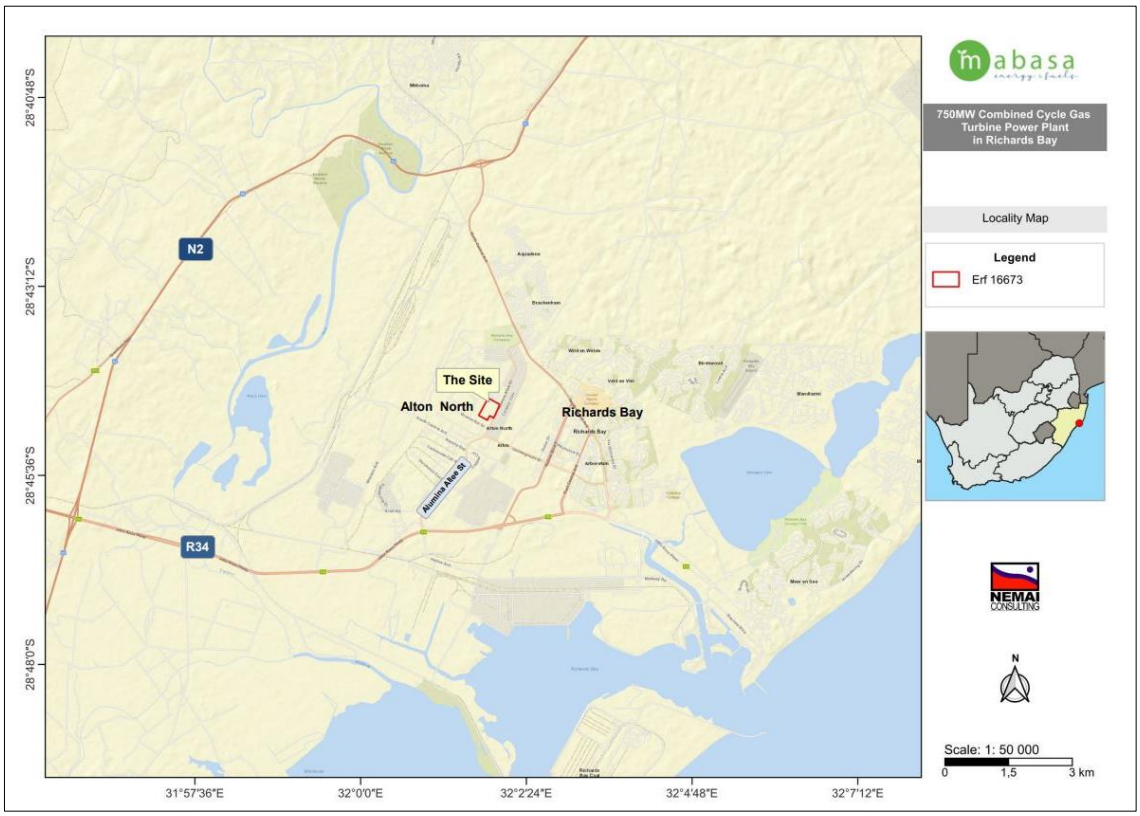

Figure 1: Regional Locality Map of CCGT Power Plant in Richards Bay

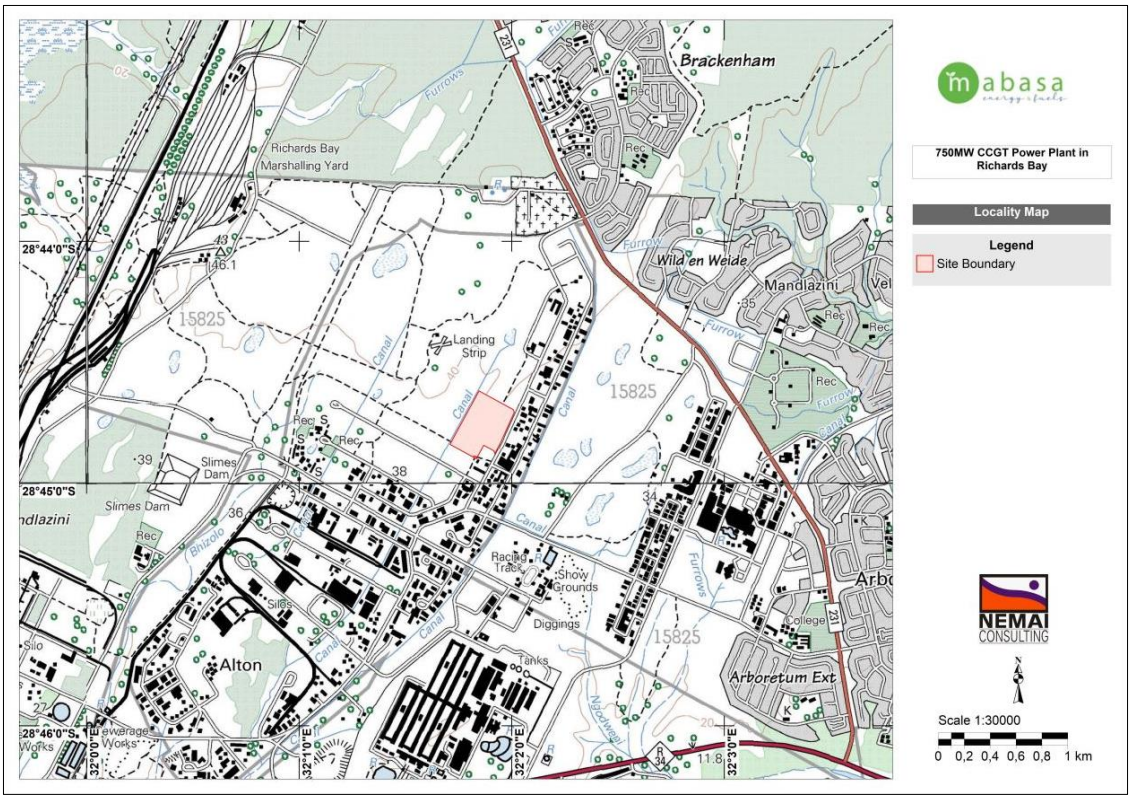

Figure 2: Topographical Locality Map of CCGT Site Footprint

2 SITE VERIFICATION REPORT: HERITAGE SENSITIVITY THEME

A basic desktop study was undertaken for the proposed Gas Turbine Power Plant development, which included accessing information from the National Web-based Environmental Screening Tool of the Department of Forestry, Fisheries & the Environment (DFFE), an examination of the historical topographic map sheets for the area and a review of past HIA reports which included the specific project area or the immediate surrounding region. Historical satellite imagery obtained from Google Earth was also examined. The desktop study was followed by an on-site inspection.

2.1 National Environmental Screening Tool (DFFE)

The National Environmental Screening Tool identified the Archaeological Cultural Sensitivity of the proposed CCGT Power Plant footprint site as Low (see Error! Reference source not found., below).

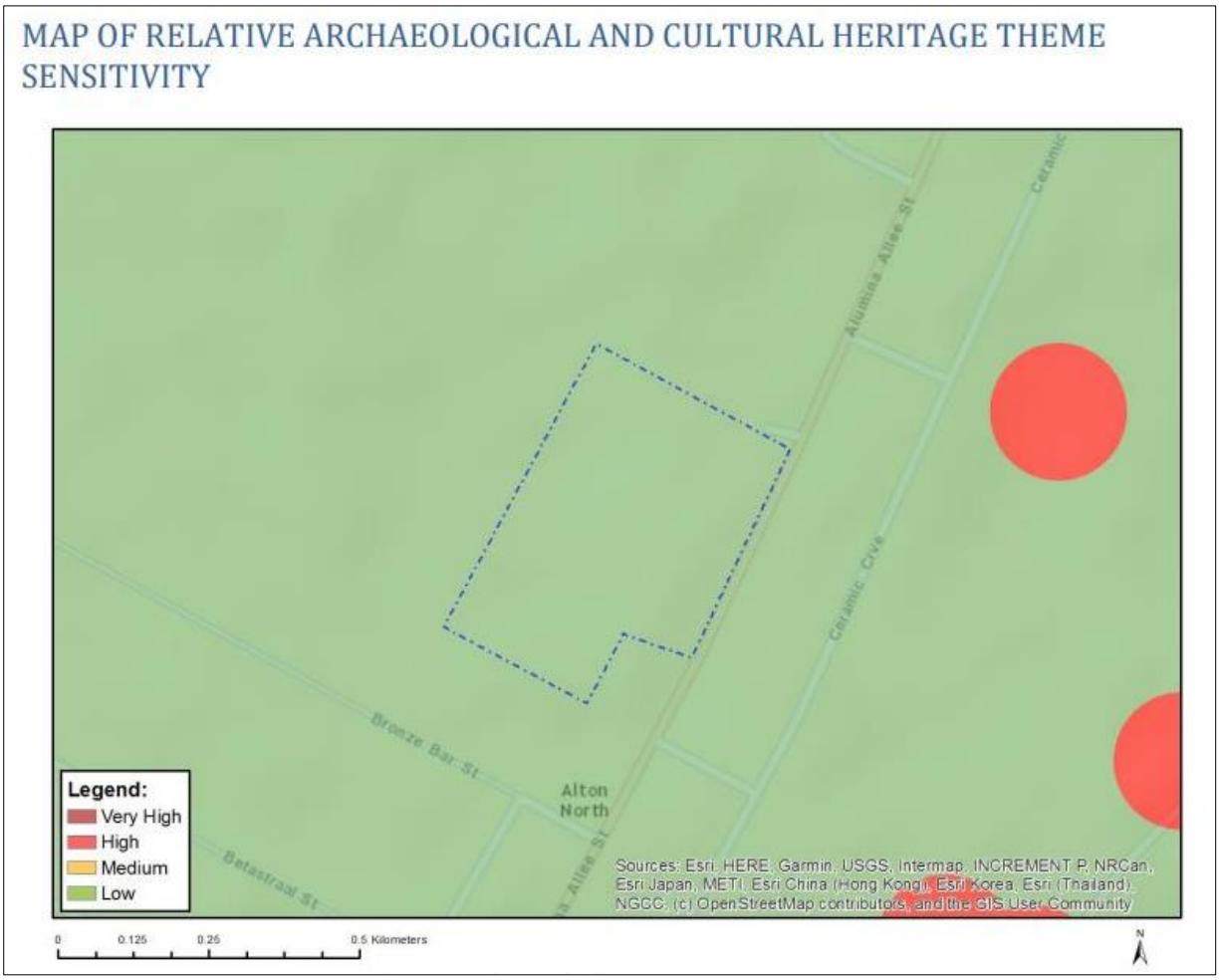

Figure 3: Archaeological Cultural Sensitivity map indicating that the project footprint is located within a region of low archaeological and cultural heritage sensitivity (DFFE Screening Tool).

2.2 Historical Topographical 1:50 000 Map sheets

An examination of the information depicted on the earliest edition (and subsequent editions) of the historical topographic map sheets was also undertaken. Overlays of the available 1:50 000 map sheets with the project footprint were generated using Google Earth. The map sheet consulted was the South Africa 2832CA Kwa Mbonambi sheet, Edition 1 1943; Edition 3 1982 and Edition 4 2005 (no Edition 2 was obtained). Any heritage structures or features that are 60 years or older would be depicted on the first edition sheet. The topographical maps were obtained from the Department of Agriculture, Land Reform and Rural Development (DALRRD) in Pretoria.

As can be seen in the figures below, (**Figure 4** to **Figure 6**) the 1943 edition 1 map, as well as the subsequent editions obtained (1982 and 2005), depict no heritage features or structures within the Erf 16673 footprint.

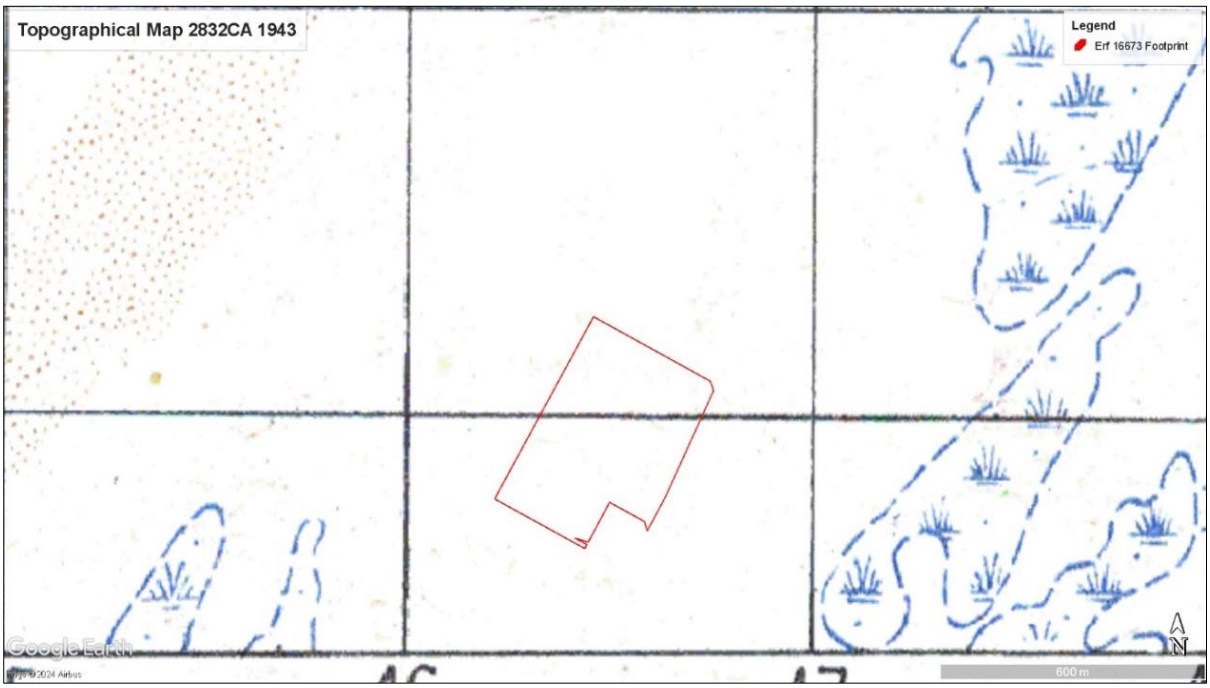

Figure 4: Enlarged view of topographic map 2832CA Ed 1 1943, depicting no heritage structures or features within or in the vicinity of the project footprint.



Figure 5: Enlarged view of topographic map 2832CA Ed 3 1982, depicting no heritage structures or features within or in the vicinity of the project footprint. Several plantations are depicted in the surrounding area

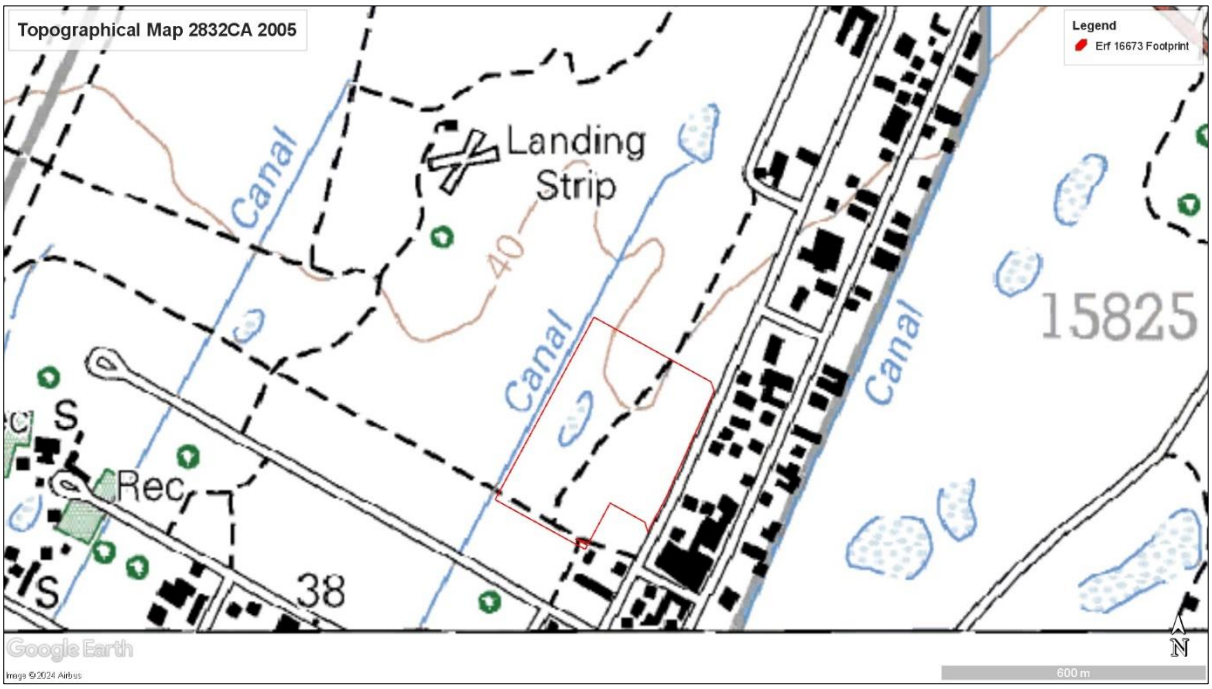

Figure 6: Enlarged view of topographic map 2832CA Ed 4 2005, depicting no heritage structures or features within the project footprint. The surrounding area is depicted as considerably built-up.

2.3 Past HIA Reports

It should be noted that an Environmental Impact Assessment (EIA) study was undertaken in 2015/2016 for the area immediately surrounding the current project footprint (Zone 1F of the RBIDZ). This EIA included a Heritage Impact Assessment (HIA) report (Prins 2015) which found no significant heritage resources within the greater RBIDZ Zone 1F study area and was approved by Amafa Heritage (2016). Several other HIA reports for areas in the immediate vicinity of the current project area were also reviewed (see details below).

Prins, F. 2015. *Cultural Heritage Impact Assessment Of Phase IF Of The Richards Bay Industrial Development Zone* (IDZ). The HIA was included in an EIA Report for the Phase 1F of the RBIDZ which proposed the installation of infrastructural services, including: internal roads, water and sewer infrastructure, stormwater infrastructure, internal electrical and ICT infrastructure, gas network, railway infrastructure and other service infrastructure. No heritage structures or features were identified.

Anderson, G. 2023. *Heritage Survey of the Nyanza 80ktpa Ti02 Pigment Plant, Richards Bay, KZN*. The study area for the proposed plant is located in the Phase 1F RBIDZ and was included in the original HIA undertaken by Prins in 2015, which did not identify any heritage resources. However, Anderson's survey for this study recorded the presence of a few Stone Age tools scattered in the more open spaces along the southern boundary of the Nyanza Plant study area. The possible occurrence of settlements from the 1930s and 1960s was also noted from aerial photographs dating to 1937 and topographical

map sheets dating to the 1960s. This study area is situated approx. 210m north-northwest of the current project area. None of the possible settlement areas identified by Anderson are located close to the current CCGT project footprint. However, Anderson does note (also in several other past HIA studies), that there is a low possibility of uncovering so-called "lag deposits" of stone tools sub-surface, as well as possible unidentified burials.

Lavin, J. 2021. *Draft Heritage Screener - Proposed Phakwe Richards Bay Gas Power 3 2000 MW Combined Cycle Gas to Power Plant (PRBGP3), Richards Bay*. The study area for the proposed plant is located in the Phase 1F RBIDZ and was included in the original HIA undertaken by Prins in 2015. This screening study notes that although there is a large number of known sites within the general vicinity of the proposed development, the specific area proposed for development has been extensively previously disturbed and is located within an area that has been extensively previously developed. This study recommended that no further archaeological studies would be required. The study area includes Erven 16674, 9042, 8822, 8821, 8820 which are situated immediately west of the current CCGT project footprint.

Anderson, G & L Anderson. 2010. *Heritage Survey Of The Proposed Richards Bay Central Industrial Area.* The site survey did not locate any heritage sites, however, an investigation of aerial photographs from 1937 indicated the possible presence of several settlement sites (and possible associated graves) within that study area. That study area is situated approx. 277m east of the current CCGT project footprint.

Anderson, G. 2015. *Alton South Transnet Railway, Richards Bay, Kwazulu-Natal*. The study examined the route of a proposed rail link from Phase 1F of the RBIDZ to the existing Transnet Railway line located in Alton South. A large number of Stone Age and Iron Age sites were noted as being recorded by previous surveys in the general area. However, no sites were recorded within the rail route area, although some Middle Stone Age and Late Stone Age lithics were recorded in the vicinity, as well as one Late Iron Age pottery sherd. Five human settlements were identified from aerial photographs (1937) as occurring within 100m of the proposed line. That study area is located 1.36km to the north and west of the current CCGT project footprint.

2.4 Satellite Imagery (Google Earth)

As noted above, historical Satellite images (Google Earth) of the area containing the footprint of the proposed CCGT Project were examined for evidence of past disturbance of the area. The information obtained from the satellite images shows evidence of considerable disturbance over large sections of the footprint area in the years between 2004 to 2019. The details are summarised below and shown in **Figure 7** to **Figure 16**.

- The earliest available images date to c.2004 and show evidence of disturbance by what is presumed to be a quadbike or motorcross track in the southernmost section of the footprint.
- By c. 2006, no further change occurs within the footprint. However, the area to the southeast of the footprint shows the construction of several new buildings.

- By c. 2010, while no further change occurs within the footprint, the area immediately southeast of the footprint shows the construction of two new buildings.
- The satellite image dated 01/2017 of the footprint (yellow polygon), shows the existence of what is likely to be a construction camp/laydown area for the installation of infrastructure services approved in the 2015/2016 EA.
- The satellite image dated 10/2017 of the footprint (yellow polygon), shows considerable disturbance of sections of the footprint and the area immediately north for the installation of infrastructure services which continues through 2018 until the beginning of 2019.
- The satellite image dated c.04/2019 of the footprint (yellow polygon), showing the completed construction of the infrastructure and the removal of the construction camp/laydown area in the north-east section of the footprint.
- The most recent satellite images (c.2020 and 2022) show only the remains of the construction camp/laydown area



Figure 7: Historical satellite image (Google Earth) dated c2004 of the area containing the footprint of the proposed CCGT Project (yellow polygon) showing the probable quadbike track disturbance in the southern section



Figure 8: Satellite dated c 2006 of the area containing the footprint of the proposed CCG Project (yellow polygon) showing no further change within the footprint. However, the area to the southeast of the footprint shows the construction of new buildings



Figure 9: Satellite image dated c2010 of the area containing the footprint of the proposed CCG Project (yellow polygon) showing no further change within the footprint. However, the area immediately southeast of the footprint shows the construction of new buildings



Figure 10: Satellite image dated 01/2017 of the footprint (yellow polygon), showing the existence of what is likely to be a construction camp/laydown area for the installation of infrastructure services approved in the 2015/2016 EA.



Figure 11: Satellite image dated 10/2017 of the footprint (yellow polygon), showing considerable disturbance of sections of the footprint and the area immediately north for the installation of infrastructure services



Figure 12: Satellite image dated c.09/2018 of the footprint (yellow polygon), showing continued disturbance of sections of the footprint and the area immediately north and west for the installation of infrastructure services



Figure 13: Satellite image dated c.04/2019 of the footprint (yellow polygon), showing completed construction of the infrastructure and the removal of the construction camp/laydown area in the north-east section of the footprint



Figure 14: Satellite image dated c.10/2019 of the footprint (yellow polygon), showing the additional disturbance in the eastern section of the footprint



Figure 15: Satellite image dated c.07/2020 of the footprint (yellow polygon), showing the area after grass-cutting



Figure 16: Most recent satellite image dated c.11/2022 of the footprint (yellow polygon)

3 CURRENT STATUS OF THE PROJECT FOOTPRINT

3.1 On-site Inspection

The Combined Cycle Gas Turbine Power Plant project footprint is situated on Erf 16673 in Phase 1F of the RBIDZ, Richards Bay. At the time of the site inspection the entire area was covered with very long and dense grass and other vegetation, including several large areas of dense bushes in the southwestern section. A large area of trees occurs on the southeastern boundary with a couple scattered groups of trees in the central area. The southwestern area also contains a few vlei-like areas. The northern section of the project area is fairly flat while the southern section contains evidence of past disturbance in the form of ditches and depressions.

The on-site inspection of the project footprint took place over one day (12 June 2024) by the author (heritage specialist). The inspection identified no heritage resources within the project area. The archaeological visibility was very low due to the extremely dense and long vegetation cover over most of the footprint; however, examination of the few patches of ground where bare soil was visible did not reveal any archaeological material. This confirmed the information from the desktop study that the project area and immediate vicinity have been disturbed considerably and that no or few heritage

resources or archaeological materials were likely to occur in the footprint (as had been indicated in previous surveys).

Therefore, the heritage sensitivity of the project footprint can be confirmed as being of Low sensitivity. As noted in several past HIA studies, however (specifically Anderson 2023), there is a low possibility of uncovering so-called “lag deposits” of stone tools sub-surface, as well as possible unidentified burials.



Figure 17: On-site Inspection Tracklog (blue line)

3.1.1 Status Quo/Baseline Receiving Environment photographs



Figure 18: View of the footprint area, looking south along the western boundary from the northern section, this shows short but dense grass cover



Figure 19: View looking east from the northern section of the project footprint, the visible buildings are light industrial located along Alumina Allee road.



Figure 20: A view looking south across the central section of the project footprint, showing longer dense grass and a few trees



Figure 21: View looking south along the eastern boundary of the project footprint area



Figure 22: View looking north along the eastern boundary of the project footprint area



Figure 23: View looking south along the eastern boundary of the southern section of the project footprint area, showing dense trees, long grass and other vegetation



Figure 24: View from southeast section of the footprint showing dense and long grass and shrubby vegetation



Figure 25: View showing small vlei area in the southern section of the project footprint



Figure 26: View showing dense trees, long grass and other vegetation in the southeast section of the project footprint



Figure 27: View looking north across the central area of the project footprint, from the southeast section



Figure 28: View looking east from the southeastern boundary corner, showing the dense and long vegetation



Figure 29: View looking west from the southeastern boundary corner, showing the dense and long vegetation



Figure 30: View showing a disturbed area (depression) in the southeastern section



Figure 31: View showing dense bushy vegetation in the southwestern section of the project footprint



Figure 32: View looking north into central section of the project footprint from the southwest section



Figure 33: View showing disturbed area (mound) and long dense grass and bushes in the southwestern section



Figure 34: View of the southwest corner section of the project footprint, showing disturbance from installation of services (red arrows)



Figure 35: View looking north along western boundary of the project footprint, showing disturbance by installation of services (red arrow), as well as a canal on the western boundary



Figure 36: View from western boundary looking northeast into central section



Figure 37: View looking east from southwestern boundary, showing evidence of services installation



Figure 38: View looking northeast across project footprint from western boundary



Figure 39: View from eastern section showing tree clump and surrounding vegetation in the central section



Figure 40: View of eastern section showing long dense grass and large clump of vegetation

4 CONCLUSION AND RECOMMENDATIONS

Based on the above Site Sensitivity Verification, the environmental sensitivity indicated by the National Environmental Screening Tool of Low sensitivity for the Archaeological and Cultural Heritage Theme for the CCGT project footprint is confirmed.

Notwithstanding the above confirmation of Low Archaeological and Cultural Heritage sensitivity, and although no evidence of archaeological or cultural heritage resources was identified within the CCGT Power Plant project footprint, since the proposed Project triggers activities in Listing Notices 1, 2 and 3, a Scoping and Environmental Impact Reporting (S&EIR) Process needs to be undertaken in terms of the EIA Regulations of 2014, as amended, promulgated under NEMA.

Therefore, a Phase 1 Heritage Impact Assessment is required to be included in the S&EIR process in terms of section 38(8) of the National Heritage Resources Act (No 25 of 1999). However, since the on-site inspection confirmed the desktop study evidence for previous considerable disturbance of the project area and in view of fact that the previous HIA report for the installation of both underground and above-ground service infrastructure within the greater Zone 1F project area was accepted by the Amafa Institute (as well as other HIAs recording no to low heritage resources), it is recommended that an application for exemption from a further full Phase 1 Heritage Impact assessment is submitted to Amafa.

5 REFERENCES

Anderson, G. 2015. *Alton South Transnet Railway, Richards Bay, Kwazulu-Natal*.

Anderson, G. 2023. *Heritage Survey of the Nyanza 80ktpa Ti02 Pigment Plant, Richards Bay, KZN*

Anderson, G & L Anderson. 2010. *Heritage Survey Of The Proposed Richards Bay Central Industrial Area*

Prins, F. 2015. *Cultural Heritage Impact Assessment Of Phase IF Of The Richards Bay Industrial Development Zone* (IDZ)

Lavin, J. 2021. *Draft Heritage Screener - Proposed Phakwe Richards Bay Gas Power 3 2000 MW Combined Cycle Gas to Power Plant (PRBGP3), Richards Bay*

Pawandiwa, B. 2016. *Richards Bay Industrial Development Zone Phase 1F, Alton North. Final Comment*. Amafa/Heritage KwaZulu Natal

APPENDIX 1: CURRICULUM VITAE OF HERITAGE SPECIALIST

1 Personal Particulars

Profession:	Heritage Specialist
Date of Birth:	11 September 1966
Name of Firm:	Nitai Consulting
Name of Staff:	Jennifer Kitto
Nationality:	RSA
Membership of Professional Societies	Association of Southern African Professional Archaeologists (444); International Association for Impact Assessment South Africa (7151); Association of Professional Heritage Practitioners (PHP0156)

2 Education:

BA Hons Social Anthropology, WITS, South Africa, 1994

BA. Archaeology and Social Anthropology, WITS, South Africa, 1993

Higher National Diploma, Practical Archaeology, Dorset Institute for Higher Education (now Bournemouth University), UK, 1989

3 Employment Record:

2022 – Present Heritage Specialist, Nitai Consulting

Conduct Heritage Impact Assessments;

2012 – 2021 Heritage Specialist, PGS Heritage (Pty) Ltd

Conduct Heritage Impact Assessments

Compile Desktop Historical Research

Compile Heritage Audit and Management Plans

Compile and submit permit applications to National and Provincial Heritage Authorities for Section 34 building alterations and demolitions (under National Heritage Resources Act, 25 of 1999)

Compile and submit permit applications to Provincial and Municipal Health Authorities for Section 36 relocations of graves and burial grounds (under National Heritage Resources Act, 25 of 1999 and National Health Act, No 61 of 2003)

2008 – 2011 Cultural Heritage Officer (National), Burial Grounds and Graves Unit: South African Heritage Resources Agency (SAHRA)

Review and assess permit applications for relocation of historical graves and burial grounds.

1998 – 2008 Cultural Heritage Officer (Provincial), Provincial Office – Gauteng: SAHRA

Review and comment on heritage and archaeological impact reports

Research for the nomination and grading process for related to the declaration of specific heritage resources as National Heritage Sites

Monitoring of certain archaeological and built environment National Heritage Sites (e.g. The Cradle of Humankind World Heritage Site)

4 Selected Consultancies

4.1 Umzimkhulu River Weir and Pumpstation Upgrade, Port Shepstone, Kwa-Zulu Natal

2023/2024, Heritage Specialist, Undertake Heritage Impact Assessment of all heritage resources affected by proposed weir and pumpstation upgrade and associated infrastructure and submit HIA Report to Amafa Institute (pending)

4.2 Pensfontein Residential Development, Postmasburg, Northern Cape Province

2023/2024, Heritage Specialist, Undertake Heritage Impact Assessment of all heritage resources within or adjacent to the development footprint

4.3 Aggeneys Renewables Development, Aggeneys, Northern Cape Province

2023/2024, Heritage Specialist, Proposed development of one Wind energy Facility, two Solar PV facilities and the associated grid corridor, Undertake Heritage Impact Assessment of all heritage resources associated with the respective footprints

4.4 Bhobhoyi Pipeline Upgrade, Port Shepstone, Kwa-Zulu Natal Province.

2023, Heritage Specialist, Pipeline Upgrade associated with proposed Umzimkhulu River Weir and Pumpstation Upgrade, Undertake Heritage Impact Assessment of all heritage resources along the proposed route and submit HIA Report to Amafa Institute

4.5 Pilanesberg Platinum Mine Community Bulk Water Supply pipeline near Pilanesberg Nature Reserve, North West Province

2023, Heritage Specialist, Proposed development of Bulk Water Supply pipeline for local community; Undertake Heritage Impact Assessment of all heritage resources along the proposed route

4.6 400kV Transmission and 132kV distribution power lines for the Apollo-Lepini-Mesong Project, Gauteng Province

2023, Heritage Specialist, Proposed development of a 400kV transmission and 132kV power lines; Undertake Heritage Impact Assessment of all heritage resources along the proposed routes for the two power lines.

4.7 Carbon Capture Utilisation & Storage (CCUS) Pilot Project - 3D Seismic Survey & Drilling, Leandra, Mpumalanga Province, South Africa

2023, Heritage Specialist. Proposed 3D Seismic Survey within the Leandra area, Undertake Heritage Impact Assessment of all heritage resources within the footprint of the survey area.

4.8 Carbon Capture Utilisation & Storage (CCUS) Pilot Project - Injection Site 2023, Leandra, Mpumalanga Province, South Africa

2023, Heritage Specialist. Proposed Injection Site 2023 for the CCUS pilot project within the Leandra area, Undertake Heritage Impact Assessment of all heritage resources within the footprint of the survey area.

4.9 Decommissioning of Komati Power Station, Middelburg, Mpumalanga, South Africa

2023, Heritage Specialist, in association with architectural historian; Proposed Decommissioning of the Komati Power Station, Undertake Heritage Impact Assessment of all heritage structures within the power station

4.10 Paulputs Strengthening Powerline Route, Postmasburg-Paulputs, Northern Cape

2023, Heritage Specialist, Proposed development of a 400kV transmission lines; Undertake Heritage Impact Assessment of all heritage resources along the proposed route

4.11 Mooivlei Solar PV Facilities, near Kroonstad, Free State Province,

2022/2023 Heritage Specialist, proposed development of three Solar PV facilities west of Kroonstad, Undertake Heritage Impact Assessment of all heritage resources associated with the three solar PV facilities:

- Mooivlei Solar 1 PV facility, west of Kroonstad,
- Mooivlei Solar 2 PV facility, west of Kroonstad,
- Mooivlei Solar 2 PV facility, west of Kroonstad,

4.12 Kroonstad South Solar PV Facilities near Kroonstad, Free State Province,

2022/2023 Heritage Specialist, Development of five Solar PV facilities south of Kroonstad, Undertake Heritage Impact Assessment of all heritage resources associated with the five solar PV facilities:

- Oslaagte Solar 1 PV project, south of Kroonstad,
- Oslaagte Solar 2 PV project, south of Kroonstad,
- Oslaagte Solar 3 480MW PV facility south of Kroonstad,
- Leeuwspruit Solar 1 320MW PV facility south of Kroonstad,
- Leeuwspruit Solar 2 PV facility south of Kroonstad,

4.13 Rustenburg Solar PV Facilities, near Rustenburg, North West Province,

*2022/2023 H*eritage Specialist, Development of three Solar PV facilities near Rustenburg, , Undertake Heritage Impact Assessment of all heritage resources associated with the three solar PV facilities.

- Onderstepoort Solar 1 PV facility, near Rustenburg,
- Onderstepoort Solar 2 PV facility, near Rustenburg,
- Rhino Solar PV facility, near Rustenburg,

4.14 Seelo Solar PV Facilities, near Carletonville, North West Province,

2022/2023 Heritage Specialist, Development of three Solar PV facilities near Carletonville, Undertake Heritage Impact Assessment of all heritage resources associated with the three solar PV facilities.

- HIA survey and report for Seelo Alpha 240MW Solar PV & BESS facility, near Carletonville, Gauteng and North West Province
- HIA survey and report for Seelo Beta 240MW Solar PV & BESS facility, near Carletonville, Gauteng and North West Province
- HIA survey and report for Seelo Charlie Solar PV & BESS facility, near Carletonville, Gauteng and North West Province

4.15 Ferrum-Upington Powerline Route, Upington-Kathu, Northern Cape

2022/2023 Heritage Specialist, Proposed Deviations to Authorised Route of a 400kV transmission power line between Upington and Kathu, Undertake Heritage Impact Assessment for of all heritage resources along the proposed route

4.16 GDID East Corridor, OHS Implementation, Tambo Memorial Regional Hospital, Gauteng (as sub-contractor to PGS Heritage (Pty) Ltd

2022 Independent Heritage Specialist, in association with architectural historian. Compile Historical Archival Report of Tambo Hospital Boksburg, Gauteng for PGS Heritage (Pty) Ltd, Finalise HIA Report and submit HIA report to Gauteng Provincial Heritage Resources Authority

4.17 GDID East Corridor, OHS Implementation, Tembisa Regional Hospital, Gauteng (as sub-contractor to PGS Heritage (Pty) Ltd

2022 Independent Heritage Specialist, in association with architectural historian. Compile Historical Archival Report of Tembisa Hospital, Ekurhuleni, Gauteng for PGS Heritage (Pty) Ltd, Finalise HIA Report and submit HIA report to Gauteng Provincial Heritage Resources Authority.

5 Languages:

English - excellent speaking, reading, and writing

Afrikaans –fair speaking, reading and writing

APPENDIX E

SSV – Palaeontology Theme

PALAEONTOLOGICAL FATAL FLAW ANALYSIS AND SITE SENSITIVITY VERIFICATION REPORT

PROPOSED 750MW COMBINED CYCLE GAS TURBINE POWER PLANT IN RICHARDS BAY, CITY OF UMHLATHUZE LOCAL

CONDUCTED BY

Banzai Environmental

1. INTRODUCTION 2
2. SITE SENSITIVITY VERIFICATION METHODOLOGY 7
3. OUTCOME OF SITE SENSITIVITY VERIFICATION 7
4. CONCLUSION 12
5. QUALIFICATIONS AND EXPERIENCE OF THE AUTHOR 13

This Palaeontological Site Sensitivity Report has been compiled considering the GN 320 and GN 1150 (20 March 2020)[2] and the NEMA EIA Regulations of 2014 (as amended) as indicated in the table below.

Table 1: Site sensitivity verification and minimum report requirements (GN 320 of 2020)

No.	Requirement	Applicable report section/ Comment
	The site sensitivity verification must be undertaken by an environmental assessment practitioner or a specialist.	Section 5
	The site sensitivity verification must be undertaken through the use of: (a) a desk top analysis, using satellite imagery;	Section 2

	(b) a preliminary on-site inspection; and	Section 2 and 4
	(c) any other available and relevant information.	Section 2
	2.3. The outcome of the site sensitivity verification must be recorded in the form of a report that: (a) confirms or disputes the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.;	Section 4
	b) contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity; and	Section 4
	(c) is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations	The SSV will be submitted as an appendix to the Palaeontological Impact Assessment

1. INTRODUCTION

Mabasa Energy and Fuels (Pty) Ltd (the "Applicant") intends to bid for the GASIPPPP and has proposed the development of a 750MW Combined Cycle Gas Turbine Power Plant (CCGT, the "Plant") in Richards Bay, which falls within the City of uMhlathuze Local Municipality in KZN (see Figure 1 below). The earmarked site is located on Erf 16673 in Phase 1F of the Richards Bay Industrial Development Zone (RBIDZ) (see Figure 2 below), under a long-term lease agreement (Nemai BID, 2024).

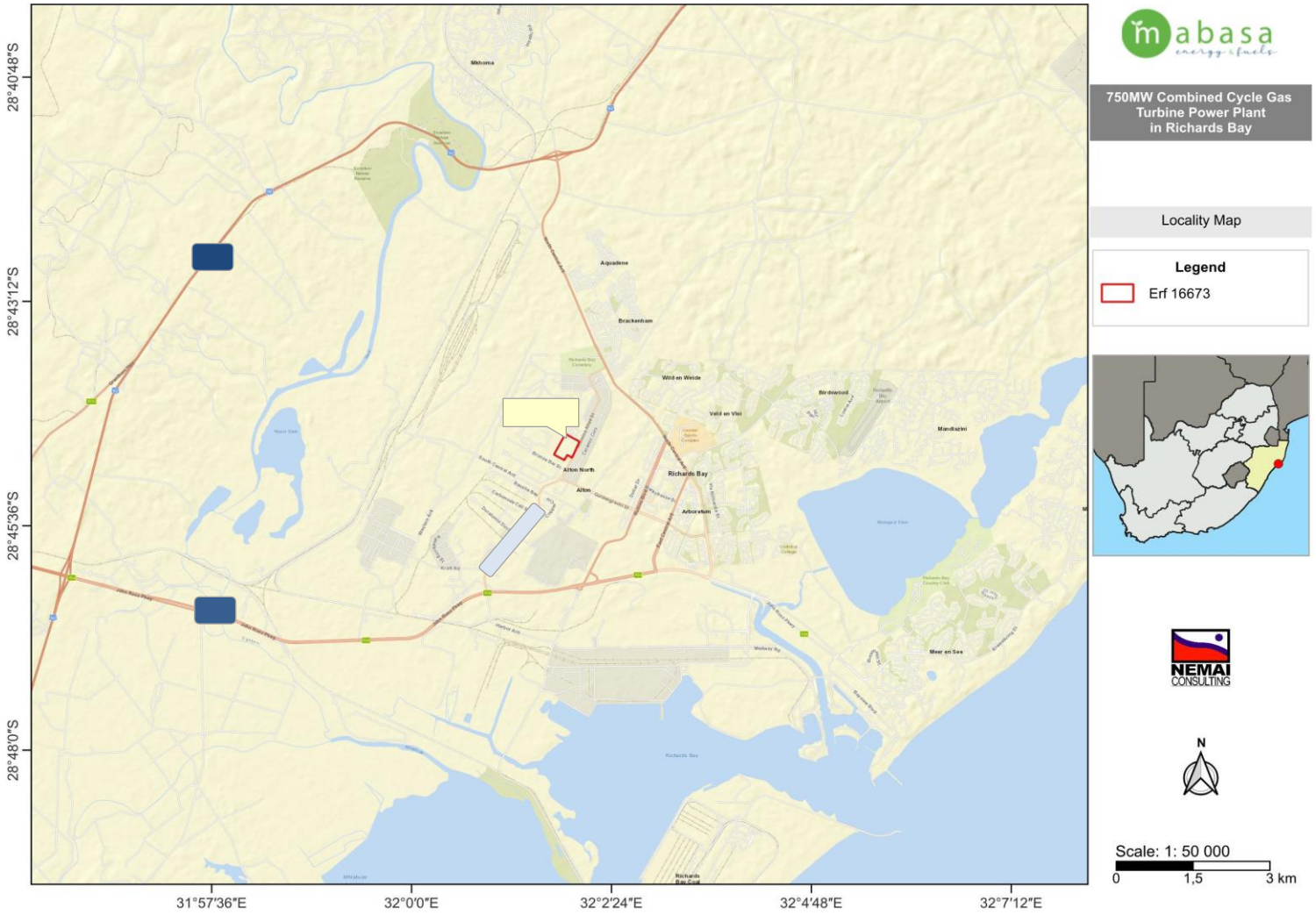

Figure 1: Layout of the project area.

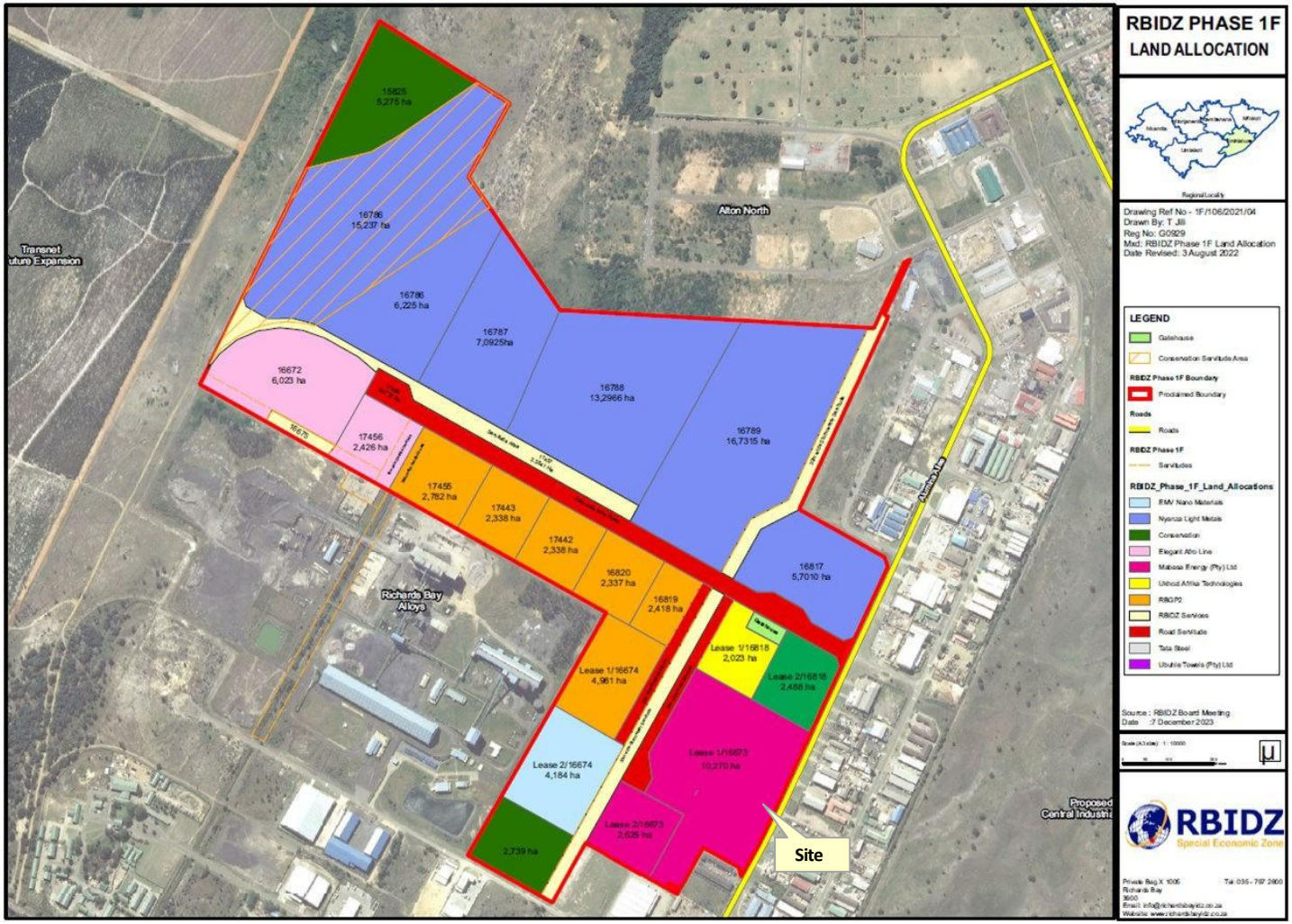

Figure 2: Location of the site in relation to the RBIDZ Phase 1 F.

The Combined Cycle Power Plant (CCPP) (the "Plant") will be designed to provide a reliable, efficient, and low cost means of generating electricity. Design features of the Plant will be carefully considered to provide the optimum balance between capital cost and operation and maintenance benefits, whilst considering environmental impacts associated with combustion of fuel and using the best available technologies.

The proposed Plant will comprise of the following key equipment:

- Two (2) General Electric (GE) Frame 9 (model 9F.03) combustion turbines and generators;
- Two (2) triple pressure, 3 drum, natural circulation Heat Recovery Steam Generators (HRSGs);
- One (1) condensing steam turbine and generator;
- One (1) de-aerating surface condenser;
- One (1) induced draft cooling tower;
- Balance of plant (BOP) equipment consisting of Pumps, Heat Exchangers, Transformers, Power Electrics, etc.;
- One (1) integrated plant distribution control system; and
- 275 kV Switchyard comprising of three (3) x 15kV to 275kV step-up transformers and one (1) station auxiliary transformer (the rating to be defined during detailed design).

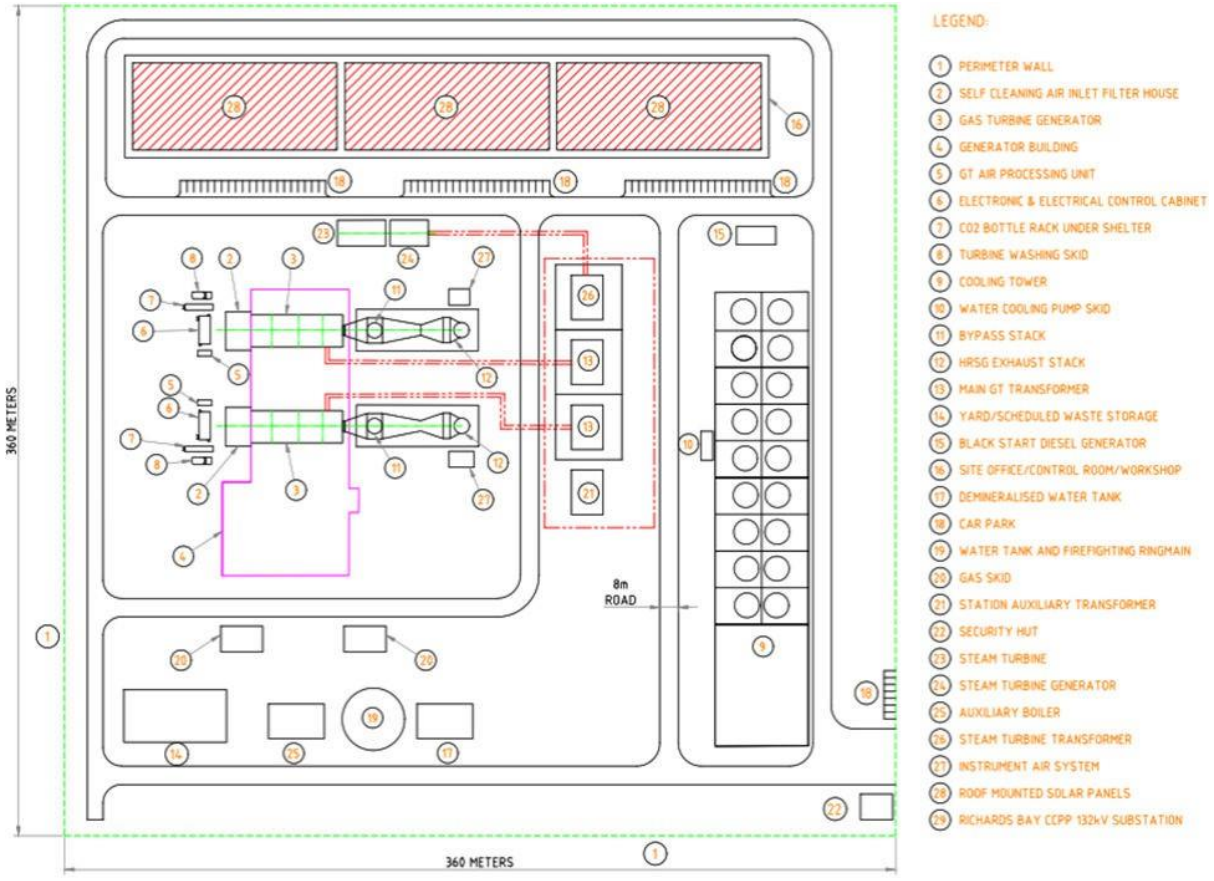

Figure 3: Power Plant Layout.

The Plant will be designed for base load operations at 500MW in Simple Cycle and 750MW in Combined Cycle on twenty-four hours a day, seven days a week basis.

The scope of supply for the Plant will be based on a "2+2+1 combination" comprising of two GE Frame gas turbines (the "Combustion Turbine") each with a dedicated HRSG to generate and supply steam to a shared steam turbine (the Combustion Turbine, HRSG and steam turbine together known as the "Power Plant"). Generators attached to each of the Combustion Turbines and steam turbines will supply electrical power to the grid.

Ambient air is drawn into the compressor element of the Combustion Turbine through the air inlet filtration and silencing system. Fuel is fired in the combustion section, and the resulting hot exhaust gases then expand through the turbine element, spinning the rotor and generator connected directly to it via a reduction gearbox. The Combustion Turbine has two functions: i) to produce electrical power through the generator and ii) to supply hot gases to the HRSG.

The exhaust gases from the Combustion Turbine will pass through the HRSG, where the heat will be used to generate steam. The gases will then exhaust through the rear HRSG stack. During maintenance or other shut-down of the proposed HRSG model, exhaust gases from the Combustion Turbine will be diverted through the front HRSG stack, preventing steam generation, but still enabling the Combustion Turbine to continue to generate power to the grid. The HRSG forms the link between the Combustion Turbine and the steam cycle. It is proposed that a horizontal gas flow type waste heat recovery boiler is used for ease of future access and maintenance. The proposed HRSG model utilizes a two-stage high pressure and low-pressure steam design (subject to final engineering) with exhaust gases flowing through the HRSG.

The steam generated in the HRSG is then distributed to the steam turbine. High-pressure (HP) steam is supplied directly to the steam turbine inlet. Low-pressure (LP) steam enters the steam turbine through a second admission steam pressure controller. The steam expands through the steam turbine sections causing the rotor to spin and generate electrical power through the generator connected directly to it via a gear box. The steam exits the steam turbine through an exhaust system connected to a condenser, where the steam is returned to a condensate / liquid state after being passed through a cooling water system. The Condensate is pumped from the condenser and returned to the HRSG where the steam generating cycle process starts again.

In terms of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) Environmental Impact Assessment (EIA) Regulations [4 December 2014, Government Notice (GN) R982, R983, R984 and R985, as amended], various aspects of the proposed development may have an impact on the environment and are considered to be listed activities. These activities require authorisation from the National Competent Authority (CA), namely the Department of Forestry, Fisheries and the Environment (DFFE), prior to the commencement thereof. Two (2) applications for EA for the proposed

development will be submitted to the DFFE, one (1) for the BA process (i.e. for Grid) and one (1) for the Scoping and EIA process (i.e. for PV), in terms of the NEMA EIA Regulations of 2014 (as amended).

In accordance with GN 320 and GN 1150 (20 March 2020)[2] of the NEMA EIA Regulations of 2014 (as amended), prior to commencing with a specialist assessment, a site sensitivity verification must be undertaken to confirm the current land use and environmental sensitivity of the proposed project areas as identified by the National Web-Based Environmental Screening Tool (i.e., Screening Tool). Elize Butler from Banzai Environmental, has been commissioned to verify the sensitivity of the project sites under these specialist protocols.

2. SITE SENSITIVITY VERIFICATION METHODOLOGY

The Palaeontology Sensitivity Verification was undertaken by the following methodology:

- The site sensitivity is established through the National Environmental Web-Based Screening Tool
- The Site is mapped on the relevant Geological Map to determine the underlying geology of the development
- Then the site is mapped on the South African Heritage Resources Information System (SAHRIS) PalaeoMap, and the Sensitivity of the proposed development established.
- Other information is obtained by using satellite imagery and
- Palaeontological Impact Assessments and Desktop Assessments of projects in the same area are studied.
- NO SITE INVESTIGATION was conducted for the site due to the Palaeontological Sensitivities indicated on the SAHRIS PalaeoMap and DFFE Screening Tool. Only a desktop assessment for the proposed development will be conducted.

3. OUTCOME OF SITE SENSITIVITY VERIFICATION

The 750 MW CCGT in Richards Bay is depicted on the 1:250 000 St Lucia 2732 Geological Map (Council for Geosciences, Pretoria) (Figure 4). This map indicates that the development is underlain by Quaternary sand (Qs, yellow).

Updated geology (Groenewald et al, 2014) indicates that the study area is underlain by the Maputaland Group (Figure 5). The Palaeontological Technical Report for KwaZulu-Natal (Groenewald, 2012) also indicates that the Richards Bay area is underlain by the Maputaland Group.



Figure 4: Extract of the 1:250 000 St Lucia 2732 Geological Map (Council of Geoscience, Pretoria) indicating that the CCGT study area is underlain by Quaternary sand (Qs, yellow).

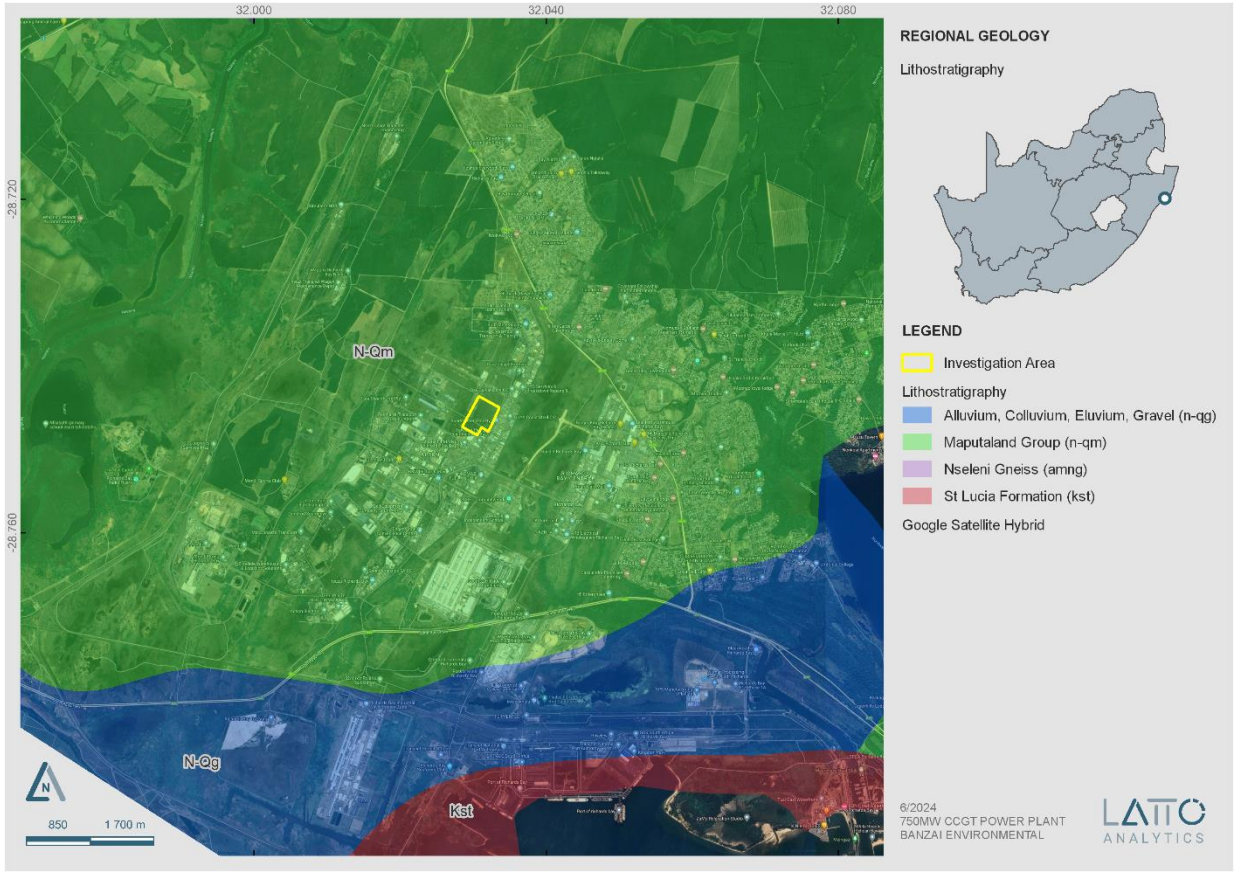

Figure 5: Updated geology (2014, Council for Geosciences, Pretoria) indicates that the study area is entirely underlain by the Maputaland Group (n-qm).

The SAHRIS PalaeoMap (Figure 6) indicates that the Palaeontological Sensitivity of the proposed development is underlain by sediments with a Low (blue) Palaeontological Sensitivity. The proposed development is indicated in yellow.

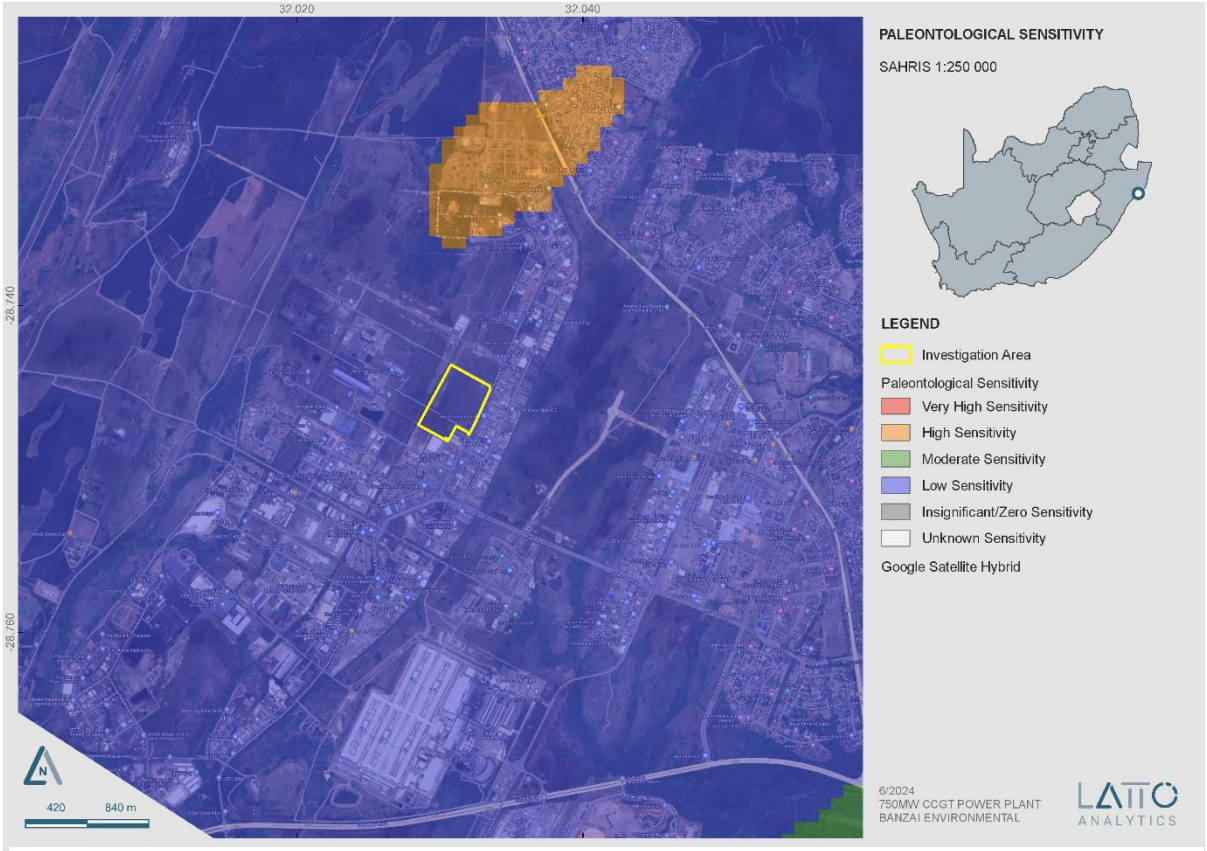

Figure 6: Extract of the 1: 250 000 SAHRIS PalaeoMap map (Council of Geosciences) indicating the proposed 750 MW CCGT in Richards Bay in yellow.

Table 2: Palaeontological Sensitivity according to the SAHRIS PalaeoMap (Almond et al, 2013; SAHRIS website).		
Colour	**Sensitivity**	**Required Action**
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study; a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	**LOW**	**no palaeontological studies are required however a protocol for finds is required**
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

The PalaeoMap of the South African Heritage Resources Information System (**Figure 6, Table 2**) indicates that the Palaeontological Sensitivity of the CCGT Power Plant is Low (blue) (Almond and Pether, 2009; Almond *et al*., 2013).

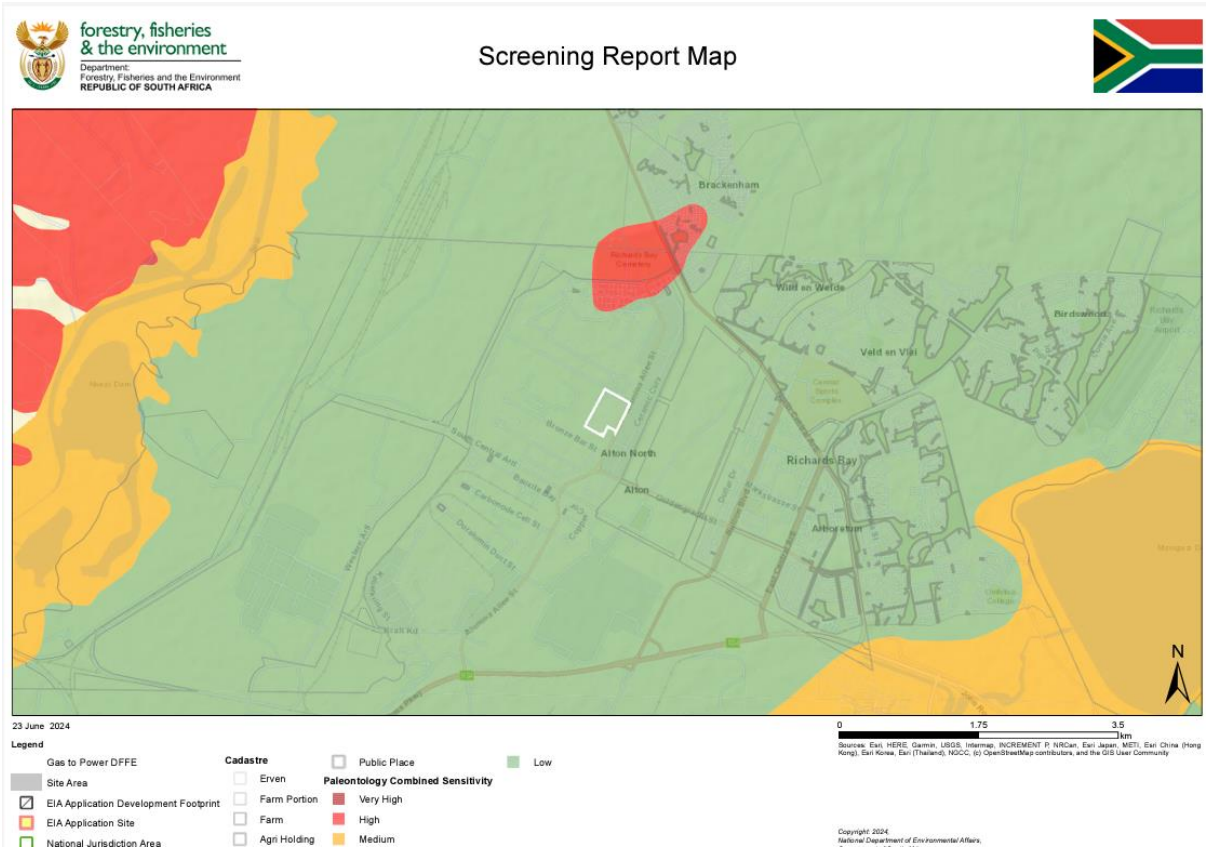

Figure 7: Palaeontological Sensitivity of the CCGT Power Plant development by the National Environmental Web-bases Screening Tool.

The National Environmental Web-based Screening Tool indicates that the Palaeontological Sensitivity of the development is Low (green).

4. CONCLUSION

The Site Sensitivities of the proposed CCGT Power Plant development has been verified and it was found that:

> The SAHRIS Palaeosensitivity map indicates that the Palaeontological Sensitivity of the development is Low, which is confirmed by the National Environmental Web-based Screening Tool

These maps indicate that the proposed CCGT Power Plant development area is not Sensitive from a Palaeontological point of view. This is confirmed by the combined Palaeontological Databases of the

country and PIAs in the area that also indicates an absence of fossils near the development. NO SITE INVESTIGATION was conducted for the site due to the Palaeontological Sensitivities indicated on the SAHRIS PalaeoMap and DFFE Screening Tool. Only a desktop assessment for the proposed development will be conducted.

Name	Screening Tool Sensitivity	Confirmed Sensitivity	Brief Statement
CCGT Power Plant	Low	Low	NO SITE INVESTIGATION was conducted for the site due to the Palaeontological Sensitivities indicated on the SAHRIS PalaeoMap and DFFE Screening Tool. Only a desktop assessment for the proposed development will be conducted.

5. QUALIFICATIONS AND EXPERIENCE OF THE AUTHOR

Mrs. Elize Butler conducted the current study. For developments in the Free State, KwaZulu-Natal, Eastern, Northern Cape, Northwest, Gauteng, Limpopo, and Mpumalanga, she has completed almost 750 palaeontological impact assessments. She has an MSc (*cum laude*) in Zoology with a focus in Palaeontology from the University of the Free State in South Africa, and she has more than 30 years of experience in the field. She has knowledge of finding, collecting, and curating fossils. She began conducting PIAs in 2014 and has been a member of the Palaeontological Society of South Africa (PSSA) since 2006.

APPENDIX F

SSV – Landscape/Visual Impact Assessment Theme

Scientific Aquatic Services

Applying science to the real world

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Attention: Mr Donavan Henning

Dear Sir,

SITE VERIFICATION

VISUAL (LANDSCAPE) SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPSOSED MABASA 750MW COMBINED CUCLE GAS TURBINE (CCBT) POWER PLANT IN RICHARDS BAY INDUSTRIAL DEVELOPMENT ZONE (RBIDZ), KWAZULU NATAL PROVINCE

Introduction

Mabasa Energy and Fuels (Pty) Ltd intends to bid for the Gas Independent Power Producers Procurement Programme (GASIPPPP) and has proposed the development of a 750MW Combined Cycle Gas Turbine Power Plant in Richards Bay, which falls within the City of uMhlathuze Local Municipality in KZN, hereafter referred to as the "study area". The study area is located on a Portion of Erf 16673 in Phase 1F of the Richards Bay Industrial Development Zone (RBIDZ). Nemai Consulting (Pty) Ltd was appointed by Mabasa Energy and Fuels to undertake the Scoping and Environmental Impact Reporting (S&EIR) Process for the Project in terms of the Environmental Impact Assessment (EIA) Regulations of 2014, as amended. It is noted that the proposed project will also require other environmental approvals, such as an Atmospheric Emission License (AEL) in terms of the National Environmental Management Air Quality Act (Act No. 39 of 2004).

According to the "Protocols for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes ("the Protocols") published in Government Gazette No. 43110 on 20 March 2020 and Government Gazette No. 43110 on 20 March 2020, the Environmental Assessment

Practitioner (EAP) must verify the current use of the site in question and its environmental sensitivity as identified by the Screening Tool to determine the need for specialist inputs in relation to the themes included in the Protocols. The Protocols are allowed for in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA"). The Protocols must be complied with for every new application for Environmental Authorisation that is submitted after 9 May 2020.

This document serves as the Visual (Landscape [Solar]) Site Sensitivity Verification Report for the proposed Mabasa 750MW Gas Powerplant in Richards Bay, in the Kwazulu Natal Province.

Study Area

The study area is located immediately west of Richard's Bay Central, which is located within the uMhlathuze Local Municipality, an administrative area of the King Cetshwayo District Municipality. The study area is situated 3 km north of the R34 John Ross Highway and 0.5 km southwest of the R619 regional road. The study area is located within a largely developed area with the immediate surrounding areas comprising predominantly industrial zones, residential developments and various service industries (e.g., petrol stations).

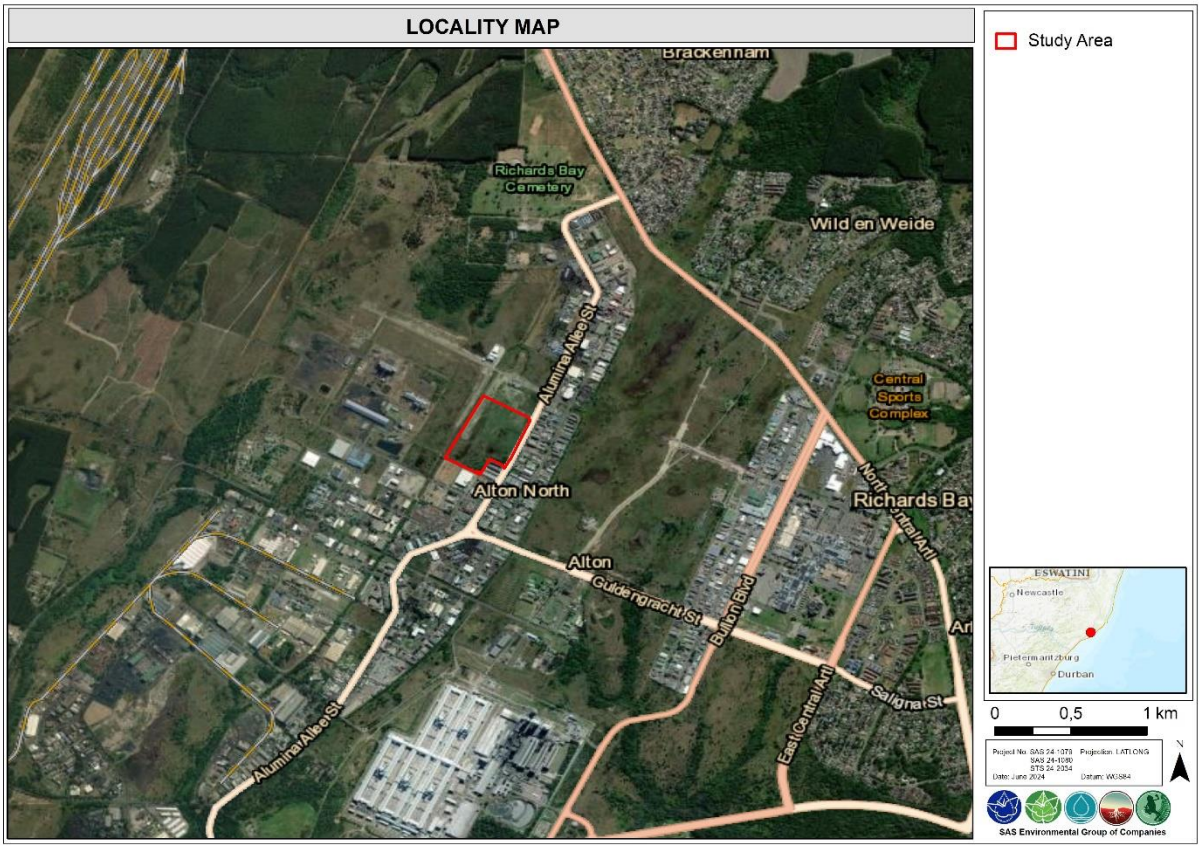

Figure 1: Digital satellite image depicting the location of the proposed Mabasa 750MW Gas Powerplant in relation to the surrounding area.

This Visual (Landscape [Solar]) site sensitivity verification report relates to a Screening Tool Report (STR) completed for the site in June 2024.

Site Verification Methodology

A site visit was conducted by the specialist to inform the specialist reports required for the proposed project.

Visual (Landscape) Site Verification

The table below provides information regarding the outcome of the Screening tool in terms of the landscape theme sensitivity associated with the proposed project as well as a brief summary of the outcome of the Visual Impact Assessment report in response.

Table 1: Visual (Landscape) Theme Sensitivity analysis for the proposed project.

Environmental Theme	Applicable Protocol	Response
Visual (Landscape) Sensitivity Rating: There was no sensitivity rating, thus the landscape was deemed to have no sensitivity in terms of industrial development aesthetic impacts.	No specific protocol - consider general requirements (GG 43110 of 20/03/2020)	An initial site assessment was conducted as part of the Visual Impact Assessment, by Scientific Aquatic Services. During the site visit it was determined that the landscape associated with the study area is similar to its surroundings and the larger region. The study area is situated within the Richards Bay Industrial Development Zone (RBIDZ), therefore it is surrounded by industrial development. The field assessment further indicated that the dense wooded grassland vegetation surrounding the study area and within the immediate area as well as the distance from the residential areas, renders no visibility of the proposed development. As such, it is deemed appropriate that the screening tool did not highlight a visual/ landscape sensitivity theme for the study area. The EIA report will provide a detailed description of the quality of the landscape prior to development taking place and then identifying possible visual impacts after development associated with the proposed project and provided suitable mitigation measures to best mitigate the potential visual impact on the receiving environment.



Figure 2: Representative photographs of the study area, displaying dense but low vegetation cover, interspersed with tree clumps and surrounded by the existing industrial facilities.



Figure 3: View along the road, overlooking the industrial area, where the proposed study are will not be visible due to the vegetation and existing facilities.

Yours Faithfully,
Stephen van Staden (Pr.Sci.Nat)

APPENDIX G

SSV – Hydrology Theme

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Our Reference 750MW CCGTPP

Your Reference 24-0250

Date: **04 July 2024**

Email reply to: **hendrikb@gcs-sa.biz**

1 INTRODUCTION

This memo serves as the preliminary hydrological specialist impact assessment and site sensitivity verification (SSV) for the proposed 750MW Combined Cycle Gas Turbine Power Plant (CCGTPP) in Richards Bay, Kwazulu-Natal (KZN).

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1.1 Background

Following the promulgation of the Integrated Resource Plan 2019 (IRP 2019), the Minister of Mineral Resources and Energy determined that the procurement of New Generation Capacity is required to ensure energy security and that approximately 3000 (three thousand) megawatts ("MW") would be procured, to be generated from gas. In response, the Department of Mineral Resources and Energy (DMRE) formally invited interested parties in December 2023 to register prospective bids under the first bid window of the Gas Independent Power Producers Procurement Programme (GASIPPPP Bid Window 1).

A total of 2000 MW will be procured in this first round from Projects supplying new generation Capacity, Ancillary Services and Energy Output to be produced from gas-fired power generation technology. This GASIPPPP specifically targets land-based electricity generation facilities utilising natural gas, located anywhere within the borders of the Republic of South Africa.

Mabasa Energy and Fuels (Pty) Ltd (the “Applicant”) intends to bid for the GASIPPPP and has proposed the development of a 750MW Combined Cycle Gas Turbine Power Plant (the “Plant”) in Richards Bay, which falls within the City of uMhlathuze Local Municipality in KZN. The earmarked site is located on Erf 16673 in Phase 1F of the Richards Bay Industrial Development Zone (RBIDZ) under a long-term lease agreement (refer to Figure 1-1).

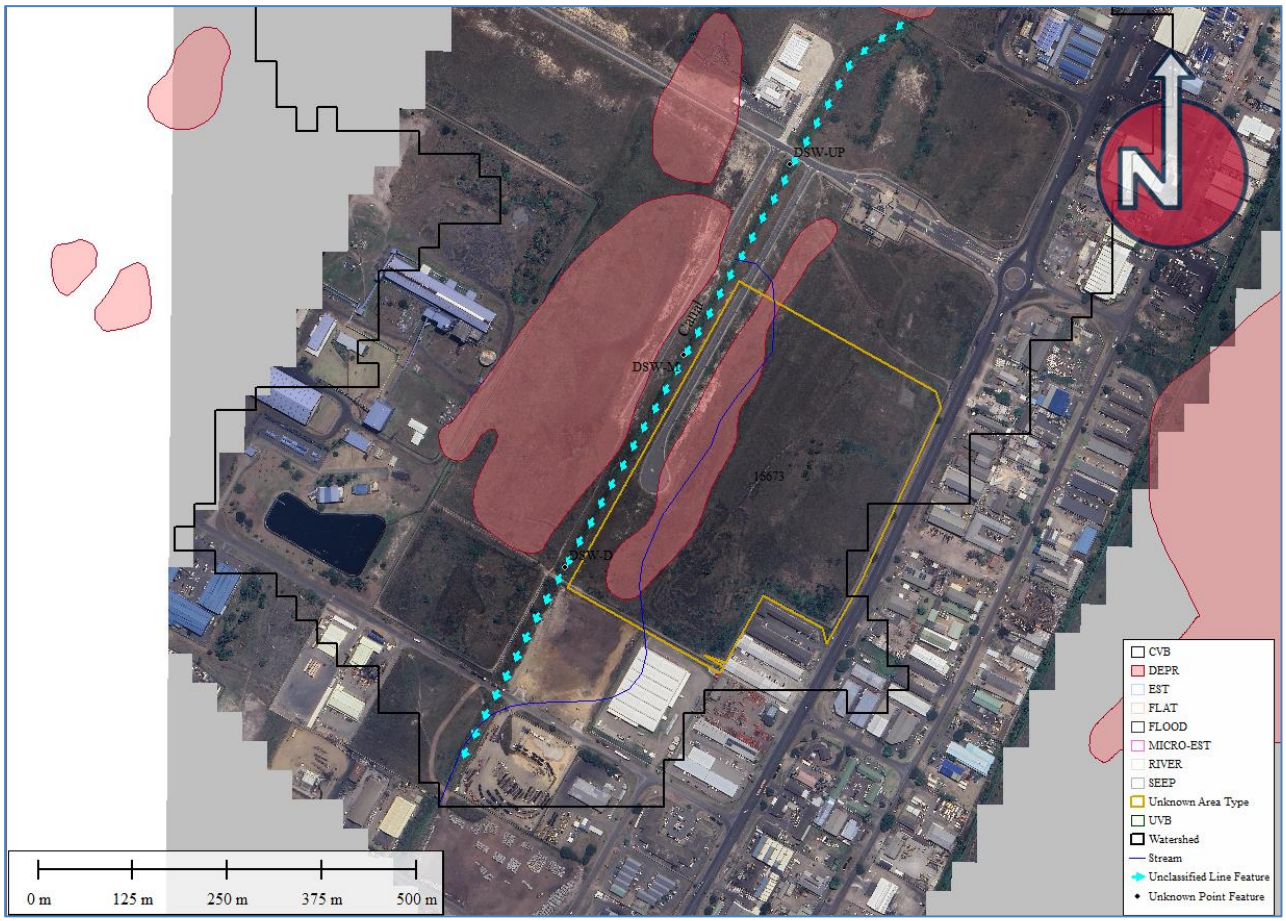


Figure 1-1: Site Locality

1.2 Project Overview

The combined Cycle Power Plant (CCPP) (the “Plant”) will be designed to provide a reliable, efficient, and low-cost means of generating electricity. Design features of the Plant will be carefully considered to provide the optimum balance between capital cost and operation and maintenance benefits, whilst considering environmental impacts associated with the combustion of fuel and using the best available technologies.

The proposed Plant will comprise of the following key equipment:

- Two (2) General Electric (GE) Frame 9 (model 9F.03) combustion turbines and generators;
- Two (2) triple-pressure, 3-drum, natural circulation Heat Recovery Steam Generators (HRSGs);
- One (1) condensing steam turbine and generator;
- One (1) de-aerating surface condenser;
- One (1) induced draft cooling tower;
- Balance of plant (BOP) equipment consisting of Pumps, Heat Exchangers, Transformers, Power Electrics, etc.;
- One (1) integrated plant distribution control system; and
- 275 kV Switchyard comprising three (3) x 15kV to 275kV step-up transformers and one (1) station auxiliary transformer (the rating to be defined during detailed design).

The plant layout is provided in Figure 1-2.

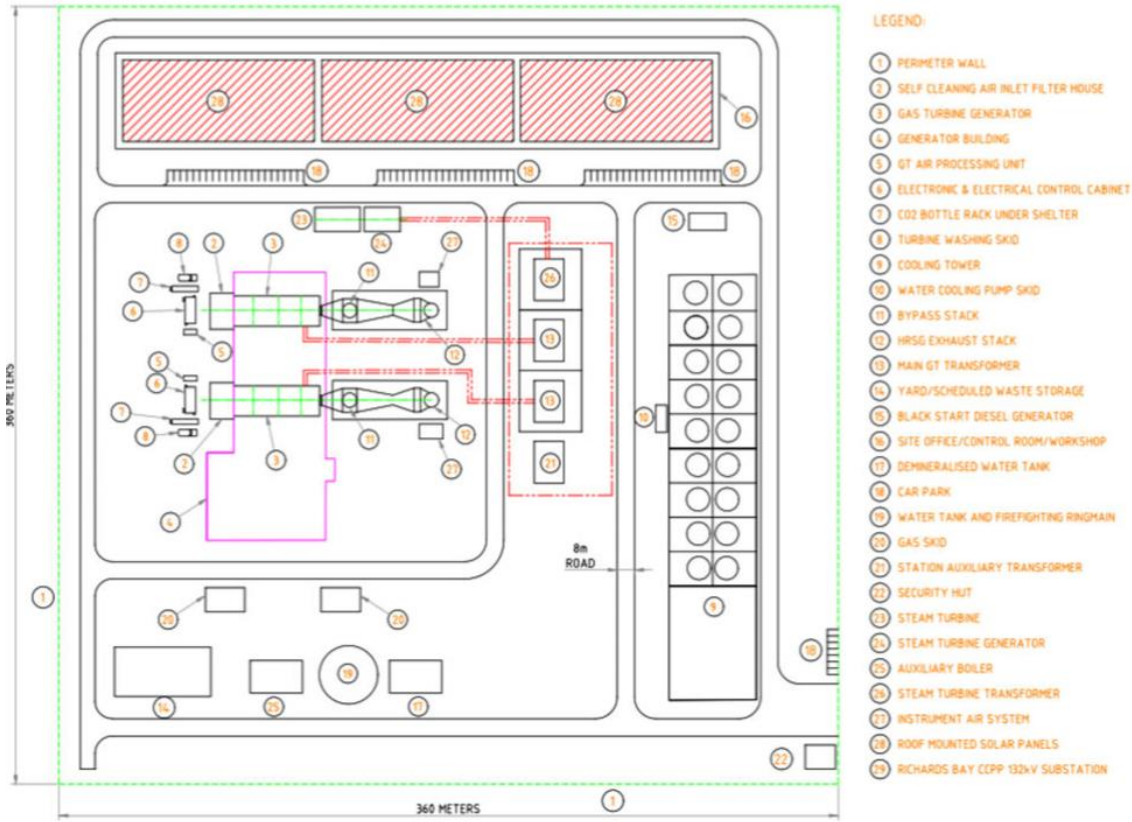


Figure 1-2: Proposed site layout

1.3 Objectives

This hybrid desktop and field-level site verification assessment was undertaken, to confirm the findings of the EIA screening tool. As part of this desktop assessment, the inherent risk posed by the proposed activity was determined and the need for a full investigation was stipulated.

Key deliverables of this compliance statement report include:

- Providing an overview of the general hydrology setting;
- Providing an overview of watercourses in the study area and risk with regards to the proposed activity;
- Confirms or disputes the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.; and
- Motivation and evidence of either the verified or different use of the land and environmental sensitivity and is submitted together with the relevant assessment report prepared per the requirements of the Environmental Impact Assessment Regulations 1 (EIA Regulations).

2 SPECIALIST IMPACT ASSESSMENT SUMMARY

Table 2-1: Study and specialist overview

STUDY	**Hydrological Impact Assessment**
SPECIALIST	**Hendrik Botha**
COMPANY	**GCS Water and Environment (Pty) Ltd**
QUALIFICATIONS AND PROFESSIONAL REGISTRATION	**MSc Environmental Sciences (Geohydrology & Geochemistry)** **BSc Hons. Environmental Sciences (Hydrology)** **BSc. Geology and Chemistry** **PR SCI NAT 400139/17** **Refer to Annexure A and Annexure B.**
EXTERNAL REVIEW	**Andrew Johnstone (CEO, GCS)**

2.1 Site Overview

The project falls within the quaternary catchment W12F of the Pongola-Mtamvuna Water Management Area (WMA) (DWS, 2016). Elevations for the site area range from 40 to 43 metres above mean sea level (mamsl) and are therefore relatively flat (refer to Figure 2-1).

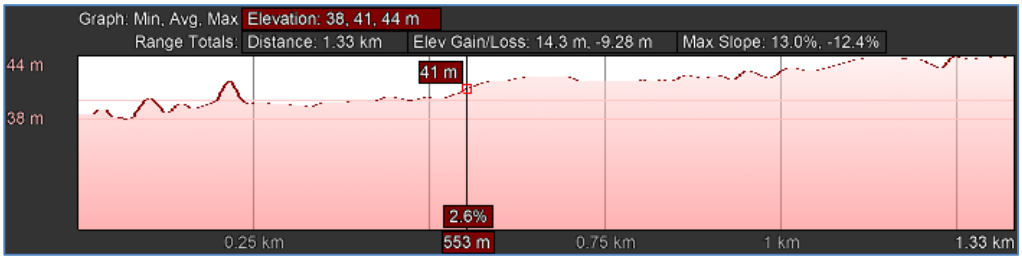


Figure 2-1: Typical cross section from headwaters to the project area

One (1) hydrological response unit (HRU) describes the surface water drainage of the greater project area (refer to Figure 1-1). On a more local scale (site specific) drainage is towards the south-west. The proposed site is nested in the RBIDZ and surrounded by built-up areas towards the southwest and open veld areas towards the northwest. The mean annual rainfall of the site is in the order of 1285 mm/yr and evaporation is in the order of 1300 mm/yr (WRC, 2015).

According to the National Wetland Map 5 (Van Deventer, 2018), there is a depression wetland associated with the site. There are no recognised natural drainage lines, rivers or streams associated with the development site. The closest non-perennial stream (Bhizolo Stream) is 1.2km east of the site and a second non-perennial stream (Ngodweni Stream) is 1.58km towards the south-east. Though there are no recognised streams a stormwater canal runs parallel to the western side of the site, which conveys stormwater from the RBIDZ to a 3rd non-perennial stream (Mhlangabezani stream) about 3.7 km downstream of the site. (refer to Figure 2-2).

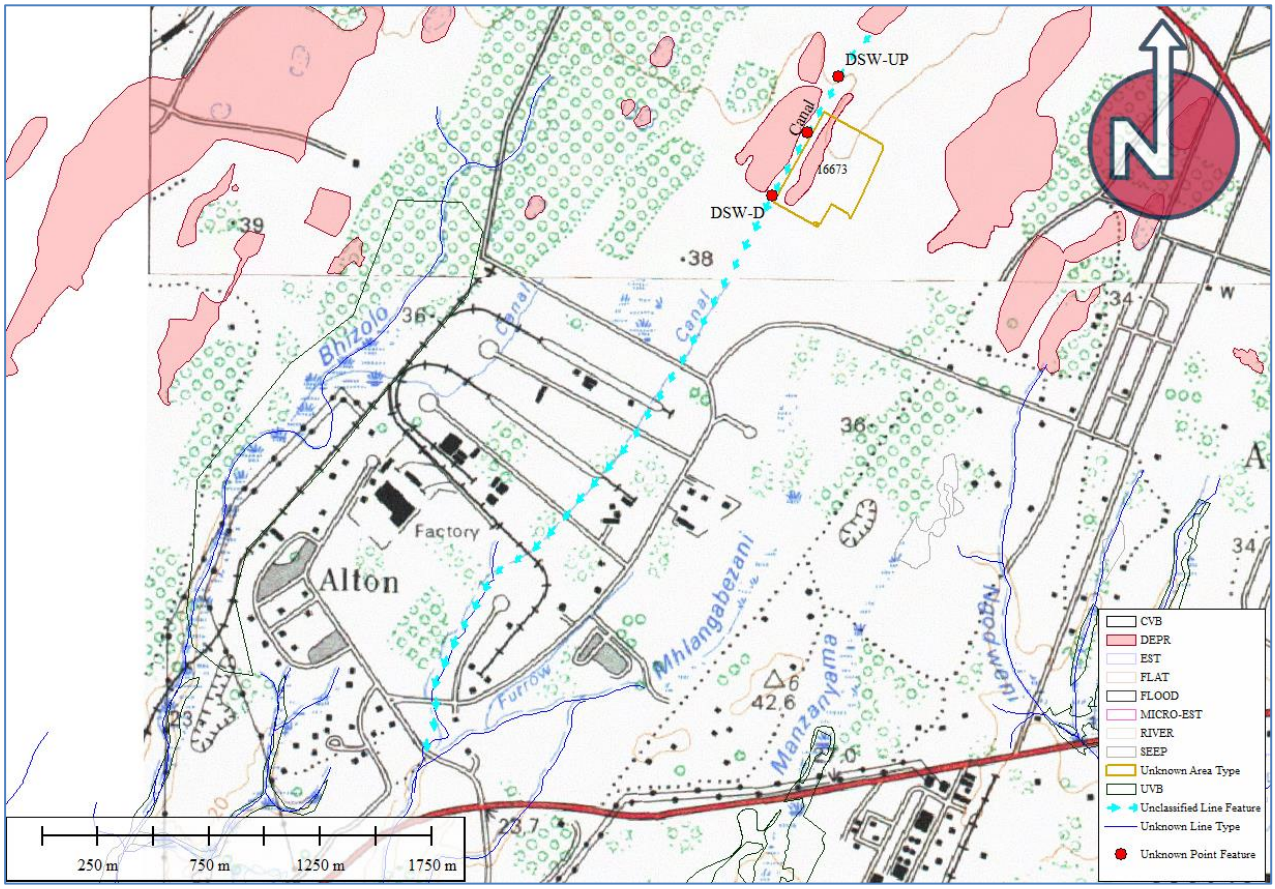


Figure 2-2: Topography map, sample sites and canal drainage system

2.2 Site observations

GCS undertook a site survey on 2024-06-11. The following was observed:

- There appears to be a wetland area on site, based on observations of the vegetation.
- The area is characterized by grass and veld shrubs.
- Surface drainage is towards the south-west, with a very small slope rise noted. The area is generally flat.

- There is a water canal that flows along the western end of the site. This is a man-made structure but now has developed wetland-type reeds. During the visit, the water was flowing low. Stream bank height ranges from 1.5 to 2.5 m.
- Two culverts exist in the canal, one upstream and one downstream with regards to the site position.
- 3 Samples (1L) were collected (Up-, Mid- and downstream) and the results will be made available in the full hydrology report. Sample names are listed below, and field measurements are available in Table 2-2.
    - DSW-Up
    - DSW-M
    - DSW-D
- No other observations were made.

Table 2-2: Sample sites and field measurements & photographs

Sample ID	Lat	Long	pH	EC (uS/cm)	TDS (mg/l)	Temp	Comment
DSW-UP	-28.742244	32.031466	7.4	580	280	18.7	Located north west, upstream of the site.



DSW-M	-28.744557	32.030113	6.9	230	100	18.3	Located west, mid-stream of the site.



DSW-D	-28.747072	32.028492	6.9	230	100	15.9	Located on the south west corner of the site, Down stream of the site.



2.3 Preliminary Impact Statement

Direct and indirect impacts

The anticipated hydrological environmental risk concerning the construction and operational phase of the proposed project was evaluated. Impact tables are available in Section 2.5.

2.3.1 Construction phase

The following activities are anticipated during the construction phase of the project:

- Typical earthworks are required to clear the areas.
- Construction of access roads, foundations and buildings.
- Excavations.
- Establishment of service platforms, material handling areas and other temporary infrastructure.
- Dust suppression of access roads.
- Placing of topsoil in designated areas.

The identified possible hydrological impacts for the construction phase include:

- The destruction of the vadose zone sediments by clearing activities (levelling) or cut and fill activities. This could lead to sediment runoff and surface water contamination.
- Clearing topsoil from footprint areas will influence the rate of infiltration of water to the shallow groundwater system and/or baseflow component to shallow streams.
- Handling of waste and transport of material can cause various types of spills (i.e. hydrocarbons) which can infiltrate and contaminate the soils and groundwater system.
- Oil and fuel spills and leakages at vehicle park areas, and in the project areas, may cause poor-quality seepage and soil contamination.

Visual monitoring of the site on an ongoing (monthly) basis will serve as a 1st order detection system for any soil and water pollution that may take place. The collected information should be used as part of an active soil/water management system and act as an early warning system for the application of mitigation measures. The identified impacts are not likely to negatively affect the commencement of the proposed projects.

2.3.2 Operational phase

The possible hydrological impacts for the operational phase of the project are likely to be:

- Poor quality stormwater discharge onto soils or into the surface environment (nearby canal).
- Oil and fuel spillages associated with service vehicles accessing and undertaking maintenance work at the site, as well as leakages from residential vehicles parked at the site.

In general, the operational phase risk associated with the project is predicted **low**, and it is foreseen that the impacts can be managed.

2.3.3 Closure and decommissioning phases

It is foreseen that the risks and impacts will be similar to the construction phase. However, in context to the operational phase (and if impacts occur) this phase will serve as rectifying actions to eliminate/reduce hydrological impacts caused (i.e. rehabilitation and removal of the source of potential pollution).

2.3.4 Cumulative impacts

The hydrology impact assessment assessed the cumulative impacts of the following projects (refer to Table 2-3) within a 30km radius of the site (retrieved from the SA Renewable Energy EIA Applications Website, hosted by DFFE – date of access 4-07-2024, refer to Figure 2-3).'

Table 2-3: Summary of other projects within a 30km radius of the site

DEA_REF	PROJ_TITLE	APP_RECEIV	APPLICANT	EAP	TECHNOLOGY	MEGAWATT	PRJ_STATUS
14/12/16/3/3/2/2041	The 320MW emergency risk mitigation power plant (RMPP) and associated infrastructure on sites located in Alton, Richards Bay within the Umhlathuze Local Municipality in Kwa-Zulu Natal Province	30/11/2020	Phinda Power Projects (Pty) Ltd	Savannah Environmental (Pty) Ltd	Solar PV	320	Approved
14/12/16/3/3/2/867	400 MW Richards Bay Power Facility on Erven 17455, 17443 and 17442 within the Richards Bay Industrial Development Zone, uMthlathuze Local Municipality in the Kwazulu Natal Province	15/06/2016	Richards Bay Gas Power 2 (Pty) Ltd	Savannah Environmental (Pty) Ltd	Solar PV	400	Approved
14/12/16/3/3/2/2117	The construction and operation of the Phakwe Richards Bay gas power 3 combined cycle power plant (ccpp), Richards Bay, KwaZulu-Natal Province.	12/11/2021	Richards Bay Gas Power 3 (Pty) Ltd	Savannah Environmental (Pty) Ltd	Biomass_Biofuels	2000	Approved
14/12/16/3/3/1/2258	The proposed 132kV underground transmission infrastructure and associated switching station on sites located in Alton, Richards Bay, KwaZulu-Natal Province	13/11/2020	Phinda Power Projects (Pty) Ltd	Savannah Environmental (Pty) Ltd	Biomass_Biofuels	450	Approved
14/12/16/3/3/2/2032	Proposed Nseleni Independent Floating Power Plant (NIFPP) and associated infrastructure for the evacuation of power from the NIFPP to the National Grid, Port of Richards Bay, KwaZulu-Natal.	05/11/2020	Nseleni Power Corporation Pty (Ltd)	Sustainable Environmental Solutions (Pty) Ltd	Biomass_Biofuels	700	Refused
14/12/16/3/3/2/2033	Proposed Liquid Natural Gas (LNG) receiving and storage facility and associated physical infrastructure to support the Nseleni Independent Floating Power Plant, Port of Richards Bay, KwaZulu-Natal.	05/11/2020	Anchor Energy Pty (Ltd)	Sustainable Environmental Solutions (Pty) Ltd	Biomass_Biofuels	700	Refused
14/12/16/3/3/2/2007	The Proposed Gas to Power Powership Project at Port of Richards Bay within UMhlathuze Local Municipality, King Cetshwayo District, KwaZulu-Natal Province.	08/10/2020	Karpowership SA (Pty) Ltd	Triplo4 Sustainable Solutions	Biomass_Biofuels	0	Refused

In terms of the construction and operational phase, there are expected cumulative hydrological impacts on the soils associated with the site. The impact is predicted to improve after the development has ceased. No cumulative hydrological impacts are expected in the context of the proposed projects mentioned above. The increase in runoff volumes from the site will be marginal, due to the proposed project scale (350m x 350m – refer to Section 1.2).

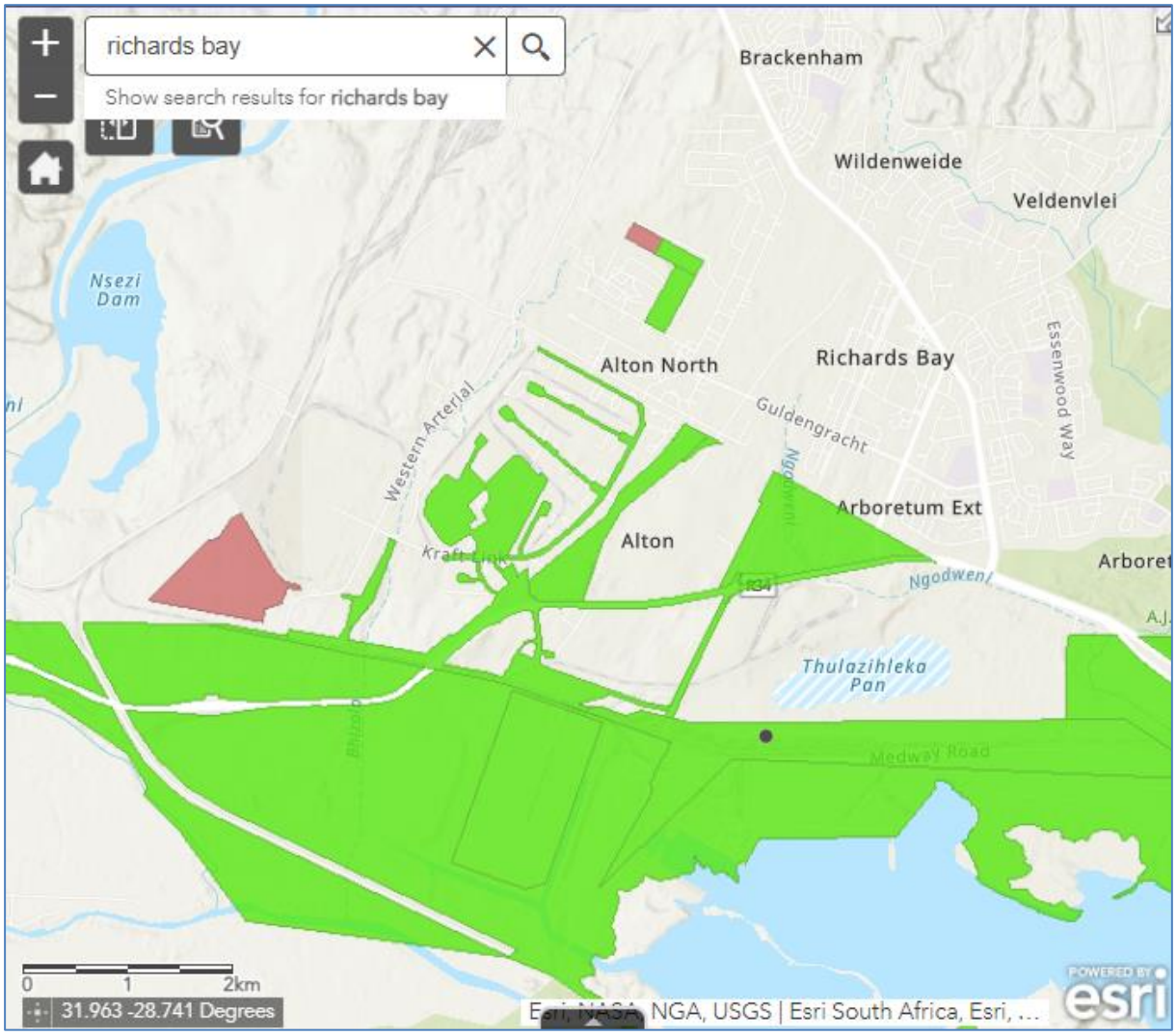


Figure 2-3: Overview of other projects associated with the project area DFFE (2024)

2.4 Impacts

The hydrological impacts as identified (and discussed above) are summarised in the tables below. Detailed risk assessment and findings are available in the Hydrology Assessment Report that will be compiled.

DIRECT & INDIRECT IMPACTS

Issue	SIGNIFICANCE PRE-MITIGATION	SIGNIFICANCE POST-MITIGATION
Construction Phase		
Vadose zone soils and subsequent aquifer (groundwater table) Disturbing vadose zone during soil excavations/construction activities. Net Result of Earthworks and Construction	**LOW (–)**	NO SIGNIFICANCE
Vadose zone soils and subsequent aquifer (groundwater table) Poor quality seepage from machinery used to excavate soils. Oil, grease, and fuel leaks could lead to hydrocarbon contamination of the vadose zone - which could percolate into the shallow aquifer. Net Result of Earthworks and Construction	**LOW (–)**	NO SIGNIFICANCE
Sedimentation of the nearby canal or water quality impacts due to potential dirty runoff generation.	**LOW (–)**	NO SIGNIFICANCE
Operational Phase		
Vadose zone soils and subsequent aquifer (groundwater table Anthropogenic activities. Poor quality seepage from service vehicles parked at the site.	**LOW (–)** **LOW (–)**	NO SIGNIFICANCE NO SIGNIFICANCE
Vadose zone soils and subsequent aquifer (groundwater table Stormwater runoff and seepage into the vadose zone. Potential soil contamination as a result of poor stormwater drainage on-site. Increased erosion due to vegetation loss at stormwater intakes and outflows.	**LOW (–)**	NO SIGNIFICANCE
Local groundwater table Oil/fuel spillages may enter the regional groundwater table if prolonged percolation via the vadose zone takes place	**LOW (–)**	NO SIGNIFICANCE
Sedimentation of the nearby canal or water quality impacts due to potential dirty runoff generation.	**LOW (–)**	NO SIGNIFICANCE

CUMULATIVE IMPACTS

No impact is predicted based on the activity proposed and considering other activities within a 30km radius of the site.

2.5 Mitigation measures

2.5.1 Construction phase

- Only excavated areas apply to the project area.
- Park heavy machinery in lined areas and place drip trays under vehicles at the site.
- Backfill the material in the same order it was excavated to reduce contamination of deeper soils with shallow oxidised soils.
- Cover excavated soils with a temporary liner to prevent contamination.
- Retain as much indigenous vegetation as possible.
- Exposed soils are to be protected using a suitable covering or revegetating.
- Park heavy machinery in lined areas and place drip trays under vehicles at the site.
- Visual soil assessments for signs of contamination during construction (monthly).

2.5.2 Operational phase

- Visual soil assessments for signs of contamination during construction (monthly)
- Have oil and fuel cleanup kits on site.
- Clear any sandy deposits and debris that collect in the stormwater systems.
- Routine hydraulic monitoring of the stormwater system (monthly)

2.5.3 Stormwater management considerations

- **Assess the site constraints and any site-specific concerns, including:**
    - Specific vegetation that may need to be identified and/or isolated from the site disturbance.
    - The type of construction should consider landform. Avoid slab-on-ground construction on steep sites.
    - Up-slope drainage catchments that may need to be diverted around the work site.
    - Workspace limitations may require site-specific sediment control measures and/or the extensive use of skips or bins for material storage and waste management.
    - Expected rainfall intensity during the period of disturbance (wet season vs dry season).
- **Stabilise the site entry/exiting points:**
    - A stabilised site access must be established and if possible, limited to one point only. The access allows for construction vehicles to enter the work area while preventing the unnecessary tracking of sediment onto the nearby environment from multiple locations. A stabilised entry/exit point normally consists of a stabilised rock pad.
- **Prevent erosion & manage stockpiles:**

- Suitable material storage areas must be located up-slope of the main sediment barrier (e.g., sediment fence).
- Stockpiles kept on site for more than two weeks will require an impervious cover (e.g., builder's plastic or geofabric) to protect against raindrop impact. Stockpiles of sandy material located behind a sediment fence will only need a protective cover if the stockpiles are likely to be exposed to strong winds.

- **Manage site waste:**
  - Adequate waste containers must be provided on-site and maintained in a way that potential and actual environmental harm resulting from such material waste is minimised.

2.5.4 Cumulative impacts

It is difficult to implement mitigation measures specific to the cumulative impacts as the applicant only has jurisdiction over their development and not over other developments or farming activities in the area. However, the applicant must implement the mitigation measures listed above for the direct impacts.

Where practical and feasible, place proposed infrastructure in areas that are already disturbed to minimise cumulative loss of natural ecosystems and therefore important water sources and biodiversity areas. Limited cumulative impacts are predicted from a hydrological perspective.

2.6 Conclusion and full study requirements

According to the Screening Report for Environmental Authorization as Required by The 2014 EIA Regulations for the Proposed Site Environmental Sensitivity a Hydrological Assessment was flagged.

As per the preliminary risk assessment undertaken (refer to the previous section), the risk in terms of hydrology is deemed **low to marginal**. This is largely due to the proposed activity and the absence of any surface water streams. The National Wetland Map 5 suggest there may be a depression wetland system associated with the site, this would need to be confirmed by a wetland specialist.

Incidents on site (i.e. spillages of fuel or solvents etc.) during the construction phase and similarly during the operational phase (this includes any poor-quality seepage and stormwater runoff) could lead to contamination of the vadose zone/site soils, which could subsequently cause secondary impacts on the groundwater environment and nearby canal. Preventing soil pollution as well as good housekeeping during the operational phase will be key to limiting the hydrological impact. Due to the size of the proposed activities, no significant impact is predicted on the hydrological cycle. Impacts on climate change should be determined by a climate expert.

Due to the absence of watercourses and the man-made canal, there is no flooding risk associated with the site. **No flood line modelling is required as part of the full hydrology study**. It is assumed that the canal has been designed to handle 1-50 and 1-100-year flood events. However, significant weed growth has been noted in the canal which would need to be cleared. The vegetation will cause flow obstruction and could cause local flooding.

It is advised that a conceptual stormwater management plan be compiled to illustrate stormwater management systems which could be considered to integrate the site into the larger project site. Stormwater peak flows to the canal system need to be determined. The conceptual stormwater management plan should be incorporated into a dedicated hydrology report.

The full hydrology report will present the following:

- Legislative frameworks about hydrology studies;
- Sub-catchment and climate overview;
- Peak flow estimates and stormwater management plan;
- Full risk assessment;
- Surface water monitoring plan and baseline water quality assessment of the nearby canal.

Based on the proposed activities and mitigations to offset impacts, GCS believes that the authorisation of the activities should be considered. The proposed activities, from a hydrology (surface water risk) perspective, are considered low risk. The final decision rests with the Government Authorities and should be based on the predicted hydrological impacts as well as the socio-economic value of the project. This statement is further founded on the assumption that the proposed mitigation measures and EMPr recommendations be implemented during the life of the project.

ANNEXURE A: DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

Hydrological Assessment for the proposed 750MW Combined Cycle Gas Turbine Power Plant (CCGTPP) in Richards Bay, Kwazulu-Natal (KZN).

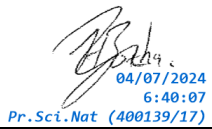
SPECIALIST INFORMATION

Specialist Company Name:	GCS Water and Environment (Pty) Ltd			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	7	Percentage Procurement Recognition	
Specialist name:	Hendrik Botha			
Specialist Qualifications:	MSc Environmental Sciences (Geohydrology & Geochemistry) BSc Hons. Environmental Sciences (Hydrology) BSc. Geology and Chemistry			
Professional affiliation/registration:	PR SCI NAT 400139/17			
Physical address:	23 Roggeveld Street, Sasolburg			
Postal address:				
Postal code:	1947	Cell:		
Telephone:	071 102 3819	Fax:		
E-mail:	hendrikb@gcs-sa.biz			

DECLARATION BY THE SPECIALIST

I, Hendrik Botha, declare that –

- I act as the independent specialist in this application.
- I will perform the work relating to the application objectively, even if this results in views and findings that are not favourable to the applicant.
- I declare that there are no circumstances that may compromise my objectivity in performing such work.
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity.
- I will comply with the Act, Regulations, and all other applicable legislation.
- I have no, and will not engage in, conflicting interests in the undertaking of the activity.
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken concerning the application by the competent authority; and - the objectivity of any report, plan, or document to be prepared by myself for submission to the competent authority.
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



Signature of the Specialist

GCS SA (Pty) Ltd

Name of Company:

04 July 2024

Date

ANNEXURE B: CV OF SPECIALIST

Hendrik Botha

Technical Director

LinkedIn:

CORE SKILLS

- Project management
- Analytical and numerical groundwater modelling
- Geochemical assessments and geochemical modelling
- Hydropedology, hydrological assessments & yield assessments
- Hydrology, floodline modelling & storm water management
- Groundwater vulnerability, impact, and risk assessments
- Technical report writing
- GIS and mapping

DETAILS

Qualifications

- BSc Chemistry and Geology (Environmental Sciences) (2012)
- BSc Hons Hydrology (Environmental Sciences) (2013)
- MSc Geohydrology and Hydrology (Environmental Sciences) (2014-2016)

Membership

- Groundwater Division of GSSA
- Groundwater Association of KwaZulu Natal Member
- International Mine Water Association (IMWA)

Languages

- Afrikaans - Speak, read, write.
- English - Speak, read, write.

Projects undertaken in

- South Africa
- Nigeria
- Namibia
- Liberia
- Malawi

PROFILE

Hendrik (Henri) Botha is currently the Technical Director at GCS Water and Environment. He holds an MSc in Environmental Science in Geohydrology & Geochemistry, and a BSc Hons. Degree in Hydrology. He is registered as a SACNASP Professional Natural Scientist in the Earth Science Field. Groundwater, geochemistry and surface hydrology, as well as knowledge of water chemistry together with GIS, and analytical and numerical modelling skills, are some of his sought-after expertise. General and applied logical knowledge are his key elements in problem-solving.

Professional Affiliations:

SACNASP Professional Natural Scientist (400139/17)

Areas of Expertise:

- Project Management of water and environmental projects for mining, industrial and agriculture sectors.
- Integrated Water Investigations
- Waste classification and Impact Assessments
- Aquifer vulnerability assessments
- Geochemical sampling, data interpretation and modelling
- Groundwater impact and risk assessments
- Numerical and Conceptual Visual Modelling (Visual Modflow, ModflowFLEX, Voxler, RockWorks, Surfer and Excel)
- Hydropedology (Hydrological Soil Types) & Soils Assessments
- Floodline Modelling (HEC-RAS)
- Conceptual Stormwater Management Assessments
- Surface Water Yield Assessments
- Water and Salt Balances

Page 1 of 8

SCAN ME
PROJECT RECORD

APPENDIX H

SSV – Noise Theme

Mabasa Energy and Fuels (Pty) Ltd

NOISE REPORT FOR

SITE SENSITIVITY VERIFICATION

for the proposed

750MW Combined Cycle Gas Turbine Power Plant

near Richards Bay, Kwa-Zulu Natal Province



Study done for:

NEMAI CONSULTING

Prepared by:

EARES
Enviro Acoustic Research

P.O. Box 2047, Garsfontein East, 0060
Tel: 012 – 004 0362, Fax: 086 – 621 0292, E-mail: info@eares.co.za

This Report should be sited as:

De Jager, M. 2024: "*Noise Report for Site Sensitivity Verification for the proposed 750MW Combine Cycle Gas Turbine Power Plant near Richards Bay, Kwa-Zulu Natal Province*". Enviro-Acoustic Research, Pretoria

Client:

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Report no:

NC-MEFRBG2P/SSVR/202407-Rev 0

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Review:

Johan Maré *(MSc. Microbiology, PriSci Nat (400092/91))*

Date:

July 2024

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APPENDICES

Appendix A Curriculum Vitae
Appendix B Glossary of Terms

ABBREVIATIONS

ACC	Air-Cooled Condenser
BA	Basic Assessment
BESS	Battery Energy Storage System
CCGT2PP	Combined Cycle Gas Turbine Power Plant
CCGT	Combine-Cycle Gas Turbine
CTG	Combustion Turbine and Generator
dB/dBA	Decibel (relative loudness of the A-weighted sound level in air)
DFFE	Department of Forestry, Fisheries and the Environment
EARES	Enviro Acoustic Research cc

ECA	Environment Conservation Act
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EHS	Environmental Health and Safety
ENIA	Environmental Noise Impact Assessment
ENPAT	Environmental Potential Atlas for South Africa
ETSU	Energy Technology Support Unit
EPs	Equator Principles
EPC	Engineering, Procurement and Construction
EPFIs	Equator Principles Financial Institutions
GN	Government Notice
GNR	Government Notice Regulation
HRSG	Heat Recovery Steam Generators
I&APs	Interested and Affected Parties
IEC	International Electrotechnical Commission
IFC	International Finance Corporation
IFH	Inlet Filter House
ISO	International Organization for Standardization
KZN	Kwa-Zulu Natal Province
METI	Ministry of Economy, Trade, and Industry
NASA	National Aeronautical and Space Administration
NEMA	National Environmental Management Act
NCR	Noise Control Regulations
NSR	Noise-sensitive Receptors
PPP	Public Participation Process
PWL	Sound Power Level
RBIDZ	Richards Bay Industrial Development Zone
SABS	South African Bureau of Standards
SANS	South African National Standards
STG	Steam Turbine Generator
UTM	Universal Transverse Mercator
WHO	World Health Organization

1 INTRODUCTION

1.1 INTRODUCTION AND PURPOSE

Enviro-Acoustic Research cc was commissioned by Nemai Consulting (Pty) Ltd (the EAP) to undertake a specialist study to determine the potential noise impact on the surrounding environment due to the proposed development of a 750MW Combined Cycle Gas Turbine Power Plant ("CCGT2PP") near Richardsbay, Kwa-Zulu Natal Province (KZN).

This report is the Site Sensitivity Verification Process as per GNR320 of 2020, considering the findings from previous site visits to the area. An additional site visit will be done during the future Environmental Impact Assessment ("EIA") for the project. The EIA process will be facilitated by Nemai Consulting (Pty) Ltd, the appointed Environmental Assessment Practitioner ("EAP") for this project.

It is important to note this document is only an initial report, to be used for site sensitivity verification purposes. This report presents conceptual scenarios to illustrate important concepts. A detailed assessment will be undertaken in the future Environmental Noise Impact Assessment.

1.2 BRIEF PROJECT DESCRIPTION

Mabasa Energy and Fuels (Pty) Ltd (the "Applicant") intends to bid for the GASIPPPP and has proposed the development of a 750MW Combined Cycle Gas Turbine Power Plant (the "Plant") in Richards Bay, which falls within the City of uMhlathuze Local Municipality in KZN.

The earmarked site is located on Erf 16673 in Phase 1F of the Richards Bay Industrial Development Zone (RBIDZ), under a long-term lease agreement. The Plant will be designed for base load operations at 500MW in Simple Cycle and 750MW in Combined Cycle on a 24-hour, 7-days a week basis.

The proposed Plant will comprise of the following key equipment:

- Two (2) General Electric (GE) Frame 9 (model 9F.03) combustion turbines and generators;
- Two (2) triple pressure, 3 drum, natural circulation Heat Recovery Steam Generators (HRSGs);
- One (1) condensing steam turbine and generator;
- One (1) de-aerating surface condenser;
- One (1) induced draft cooling tower;

- Balance of plant (BOP) equipment consisting of Pumps, Heat Exchangers, Transformers, Power Electrics, etc.;
- One (1) integrated plant distribution control system; and
- 275 kV Switchyard comprising of three (3) x 15kV to 275kV step-up transformers and one (1) station auxiliary transformer (the rating to be defined during detailed design).

1.3 POTENTIAL NOISE SOURCES

Noise will be associated with the construction and operational phases, though the main noise source from this plant would be the equipment directly associated with power generation during the operational phase. Low noise levels are associated with the transformers, substation and overhead power lines.

The major noise sources for a typical most combine-cycle gas turbine (CCGT) power plants are the air-cooled condenser (ACC), the steam turbine generator (STG), the inlet filter house (IFH), the exhaust stack as well as the heat recovery steam generator (HRSG). Conceptual schematics for such a plant are presented in **Figure 1-1** and **Figure 1-2**. Significant temporary noises are also created during start-up due to high-pressure steam flowing through the piping, though this is generally a temporary noise and will not be assessed in the future.

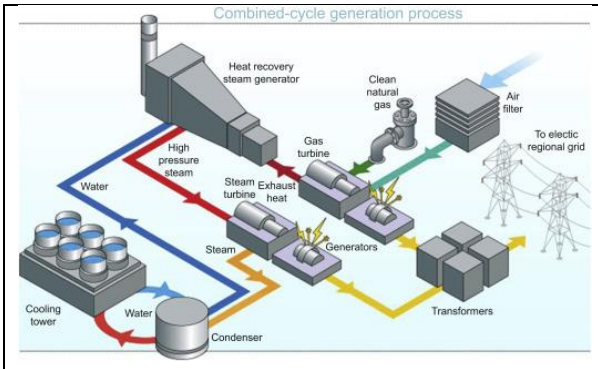

Figure 1-1: CCGT schematic[1]

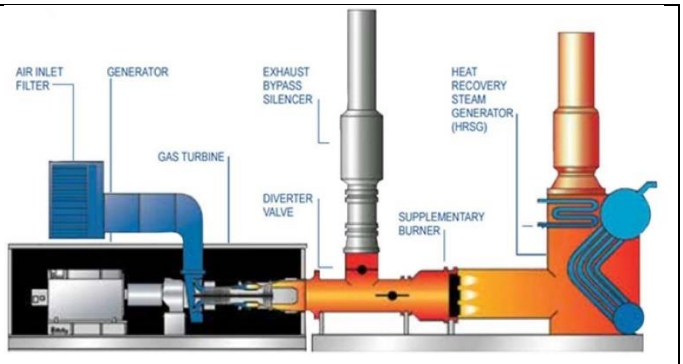

Figure 1-2: Gas Turbine Package with HRSG schematic[2]

The combustion turbine and generator (CTG) are typically housed in weather enclosures (typical also incorporating acoustical treatment) which significantly decrease noise emissions. This is not to suggest that other balance-of-plant (BOP) equipment does not

[1] Alsaffar, Iman & Ezzat, Akram. (2020). Qualitative Risk Assessment of Combined Cycle Power Plant Using Hazards Identification Technique. Journal of Mechanical Engineering Research and Developments. 43. 284-293.
[2] U.S Department of Energy: Combined Heat and Power Technology Fact Sheet Series.

generate noise, as the cumulative effect of fuel gas compressors, air compressor skids, boiler feedwater pumps, lube oil coolers and other equipment can also have a profound effect on far-field noise levels. However, significant noise source that generally contribute more than 80% of the noise include:

- The ACC (or Cooling Tower) - a major noise source, primarily due to the cumulative effect of a bank of fans located between 4 to 10 meters above ground level. For mitigation, options include fan selection (larger, slower-turning fans), fan deck acoustic barrier walls and air inlet acoustic baffles;
- The Exhaust Stack and HRSG – often the primary noise source, with noise generated by turbulent exhaust gases exiting the stack, the vibrating casing and various BOP equipment associated with the HRSG. Vertical silencers in the stack, horizontal silencers within the HRSG are typically used to mitigate noise caused by the exhaust stream itself with acoustical lagging and thicker casing material used to reduce this noise source;
- The STG – consisting of the steam turbine, the steam generator, condenser and condensate pumps. This equipment is normally protected from the elements inside an enclosure, typically treated acoustically to reduce noise levels.

It should be noted that even in industrial areas, noises from equipment and activities must also consider the potential noise impact on people working in the vicinity of the equipment. Manufacturers of such power generation equipment therefore do consider the Occupational requirements, providing acoustical treatment to ensure that nearby employees are not subject to unreasonable noise levels. As such manufacturers would aim to limit noise emission levels to be less than 85 dBA (measured at 10 m) from various equipment.

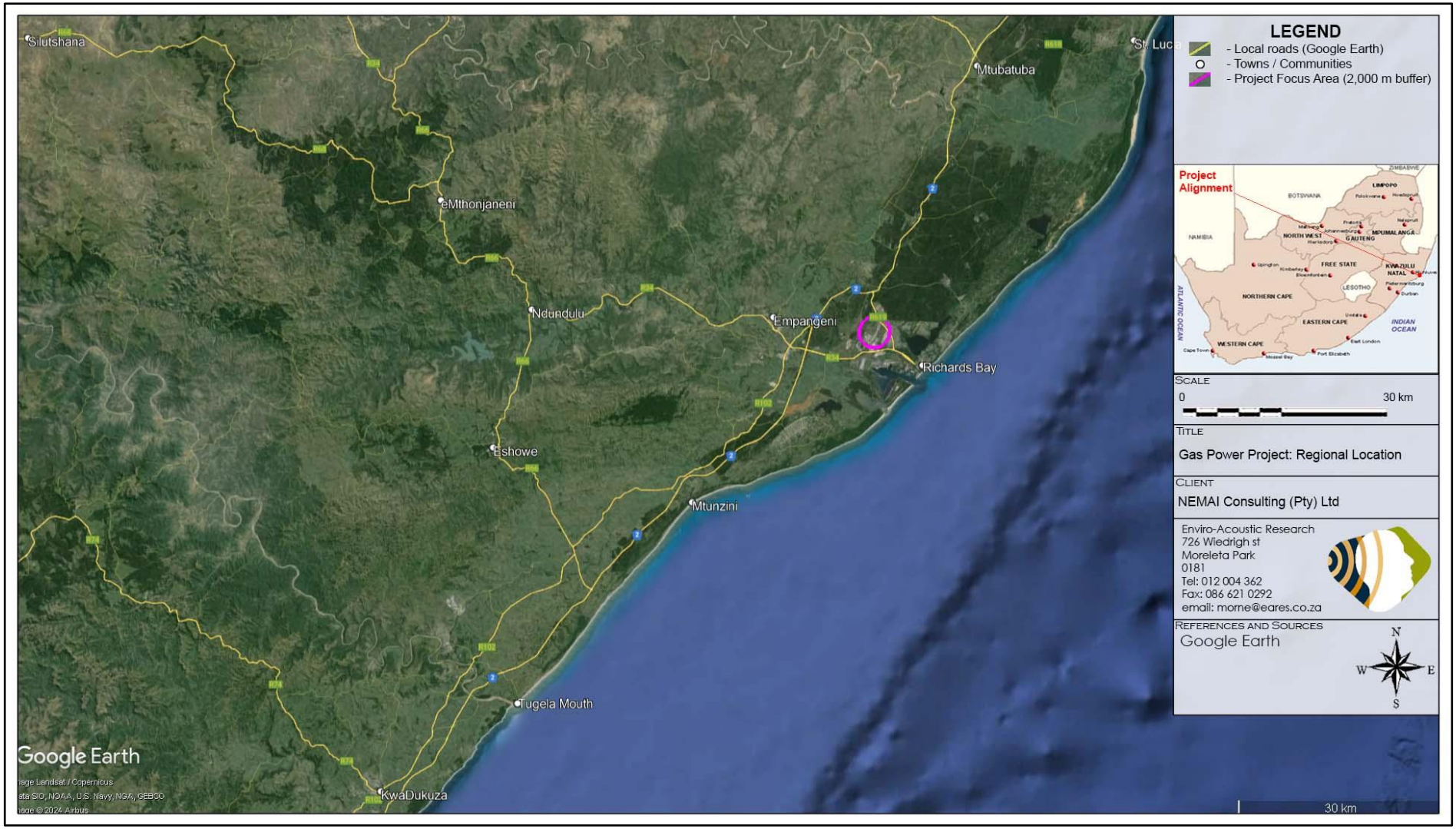

Figure 1-3: Regional Location of the proposed CCGT2PP project

2 STUDY AREA

The facility is proposed in the vicinity of Richards Bay, located within the boundaries of the City of uMhlathuze Local Municipality and the King Cetshwayo District Municipality. The project focus area ("PFA") is an area selected to enclose all potential project infrastructure up to 2,000 m from activities or equipment that may generate significant noise. The regional location is illustrated in **Figure 1-3**. The PFA is further described in terms of environmental components that may contribute to or change the sound character in the area.

2.1 TOPOGRAPHY

ENPAT[3] (1998) describes the topography as *"Plains"* , while Musina L. & Rutherford (The vegetation of South Africa, Lesotho and Swaziland)[4] delineates the area as "flat c*oastal plain".* There are little natural features that could act as noise barriers considering practical distances at which sound propagates.

2.2 ROADS AND RAIL ROADS

There are a number of roads within the IDZ, though noise from road traffic on these routes will unlikely to influence the ambient sound levels in the closest residential areas. The only road that may influence the ambient sound levels in the Wild en Weide suburb is the R619, which carries traffic night and day.

2.3 LAND USE AND UNRELATED NOISE SOURCES

The project is proposed within the Richards Bay IDZ, Phase 1F (located within the Richards Bay Municipal area), with only industrial uses taking place in the area. Ambient sound levels are generally elevated due to the cumulative effect of noises from numerous industries. It should be noticed that the Phakwe Gas to Power facility are proposed to the north-west of the plant.

2.4 RESIDENTIAL AREAS

The formal Wild and Weide residential area are located to the north-east of the project area.

[3] Van Riet, W. Claassen, P. van Rensburg, J. van Viegen & L. du Plessis, "*Environmental Potential Atlas for South Africa"*, Pretoria, 1998.
[4] Musina L. & Rutherford." The vegetation of South Africa, Lesotho and Swaziland". Strelitzia 19, South African National Biodiversity Institute, Pretoria. 2006.

2.5 GROUND CONDITIONS AND VEGETATION

The site falls within the Savanna biome, with the natural vegetation type being Coastal Forest and Thornveld. Considering information gained during the site visit and GoogleEarth ® imagery it appears that the natural vegetation has been significantly disturbed by anthropogenic activities, though the ground surface is generally covered with dense vegetation.

Medium ground surface conditions will be used for modelling purposes in the future Environmental Noise Impact Assessment ("ENIA"). It should be noted that this factor is only relevant for air-borne waves being reflected from the ground surface, with certain frequencies slightly absorbed by the vegetation.

2.6 DESIRED RATING LEVELS

The development of the CCGT2PP project will result in changes in the ambient sound levels during the construction and operational phases. Considering the recommendations from the SANS 10103:2008 guideline, two potential noise rating levels would be relevant, namely:

- Noise Rating Levels relevant for the residential areas (similar to the noise limits recommended by the World Health Organization ("WHO") and the International Finance Corporation ("IFC") for residential use):
    - 55 dBA for the daytime period (typical of an urban noise district); and
    - 45 dBA for the night-time period (typical of an urban noise district), as well as
- Noise Rating Levels relevant for industrial areas (as measured on the boundary):
    - 70 dBA for the daytime period; and
    - 60 dBA for the night-time period.

Office uses within the PFA may require maximum outside noise levels below a level to ensure compliance with design and maximum equivalent rating levels as specified in Table 1 of SANS 10103:2008 (which depend on the specific use).

2.7 POTENTIAL PROJECT ALTERNATIVES

The decision to develop this CCGT2PP project at this location is the result of a number of feasibility studies, considering a number of factors, including (amongst others):

- the availability of land to develop the project;
- grid capacity and the viability to connect the project to the national grid or to supply the electrical power to an end-user (potential off-take agreement(s));

- topography and site access;
- land use and suitability;
- landowner support; and
- limited environmental constraints.

2.8 ENVIRONMENTAL SENSITIVITY – NOISE THEME

The project site was assessed in terms of the Noise Sensitivity Theme using the National Web-based Environmental Screening Tool[5]. The site report generated by the Screening Tool highlighted that a Noise Impact Assessment must be completed and appended to the Environmental Authorization ("EA") documentation. The screening report was developed for both:

- *Utilities Infrastructure => Electricity => Generation => Non-renewable => Hydrocarbon => Petroleum*, and
- *Activity requiring permit or licence in terms of National or Provincial legislation governing the release or generation of emissions => Emissions*.

The potential noise sensitive areas layer is not included in the above-mentioned categories, but was obtained from the *Utilities Infrastructure => Electricity => Generation => Renewable => Wind* category, with the noise sensitive areas illustrated on **Figure 3-1** (highlighting that most of the area is considered to have a "Very High" sensitivity to noise).

2.9 LEGISLATIVE REQUIREMENTS AND TERMS OF REFERENCE

A noise impact assessment must be conducted if the proposed development triggers the following:

- A change in land use as highlighted in SANS 10328:2008 (section 3.3 of the SANS guideline);
- If a wind farm (wind turbines - SANS 10328:2008 [5.4 (i)]) or a source of low-frequency noise (such as cooling or ventilation fans - SANS 10328:2008 [5.4 (l)]) is to be established within 2,000 m from a potential NSR *or visa versa*;
- It is generally required by the local or district authority as part of the environmental authorization or planning approval in terms of Regulation 2(d) or GN R154 of 1992;
- It is a controlled activity in terms of the NEMA EIA Regulations, 2014, as amended and an ENIA is required, because:
    - It may cause a disturbing noise that is prohibited in terms of section 18(1) of the Government Notice 579 of 2010;

[5] https://screening.environment.gov.za/screeningtool/#/pages/welcome

- It is an environmental theme to be further assessed as identified by the National Web-based Environmental Screening Tool as required by Government Gazette No. 42451 of 10 May 2019 (proposed procedures for noise assessments);

2.9.1 Requirements as per GG 43110 (GNR 320 of March 2020)

The Department of Forestry, Fisheries and Environment ("DFFE") also promulgated Government Notice Regulation (GNR) 320, dated 20 March 2020 as published in Government Gazette No. 43110. The Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in Terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation would be applicable to this project.

This regulation defines the requirements for undertaking a site sensitivity verification, specialist assessment and the minimum report content requirements for environmental impact where a specialist assessment is required but no protocol has been prescribed. It requires that the current land use be considered using the national web based environmental screening tool to confirm the site sensitivity available at: https://screening.environment.gov.za.

If an applicant intending to undertake an activity identified in the scope of this protocol for which a specialist assessment has been identified on the screening tool on a site identified as being of:

- "very high" sensitivity for noise, must submit a Noise Specialist Assessment; or
- "low" sensitivity for noise, must submit a Noise Compliance Statement.

On a site where the information gathered from the site sensitivity verification differs from the designation of "very high" sensitivity on the screening tool and it is found to be of a "low" sensitivity, a Noise Compliance Statement must be submitted. On a site where the information gathered from the initial site sensitivity verification differs from the designation of "low" sensitivity on the screening tool and it is found to be of a "very high" sensitivity, a Noise Specialist Assessment must be submitted.

If any part of the proposed development footprint falls within an area of "very high" sensitivity, the assessment and reporting requirements prescribed for the "very high" sensitivity apply to the entire footprint excluding linear activities for which noise impacts are associated with construction activities only and the noise levels return to the current levels after the completion of construction activities, in which case a compliance statement

applies. In the context of this protocol, development footprint means the area on which the proposed development will take place and includes any area that will be disturbed.

In terms of GNR320 (of 20 March 2020), the Site Sensitivity Verification should be undertaken prior to the commencement of the Specialist assessment. The protocol states:

1. The site sensitivity verification must be undertaken by an environmental assessment practitioner or a noise specialist, where the noise specialist means someone with relevant academic qualifications and with experience in the domain of acoustic assessments and noise management.
2. The site sensitivity verification must be undertaken through the use of:
   a) a desktop analysis, using satellite imagery;
   b) a preliminary onsite inspection; and
   c) any other available and relevant information.
3. The outcome of the site sensitivity verification must be recorded in the form of a report that:
   a) confirms or disputes the current use of the land and environmental sensitivity as identified by the screening tool, such as new developments or infrastructure etc.;
   b) contains a motivation and evidence (e.g., photographs) of either the verified or different use of the land and environmental sensitivity; and
   c) is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations.

The National Web based Environmental Screening Tool[6] was used to screen the proposed site for the noise environmental sensitivity as per the requirements of Government Notice Regulation ("GNR") 320 (of 20 March 2020), considering the site location illustrated in **Figure 3-1**.

A screening report generated by the Online Screening Tool highlighted that a Noise Impact Assessment must be completed and appended to the Environmental Impact Assessment ("EIA") documentation for the project. This screening report was developed for *Utilities Infrastructure => Electricity => Generation => Renewable => Wind* category, with the noise sensitive areas illustrated on **Figure 3-1**. The areas defined to have a potential "**very high**" sensitivity to noise were downloaded as a layer from the online screening tool.

[6] https://screening.environment.gov.za/screeningtool/#/pages/welcome

3 SITE SENSITIVITY VERIFICATION

A site sensitivity verification has been undertaken in accordance with GNR 320 as promulgated in GG43110 in 2020 considering the findings from site visits conducted during July 2020, March 2022 and July 2024. An additional site visit will be done during the future EIA to collect new ambient sound level data for the project area.

3.1 OUTPUT FROM NATIONAL ENVIRONMENTAL SCREENING TOOL

The site was initially assessed using the National Environmental Screening tool, available at, https://screening.environment.gov.za. The output from the National Online Screening tool indicates a number of areas within and up to 2,000 m from the project boundary to be considered to be of a "Very High" sensitivity to noise. It should be noted that most of the area is considered to have a "Very High" sensitivity to noise as illustrated in **Figure 3-1**.

3.2 DESCRIPTION ON HOW THE SITE SENSITIVITY VERIFICATION WAS UNDERTAKEN

The site sensitivity verification is based on information gathered during a number of site visits and the use of GoogleEarth images (dated 2022-10-20). An additional site visit will be done during the future EIA to collect new ambient sound level data for the project area, as well as define other potential noise-sensitive activities (such as Unizulu Science Centre and the office uses) located within the PFA.

3.3 OUTCOME OF THE SITE SENSITIVITY VERIFICATION

Areas with a "Very High" Sensitivity to noise are indicated on **Figure 3-1**. The online screening tool identified that most of the surrounding area have a "very high" sensitivity to noise in the vicinity of the proposed development.

There are permanent residential activities to the north-east of the PFA. These residential activities are considered to be noise-sensitive and the areas are considered to have a "Very High" sensitivity to noise. There are also office and training facilities to the south-east of the project, with these activities having recommended noise rating levels for the applicable use. This report therefore agrees with the finding of the online screening tool.

Considering the potential noise-sensitive nature of the residential area(s) and the office/training facilities, the potential impact from noise from the project should be assessed in a Noise Specialist Study.

3.4 POTENTIAL NOISE SENSITIVE RECEPTORS

Figure 3-2 illustrate the locations of potential noise-sensitive receptors as well as generalized 200 m, 500 m, 1,000 m and 2,000 m buffer areas around the project location. Generally, noises from industrial scale power producing projects:

- would be significant within 200 m from the project, with high noise levels that could be considered to be at a disturbing level both day and night;
- could be significant within 500 m from the project and noise levels could be at a sufficient level to be considered disturbing during the night-time period;
- are normally clearly audible when between 500 and 1000 m from the project and the noise levels could be disturbing at night in a quiet environment;
- may be audible to significant, depending on the project design and the existing ambient sound levels; and,
- are generally of a low significance at distanced greater than 2,000m.

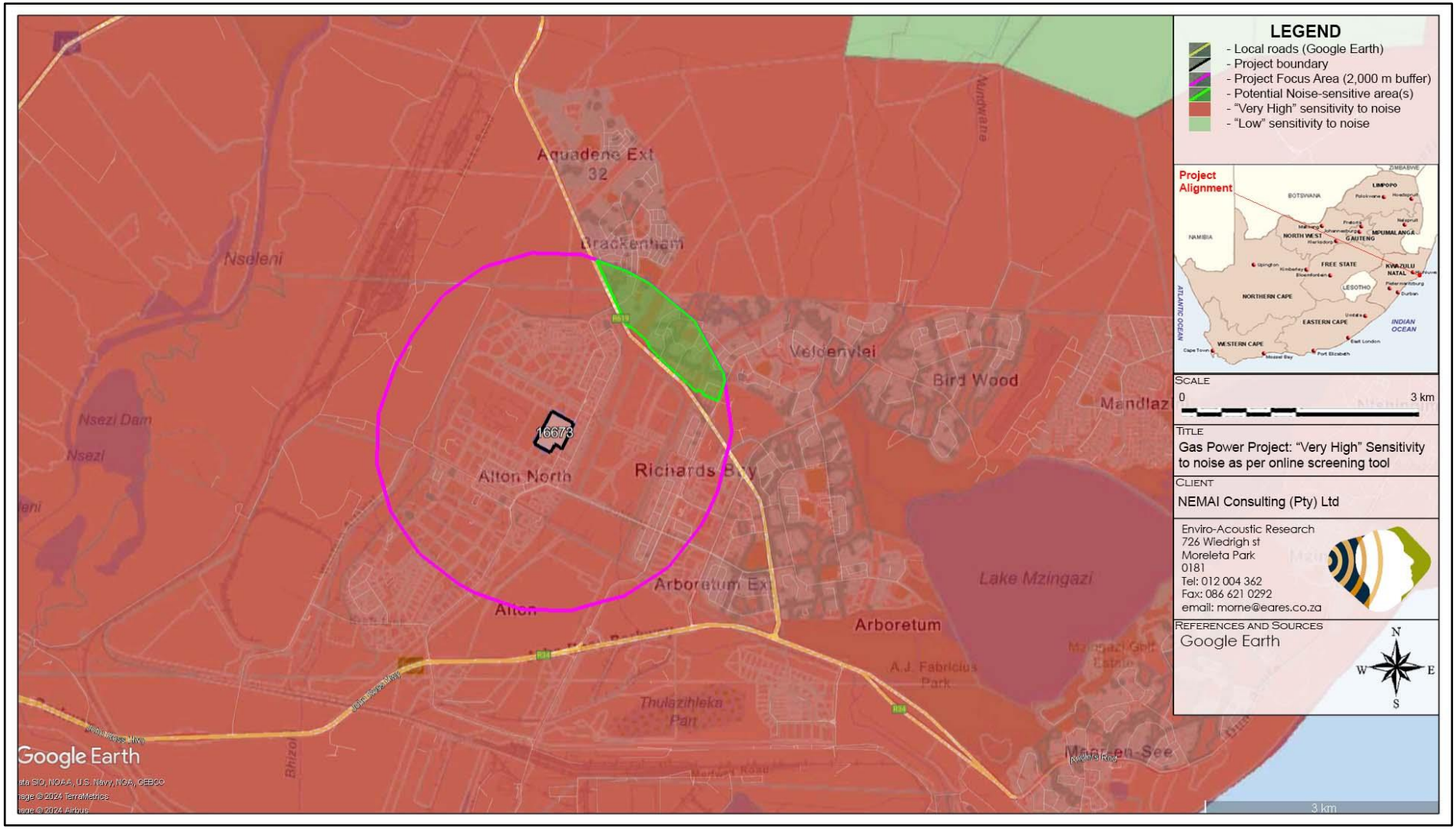

Figure 3-1: Areas identified by the online screening tool to have a "Very High" sensitivity to noise



Figure 3-2: Aerial Image indicating closest NSR and buffer areas

4 TERMS OF REFERENCE FOR THE ENVIRONMENTAL NOISE IMPACT ASSESSMENT PHASE

Work that will take place during the ENIA phase is defined in section 8 of SANS 10328:2008.

4.1 PURPOSE OF THE ENVIRONMENTAL NOISE IMPACT ASSESSMENT

The purpose of an environmental noise impact investigation and assessment is to determine and quantify the acoustical impact of, or on a proposed development.

4.2 PLAN OF STUDY FOR ENVIRONMENTAL NOISE IMPACT INVESTIGATION AND ASSESSMENT

In this regard the following will be included to assist the EAP in the compilation of the Plan of Study (PoS) for the BA:

- A future site visit to measure ambient sound levels as per GNR320 of 2020;
- Analysis of the ambient sound levels to confirm existing rating levels as well as the desired noise limits for the area;
- Data (layout and PWL of potential project equipment and/or activities) will be used to model the potential noise impact. The following information will be considered:
    - The PWL details of a number of typical gas to power generation equipment and activities;
    - The project layout;
    - The surface contours of the project focus area;
    - Surface and meteorological constants;
- The potential impact will be evaluated (where possible) in terms of the nature (description of what causes the effect, what/who might be affected and how it/they might be affected) as well as the extent of the impact;
- The potential significance of the identified issues will be calculated based on the evaluation of the issues/impacts;
- The development of an Environmental Management Plan and a proposal of potential mitigation measures (if required); and
- Recommendations.

4.3 ENVIRONMENTAL NOISE IMPACT INVESTIGATION

4.3.1 Sound emission from the identified noise sources

Sound power emission data as used for similar projects would be used to calculate the potential noise emissions from the project. In the instance that this data is unavailable, sound emission data as included in the SoundPlan library, or received from equipment manufacturers could be used.

The operating cycle and nature of the sound emission (impulsiveness and/or tonal character) would, where relevant, be considered when the expected rating level in the target area is calculated.

4.3.2 Determination of Rating levels

The sound propagation model defined by ISO 9613-2:1996 for both the construction and operational phases to calculate projected equivalent noise levels. Other input parameters used would include:

- Air temperature of 10 °C;
- Relative humidity of 70%;
- Layout of the proposed facility as provided by the developer;
- Topography details;
- Projected outside equivalent noise levels at Potentially Sensitive Receptors at height above sea-level (plus 2 meters for the construction and operational phases);
- 50% medium ground surface for the construction and operational phases.

4.3.3 Assessment of the noise impact: No mitigation

The significance will be determined considering the defined magnitude of the noise level, the extent as well as the duration of the projected noise impact, as well as the probability that this impact may take place.

The magnitude of the noise impact will be assessed by considering:

- The total projected cumulative noise level compared to the appropriate acceptable rating levels as defined in Table 2 of SANS 10103:2008;
- The potential community response from Table 5 of SANS 10103:2008. In addition, other relevant and suitable literature may be consulted as defined in the scoping report. In particular the likely ambient sound levels due to wind induced noises will be estimated at the wind speed under investigation and considered; and
- The likely and projected ambient sound levels.

Likely ambient sound levels associated with wind speeds as well as the projected change in ambient sound levels would also be considered when estimating the probability that a NSR may be impacted by increased noise levels.

4.3.4 Assessment of the noise impact: With Implementation of Mitigation

Should the significance of the impact be medium or high, the potential significance will be estimated considering that the developer would be implementing reasonable mitigation measures. Potential viable mitigation measures will be included.

4.4 ENVIRONMENTAL NOISE IMPACT REPORT

The Environmental Noise Impact Report will cover the following points:

- the purpose of the investigation;
- a brief description of the planned development or the changes that are being considered;
- a brief description of the existing environment including, where relevant, the topography, surface conditions and meteorological conditions during measurements;
- the identified noise sources together with their respective sound pressure levels or sound power levels (or both) and, where applicable, the operating cycles, the nature of sound emission, the spectral composition and the directional characteristics;
- the identified noise sources that were not taken into account and the reasons as to why they were not investigated;
- the identified Potentially Sensitive Receptors and the noise impact on them;
- where applicable, any assumptions, with references, made with regard to any calculations or determination of source and propagation characteristics;
- an explanation, either by a brief description or by reference, of all measuring and calculation procedures that were followed, as well as any possible adjustments to existing measuring methods that had to be made, together with the results of calculations;
- an explanation, either by description or by reference, of all measuring or calculation methods (or both) that were used to determine existing and predicted rating levels, as well as other relevant information, including a statement of how the data were obtained and applied to determine the rating level for the area in question;
- the location of measuring or calculating points in a sketch or on a map;
- quantification of the noise impact with, where relevant, reference to the literature consulted and the assumptions made;
- alternatives that were considered and the results of those that were investigated;

- a list of all the interested or affected parties that offered any comments with respect to the environmental noise impact investigation (if comments are received);
- a detailed summary of all the comments received from interested or affected parties as well as the procedures and discussions followed to deal with them (if comments are received);
- conclusions that were reached;
- proposed recommendations including potential mitigation measures;
- any follow-up investigation which should be conducted at completion of the project as well as at regular intervals after the commissioning of the project so as to ensure that the recommendations of this report will be maintained in the future.

5 CONCLUSIONS AND RECOMMENDATIONS

This report is a site sensitivity verification for a proposed Combined Cycle Gas to Power project near Richardsbay, KZN.

This assessment confirms that there are locations that can be considered to have a "very high" sensitivity to noise within the project boundary. This site sensitivity verification therefore agrees with the findings of the online screening tool.

Due to the "very high" sensitivity of the area to noise, further study is required and it is recommended that a full Environmental Noise Impact Assessment study be conducted for the project.



Morné de Jager
Enviro-Acoustic Research cc
2024 – 07 – 12

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APPENDIX A

Curriculum Vitae

Author:

The author started his career in the mining industry as a bursar Learner Official (JCI, Randfontein), working in the mining industry, doing various mining related courses (Rock Mechanics, Surveying, Sampling, Safety and Health [Ventilation, noise, illumination etc.] and Metallurgy. He did work in both underground (Coal, Gold and Platinum) as well as opencast (Coal) for 4 years. He changed course from Mining Engineering to Chemical Engineering after his second year of his studies at the University of Pretoria.

After graduation he worked as a Water Pollution Control Officer at the Department of Water Affairs and Forestry for two years (first year seconded from Wates, Meiring and Barnard), where duties included the perusal (evaluation, commenting and recommendation) of various regulatory required documents (such as EMPR's, Water Use License Applications and EIA's), auditing of license conditions as well as the compilation of Technical Documents.

Since leaving the Department of Water Affairs, Morné has been in private consulting for the last 20 years, managing various projects for the mining and industrial sector, private developers, business, other environmental consulting firms as well as the Department of Water Affairs. During that period he has been involved in various projects, either as specialist, consultant, trainer or project manager, successfully completing these projects within budget and timeframe. During that period he gradually moved towards environmental acoustics, focusing on this field exclusively since 2007.

He has been interested in acoustics as from school days, doing projects mainly related to loudspeaker design. Interest in the matter brought him into the field of Environmental Noise Measurement, Prediction and Control as well as blasting impacts. Since 2007 he has completed more than 300 Environmental Noise Impact Assessments, numerous Noise Monitoring Reports as well as various acoustic consulting services, including amongst others:

Wind Energy Facilities	*Full Environmental Noise Impact Assessments for - Bannf (Vidigenix), iNCa Gouda (Aurecon SA), Isivunguvungu (Aurecon), De Aar (Aurecon), Kokerboom 1 (Aurecon), Kokerboom 2 (Aurecon), Kokerboom 3 (Aurecon), Kangnas (Aurecon), Plateau East and West (Aurecon), Wolf (Aurecon), Outeniqwa (Aurecon), Umsinde Emoyeni (ARCUS) , Komsberg (ARCUS), Karee (ARCUS), Kolkies (ARCUS), San Kraal (ARCUS), Phezukomoya (ARCUS), Canyon Springs (Canyon Springs), Perdekraal (ERM), Scarlet Ibis (CESNET), Albany (CESNET), Sutherland (CSIR), Kap Vley (CSIR), Kuruman (CSIR), Rietrug (CSIR), Sutherland 2 (CSIR), Perdekraal (ERM), Teekloof (Mainstream), Eskom Aberdene (SE), Dorper (SE), Spreeukloof (SE), Loperberg (SE), Penhoek Pass (SE), Amakhala Emoyeni (SE), Zen (SRK Consulting (South Africa) – SE), Goereesoe (SE), Springfontein (SE), Garob (SE), Project Blue (SE), ESKOM Kleinzee (SE), Namas (SE), Zonnequa (SE), Walker Bay (SE), Oyster Bay (SE), Hidden Valley (SE), Deep River (SE), Tsitsikamma (SE), AB (SE), West Coast One (SE), Hopefield II (SE), Namakwa Sands (SE), VentuSA Gouda (SE), Dorper (SE), Klipheuwel (SE), INCA Swellendam (SE), Cookhouse (SE),*

	Iziduli (SE), Msenge (SE), Cookhouse II (SE), Rheboksfontein (SE), Suurplaat (SE), Karoo Renewables (SE), Koningaas (SE), Spitskop (SE), Castle (SE), Khai Ma (SE), Poortjies (SE), Korana (SE), IE Moorreesburg (SE), Gunstfontein (SE), Boulders (SE), Vredenburg (Terramanzi), Loeriesfontein (SiVEST), Rhenosterberg (SiVEST), Noupoort (SiVEST), Prieska (SiVEST), Dwarsrug (SiVEST), Graskoppies (SiVEST), Philco (SiVEST), Hartebeest Leegte (SiVEST), Ithemba (SiVEST), !Xha Boom (SiVEST), Spitskop West (Terramanzi), Haga Haga (Terramanzi), Vredenburg (Terramanzi), Msenge Emoyeni (Windlab), Wobben (IWP), Trakas (SiVest), Beaufort West (SiVest)
Mining and Industry	*Full Environmental Noise Impact Assessments for – Delft Sand (AGES), BECSA – Middelburg (Golder Associates), Kromkrans Colliery (Geovicon Environmental), SASOL Borrow Pits Project (JMA Consulting), Lesego Platinum (AGES), Tweefontein Colliery (Cleanstream Environmental), Evraz Vametco Mine and Plant (JMA), Goedehoop Colliery (Geovicon), Hacra Project (Prescali Environmental), Der Brochen Platinum Project (J9 Environment), Brandbach Sand (AGES), Verkeerdepan Extension (CleanStream Environmental), Dwaalboom Limestone (AGES), Jagdlust Chrome (MENCO), WPB Coal (MENCO), Landau Expansion (CleanStream Environmental), Otjikoto Gold (AurexGold), Klipfontein Colliery (MENCO), Imbabala Coal (MENCO), ATCOM East Expansion (Jones and Wagner), IPP Waterberg Power Station (SE), Kangra Coal (ERM), Schoongesicht (CleanStream Environmental), EastPlats (CleanStream Environmental), Chapudi Coal (Jacana Environmental), Generaal Coal (JE), Mopane Coal (JE), Glencore Boshoek Chrome (JMA), Langpan Chrome (PE), Vlakpoort Chrome (PE), Sekoko Coal (SE), Frankford Power (REMIG), Strahrae Coal (Ferret Mining), Transalloys Power Station (Savannah), Pan Palladum Smelter, Iron and PGM Complex (Prescali Environmental), Fumani Gold (AGES), Leiden Coal (EIMS), Colenso Coal and Power Station (SiVEST/EcoPartners), Klippoortjie Coal (Gudani), Rietspruit Crushers (MENCO), Assen Iron (Tshikovha), Transalloys (SE), ESKOM Ankerlig (SE), Nooitgedacht Titano Project (EcoPartners), Algoa Oil Well (EIMS), Spitskop Chrome (EMAssistance), Vlakfontein South (Gudani), Leandra Coal (Jacana), Grazvalley and Zoetveld (Prescali), Tjate Chrome (Prescali), Langpan Chromite (Prescali), Vereeniging Recycling (Pro Roof), Meyerton Recycling (Pro Roof), Hammanskraal Billeting Plant 1 and 2 (Unica), Development of Altona Furnace, Limpopo Province (Prescali Environmental), Haakdoorndrift Opencast at Amandelbult Platinum (Aurecon), Landau Dragline relocation (Aurecon), Stuart Coal Opencast (CleanStream Environmental), Tetra4 Gas Field Development (EIMS), Kao Diamonds – Tiping Village Relocation (EIMS), Kao Diamonds – West Valley Tailings Deposit (EIMS), Upington Special Economic Zone (EOH), Arcellor Mittal CCGT Project near Saldanha (ERM), Malawi Sugar Mill Project (ERM), Proposed Mooifontein Colliery (Geovicon Environmental), Goedehoop North Residue Deposit Expansion (Geovicon Environmental), Mutsho 600MW Coal-Fired Power Plant (Jacana Environmentals), Tshivhaso Coal-Fired Power Plant (SRK Consulting (South Africa)), Doornhoek Fluorspar Project (Exigo), Royal Sheba Project (Cabanga Environmental), Rietkol Silica (Jacana), Gruisfontein Colliery (Jacana), Lehlabile Colliery (Jaco-K Consulting), Bloemendal Colliery (Enviro-Insight), Rondevly Colliery (REC), Welgedacht Colliery (REC), Kalabasfontein Extension (EIMS), Waltloo Power Generation Project (EScience), Buffalo Colliery (Marang), Balgarthen Colliery (Rayten), Kusipongo Block C (Rayten), Zandheuvel (Exigo), NamPower Walvis Bay (GPT), Eloff Phase 3 (EIMS), Dunbar (Enviro-Insight), Smokey Hills (Prescali), Bierspruit (Aurecon)*
Road and Railway	*K220 Road Extension (Urbansmart), Boskop Road (MTO), Sekoko Mining (AGES), Davel-Swaziland-Richards Bay Rail Link (Aurecon), Moloto Transport Corridor Status Quo Report and Pre-Feasibility (SiVEST), Postmasburg Housing Development (SE), Tshwane Rapid Transport Project, Phase 1 and 2 (NRM Consulting/City of Tshwane), Transnet Apies-river Bridge Upgrade (Transnet), Gautrain Due-diligence (SiVest), N2 Piet Retief (SANRAL), Atterbury Extension, CoT (Bokomoso Environmental), Riverfarm Development (Terramanzi), Conakry to Kindia Toll Road (Rayten)*
Airport	*Oudtshoorn Noise Monitoring (AGES), Sandton Heliport (Alpine Aviation), Tete Airport Scoping (Aurecon)*
Noise monitoring and Audit Reports	*Peerboom Colliery (EcoPartners), Thabametsi (Digby Wells), Doxa Deo (Doxa Deo), Harties Dredging (Rand Water), Xstrata Coal – Witbank Regional (Xstrata), Sephaku Delmas (AGES), Amakhala Emoyeni WEF (Windlab Developments), Oyster Bay WEF (Renewable Energy Systems), Tsitsikamma WEF Ambient Sound Level study (Cennergi and SE), Hopefield WEF (Umoya), Wesley WEF (Innowind), Ncora WEF (Innowind), Boschmanspoort (Jones and Wagner), Nqamakwe WEF (Innowind), Hopefield WEF Noise Analysis (Umoya), Dassiesfontein WEF Noise Analysis (BioTherm), Transnet Noise Analysis (Aurecon), Jeffries Bay Wind Farm (Globeleq), Sephaku Aganang (Exigo), Sephaku Delmas (Exigo), Beira Audit (BP/GPT), Nacala Audit (BP/GPT), NATREF (Nemai), Rappa Resources (Rayten), Measurement Report for Sephaku Delmas (Ages), Measurement Report for Sephaku Aganang (Ages), Bank of Botswana measurements (Linnspace), Skukuza Noise Measurements (Concor), Development*

	noise measurement protocol for Mamba Cement (Exigo), Measurement Report for Mamba Cement (Exigo), Measurement Report for Nokeng Fluorspar (Exigo), Tsitsikamma Community Wind Farm Pre-operation sound measurements (Cennergi), Waainek WEF Operational Noise Measurements (Innowind), Sedibeng Brewery Noise Measurements (MENCO), Tsitsikamma Community Wind Farm Operational noise measurements (Cennergi), Noupoort Wind Farm Operational noise measurements (Mainstream), Twisdraai Colliery (Lefatshe Minerals), SASOL Prospecting (Lefatshe Minerals), South32 Klipspruit (Rayten), Sibanye Stillwater Kroondal (Rayten), Rooiberg Asphalt (Rooiberg Asphalt), SASOL Shondoni (Lefatshe), SASOL Twisdraai (Lefatshe), Anglo Mototolo (Exigo), Heineken Inyaniga (AECOM), Glencore Izimbiwa (Cleanstream) Glencore Impunzi (Cleanstream), Black Chrome Mine (Prescali) Sibanye Stillwater Ezulwini (Aurecon), Sibanye Stillwater Beatrix (Aurecon), Bank of Botshwana (Linspace), Lakeside (Linspace), Skukuza (SiVest), Rietvlei Colliery (Jaco-K Consulting)
Small Noise Impact Assessments	*TCTA AMD Project Baseline (AECOM), NATREF (Nemai Consulting), Christian Life Church (UrbanSmart), Kosmosdale (UrbanSmart), Louwlardia K220 (UrbanSmart), Richards Bay Port Expansion (AECOM), Babalegi Steel Recycling (AGES), Safika Slag Milling Plant (AGES), Arcelor Mittal WEF (Aurecon), RVM Hydroplant (Aurecon), Grootvlei PS Oil Storage (SiVEST), Rhenosterberg WEF, (SiVEST), Concerto Estate (BPTrust), Ekuseni Youth Centre (MENCO), Kranskop Industrial Park (Cape South Developments), Pretoria Central Mosque (Noman Shaikh), Soshanguve Development (Maluleke Investments), Seshego-D Waste Disposal (Enviroxcellence), Zambesi Safari Equipment (Owner), Noise Annoyance Assessment due to the Operation of the Gautrain (Thornhill and Lakeside Residential Estate), Upington Solar (SE), Ilangalethu Solar (SE), Pofadder Solar (SE), Flagging Trees WEF (SE), Uyekraal WEF (SE), Ruuki Power Station (SE), Richards Bay Port Expansion 2 (AECOM), Babalegi Steel Recycling (AGES), Safika Ladium (AGES), Safika Cement Isando (AGES), RareCo (SE), Struisbaai WEF (SE), Perdekraal WEF (ERM), Kotula Tsatsi Energy (SE), Olievenhoutbosch Township (Nali), , HDMS Project (AECOM), Quarry extensions near Ermelo (Rietspruit Crushers), Proposed uMzimkhulu Landfill in KZN (nZingwe Consultancy), Linksfield Residential Development (Bokomoso Environmental), Rooihuiskraal Ext. Residential Development, CoT (Plandev Town Planners), Floating Power Plant and LNG Import Facility, Richards Bay (ERM), Floating Power Plant project, Saldanha (ERM), Vopak Growth 4 project (ERM), Elandspoort Ext 3 Residential Development (Gibb Engineering), Tiegerpoort Wedding Venue (Henwood Environmental), Monavoni Development (Marindzini), Rezoning of Portion 1 (Primo Properties), Tswaing Mega City (Makole), Mabopane Church (EP Architects), ERGO Soweto Cluster (Kongiwe), Fabio Chains (Marang), GIDZ JMP (Marang), Temple Complex (KWP Create), Germiston Metals (Dorean), Sebenza Metals (Dorean)*
Project reviews and amendment reports	*Loperberg (Savannah), Dorper (Savannah), Penhoek Pass (Savannah), Oyster Bay (RES), Tsitsikamma Community Wind Farm Noise Simulation project (Cennergi), Amakhala Emoyeni (Windlab), Spreeukloof (Savannah), Spinning Head (SE), Kangra Coal (ERM), West Coast One (Moyeng Energy), Rheboksfontein (Moyeng Energy), De Aar WEF (Holland), Quarterly Measurement Reports – Dangote Delmas (Exigo), Quarterly Measurement Reports – Dangote Lichtenburg (Exigo), Quarterly Measurement Reports – Mamba Cement (Exigo), Quarterly Measurement Reports – Dangote Delmas (Exigo) Quarterly Measurement Reports – Nokeng Fluorspar (Exigo), Proton Energy Limited Nigeria (ERM), Hartebeest WEF Update (Moorreesburg) (SRK Consulting (South Africa)), Modderfontein WEF Opinion (Terramanzi), IPD Vredenburg WEF (IPD Power Vredenburg), Paul Puts WEF (ARCUS), Juno WEF (ARCUS), etc.*

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APPENDIX B

Glossary of Terms

GLOSSARY OF ACOUSTIC TERMS, DEFINITIONS AND GENERAL INFORMATION

1/3-Octave Band	A filter with a bandwidth of one-third of an octave representing four semitones, or notes on the musical scale. This relationship is applied to both the width of the band, and the centre frequency of the band. See also definition of octave band.
A – Weighting	An internationally standardised frequency weighting that approximates the frequency response of the human ear and gives an objective reading that therefore agrees with the subjective human response to that sound.
Air Absorption	The phenomena of attenuation of sound waves with distance propagated in air, due to dissipative interaction within the gas molecules.
Alternatives	A possible course of action, in place of another, that would meet the same purpose and need (of proposal). Alternatives can refer to any of the following, but are not limited hereto: alternative sites for development, alternative site layouts, alternative designs, alternative processes and materials. In Integrated Environmental Management the so-called "no go" alternative refers to the option of not allowing the development and may also require investigation in certain circumstances.
Ambient	The conditions surrounding an organism or area.
Ambient Noise	The all-encompassing sound at a point being composed of sounds from many sources both near and far. It includes the noise from the noise source under investigation.
Ambient Sound	The all-encompassing sound at a point being composite of sounds from near and far.
Ambient Sound Level	Means the reading on an integrating impulse sound level meter taken at a measuring point in the absence of any alleged disturbing noise at the end of a total period of at least 10 minutes after such a meter was put into operation. In this report the term Background Ambient Sound Level will be used.
Amplitude Modulated Sound	A sound that noticeably fluctuates in loudness over time.
Applicant	Any person who applies for an authorisation to undertake a listed activity or to cause such activity in terms of the relevant environmental legislation.
Assessment	The process of collecting, organising, analysing, interpreting and communicating data that is relevant to some decision.
Attenuation	Term used to indicate reduction of noise or vibration, by whatever method necessary, usually expressed in decibels.
Audible frequency Range	Generally assumed to be the range from about 20 Hz to 20,000 Hz, the range of frequencies that our ears perceive as sound.
Ambient Sound Level	The level of the ambient sound indicated on a sound level meter in the absence of the sound under investigation (e.g., sound from a particular noise source or sound generated for test purposes). Ambient sound level as per Noise Control Regulations.
Broadband Noise	Spectrum consisting of a large number of frequency components, none of which is individually dominant.
C-Weighting	This is an international standard filter, which can be applied to a pressure signal or to a *PWL* spectrum, and which is essentially a pass-band filter in the frequency range of approximately 63 to 4000 Hz. This filter provides a more constant, flatter, frequency response, providing significantly less adjustment than the A-scale filter for frequencies less than 1000 Hz.
Controlled area (as per National Noise Control Regulations)	a piece of land designated by a local authority where, in the case of- (a) road transport noise in the vicinity of a road- (i) the reading on an integrating impulse sound level meter, taken outdoors at the end of a period extending from 06:00 to 24:00 while such meter is in operation, exceeds 65 dBA; or (ii) the equivalent continuous "A"-weighted sound pressure level at a height of at least 1,2 metres, but not more than 1,4 metres, above the

	ground for a period extending from 06:00 to 24:00 as calculated in accordance with SABS 0210-1986, titled: "Code of Practice for calculating and predicting road traffic noise", published under Government Notice No. 358 of 20 February 1987, and projected for a period of 15 years following the date on which the local authority has made such designation, exceeds 65 dBA; (b) aircraft noise in the vicinity of an airfield, the calculated noisiness index, projected for a period of 15 years following the date on which the local authority has made such designation, exceeds 65 dBA; or (c) industrial noise in the vicinity of an industry- (i) the reading on an integrating impulse sound level meter, taken outdoors at the end of a period of 24 hours while such meter is in operation, exceeds 61 dBA; or (ii) the calculated outdoor equivalent continuous "A"-weighted sound pressure level at a height of at least 1,2 metres, but not more than 1,4 metres, above the ground for a period of 24 hours, exceeds 61 dBA;
dB(A)	Sound Pressure Level in decibel that has been A-weighted, or filtered, to match the response of the human ear.
Decibel (dB)	A logarithmic scale for sound corresponding to a multiple of 10 of the threshold of hearing. Decibels for sound levels in air are referenced to an atmospheric pressure of 20 μ Pa.
Diffraction	The process whereby an acoustic wave is disturbed and its energy redistributed in space as a result of an obstacle in its path, Reflection and refraction are special cases of diffraction.
Direction of Propagation	The direction of flow of energy associated with a wave.
Disturbing noise	Means a noise level that exceeds the zone sound level or, if no zone sound level has been designated, a noise level that exceeds the ambient sound level at the same measuring point by 7 dBA or more.
Environment	The external circumstances, conditions and objects that affect the existence and development of an individual, organism or group; these circumstances include biophysical, social, economic, historical, cultural and political aspects.
Environmental Control Officer	Independent Officer employed by the applicant to ensure the implementation of the Environmental Management Plan (EMP) and manages any further environmental issues that may arise.
Environmental impact	A change resulting from the effect of an activity on the environment, whether desirable or undesirable. Impacts may be the direct consequence of an organisation's activities or may be indirectly caused by them.
Environmental Impact Assessment	An Environmental Impact Assessment (EIA) refers to the process of identifying, predicting and assessing the potential positive and negative social, economic and biophysical impacts of any proposed project, plan, programme or policy that requires authorisation of permission by law and that may significantly affect the environment. The EIA includes an evaluation of alternatives, as well as recommendations for appropriate mitigation measures for minimising or avoiding negative impacts, measures for enhancing the positive aspects of the proposal, and environmental management and monitoring measures.
Environmental issue	A concern felt by one or more parties about some existing, potential or perceived environmental impact.
Equivalent continuous A-weighted sound exposure level ($L_{Aeq,T}$)	The value of the average A-weighted sound pressure level measured continuously within a reference time interval *T*, which have the same mean-square sound pressure as a sound under consideration for which the level varies with time.
Equivalent continuous A-weighted rating level ($L_{Req,T}$)	The Equivalent continuous A-weighted sound exposure level *($L_{Aeq,T}$)* to which various adjustments has been added. More commonly used as ($L_{Req,d}$) over a time interval 06:00 – 22:00 (T=16 hours) and ($L_{Req,n}$) over a time interval of 22:00 – 06:00 (T=8 hours). It is a calculated value.
F (fast) time weighting	(1) Averaging detection time used in sound level meters.

	(2) Fast setting has a time constant of 125 milliseconds and provides a fast reacting display response allowing the user to follow and measure not too rapidly fluctuating sound.
Footprint area	Area to be used for the construction of the proposed development, which does not include the total study area.
Free Field Condition	An environment where there is no reflective surfaces.
Frequency	The rate of oscillation of a sound, measured in units of Hertz (Hz) or kiloHertz (kHz). One hundred Hz is a rate of one hundred times per second. The frequency of a sound is the property perceived as pitch: a low-frequency sound (such as a bass note) oscillates at a relatively slow rate, and a high-frequency sound (such as a treble note) oscillates at a relatively high rate.
Green field	A parcel of land not previously developed beyond that of agriculture or forestry use; virgin land. The opposite of Greenfield is Brownfield, which is a site previously developed and used by an enterprise, especially for a manufacturing or processing operation. The term Brownfield suggests that an investigation should be made to determine if environmental damage exists.
G-Weighting	An International Standard filter used to represent the infrasonic components of a sound spectrum.
Harmonics	Any of a series of musical tones for which the frequencies are integral multiples of the frequency of a fundamental tone.
I (impulse) time weighting	(1) Averaging detection time used in sound level meters as per South African standards and Regulations. (2) Impulse setting has a time constant of 35 milliseconds when the signal is increasing (sound pressure level rising) and a time constant of 1,500 milliseconds while the signal is decreasing.
Impulsive sound	A sound characterized by brief excursions of sound pressure (transient signal) that significantly exceed the ambient sound level.
Infrasound	Sound with a frequency content below the threshold of hearing, generally held to be about 20 Hz. Infrasonic sound with sufficiently large amplitude can be perceived, and is both heard and felt as vibration. Natural sources of infrasound are waves, thunder and wind.
Integrated Development Plan	A participatory planning process aimed at developing a strategic development plan to guide and inform all planning, budgeting, management and decision-making in a Local Authority, in terms of the requirements of Chapter 5 of the Municipal Systems Act, 2000 (Act 32 of 2000).
Integrated Environmental Management	IEM provides an integrated approach for environmental assessment, management, and decision-making and to promote sustainable development and the equitable use of resources. Principles underlying IEM provide for a democratic, participatory, holistic, sustainable, equitable and accountable approach.
Interested and affected parties	Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups and the general public.
Key issue	An issue raised during the Scoping process that has not received an adequate response and that requires further investigation before it can be resolved.
L_{A90}	the sound level exceeded for the 90% of the time under consideration
Listed activities	Development actions that is likely to result in significant environmental impacts as identified by the delegated authority (formerly the Minister of Environmental Affairs and Tourism) in terms of Section 21 of the Environment Conservation Act.
L_{AMin} *and* L_{AMax}	Is the RMS (root mean squared) minimum or maximum level of a noise source.
Loudness	The attribute of an auditory sensation that describes the listener's ranking of sound in terms of its audibility.
Magnitude of impact	Magnitude of impact means the combination of the intensity, duration and extent of an impact occurring.
Masking	The raising of a listener's threshold of hearing for a given sound due to the presence of another sound.
Mitigation	To cause to become less harsh or hostile.

Negative impact	A change that reduces the quality of the environment (for example, by reducing species diversity and the reproductive capacity of the ecosystem, by damaging health, or by causing nuisance).
Noise	a. Sound that a listener does not wish to hear (unwanted sounds). b. Sound from sources other than the one emitting the sound it is desired to receive, measure or record. c. A class of sound of an erratic, intermittent or statistically random nature.
Noise Level	The term used in lieu of sound level when the sound concerned is being measured or ranked for its undesirability in the contextual circumstances.
Noise-sensitive development	developments that could be influenced by noise such as: a) districts (see table 2 of SANS 10103:2008) 1. rural districts, 2. suburban districts with little road traffic, 3. urban districts, 4. urban districts with some workshops, with business premises, and with main roads, 5. central business districts, and 6. industrial districts; b) educational, residential, office and health care buildings and their surroundings; c) churches and their surroundings; d) auditoriums and concert halls and their surroundings; e) recreational areas; and f) nature reserves. In this report Noise-sensitive developments is also referred to as a Potential Sensitive Receptor
Octave Band	A filter with a bandwidth of one octave, or twelve semi-tones on the musical scale representing a doubling of frequency.
Positive impact	A change that improves the quality of life of affected people or the quality of the environment.
Property	Any piece of land indicated on a diagram or general plan approved by the Surveyor-General intended for registration as a separate unit in terms of the Deeds Registries Act and includes an erf, a site and a farm portion as well as the buildings erected thereon
Public Participation Process	A process of involving the public in order to identify needs, address concerns, choose options, plan and monitor in terms of a proposed project, programme or development
Reflection	Redirection of sound waves.
Refraction	Change in direction of sound waves caused by changes in the sound wave velocity, typically when sound wave propagates in a medium of different density.
Reverberant Sound	The sound in an enclosure which results from repeated reflections from the boundaries.
Reverberation	The persistence, after emission of a sound has stopped, of a sound field within an enclosure.
Significant Impact	An impact can be deemed significant if consultation with the relevant authorities and other interested and affected parties, on the context and intensity of its effects, provides reasonable grounds for mitigating measures to be included in the environmental management report. The onus will be on the applicant to include the relevant authorities and other interested and affected parties in the consultation process. Present and potential future, cumulative and synergistic effects should all be taken into account.
S (slow) time weighting	(1) Averaging times used in sound level meters. (2) Time constant of one [1] second that gives a slower response which helps average out the display fluctuations.
Sound Level	The level of the frequency and time weighted sound pressure as determined by a sound level meter, i.e., A-weighted sound level.
Sound Power	Of a source, the total sound energy radiated per unit time.
*Sound Pressure Level (*PWL*)*	Of a sound, 20 times the logarithm to the base 10 of the ratio of the RMS sound pressure level to the reference sound pressure level. International values for the reference sound pressure level are 20 micro pascals in air and 100

	millipascals in water. PWL is reported as L_p in dB (not weighted) or in various other weightings.
Soundscape	Sound or a combination of sounds that forms or arises from an immersive environment. The study of soundscape is the subject of acoustic ecology. The idea of soundscape refers to both the natural acoustic environment, consisting of natural sounds, including animal vocalizations and, for instance, the sounds of weather and other natural elements; and environmental sounds created by humans, through musical composition, sound design, and other ordinary human activities including conversation, work, and sounds of mechanical origin resulting from use of industrial technology. The disruption of these acoustic environments results in noise pollution.
Study area	Refers to the entire study area encompassing all the alternative routes as indicated on the study area map.
Sustainable Development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concept of "needs", in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and the future needs (Brundtland Commission, 1987).
Tread braked	The traditional form of wheel brake consisting of a block of friction material (which could be cast iron, wood or nowadays a composition material) hung from a lever and being pressed against the wheel tread by air pressure (in the air brake) or atmospheric pressure in the case of the vacuum brake.
Zone of Potential Influence	The area defined as the radius about an object, or objects beyond which the noise impact will be insignificant.
Zone Sound Level	Means a derived dBA value determined indirectly by means of a series of measurements, calculations or table readings and designated by a local authority for an area. This is similar to the Rating Level as defined in SANS 10103:2008.

APPENDIX I

SSV – Air Quality Theme

2024

PROPOSED MABASA ENERGY AND FUELS 750 MW COMBINED CYCLE POWER PLANT IN RICHARDS BAY

SITE SENSITIVITY: AIR QUALITY

Mark Zunckel & Atham Raghunandan

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1 INTRODUCTION

Following the promulgation of the Integrated Resource Plan 2019 (IRP 2019), the Minister of Mineral Resources and Energy determined that the procurement of New Generation Capacity is required to ensure energy security and that approximately 3000 MW of this capacity would be generated from gas. In response, the Department of Mineral Resources and Energy (DMRE) formally invited interested parties in December 2023 to register prospective bids under the first bid window of the Gas Independent Power Producers Procurement Programme (GASIPPPP Bid Window 1). In this respect, Mabasa Energy and Fuels (Pty) Ltd intends to bid for the GASIPPPP and has proposed the development a 750 MW Combined Cycle Power Plant (CCPP) in Richards Bay using Liquefied Natural Gas (LNG).

Mabasa Energy and Fuels have appointed Nemai Consulting (Pty) Ltd to facilitate the required environmental authorisation process and to conduct an Environmental Impact Assessment (EIA) in terms of the National Environmental Management Act. Nemai Consulting has in turn, appointed uMoya-NILU Consulting (Pty) Ltd to undertake the supporting air quality specialist study for the EIA. An initial phase of the study is this site sensitivity assessment focusing on air quality.

2 PROJECT DESCRIPTION

The proposed CCPP is located on Erf 16673 in Phase 1F of the Richards Bay Industrial Development Zone (RBIDZ), within the City of uMhlathuze Local Municipality and King Cetshwayo District Municipality in KwaZulu Natal (Figure 2-1). It will be designed for base load operations at 500 MW in Simple Cycle and 750 MW in Combined Cycle on a twenty-four hours a day, seven days a week basis. The scope of supply for the Mabasa CCPP will be based on a "2+2+1 combination" comprising of two General Electric Frame gas turbines (the "Combustion Turbine") each with a dedicated Heat Recovery Steam Generator (HRSG) to generate and supply steam to a shared steam turbine (the Combustion Turbines, HRSG and steam turbine together known as the "Power Plant"). Generators attached to each of the Combustion Turbines and steam turbine will supply electrical power to the grid. The natural gas is expected to be supplied through a pipeline from the Transnet natural gas terminal to the Mabasa CCPP.

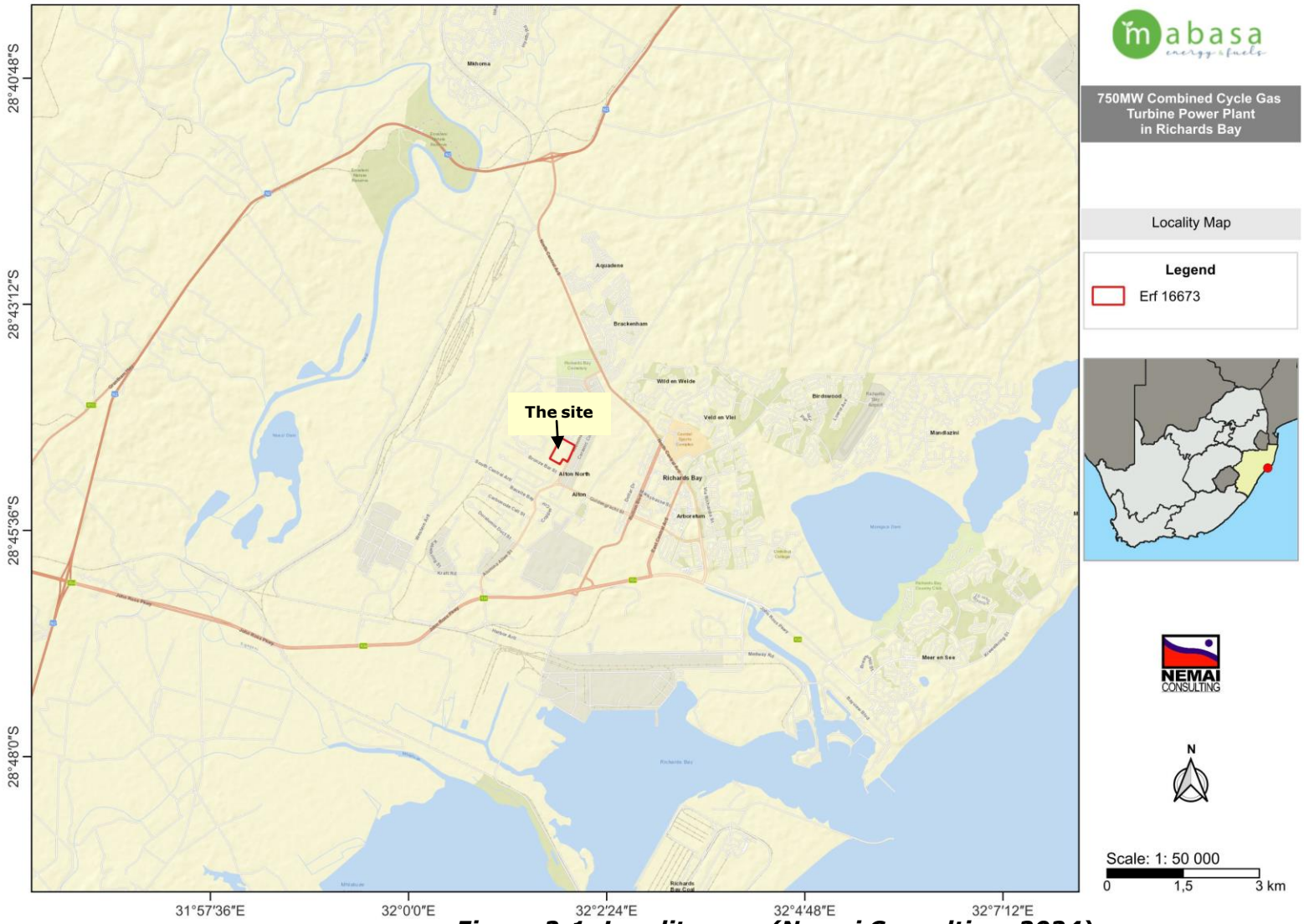

Figure 2-1: Locality map (Nemai Consulting, 2024)

3 AIR POLLUTANTS RESULTING FROM THE PROCESS

3.1 Overview

While LNG is a relatively clean fuel, its combustion results in gaseous emissions of some sulphur dioxide (SO_2), oxides of nitrogen ($NO + NO_2 = NO_X$), carbon monoxide (CO), and some particulate matter (PM). SO_2 is produced from the combustion of sulphur in the LNG. NO_X is produced from thermal fixation of atmospheric nitrogen in the combustion flame and from oxidation of nitrogen bound in the LNG. The quantity of NO_x produced is directly proportional to the temperature of the flame. CO is produced when fuels are burned, but not completely. Partial burning doesn't allow enough oxygen to create carbon dioxide (CO_2), so CO is produced instead. The non-combustible portion of the fuel remains as solid waste and emitted as PM.

3.2 National Ambient Air Quality Standards (NAAQS)

The effects of air pollutants on human health occur in different ways with short-term or acute effects, and chronic or long-term effects. Different groups of people are affected differently, depending on their level of sensitivity, with the elderly and young children being more susceptible. Factors that link the concentration of an air pollutant to an observed health effect are the concentration and duration of exposure to that particular air pollutant.

Criteria pollutants occur ubiquitously in urban and industrial environments. Their effects on human health and the environment are well documented by the World Health Organisation (WHO) (e.g. WHO, 1999; 2003; 2005). South Africa has accordingly established NAAQS for SO_2, NO_2, CO, respirable particulate matter (PM_{10} and $PM_{2.5}$), amongst others (DEA, 2009).

The NAAQS consists of a 'limit' value and a permitted frequency of exceedance. The limit value is the fixed concentration level aimed at reducing the harmful effects of a pollutant. The permitted frequency of exceedance represents the acceptable number of exceedances of the limit value expressed as the 99th percentile. Compliance with the ambient standard implies that the frequency of exceedance of the limit value does not exceed the permitted tolerance.

Being a health-based standard, ambient concentrations below the standard imply that air quality poses an acceptable risk to human health, while exposure to ambient concentrations above the standard implies that there is an unacceptable risk to human health. The NAAQS for SO_2, NO_2, CO, PM_{10} and $PM_{2.5}$ are listed in Table 3-1.

Table 3-1: NAAQS for pollutants relevant to the Mabasa CCPP

Pollutant	Averaging period	Limit value (µg/m³)	Tolerance
SO_2	1-hour	350	88
	24-hour	125	4
	Annual	50	0
NO_2	1-hour	200	88
	Annual	40	0
PM_{10}	24-hour	75	4
	Annual	40	0
$PM_{2..5}$	24 hour	40	0
	Annual	20	0
CO	1-hour	30 000	88
	8-hour running mean	10 000	11

4 AMBIENT AIR QUALITY IN RICHARDS BAY

4.1 Emission sources

Richards Bay is one of the fastest developing areas in South Africa with the Port of Richards Bay and the Richards Bay Industrial Development Zone being a major attraction for industrial and commercial development. The Port of Richards Bay houses one of the largest coal export terminals in the world. Activities at the Port, including shipping and coal handling, are sources of air pollution. A number of major and smaller industries located in Richards Bay all emit a range of air pollutants into the atmosphere.

Other local air pollution sources include emissions from vehicles exhaust, dust from mining activities, forest and sugarcane burning and dust from coal stockpiles. Collectively these sources of air pollutants contribute to the ambient concentrations experienced in Richards Bay. In addition, long-range transport of air pollutants to the east coast from the industrialised Highveld and elsewhere contribute to the local air which has an additive effect.

4.2 Ambient air quality

Ambient air quality monitoring is undertaken in Richards Bay by the City of uMhlathuze and the Richards Bay Clean Air Association (RBCAA). The current ambient air quality conditions is evaluated for this sensitivity analysis using the available data from air quality monitoring stations (AQMS) in the area. Ambient data was only available for SO_2, PM_{10} and $PM_{2.5}$. Available hourly data was downloaded from the South African Air Quality Information System (SAAQIS) (http://saaqis.environment.co.za). SO_2 data was obtained from the Harbour AQMS. PM_{10} data was obtained from the CBD AQMS. $PM_{2.5}$ data was obtained from the Brackenham AQMS. On average, data capture for 2021-2023 is 91% (

Table 4-1) and thus may be considered representative for the baseline air quality conditions in the area.

Table 4-1: Data Capture for data obtained from respective monitoring stations between 2021-2023

Pollutant	Data Capture (%)	Station
SO_2	96	Harbour
PM_{10}	92	CBD
$PM_{2.5}$	84	Brackenham

4.2.1 Sulphur dioxide (SO_2)

Ambient SO_2 concentrations may be attributed mostly to local industrial sources. Hourly average SO_2 concentrations at the Harbour AQMS ranged between 0.003 ppb and 425.2 ppb (Figure 4-1), whereas daily average SO_2 concentrations ranged between 0.07 and 330.47 ppb (Figure 4-2). There were 53 exceedances of the hourly standard (134 ppb) and 37 exceedances of the daily standard (48 ppb). In terms of the South African NAAQS, 88 exceedances of the hourly limit are permitted, whereas 4 exceedances of daily limit are permitted within a calendar year. Therefore, SO_2 levels measured at the Harbour AQMS between 2021-2023 exceeded the daily air quality standard. Annual average SO_2 concentrations ranged between 6.78 ppb and 9.59 ppb. No exceedances of the SO_2 annual standard (19 ppb) were observed during the monitoring period.

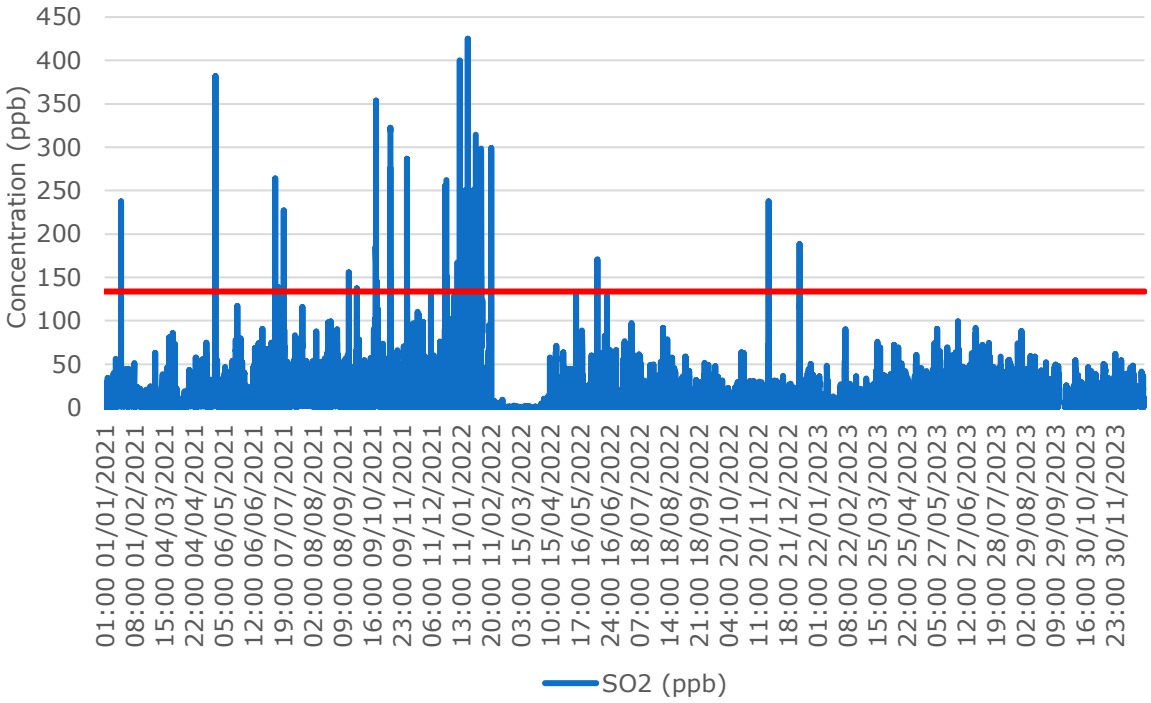

Figure 4-1: Hourly average SO_2 concentrations (ppb) measured at the Harbour AQMS

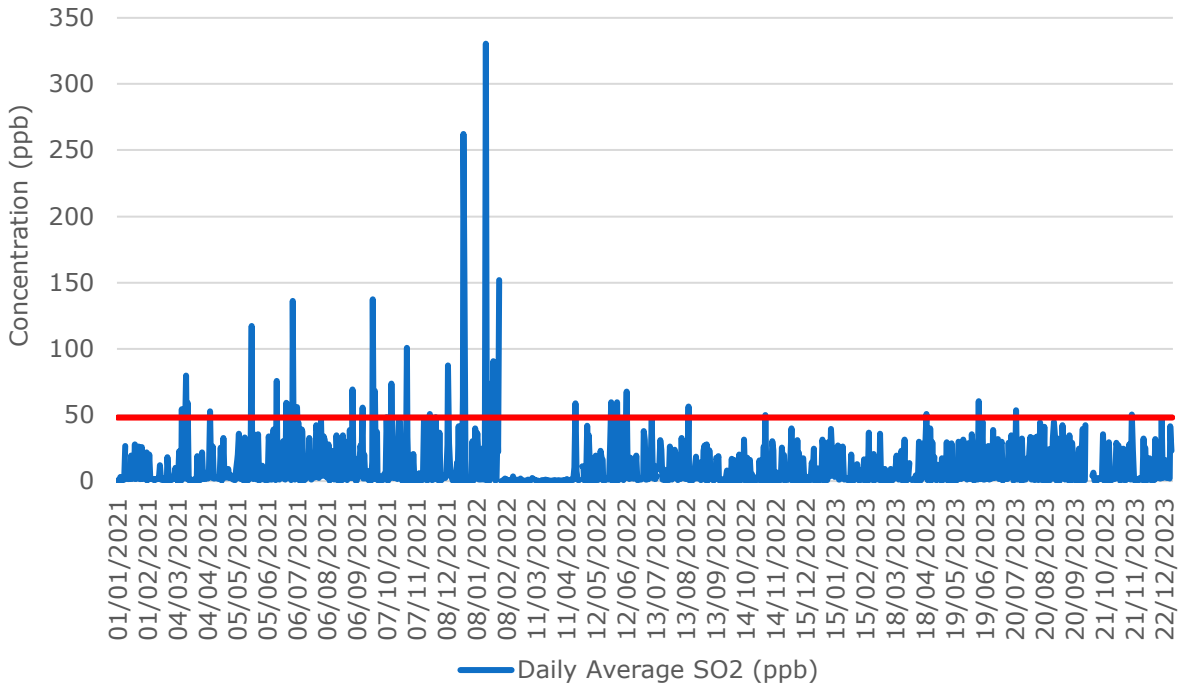

Figure 4-2: Daily average SO_2 concentrations (ppb) measured at the Harbour AQMS

4.2.2 Particulate matter (PM_{10})

PM_{10} is a regional pollutant with a regional background concentration in Richards Bay of more than 20 µg/m^3 (Okello et al, 2018). Ambient PM_{10} concentrations may be attributed mostly to the high regional background with some contribution from local sources.

Daily average PM_{10} concentrations at the CBD AQMS ranged between 1.99 µg/m^3 and 182.69 µg/m^3, with an average of 11.8 µg/m^3. Only 1 exceedance of the PM_{10} daily standard (75 µg/m^3) was observed during the monitoring period (Figure 4-3). In terms of the South African NAAQS, 4 exceedances of the PM_{10} 24-hour standard are permitted within a calendar year. Therefore, PM_{10} concentrations measured between 2021-2023 at the CBD AQMS are below the standard. Annual average PM_{10} concentrations ranged between 10.48 µg/m^3 and 18.21 µg/m^3, with an average of 13.32 µg/m^3. PM_{10} annual levels were therefore below the annual standard of 40 µg/m^3.

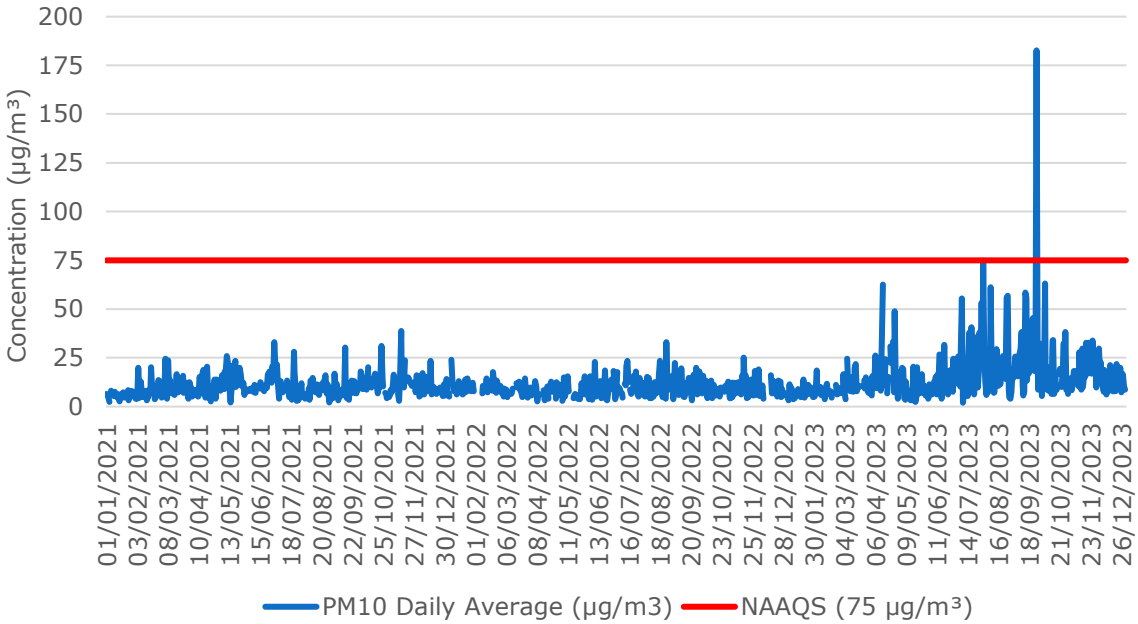

Figure 4-3: Daily average PM_{10} concentrations ($\mu g/m^3$) measured at the CBD AQMS

Daily average $PM_{2.5}$ concentrations at the Brackenham AQMS range between 2 $\mu g/m^3$ to 50 $\mu g/m^3$, with an average of 11.43 $\mu g/m^3$. A total of 9 exceedances of the $PM_{2.5}$ daily standard (i.e. 40 $\mu g/m^3$) were observed during the monitoring period (Figure 4-4). In terms of the South African NAAQS, no exceedances of the $PM_{2.5}$ 24-hour standard are permitted within a calendar year. $PM_{2.5}$ concentrations measured at the Brackenham AQMS are therefore not in compliance with the standard. Annual average $PM_{2.5}$ concentrations ranged between 12.21 $\mu g/m^3$ to 13.30 $\mu g/m^3$, with an average of 12.65 $\mu g/m^3$. $PM_{2.5}$ annual levels were therefore below the annual standard of 20 $\mu g/m^3$.

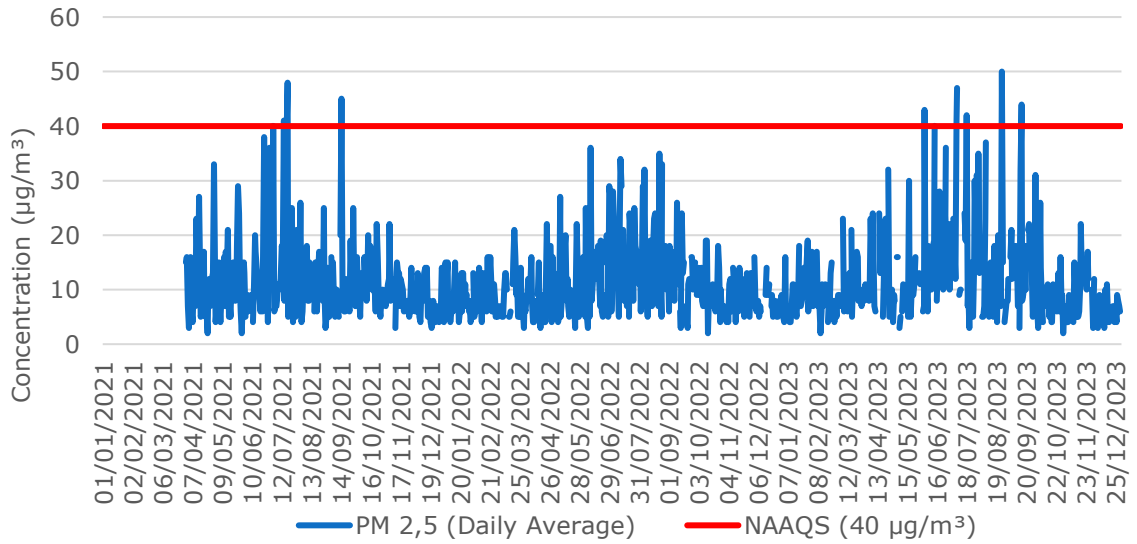

Figure 4-4: Daily average $PM_{2.5}$ concentrations ($\mu g/m^3$) measured at the Brackenham AQMS

4.2.3 Coal dust

There has been a significant demand internationally for coal which resulted in an increase in the amount of coal being brought to Richards Bay. It is stored and handled in open coal yards before being exported through the Port of Richards Bay. Fugitive emissions of coal dust from storage, handling and wind entrainment are sources of coal dust. A review of complaints listed in the RBCAA's monthly report for September 2022 (https://rbcaa.org.za/) highlights the negative impacts of coal dust on health and property in Arboretum, Alton, Birdswood, Veldenvlei, amongst others.

5 SITE SENSITIVITY

5.1 Sensitive receptors

The US Environmental Protection Agency (2024)[1] recognise Sensitive Receptors as areas which include, but are not limited to, hospitals, schools, daycare facilities, elderly housing and convalescent facilities or specialised healthcare facilities. These are areas where the occupants are more susceptible to the adverse effects of exposure to toxic chemicals, pesticides and other pollutants.

The California Air Resources Board[2] identify Sensitive Receptors as children, elderly, asthmatics and others who are at a heightened risk of negative health outcomes due to exposure to air pollution. The locations where these sensitive receptors congregate are considered sensitive receptor locations and therefore include hospitals, schools and day care centres, and other such locations.

5.2 Site sensitivity

The Site Sensitivity regarding air quality considers the existing state of air quality in Richards Bay and is based on the definition and understanding of sensitive receptors. Three sensitivity classes are defined for this Site Sensitivity assessment:

High sensitivity:	Hospitals, clinics, schools, daycare facilities and old age homes
Medium sensitivity:	Residential areas
Low sensitivity:	Commercial and industrial areas

For the Site Sensitivity assessment, receptors are assessed within a 5 km radius of the proposed Mabasa CCPP site, as indicated by the circle in Figure 6-1.

[1]https://www.epa.gov/newenglandhc/environmental-issues-concern-urban-communities-resources

[2]https://ww2.arb.ca.gov/capp-resource-center/community-assessment/sensitive-receptor-assessment

Areas of high sensitivity include sensitive receptors as defined above, and up to 200 m around the respective receptors, indicated as red-shaded areas in Figure 6-1. Included are schools in, amongst others, Aquadene, Brakenham, Arboretum and Alton, and hospitals and clinics to the east of the proposed Mabasa CCPP site.

The areas of medium sensitivity are residential areas within the 5 km radius and are indicated in orange-shaded areas. These are generally east of the R619 and include Aquadene, Brakenham, Wild En Weide, Veldenvlei, Birdswood and Arboretum. Generally people spend the majority of time in these areas.

Low sensitivity areas (blue-shaded areas) which are commercial and industrial areas i.e. non-residential are west of the R619 and include Atton; and south of the R34 including the Port of Richards Bay. Low sensitivity rating is assigned as generally less time is spent by individuals who include economically active adults. Open unoccupied areas such as forests, agricultural areas, water bodies etc. are excluded from the Site Sensitivity.

6 CONCLUSION

The following points are made in conclusion

- Air quality in Richards Bay is compromised by emissions of air pollutants from a range of sources. The air pollutant concentrations vary spatially and temporally in the area, and exceedances of the NAAQS are therefore experienced at times.
- The Mabasa CCPP proposes to use natural gas to generate electricity using a CCGT. Low emissions result from natural gas combustion and the CCGT.
- There are a number of highly sensitive receptors within 5 km of the proposed Mabasa CCPP site. Therefore every measure must be taken ensure that the added contribution to the existing state of air quality is as low as possible and the risk to sensitive areas is minimised.

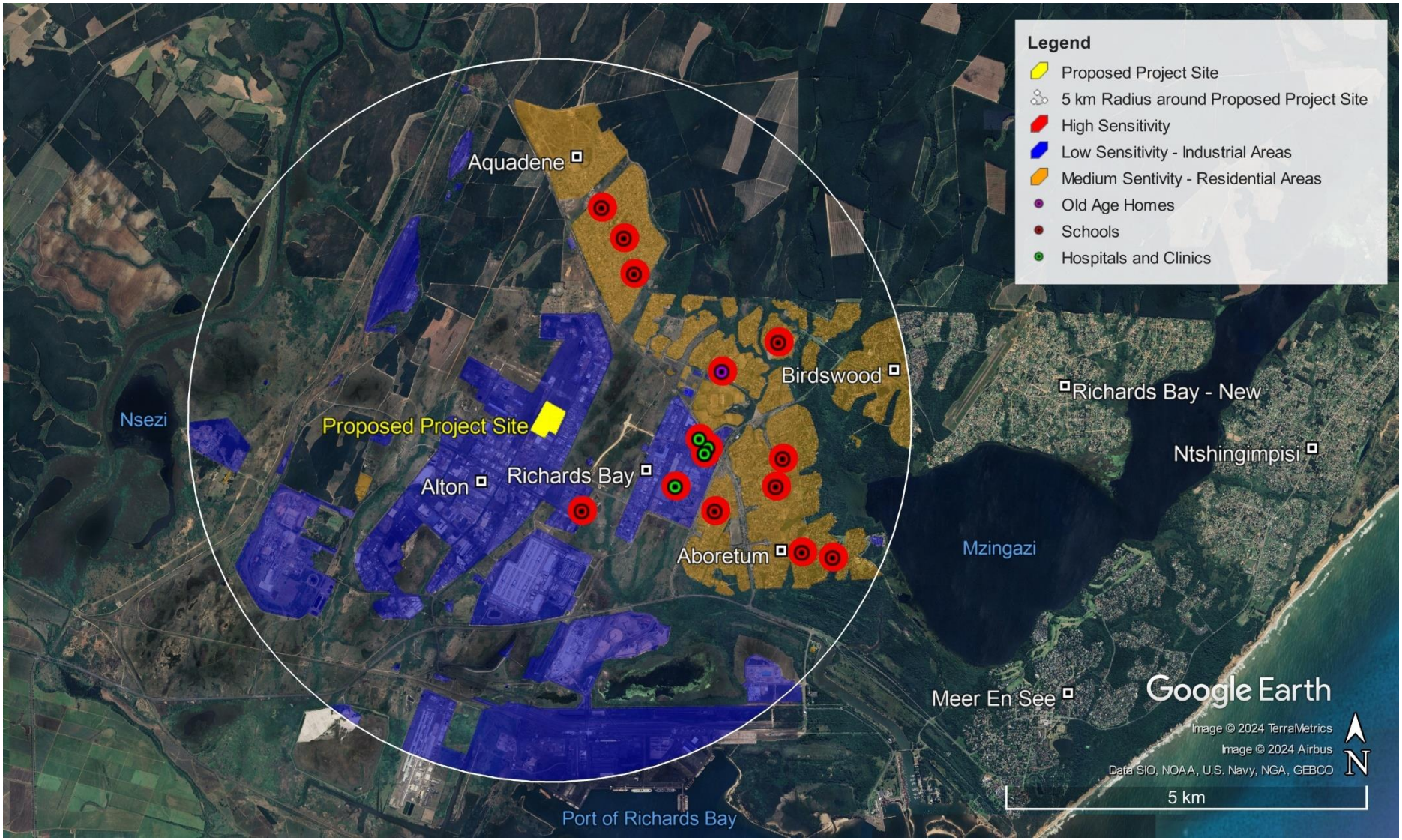

Figure 6-1: Site sensitivity map for air quality

REFERENCES

Nemai Consulting (Pty) Ltd) (2024): Proposed 750 MW Combined Cycle Gas Turbine Power Plant In Richards Bay, City of Umhlathuze Local Municipality, Kwazulu-Natal, Background Information Document, May 2024.