

Draft Scoping Report for the Proposed Sunderland Ridge Organic Waste-to-Energy Biogas Project

Report Prepared for

Bio2Watt Energy Holdings (Pty) Ltd.



Report Number 596240/DSR

Report Prepared by



October 2023

Draft Scoping Report for the Proposed Sunderland Ridge Organic Waste-to-Energy Biogas Project

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Executive Summary

Bio2Watt Energy Holdings (Pty) Ltd (BEH) are proposing to develop an organic waste-to-energy Biogas Plant at Sunderland Ridge, Gauteng Province, South Africa.

To meet investor requirements, an Environmental and Social Impact Assessment (ESIA) process is currently being undertaken in accordance with the International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (ESG), dated January 2012 and other applicable requirements. To align with the South African regulatory terminology, this study will be referred to as an Environmental Impact Assessment (EIA) however will include biophysical and social requirements, as per the international standards.

SRK Consulting (South Africa) (Pty) Ltd (SRK) has been appointed by BEH to provide Environmental Advisory Services for the Sunderland Ridge Biogas Project. The first component of SRK's scope includes the preparation of a screening report, this report, to identify all environmental permits, approvals and regulatory requirements.

In terms of the latest amendments to the 2014 Environmental Impact Assessment Regulations, an application for Environmental Authorisation via a Scoping and Environmental Impact Reporting process is required. This process consists of two phases, a Scoping Phase and an Environmental Impact Assessment (EIA) Phase.

This document constitutes the Draft Scoping Report, which contains the information applicable to the Scoping Phase.

This report includes the following:

- Introduction, the objectives of the scoping process and the legislated requirements for the content of a Scoping Report (Section 1).
- Details regarding the Environmental Assessment Practitioner (Section 2).
- Project location and description (Sections 3-4).
- The legislative context (Section 5).
- Project need and desirability (Section 6).
- Alternatives (Section 7).
- The environmental attributes of the project site (Section 8).
- The public participation process and identified issues (Sections 9-10).
- The assessment methodology and preliminary assessment (Sections 11-12).
- A Plan of Study for the Environmental Impact Assessment Phase (Section 13).
- The Environmental Assessment Practitioner affirmation and other requirements (Sections 14).
- Conclusions and recommendations (Section 16).

Based on the investigations undertaken during Scoping, SRK Consulting is of the opinion that the proposed activity is not in conflict with any prohibition contained in legislation. Furthermore, the Scoping Report complies substantially with Appendix 2 of Government Notice 982, as amended and all identified applicable protocols and minimum information requirements. The applicant is willing and able to ensure compliance with these requirements within the prescribed timeframe.

SRK Consulting therefore recommends that the Scoping Report be accepted, with or without conditions, and that the applicant be allowed to continue with the tasks contemplated in the Plan of Study for the Impact Assessment Phase.

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Disclaimer

The opinions expressed in this Report have been based on the information supplied to SRK Consulting (South Africa) (Pty) Ltd (SRK) by Bio2Watt Energy Holdings (Pty) Ltd. (BEH) and specialists. SRK has exercised all due care in reviewing the supplied information. Whilst SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Opinions presented in this report apply to the site conditions and features as they existed at the time of SRK's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this Report, about which SRK had no prior knowledge nor had the opportunity to evaluate.

List of Abbreviations

AD	Anaerobic Digestion
AEL	Atmospheric Emissions Licence
BA	Basic Assessment
BBP	Bronkhorstspuit Biogas Plant
BEH	Bio2Watt Energy Holdings (Pty) Ltd
CBA	Critical Biodiversity Area
CHP	Combined Heat and Power
CSTR	Continuously Stirred Tank Reactors
DALRRD	Department of Land Reform and Rural Development
DFFE	Department of Forestry, Fisheries and Environment
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
GDARDE	Gauteng Department of Agriculture, Rural Development and Environment
GHG	Greenhouse Gas
GIIP	Good International Industry Practice
IFC	International Finance Corporation
IFC PS	IFC Performance Standards on Environmental and Social Sustainability
NAAQS	National Ambient Air Quality Standards
NDP	National Development Plan
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM: AQA	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
NEM: WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
OEM	Original Equipment Manufacturer
PLC	Programmable Logic Controller
PPA	Power Purchase Agreement
S&EIR	Scoping and Environmental Impact Reporting
SACNASP	South African Council for Natural Scientific Professions

SAHRA	South African Heritage Resources Agency
SACAD	South African Conservation Areas Database
SCADA	Supervisory Control and Data Acquisition
SDF	Spatial Development Frameworks
SPLUMA	Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013)
SRK	SRK Consulting (South Africa) (Pty) Ltd
WML	Waste Management License
WUL	Water Use License

Units

%	percent
°C	degrees Celsius
ha	hectare
kg	kilogram
kV	kilovolt
kW	kilowatt
l/s	litres per second
m	metre
m ²	square metre
m ³	cubic metre
mamsl	metres above mean sea level
MI	megalitre
mm	millimetre
MW	megawatt
MWh	megawatt hour
No.	number
pH	measure of the acidity or alkalinity of a solution
t	metric tonne, 1 000 kg

Chemical Symbols

H ₂ S	Hydrogen Sulphide
NH ₃	Ammonia
NO ₂	Nitrogen dioxide
PM	Particulate matter
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10 microns

PM_{2.5} Particulate matter with an aerodynamic diameter of less than 2.5 microns

SO₂ Sulphur dioxide

1 Introduction and Purpose of Report

1.1 Background to the project

Bio2Watt Energy Holdings (Pty) Ltd (BEH) are proposing to develop an organic waste-to-energy Biogas Plant at Sunderland Ridge, Gauteng Province, South Africa (hereafter referred to as the Project). Figure 1-1 presents a locality map for the proposed Project.

To meet investor requirements, an Environmental and Social Impact Assessment (ESIA) process is currently being undertaken in fulfilment of South African legislation as well as the International Finance Corporation Performance Standards on Environmental and Social Sustainability (IFC PS), dated January 2012 and other applicable requirements. To align with the South African regulatory terminology, this study will be referred to as an Environmental Impact Assessment (EIA) however will include biophysical and social requirements, as per the international standards.

SRK Consulting (South Africa) (Pty) Ltd (SRK) was appointed as the Environmental Assessment Practitioner (EAP) to undertake the required environmental applications on behalf of BEH for the proposed Project.

1.2 Regulatory requirements

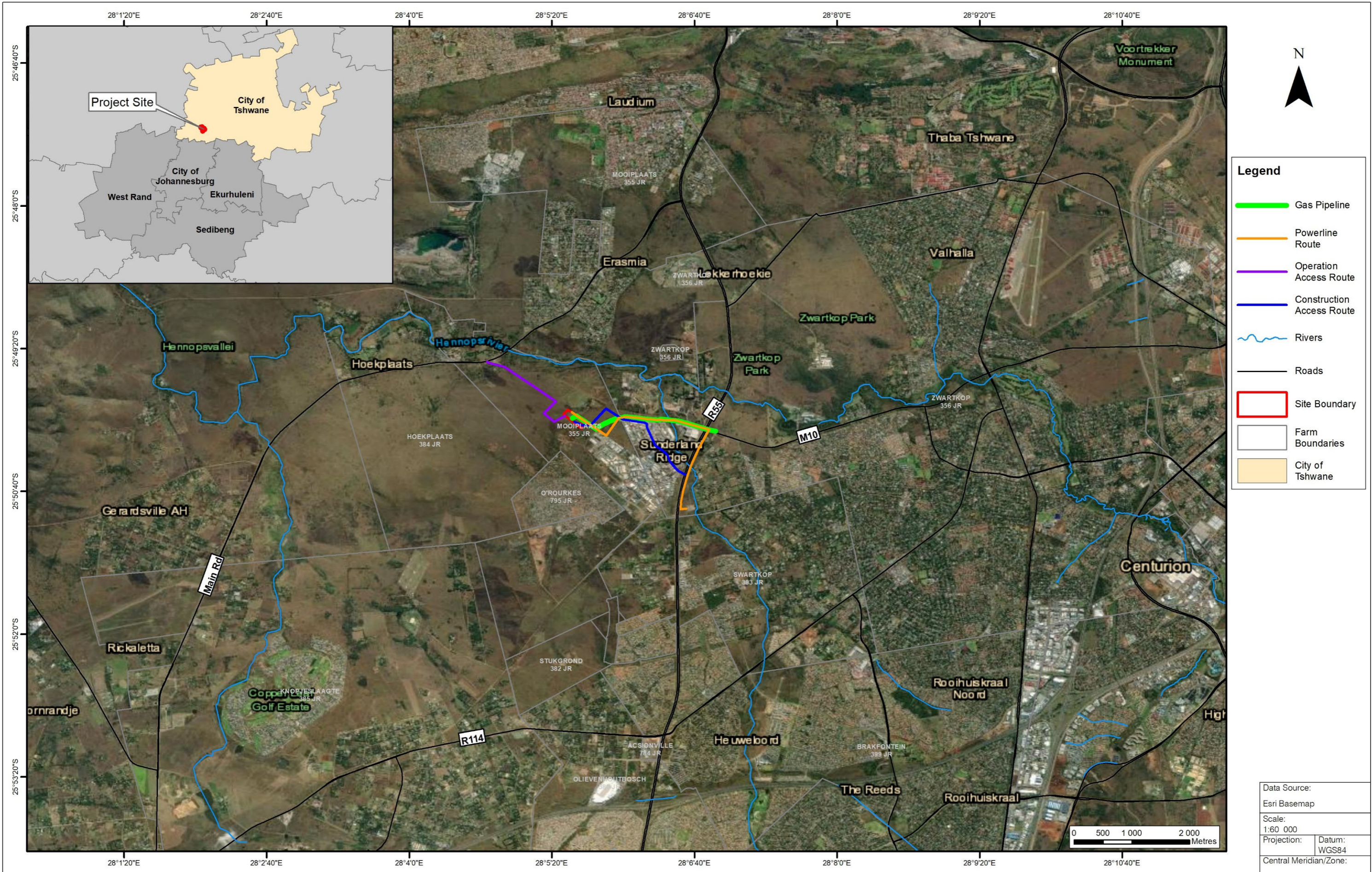
In terms of the 2014 EIA Regulations promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), as amended, an application for Environmental Authorisation for a Scoping and Environmental Impact Reporting (S&EIR) process is required. In addition, a Waste Management Licence is required in terms of the 2017 *List of Waste Management Activities that have, or are likely to have, a Detrimental Effect on the Environment*, promulgated in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM:WA), as amended. This licence application will be undertaken through the S&EIR process. An integrated application for Environmental Authorisation is being applied for in terms of Section 24L of NEMA.

The S&EIR process consists of two phases, namely the Scoping Phase and the EIA Phase. A detailed overview of the applicable South African laws and Good International Industry Practice (GIIP) standards and guidelines are presented in Section 5.

1.3 Purpose of the report

This document constitutes the Draft Scoping Report that contains the information applicable to the Scoping Phase. The draft version of this report will be distributed to relevant authorities and key stakeholders and made available to the general public for review and comment. All comments received on the draft report, along with the responses, will be incorporated into the Final Scoping Report, to be submitted to the Gauteng Department of Agriculture, Rural Development and Environment (GDARDE)¹ for a decision as to whether the application may proceed to the next phase.

¹ GDARD is the Competent Authority for this integrated application.



**SUNDERLAND RIDGE BIOGAS ORGANIC WASTE TO ENERGY PROJECT
LOCALITY MAP**



- Legend**
- Gas Pipeline
 - Powerline Route
 - Operation Access Route
 - Construction Access Route
 - Rivers
 - Roads
 - Site Boundary
 - Farm Boundaries
 - City of Tshwane

Data Source:	
Esri Basemap	
Scale:	
1:60 000	
Projection:	Datum:
Central Meridian/Zone:	WGS84
Date:	Compiled by:
16/08/2023	LEKT
Project No:	Fig No:
596240	
Revision: C Date: 26/09/2023	

1.4 Objectives of the scoping process

The objectives of the scoping process are specified in Appendix 2 of the Amendments to the 2014 EIA Regulations, as published by the Department of Environmental Affairs (DEA)² in Government Notice (GN) , as amended.

Table 1-1 lists the scoping objectives from GN , as amended, and provides a reference to the applicable Section of this document where each objective is addressed.

Table 1-1: Objectives of the Scoping Process

Scoping Objectives (Appendix 2 of GN, as amended)	Reference in this Document
1. The objective of the scoping process is to, through a consultative process-	Section 1.4: Objectives of the scoping process Section 8: Environmental Attributes
(a) Identify the relevant policies and legislation relevant to the activity.	Section 5: Legislative Context
(b) Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location.	Section 6: Project Need and Desirability
(c) Identify and confirm the preferred activity and technology alternative through an identification of impacts and risks and ranking process of such impacts and risks.	Section 4: Project Description Section 7: Alternatives
(d) Identify and confirm the preferred site, through a detailed site selection process, which includes an identification of impacts and risks inclusive of identification of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment.	Section 3: Project Location Section 8: Environmental Attributes
(e) Identify the key issues to be addressed in the assessment phase.	Section 10: Issues and Responses
(f) Agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site.	Section 11: Assessment Methodology Section 13: Plan of Study for EIA
(g) Identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	Section 12: Preliminary Assessment

Source: Appendix 2 of GN , as amended (DEA, 2017).

1.5 Report content

The legislated requirements for the content of a Scoping Report are specified in Appendix 2 of the Amendments to the 2014 EIA Regulations (GN , as amended).

Table 1-2 lists the content requirements from GN , as amended and provides a reference to the applicable Section of this document where the specified information is provided.

² The DEA is now the Department of Forestry, Fisheries and Environment (DFFE)

Table 1-2: Legislated Requirements for the Content of a Scoping Report

Content Requirements (Appendix 2 of GN , as amended)	Reference in this Document
2(1) A scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include—	Section 1: Report Content
(a) details of — (i) the EAP who prepared the report. (ii) the expertise of the EAP, including a curriculum vitae.	Section 2: The Environmental Assessment Practitioner
(b) the location of the activity, including— (i) the 21 digit Surveyor General code of each cadastral land parcel. (ii) where available, the physical address and farm name. (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	Section 3: Project Location
(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is— (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken.	Figure 1-1: Locality map Figure 4-2: Preliminary layout plan for the Sunderland Ridge Biogas Plant
(d) a description of the scope of the proposed activity, including— (i) all listed and specified activities triggered. (ii) a description of the activities to be undertaken, including associated structures and infrastructure.	Section 4: Project Description Section 5: Legislative Context Table 5-1: NEMA EIA Listed Activities potentially triggered by the project and Table 5-2: NEM:WA Listed Activities potentially triggered by the project.
(e) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.	Section 5: Legislative Context
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location.	Section 6: Project Need and Desirability
(g) a full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including— (i) details of all the alternatives considered; (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; (iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 7: Alternatives Section 8: Public Participation Process Section 10: Issues Section 7.3.3: Environmental Attributes

Content Requirements (Appendix 2 of GN , as amended)	Reference in this Document
<ul style="list-style-type: none"> (v) the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts— <ul style="list-style-type: none"> (aa) can be reversed. (bb) may cause irreplaceable loss of resources. (cc) can be avoided, managed or mitigated. (vi) the methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives. (vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects. (viii) the possible mitigation measures that could be applied and level of residual risk. (ix) the outcome of the site selection matrix. (x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such. (xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity. 	<p>Section 12: Preliminary Assessment</p> <p>Section 11: Assessment Methodology</p> <p>Section 12: Preliminary Assessment</p> <p>Section 12: Preliminary Assessment</p> <p>Section 12: Preliminary Assessment</p> <p>Section 7: Alternatives</p> <p>Section 12: Preliminary Assessment</p>
<ul style="list-style-type: none"> (h) a plan of study for undertaking the environmental impact assessment process to be undertaken, including— <ul style="list-style-type: none"> (i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity. (ii) a description of the aspects to be assessed as part of the environmental impact assessment process. (iii) aspects to be assessed by specialists. (iv) a description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists. (v) a description of the proposed method of assessing duration and significance. (vi) an indication of the stages at which the competent authority will be consulted. (vii) particulars of the public participation process that will be conducted during the environmental impact assessment process. (viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process. (ix) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored. 	<p>Section 13: Plan of Study for EIA</p>
<ul style="list-style-type: none"> (i) an undertaking under oath or affirmation by the EAP in relation to— <ul style="list-style-type: none"> (i) the correctness of the information provided in the report. (ii) the inclusion of comments and inputs from stakeholders and interested and affected parties. 	<p>Section 13.3.15: EAP Affirmation</p>

Content Requirements (Appendix 2 of GN , as amended)	Reference in this Document
(iii) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties.	
(j) an undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment.	Section 13.3.15: EAP Affirmation
(k) where applicable, any specific information required by the competent authority.	Section 15: Other Requirements
(l) any other matter required in terms of section 24(4)(a) and (b) of the Act.	Section 15: Other Requirements
(2) Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a scoping report, the requirements as indicated in such notice will apply.	Section 15: Other Requirements

Source: Appendix 2 of GN , as amended (DEA, 2017).

2 Environmental Assessment Practitioner

In accordance with Item 2(1)(a) in Appendix 2 of GN , as amended, this Section provides details of:

- (i) The EAP who prepared this report.
- (ii) The expertise of the EAP.

2.1 SRK Consulting

SRK was established in South Africa in 1974 and has expanded over the years with the SRK Group Consulting Practices now employing approximately 1 400 professional staff operating from more than 50 established offices on six continents.

SRK offers expertise in a wide range of environmental and engineering disciplines whilst implementing rigorous quality assurance standards in accordance with SRK's International Standards Organisation (ISO) 9001:2015 accreditations.

SRK's independence is ensured by the fact that it is strictly a consultancy organisation, not holding equity in any project and with ownership primarily by staff. SRK's senior technical staff also maintain independent accreditation with the relevant professional accreditation bodies. This permits its consultants to provide clients with conflict-free and objective support on crucial issues. SRK's fee for completing this report is based on its normal professional daily rates plus reimbursement of incidental expenses. The payment of that professional fee is not contingent upon the outcome of the report.

SRK Environmental, Social and Governance team has been practicing in South Africa since 1989 and has a distinguished track-record of managing a diverse range of large and complex projects, including conducting ESIA processes.

2.2 Details of the EAP

The EAP for this application is Mrs. Tamaryn Hale, Senior Environmental Scientist at SRK.

Pertinent information relating to the expertise of the EAP is summarised below:

- Bachelor of Science Honours Degree in Environmental Science (2007) from the University of Kwa-Zulu Natal.
- 15 years of experience in the field of environmental management.
- Specialises in environmental assessment, environmental auditing and integrated environmental licencing for the industrial, waste management and mining sectors.
- A registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA) (Reg. No. 2020/1604).
- A registered natural scientist with the South African Council for Natural Scientific Professions (SACNASP) (Reg. No. 118704)

For further details, refer to the EAP curriculum vitae in **Appendix A**.

3 Project Location

In accordance with Items 2(1)(b) and 2(1)(c) in Appendix 2 of GN , as amended, this Section provides details of the location of the proposed Project, including:

- The 21-digit Surveyor General (SG) code of each cadastral land parcel (**Table 3-1**).
- The physical address and property name (refer to the box below).
- Geographical coordinates for the site (**Table 3-2**).
- A plan which locates the proposed activities applied for at an appropriate scale (**Figure 1-1** and **Figure 4-2**).

The proposed Project, which includes a biogas plant, has a development footprint of 5 hectares (ha) and will be constructed on a portion of a 10 ha site located within the Centurion area. A preliminary layout plan has been provided. The final layout will be made available during the EIA Phase.

Details of the project location are as follows:

Country:	South Africa
Province:	Gauteng
Municipality:	City of Tshwane Metropolitan Municipality
Town:	Centurion
Suburb:	Sunderland Ridge
Erven:	Remainder 29 of Portion 122 of Erf 355-JR Mooiplaats
Zoning:	Agriculture: Undetermined and within the Gauteng Environmental Management Framework (EMF)

The extent and SG codes for the erf comprising the project site is provided in **Table 3-1**.

Table 3-1: Project site erven, extent and Surveyor General (SG) codes

Site Erven	Erf Extent	SG Code
Remainder 29 of Portion 122 of Erf 355-JR Mooiplaats	12.74 ha	T0JR0000000035500000

The coordinates of the boundary of the property are provided in **Table 3-2**. **Section 8.1** provides a description of the surrounding land uses and the site neighbours.

Table 3-2: Geographical coordinates of the external corner points of the site

Corner no.	Latitude			Longitude		
1	25°	49'	55.55"	28°	05'	31.05"
2	25°	50'	02.41"	28°	05'	36.87"
3	25°	50'	13.02"	28°	05'	35.20"
4	25°	50'	00.50"	28°	05'	20.38"

Source: SRK GIS, August 2023

4 Project Description

In accordance with Item 2(1)(d)(ii) in Appendix 2 of GN 982, as amended, this Section provides a description of the proposed activities, including associated structures and infrastructure.

BEH are proposing the establishment of an anaerobic digestion, organic waste-to-energy biogas plant in Sunderland Ridge. The plant will process organic waste (from agriculture and the food industry) to produce biogas and digestate. The digestate will be sold for use as a soil enhancer/fertiliser) and two alternatives for the biogas are being considered. The biogas will be converted to electricity and fed into the national grid and compressed and sold to an off taker.

The Sunderland Ridge Biogas Plant will divert waste from traditional methods of composting, landfills and at times burying of waste, to a sustainable solution, which will see baseload energy being produced in the country, and much needed green jobs created. The plant will prevent a significant amount of methane entering the environment daily, methane being up to 80 times more destructive than carbon dioxide regarding climate change. The plant will see the circular green economy being enhanced in the Gauteng Province on an industrial scale. The Plant footprint is approximately 5ha in extent.

The sub-sections below provide further information in terms of:

- Process overview.
- Feedstock.
- Water supply.
- Power supply.
- Products.
- Waste management.
- Water management.
- Stormwater management.
- Access.
- Resource efficiency initiatives.

4.1 Process overview

Biogas is produced from organic waste, through a process of Anaerobic Digestion (AD). The biogas will be used to power gas engines which each run a coupled electric generator, to produce electrical power and the biogas will be compressed and sold to an offtaker. Once the organic waste has been circulated through the biogas plant it is recycled, the liquid digestate will be sold for irrigation on agricultural land and the solids used for composting purposes by an independent local contractor. As with the existing Bronkhorstspruit Biogas Plant, digestate will be registered with the Department of Land Reform and Rural Development (DALRRD) as a Group 2 fertilizer and will be commercially marketed and sold as such.

The plant is classified as a small industrial plant and has an estimated design life of 20 years. AD is a multi-stage biological process whereby bacteria, in the absence of oxygen, decompose organic matter to carbon dioxide, methane and water. In this way the feedstock is stabilized and noxious odours are removed, while the organic matter in the sludge is converted into a clean-burning combustible gas.

The process occurs in two stages:

- First Stage: The organic matter in the feedstock is converted into organic acids (also called volatile fatty acids) by acid forming bacteria.
- Second Stage: These organic acids serve as the substrate (food) for the strictly anaerobic, methane – producing bacteria, which convert the acids into methane and carbon dioxide.

The end result of the process is:

- A well-stabilized sludge in which 50 to 60% of the volatile solids have been eliminated.
- A combustible gas consisting of 60 to 65% methane, with the remainder being largely carbon dioxide and a small amount of water vapor.

The advantages of the digester are as follows:

- The system is fully enclosed, which reduces nuisance odour.
- The system makes use of industrial waste, which would otherwise present a disposal problem.
- The system is efficient and has a high gas yield when compared with similar technologies.

A description of the process is provided in the sub-sections below, a process flow diagram is provided in **Figure 4-1** and a preliminary layout of the site provided in **Figure 4-2**. It is noted that the layout of the site is still being finalised, and the final layout plan will be provided in the EIA Phase. Plate 4-1 provides a photograph of an existing Biogas Plant.



Source: BEH website (<https://www.bio2watt.com/>)

Plate 4-1: Existing Biogas Plant at Bronkhorstspuit

4.2 Biogas plant

The Biogas plant encompasses approximately 5 hectares and consists principally of:

- Covered feedstock discharge slabs.
- Unstackable solid waste and cattle manure pit.
- Liquids receiving area including liquid reception tank (storage capacity of 556m³).
- Liquid intake tank with decanters.
- Mixing tank (storage capacity of 2182m³) and solid feeders.
- Feedstock to pasteurization tank (storage capacity of 234m³).
- Hygienisation Plant / Pasteurization unit.
- 3 main anaerobic digester tanks (each with a storage capacity of 5650m³).
- 3 post anaerobic digester tanks (each with a storage capacity of 5650m³).
- Ammonia (NH₃) stripper.
- 2 Ammonium Sulphate Storage tanks (combined storage capacity of 50m³).
- Heat Exchanger Unit.
- Biogas treatment.
- Chemical storage.
- Potentially 2 or more Liquid digestate tanks (each with an estimated storage volume of 2182m³) and associated decanter.
- Possibly 2 Gas Flares.
- Retention pond.
- Administration Building and control room.

- Fire-fighting system and fire house.
- Electricity generation:
 - Combined Heat and Power (CHP) generator main.
 - Transfer station / Transformer.
- Gas compression:
 - Emergency gas storage tank (storage capacity of 500m³).
- Weighbridge.
- Stormwater management system.
- Dangerous goods / chemical storage facility.

4.2.1 Feed receiving, preparation and buffering

All the feed materials are received and treated in this stage to enable optimum operation of the digester. These include maceration of solids as well as sand, slit, plastic and wood removal. The mixing of the feed into the desired ratio also takes place in this stage.

Vehicles delivering feedstock will be weighed on a weighbridge situated near the plant entrance. Both gross and net mass readings will be performed in order to calculate the mass of feedstock delivered, forming the basis of gate fee calculations.

Stackable / solid feedstock will be unloaded onto a covered reception slab or into covered feedstock reception bays providing 2 days of feedstock storage. Liquid feedstock will be unloaded straight into the biogas plant and stored in a liquid reception tank. Hazardous feedstock (like processed abattoir waste products) will be unloaded directly into the hygienisation plant for pasteurisation.

From the solid feeders, solid feedstock will enter one of two (2) shredders where the size of solid particles will be reduced. Macerated solids, together with liquid and pasteurised substrate will be pumped by one of two (2) mixing pumps to a mixing tank for 1 hour retention. The purpose of the mixing tank is to thoroughly mix the waste streams and allow for heavy grit and stones to settle and be removed. In the mixing tank, the consistency of the mixed feed is carefully controlled through the addition of recycled water from the digestate treatment (refer to **Section 4.2.4**), and fresh water as required at Startup. Any pH adjustments required will also be made in the mixing tank by the addition of caustic soda or similar.

4.2.2 Anaerobic digestion

The feed from the mixing tank is fed into digesters whereby the digestion process takes place and biogas is produced.

Feed is fed from the mixing tank into an estimated three main digesters (refer to Plate 4-2 for an example) and three post-digesters (refer to Plate 4-3 for an example), known as Continuously Stirred Tank Reactors (CSTRs) for the anaerobic digestion process. A CSTR, also referred to as a completely mixed reactor, is the most common form of an anaerobic digester. It is widely used in sewage treatment plants and many industrial wastewater treatment facilities. A completely mixed reactor is a low-rate digester technology and is essentially a tank that is heated and mixed. The advantage of the CSTR is that the process is more tolerant to variations in feed quality because the large hydraulic volume serves as a buffer for changes in feed pH and temperature.

The AD process will operate in the mesophilic temperature range, being 35 – 40°C in the main digesters and 35 - 40°C in the post digesters. Each of the six (6) digester tanks will be fitted with a gas storage dome, providing a total of 12 700 m³ of biogas storage. The gas is collected from the top of the digesters, from where it is fed to the engines, via a chiller, to remove excess moisture and H₂S.

The heat supplied to the digesters will be provided from the CHP engine cooling water circuits. This heat will be provided to substrate drawn from the post digesters and pumped back into the main digesters at a temperature of approximately 44°C.

Approximately 600 tons of solid / liquid organic waste and 150-180m³ of water will be fed through the digesters on a daily basis.



Plate 4-2: Example of a digester



Plate 4-3: Example of a post-digester

4.2.3 Digestate treatment

Overview: After the digestion, the end-product (called digestate) is fed through a de-watering process where the digestate is separated into solid and liquid components. The solids are available as compost for fertilizing, and the liquid effluent is available as a liquid fertilizer.

Substrate from the post digesters will contain 6% solids. The digestate will be pumped to a solid bowl decanter(s) for the removal of the solid fraction. Digestate is removed from the post digesters once most of the volatile content has been used up. The digestate is pressed to remove excess water, which can be recycled back into the process or used as liquid fertiliser. The remaining solid is sold as compost. Once nitrogen levels in the recycled water build up to prescribed levels, the water is removed from the system and used as a fertilizer.

Solids will have a moisture content of 75% and will be available for sale or disposal as organic compost. Liquid fraction will have a solid content of 3.7% and be stored in the liquid digestate tank and it will be sold as a liquid fertiliser to composters or farmers. Prior to sale of the product, testing will be done to ensure the product remains within the required parameters once the digestate is registered as a fertiliser with DALRRD.

4.2.4 Gas purification

Low concentrations of Hydrogen Sulphide (H_2S) in the Biogas are an inevitable result of the digestion process. In the view of the feedstock used in the process, a Sulphide scrubber is not required, however, the design does cater for a scrubber should it becomes necessary at some point. The production of H_2S which is harmful to the gas engines and results in the presence of Sulphur Dioxide (SO_2) in the engine, is controlled and limited through the addition of Ferric salts into the feedstock. The Biogas goes through a gas chiller to ensure that the input gas is at the right temperature and humidity for the gas engines. This also serves the purpose reduced the concentration of H_2S .

H_2S concentration in the gas supplied to the gas engines is kept below 500ppm and is monitored on a weekly basis. All H_2S passing through the gas engine is converted to SO_2 which is evacuated to

atmosphere in the engine exhaust. Stoichiometric calculations indicate that the typical SO₂ emissions will be maintained below 10mg/Nm³.

4.2.5 Biogas flares

Since the AD process is continuous, the production of biogas will continue even in the event of no demand from the CHP engines. In such an event the biogas must be safely burned in a flare stack (**Plate 4-4**), of which potentially 2 will be provided in the plant construction. The flares ensure that the methane is combusted prior to being exposed to the air to reduce greenhouse gas (GHG) emissions. CO₂ and water vapour is emitted instead. The flares serve as an emergency mitigation measure.



Plate 4-4: Example of a flare stack to be installed

4.2.6 Automation

The entire AD process will be fully automated by making use of appropriate field instruments, a plant-wide PLC and SCADA system. The plant control system will be a platform commonly used in South Africa (such as Siemens). Operator intervention in the AD process will be kept to a minimum. Similarly, the operation of the power generation section will be controlled by PLC/SCADA supplied by the Original Equipment Manufacturer (OEM) and overseen by skilled and trained operators.

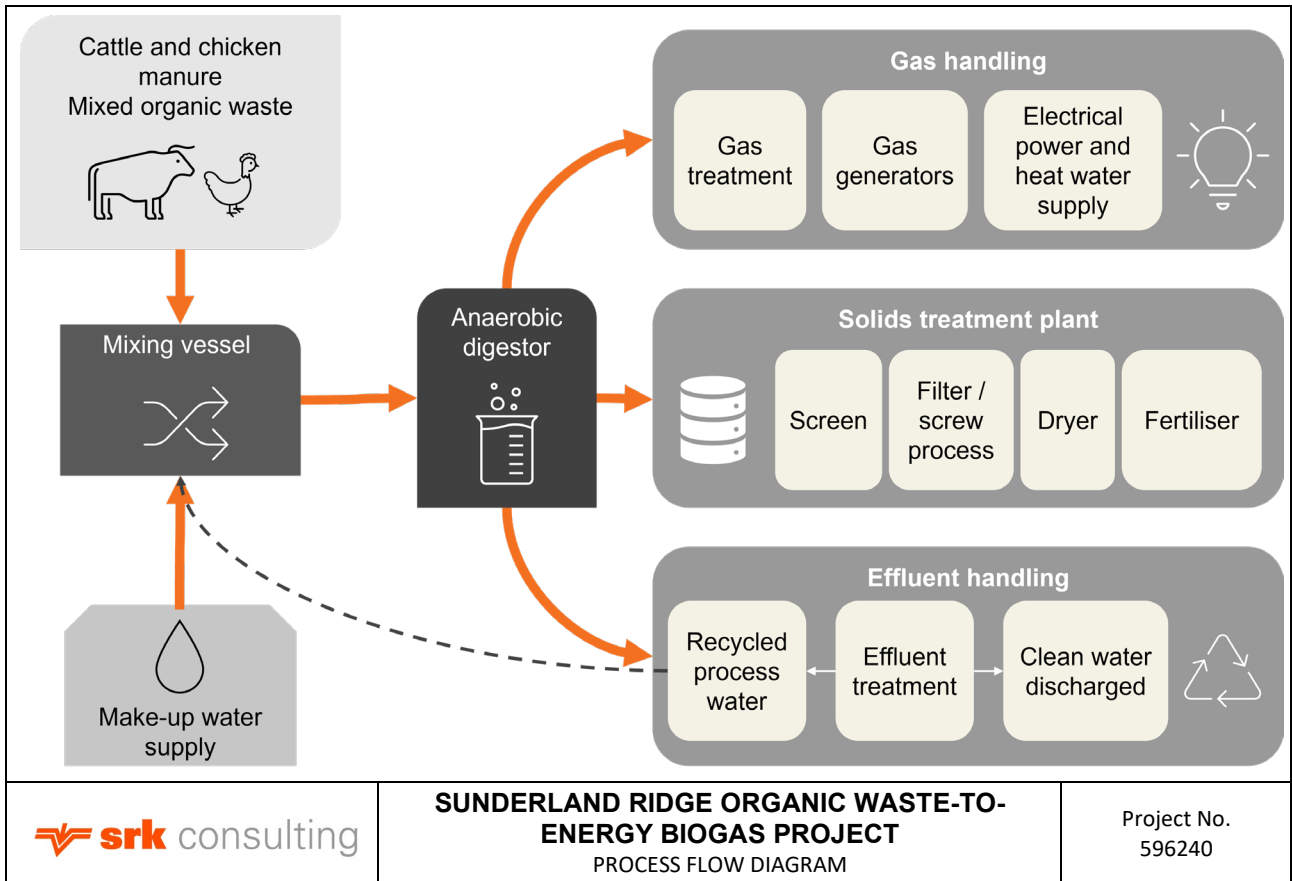


Figure 4-1: Process flow diagram

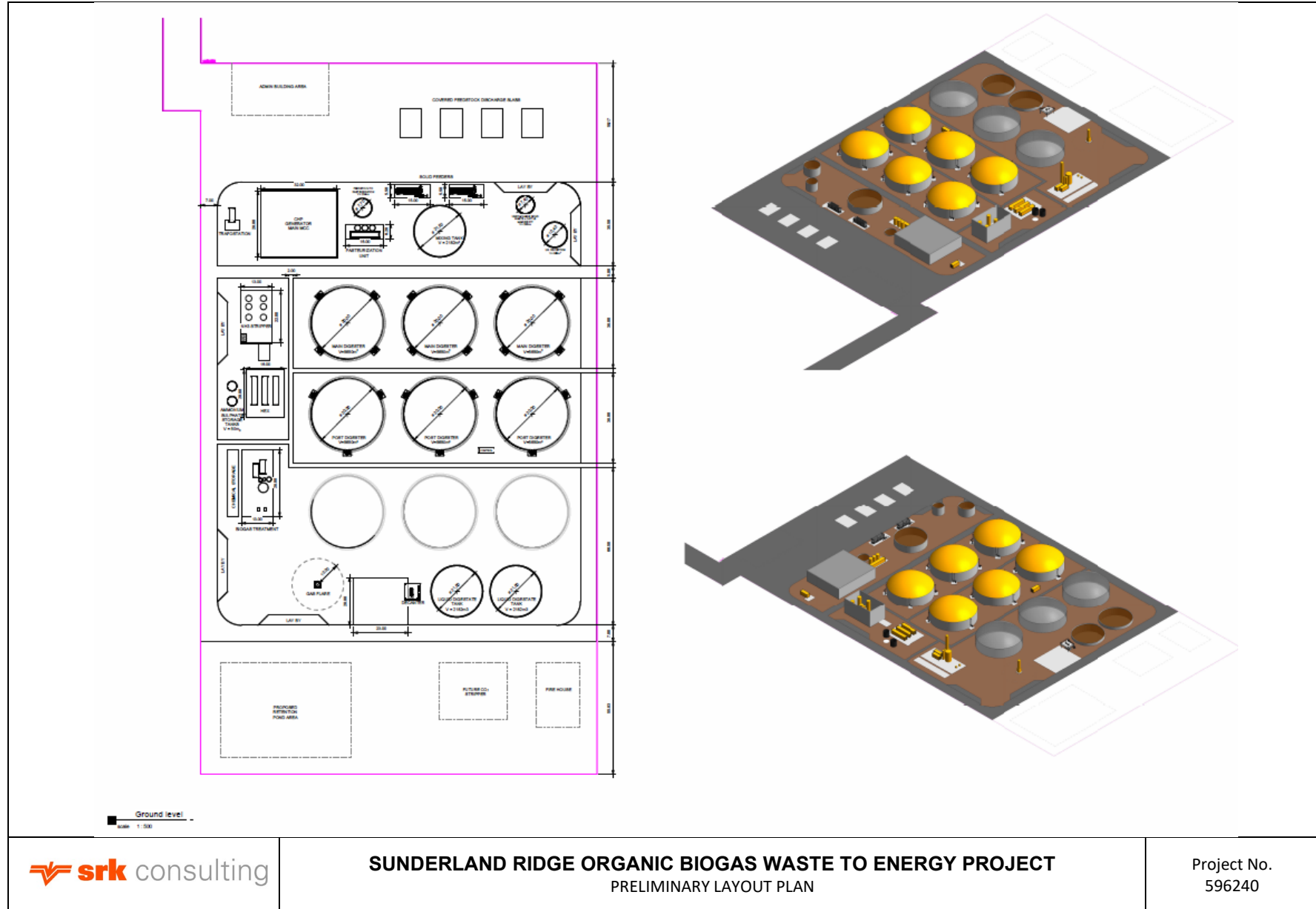


Figure 4-2: Preliminary layout plan for the Sunderland Ridge Biogas Plant

4.3 Feedstock

The following feedstock will be utilised for the proposed Biogas Plant:

- Solid feedstock – this will be trucked to site and stacked or placed into feedstock reception bays.
- Liquid feedstock – this will be trucked to site and loaded directly into the process and loaded into a liquid reception tank.
- Hazardous feedstock (e.g. processed abattoir waste) – this will be unloaded directly into the hygienisation plant.
- Approximately 600 tons of feedstock will be required per day.

Commitments have been made by waste companies and agricultural operations to supply the plant with organic waste. All feedstocks will be delivered to the plant by means of road haulage on a 7 days per week, 24 hours per day basis.

4.4 Water supply

Water will be sourced from the municipal bulk water supply. Approximately 150-180m³ will be required per day for all operating process on site. The proposed method will be finalised in the EIA Phase.

4.5 Power supply

The site will have an installed capacity of up to 9.8MW of electricity and is also considering being self-reliant for power supply. The electricity will be used to power the site and the option of selling excess electricity to the national grid is being considered in this ESIA process (refer to **Section 7.2**). Should this alternative be implemented, a new overhead transmission line (either 11 or 22kV) will be installed to connect the Biogas Plant to the existing Raslow substation, which lies approximately 2.2km south-east of the site (**Figure 1-1**).

4.6 Products

The Plant will generate biogas and have a total storage capacity of 12 700m³. The biogas will be used to generate up to 9.8MW of electricity and be compressed and sold to an off taker.

A by-product of the process is liquid and solid digestate. Approximately 500m³ per day of liquid digestate will be generated and stored in dams for sale and distribution to off-takers. This will be sold as a soil enhancer/fertilizer, once registered as an approved fertilizer with the Department of Agriculture and Land Reform. The solid digestate, approximately 100-150m³ per day, will likewise be sold and used for composting purposes once registered.

4.7 Waste management

Some of the organic liquid waste generated by the process will be collected into a pond, tested and pumped back into the process through the solid pit. Approximately 550-600 m³ of organic waste will be generated per day. Domestic waste generated by the Project will be disposed of via the municipal waste removal system. General waste on site will be separated and recycled accordingly. Waste oil generated on site will be recycled through a registered recycler.

4.8 Wastewater management

The sewage generated on site will either be disposed of through the installation of a septic tank and soakaway system or connection to the existing Municipal sewage system. Details relating to the proposed wastewater management system will be provided in the EIA Phase.

4.9 Stormwater management

Stormwater for the site will be diverted around the site using open channels and rainwater in and around the buildings will be channelled towards a lined retention pond. A stormwater management plan will be prepared and will be available during the EIA Phase. All process water will be directed to the retention and contained on site.

4.10 Access

An access road off the Main Road, M26, will be constructed by the landowner.

The site location perimeter will be fenced, with suitable access control to be provided by the landowner in consultation with BEH.

Feedstock will be transported to site via trucks. It is anticipated that approximately 17 trucks and 20 light motor vehicles will access the site daily.

Should BEH decide to truck the gas off site, an additional 3 trucks per day will access the site.

Digestate will also be trucked from the site via trucks.

4.11 Resource efficiency initiatives

To achieve the United Nations 2030 Sustainable Development Goals (SDGs), all industries are required to examine the efficiencies of their processes and equipment and to seek ways to maximise resource efficiencies.

To improve water resource efficiency, the digestate from the post digesters will be pumped to a solid bowl decanter(s) for the removal of the solid fraction (roughly 6%). The digestate is pressed to remove excess water, which is then recycled back into the process.

The proposed Sunderland Ridge Organic Waste-to-Energy Biogas Plant will divert waste from traditional methods of composting, landfills and at times burying of waste, to a sustainable solution which will see baseload energy being produced in the country, whilst creating much needed green jobs. The Plant will prevent a significant amount of methane entering the environment daily, methane being up to 80 times more destructive than carbon dioxide regarding climate change. The plant will see the circular green economy being enhanced in the Gauteng Province on an industrial scale. The Plant will therefore improve energy efficiency, reduce Greenhouse Gas (GHG) emissions and reduce waste.

The Project will implement the following waste recycling and reuse initiatives:

- Organic waste is recycled back into the process.
- Liquid digestate will be sold as a soil enhancer/fertilizer.
- Solid digestate will be sold and used for composting purposes.
- General waste on site will be separated and recycled accordingly.
- Waste oil generated on site will be recycled through a registered recycler.

Moreover, the layout of the facility will be designed in such a way as to maximise efficiencies in terms of movement and handling of resources throughout the process. The delivery of raw materials will be located as close to the entrance as possible to minimize vehicular movement through the site. Furthermore, the site layout has been designed such that the feed flows from one process to the next with minimal transfer distance.

5 Legislative Context

This Section provides an overview of the applicable South African laws that inform the environmental authorisation process. It also presents the GIIP standards and guidelines that were taken into account, notably the IFC PS and Equator Principal 4 (EP4).

5.1 National legislation

Key legislation that regulates environmental matters in relation to development projects (i.e. where environmental authorisations, permits or licences may be required) are discussed in terms of their applicability to the proposed project below.

Relevant legislation, policy, programmes and plans relating to the following aspects were consulted:

- The South African Constitution.
- Environmental management.
- Waste management.
- Air quality.
- Water resource management.
- Heritage and palaeontological resources management.
- Spatial planning.
- Other legislation, policies, plans, guidelines, spatial tools and municipal development planning frameworks.

The authorisations that are required are outlined in **Sections 5.1.1 to 5.5** below.

5.1.1 South African Constitution

The Constitution of the Republic of South Africa Act 108 of 1996 is the supreme law of the land. In terms of environmental management, the Constitution provides the overarching framework for sustainable development, including the protection of natural resources while promoting economic and social development.

The environmental clause in Section 24 of the Constitution provides that:

“Everyone has the right –

- a) *To an environment which is not harmful to their health or wellbeing.*
- b) *To have the environment protected for the benefit of present and future generations through reasonable legislation and other measures that:*
 - i. *Prevent pollution and ecological degradation;*
 - ii. *Promotes conservation;*
 - iii. *Secure ecologically sustainable development and the use of natural resources while promoting justifiable economic and social development.”*

5.1.2 Environmental Management Act (NEMA)

The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) provides for co-operative governance by establishing decision-making principles on matters affecting the environment including:

- a) Sustainable development.
- b) Integrated environmental management.
- c) Polluter pays principle.
- d) Cradle-to-grave responsibility.

- e) Precautionary principle.
- f) Involvement of stakeholders in decision making.

NEMA provides for the management and protection of environmental resources through *inter alia* the imposition of Environmental Authorisation requirements. Section 49 of NEMA outlines offences in terms of NEMA that include commencing with an activity without first having obtained Environmental Authorisation as detailed below. Section 49 of NEMA also details the penalties associated with offences that include fines, imprisonment or both.

The Competent Authority responsible for the administration and enforcement of the NEMA for the site is the Provincial GDARDE.

NEMA identifies activities that require Environmental Authorisation. Activities listed in Listing Notice 1³ and Listing Notice 3⁴ require a Basic Assessment (BA) process, while activities listed in Listing Notice 2⁵ require Scoping and Environmental Impact Reporting (S&EIR, interchangeably referred to as a “full” EIA).

A review of the listed activities potentially triggered by this project is provided in **Table 5-1**.

Table 5-1: NEMA EIA Listed Activities potentially triggered by the project

No.	Listed Activity	Comment
Listing Notice 1 (GN R983)		
12	The development of (ii) infrastructure or structures with a physical footprint of 100m ² or more; where such development occurs— (a) within a watercourse; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding— (dd) where such development occurs within an urban area;	The routes of the powerline and gas pipeline running to the Raslow substation, will be within 32m of a watercourse as these alignments will require crossing of the Riet Spruit. The activity may be within an urban area, in which case exclusion (dd) is applicable and this activity would therefore not be triggered. GDARDE noted in the pre-application meeting that they would confirm if the site falls within an urban area or not.
19	The infilling or depositing of any material of more than 10m ³ into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 m ³ from a watercourse;	The routes of the powerline and gas pipeline running to the Raslow substation will require crossing of the Riet Spruit. At least 10m ³ of soil will be removed for this installation.
27	The clearance of an area of 1 ha or more, but less than 20 ha of indigenous vegetation.	At least 1ha and a maximum of 5ha of indigenous vegetation will be cleared for the construction of the Biogas facility.
28	Residential, mixed, retail, commercial, <u>industrial</u> or institutional developments where such land was used for <u>agriculture</u> , game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (i) will occur inside an urban area, where the total land to be developed is bigger than 5 ha; or (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 ha;	The site is currently zoned Agriculture and the area to be developed for industrial purposes will be approximately 5ha. The activity may be within an urban area, in which case this activity would not be triggered, as it is not greater than 5ha. GDARDE noted in the pre-application meeting that they would confirm if the site falls within an urban area or not.

³ Government Notice (GN) R983 of 2014, as amended

⁴ GN R985 of 2014, as amended

⁵ GN R984 of 2014, as amended

No.	Listed Activity	Comment
	excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.	
Listing Notice 2		
4	The development and related operation of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 m ³ .	Emergency storage tanks are provided on site for storage of Biogas in the event of a disruption to the normal removal of biogas from the site. the storage tank will have a capacity of at least 500m ³ .
6	The development of facilities or infrastructure for any process or activity which requires a <u>permit or licence</u> or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent.	An organic waste-to-energy biogas facility will be constructed that will require an Atmospheric Emissions License in terms of the National Environmental Management Air Quality Act, 2004 (Act No. 39 of 2004) (refer to Section 5.1.4).
7	The development and related operation of facilities or infrastructure for the bulk transportation of dangerous goods— (h) in gas form, outside an industrial complex, using pipelines, exceeding 1 000 metres in length, with a throughput capacity of more than 700 tons per day.	The alternative to pipe the biogas to an offsite off taker will require the establishment and operation of a pipeline of more than 1000m (approximately 4km) with a throughput capacity greater than 700 tons per day.
Listing Notice 3		
12c(ii)	The clearance of an area of 300 m ² or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. In Gauteng, sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans.	At least 1ha and a maximum of 5ha of indigenous vegetation will be cleared for the construction of the Biogas facility. The development site where the Biogas facility is to be constructed falls within a critical biodiversity area
14(ii)c(iv)	The development of infrastructure or structures with a physical footprint of 10 m ² or more; where such development occurs: (a) within a watercourse; (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; In Gauteng sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans.	The routes of the powerline and gas pipeline running to the Raslow substation, will be within 32m of a watercourse as these alignments will require crossing of the Riet Spruit. The development site falls within a critical biodiversity area in terms of the Gauteng Conservation Plan.

5.1.3 Waste Act (NEM:WA)

The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM: WA) regulates waste management in order to protect the health and environment of South African citizens. This is achieved through pollution prevention, institutional arrangements and planning matters, national norms and standards and the licencing and control of waste management activities.

The NEM: WA enforcing authority for hazardous waste is the DFFE and for general waste GDARDE.

A list of waste management activities that have, or are likely to have, a detrimental effect on the environment was published in terms of NEM: WA under Government Notice (GN) 921 on

29 November 2013 (as amended by GN 1094, 11 October 2017). Waste management activities are listed in three categories (Category A, B and C).

Activities listed in Category A require that a BA process be undertaken as part of the application for a Waste Management License (WML), while activities listed in Category B require that a S&EIR process be undertaken for the WML application.

Waste activities listed in Category A and B include:

- Storage of waste in lagoons (excluding effluent, wastewater and sewage).
- Reuse, recycling or recovery of waste.
- Treatment of waste.
- Disposal of waste on land.
- Construction, expansion or decommissioning of facilities and associated structures and infrastructure.
- Residue stockpiles or residue deposits.

Various thresholds are stipulated in Category A and B which determine whether the above-listed waste management activities require application for a WML and if so, whether a BA or S&EIR application is required.

The activities triggering the requirement for a WML are detailed in Table 5-2. It is noted that both NEMA (**Table 5-1**) and NEM:WA listed activities are triggered. In terms of Section 24L NEMA, an integrated application for an EA are being applied for.

Table 5-2: NEM:WA Listed Activities potentially triggered by the project.

Category A or B	Activity Numbers	Describe Each Listed Activity
B	3	The proposed biogas plant will process approximately 600 tons of organic waste (from agriculture and the food industry) to produce biogas and digestate. The organic waste will be a combination of general (in excess of 100 tons per day) and hazardous waste (in excess of 1 ton per day).
B	10	The proposed biogas plant triggers Category B(3). The application is for the construction of a new facility.

5.1.4 Air Quality Act (NEM:AQA)

The National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM: AQA) aims at identifying and providing guidelines to activities which result in atmospheric emissions which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage.

The NEM: AQA enforcing authority is the Tshwane Metropolitan Municipality.

All activities which are listed under Section 21 (GN 893, as amended by GN 551 of 12 June 2015) of NEM: AQA, are required to apply for an Atmospheric Emissions Licence (AEL), as well as comply with the specified Minimum Emission Standards (MES) noted in the relevant category.

National Ambient Air Quality Standards (NAAQS) were also published in terms of NEM: AQA in GN 1210 on 24 December 2009 and in GN 486 on 29 June 2012 (for particulate matter with an aerodynamic diameter less than 2.5 micron metres PM_{2.5}).

The activities triggering the requirement for an AEL are detailed in **Table 5-3**.

Table 5-3: NEM:AQA Listed Activities potentially triggered by the project

Listed Activity No.	Category of Listed Activity	Sub-category of Listed Activity	Listed Activity Name	Description of Listed Activity
1	10	10	Animal Matter Processing	Digestion of animal waste and manure for the purpose of producing methane gas for power generation

5.1.5 Water Act (NWA)

The National Water Act, 1998 (Act No. 36 of 1998) (NWA) provides for fundamental reform of the law relating to the water resources; to repeal certain laws; and to provide for matters connected therewith.

The NWA enforcing authority is the Department of Water and Sanitation (DWS).

Section 21 of the NWA lists the following water uses for which a Water Use License (WUL) is required, unless it is listed in Schedule I, is an existing lawful use, is permissible under a general authorisation, or if a responsible authority waives the need for a licence:

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

The activities triggering the requirement for a WUL are detailed in **Table 5-4**.

Table 5-4: NWA Listed Activities potentially triggered by the project

Activity Numbers	Description
21(c) and 21(i)	Road, pipeline and powerline watercourse crossings
21(g)	Effluent dams containing digestate

5.1.6 Heritage Resources Management Act (NHRA)

The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) requires the following:

- Section 34(1) – “No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority”.
- Section 38(1)(a) – “the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length”.
- Section 38(1)(c)(ii) – “...any person who intends to undertake a development categorised as – any development or other activity which will change the character of a site exceeding 5 000 m² in extent must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development”.

The responsible authority, the South African Heritage Resources Agency (SAHRA), may require that a Heritage Impact Assessment (including archaeology and palaeontology) must be conducted prior to providing approval in terms of the NHRA.

A heritage specialist has undertaken a Heritage Impact Assessment, and the following feedback has been provided:

Based on Impact Assessment criteria used, the potential impact of the proposed development on any known significant sites of Cultural Heritage origin is negligible. Therefore, from a Cultural Heritage perspective, it is recommended that the proposed Sunderland Ridge Biogas Plant Development be allowed to continue. However, the submission and implementation of a Chance Find Protocol for the Development is recommended.

Through preliminary engagement with the palaeontologist, it has been confirmed that a fossil has been identified on site. The required process and permits required will be confirmed during the EIA Phase.

5.2 Spatial Planning and Land Use Management Act (SPLUMA)

The Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013) (SPLUMA) is the national framework for spatial planning and land use management in South Africa. SPLUMA mandates all municipalities to operate within the legislative requirements of the Act.

The Revision of the Municipal Spatial Development Framework (MSDF) is required in terms of the SPLUMA. The MSDF is also referred to as the Metropolitan Spatial Development Framework within the Tshwane context. The purpose of the MSDF is to provide a spatial representation of the city Vision and to be a tool to integrate all aspects of spatial planning. The City of Tshwane has reviewed the 2012 Metropolitan Spatial Development Framework. The reviewed MSDF was approved and adopted by Council on 29 July 2021 (Tshwane IDP, 2023-2024).

In addition to SPLUMA requirements, it is necessary to take account of relevant national, provincial and local plans, notably the National Development Plan (NDP), Centurion Town Planning Scheme and GDRAD Agricultural Hubs Policy:

- The Centurion Town Planning Scheme forms part of the municipalities spatial planning tools. The site is currently zoned Agriculture: Undetermined. In terms of the Centurion Town Planning Scheme, industries causing noxious gases are excluded from this zoning. The site will need to be rezoned to Industrial 2, which allows for industry with noxious gases. A separate rezoning application process will be undertaken in due course.
- GDARDE identified 7 Agricultural Hubs in Gauteng province. These hubs are earmarked for agricultural activities and there are policies and guidelines that should be taken into consideration when one plans to develop in these hubs areas. Urban development is usually not supported in these hubs. The site is not situated within any of the 7 agricultural hubs identified for Gauteng (Sunderland Ridge X33 Final BA Report, 2013).

5.3 DFFE Screening Tool

In accordance with Regulation 16(1)(v) of the EIA Regulations 2014, as amended, whereby a Screening Report is required to accompany any application for Environmental Authorisation, the national web-based environmental screening tool was used to generate a Screening Report (**Appendix B**).

The screening tool provided the following background information on the site:

- Relevant development incentives, restrictions, exclusions or prohibitions:
 - There are two approved Solar PV applications 29km from the site. Moreover, the site falls within a Strategic Transmission Corridor – Central Corridor.
 - The site falls within the Zone 1: Urban Development Zone within the Gauteng Environmental Management Framework (EMF). It is noted that “noxious industry” falls within the list of land uses that are undesirable for this zone⁶.
 - According to the South African Conservation Areas Database (SACAD), the site falls within the Critical Biodiversity Area (CBA).
- Proposed Development Area Environmental Sensitivity is as follows:
 - Themes that have a **very high sensitivity**: defence, paleontology and terrestrial biodiversity. A palaeontologist and terrestrial biodiversity specialists were appointed to assess the potential impacts of the development on these potential resources.
 - Themes that have a **high sensitivity**: agriculture and civil aviation.
 - Whilst the screening tool has identified the site as having a high agricultural sensitivity, the associated map (**Figure 5-1**) indicates that a large portion of the area where the facility will be located within the site is a medium sensitivity. Moreover, location for the facility has been transformed and is degraded with little evidence of agricultural potential. A agricultural assessment is being undertaken as part of the specialist investigations.
 - The civil aviation theme is considered to be high as there is a civil aviation aerodrome within 8km of the site. To the north of the site there is an adventure sports facility, Hangar 47, Epic Aviation Paramotor SA and the Centurion Flight School. These facilities and the Civil Aviation Association (CAA) have been included as Interested and Affected Parties (I&AP) and will be engaged with during the public participation process.
 - Themes that have a **medium sensitivity**: animal and plant species. The biodiversity specialist will assess the animal and plant species in the assessment.
 - Themes have a **low sensitivity**: aquatic biodiversity and archaeological and cultural. An aquatic specialist has been appointed to assess the water resources within the regulated zone of influence and a heritage assessment will be undertaken to confirm the presence or absence of potential resources.

⁶ Gauteng Provincial Environmental Management Framework (March 2021)

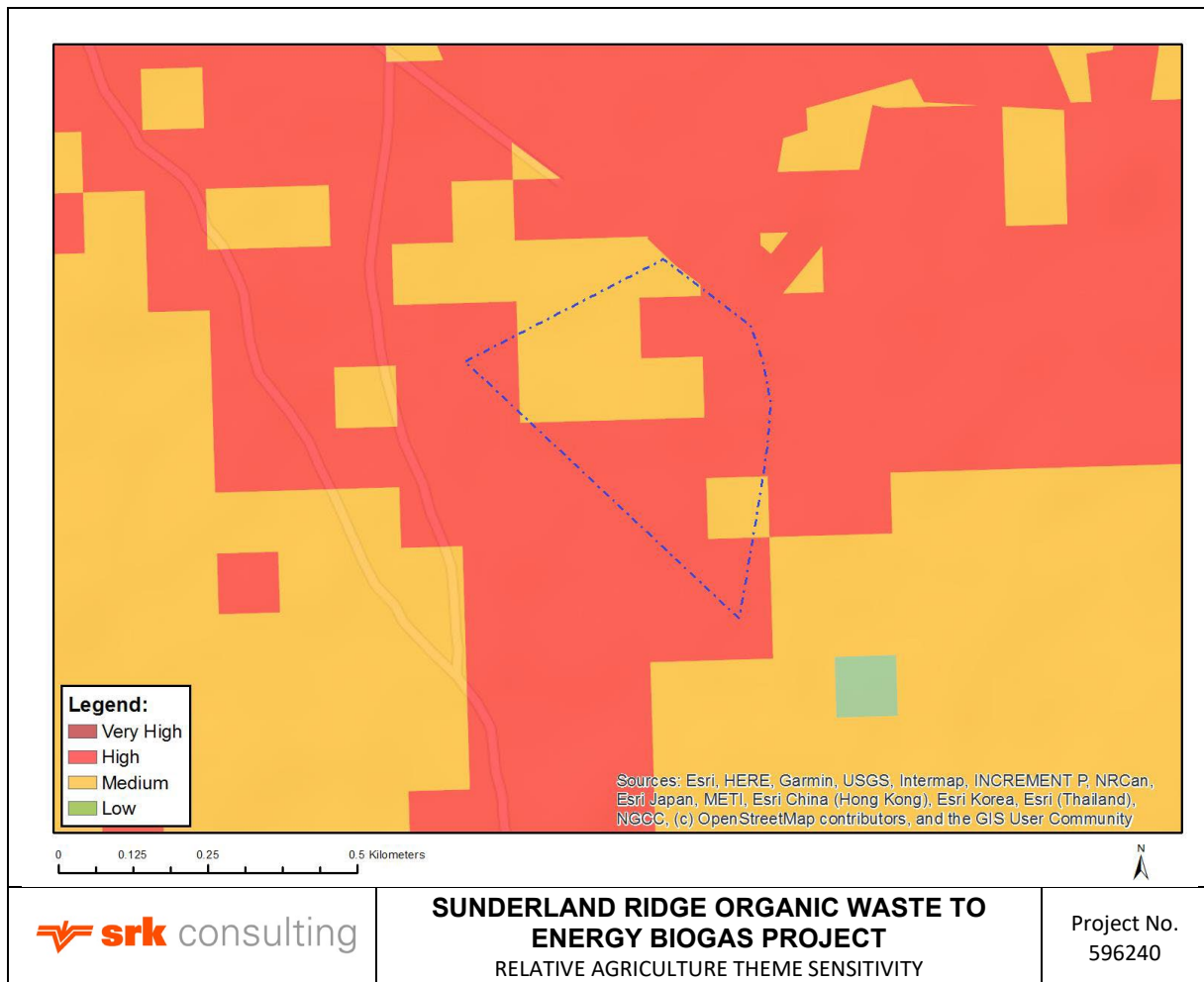


Figure 5-1: Screening tool showing relative agriculture theme sensitivity

5.4 Other Legislation, Policies, Plans, Guidelines, Spatial Tools and Municipal Development Planning Frameworks

The Project will also take account of the following sectoral national laws and local by-laws, as applicable:

- Environmental Conservation Act, 1989 (Act No. 73 of 1989).
- Occupational Health & Safety Act, 1993 (Act No. 85 of 1993).
- Model Noise Regulations published under the ECA.
- Gauteng Noise Regulations, 1999.
- Health Act, 1977 (Act No. 63 of 1977).
- National Forests Act, 1998 (Act No. 84 of 1998).
- Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983).
- Gauteng Transport Infrastructure Act, 2001 (Act No. 8 of 2001).
- Tshwane Municipality by-laws.

5.5 International GIIP Standards, Guidelines and Principles

In order to meet lender requirements, the EA process also takes account of GIIP standards, guidelines and principles. The key documentation is presented in this section.

5.5.1 IFC Performance Standard requirements

The IFC first published its Performance Standards on Environmental and Social Sustainability (IFC PS) in April 2006, to serve as comprehensive private sector standards available to international finance institutions. The revised performance standards were published in 2012. The objectives of the IFC PS are:

- To identify and evaluate environmental and social risks and impacts of the project.
- To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment.

The IFC PSs cover the following:

- Assessment and management of environmental and social risks and impacts (PS1).
- Labour and working conditions (PS2).
- Resource efficiency and pollution prevention (PS3).
- Community health, safety and security (PS4).
- Land acquisition and involuntary resettlement (PS5).
- Biodiversity conservation and sustainable management of living natural resources (PS6).
- Indigenous peoples (PS7).
- Cultural heritage (PS8).

5.5.2 World Bank EHS Guidelines

The World Bank General Environmental Health and Safety (EHS) Guidelines were originally published by the World Bank in 2007 as a technical source of information during project appraisal activities. The EHS Guidelines is a reference document with general and industry-specific examples of GIIP. Following the 2012 update of IFC's Policy and Performance Standards on Environmental and Social Sustainability, it was decided to update the 2007 EHS Guidelines. This process commenced in 2013 and new EHS guidelines are being released following consultation, including those for the energy sector.

5.5.3 Equator Principles

Development financing plays a major role in the enforcement of international sustainable development through the conditioning of loans, typically via the Equator Principles (EPs), formally launched by the IFC in 2003. Large infrastructure and industrial Projects can have adverse impacts on people and on the environment. The latest version of the EPs was released in July 2020 and includes the 10 principles, namely:

- EP1: Review and Categorisation.
- EP2: Environmental and Social Assessment.
- EP3: Applicable Environmental and Social Standards.
- EP4: Environmental and Social Management System and Equator Principles Action Plan.
- EP5: Stakeholder Engagement.
- EP6: Grievance Mechanism.
- EP7: Independent Review.
- EP8: Covenants.
- EP9: Independent Monitoring & Reporting.
- EP10: Reporting and Transparency.

The EPs are intended to serve as a common baseline and risk management framework for financial institutions to identify, assess and manage environmental and social risks when financing Projects.

6 Project Need and Desirability

In accordance with Item 2(1)(f) in Appendix 2 of GN 982, as amended, this Section provides a motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location.

The DEA has published a *Guideline on Need and Desirability* (DEA, 2017) which contains best practice guidelines for the consideration of the need and desirability of a development involving NEMA listed activities.

Need and desirability is based on the principle of sustainability, set out in the Constitution and in NEMA, and provided for in various policies and plans, including the National Development Plan 2030. Addressing the need and desirability of a development is a way of ensuring sustainable development – in other words, that a development is ecologically sustainable and socially and economically justifiable – and ensuring the simultaneous achievement of the triple bottom-line.

The guideline sets out a list of questions which should be addressed when considering the need and desirability of a proposed development based on Section 24 of the Constitution. Section 25 of the Constitution calls for the securing of “ecological sustainable development and use of natural resources” and the promotion of “justifiable economic and social development”.

The motivation for the project is provided in the sub-sections below in terms of:

- Green energy.
- Employment opportunities and skills development.
- Project location.
- Community programmes.

6.1 Green energy

Biogas plants worldwide are known to be very efficient at digesting organic waste and changing it into ‘green energy’. As a renewable power source, green energy contributes to the commitment South Africa has made to a just energy transition and to the UN’s Sustainable Development Goals. The benefits of biogas is that it allows for baseload energy generation, which by implication means power is generated 24 hours a day 7 days a week. This is one of the key value propositions of biogas, which solar and wind cannot deliver.

BEH has developed a commercially viable biogas waste-to-energy plant in Bronkhorstspuit. The Bronkhorstspuit Biogas Plant (BBP) is a black female owned renewable energy company and has been in operation since 2015. Since then it has supplied over 100GWh into the national grid alleviating some of the pressure on the national utility, Eskom. It remains at the forefront of commercial biogas generation in South Africa. BBP has been nominated on various platforms, including receiving the President’s Award in 2019, as well as being represented at the Black Industrialist and Exporters Conference in 2022. BBP is officially recognised as a Presidential Project.

BBP was also the first renewable energy company to sign a PPA with a Blue Chip Company, BMW SA in 2014. BBP was also nominated as a top supplier in 2016 at the BMW International Supplier Competition in Munich and recognised for its contribution to green energy.

With a generation capacity of 4.6MW, BBP has been used as a pilot project to test new technology and processes and identify efficiencies. Using the knowledge and experience gained at BBP, BEH are in the process of expanding to install additional biogas plants across the country. BEH is expanding its footprint with the Cape Dairy Biogas Plant, in Malmesbury, Western Cape. The project has received all the necessary legislative authorisations and permits. The site is approved to produce 9.8 MW. Once the detailed engineering designs are approved, construction is envisaged to commence in the first

quarter of 2024. The Sunderland Ridge Biogas Plant is the next facility proposed in the Gauteng Province.

The Project will divert waste from traditional methods of composting, landfills and at times burying of waste, to a sustainable solution which will see baseload energy being produced in the country, whilst creating much needed green jobs. The plant will prevent a significant amount of methane entering the environment daily, methane being up to 80 times more destructive than carbon dioxide regarding climate change. The plant will see the circular green economy being enhanced in the Gauteng Province on an industrial scale.

6.2 Employment opportunities and skills development

On inception, BBP did not have the critical skills locally and secured much of these skills internationally. However, the team realised that through appropriate training and skills transfer local staff could be empowered with these critical skills. Since 2015, BBP has employed directly and indirectly over 100 skilled and unskilled labourers during the project development, construction and operational phases. BBP currently employs 30 staff permanently and approximately 40-60 unskilled labourers from the local community on an *ad hoc* basis.

It is projected that the proposed Sunderland Ridge Biogas Plant will create 150 employment opportunities during the construction phase and the operation will create 15 permanent skilled and 20 unskilled employment opportunities. Indirect job opportunities, e.g. digestate transporter, external service providers for maintenance and supply of feedstock, will also be generated. Utilising the same model as BBP, the aim is to empower South African staff through appropriate training and skills transfer.

Moreover, a by-product of biogas, besides energy production, is a product called digestate. This is a nutrient rich liquid that contains solids and is used as a soil enhancer / fertilizer. Studies have been undertaken by United Nations Industrial Development Organisation (UNIDO) and the Agricultural Research Council (ARC) to understand the value and scientific impact of BBP's digestate on crops and soil conditions. The results have proven positive and BBP has subsequently registered its digestate as a Category 2 fertilizer with the DALRRD. The fertilizer has proven to improve soil quality, enhance the water retention properties of the tested soil and increase the nutritional content of the soil. Once operational, BEH will seek to register the digestate from the proposed Project as a fertilizer with the DALRRD. As experienced at BBP, this new venture would enable BEH to employ more staff.

BEH and its funders are committed to community development programmes in the community where they operate. This has been evident with the following community development programmes at BBP:

- Skills training for the youth on the design and installation of PV Solar panels.
- NQF3 Electrical Engineering Learnership programme.
- Installation of borehole for the supply of drinking water for the local high school.

This trajectory of community development programmes shall be followed once the Sunderland Ridge is implemented.

6.3 Project location

The site is located in the Sunderland Ridge industrial zone in Centurion. This industrial precinct is located in the City of Tshwane Metropolitan Municipality, Gauteng Province. Gauteng is the smallest of the nine provinces in South Africa and has a population of c. 15 million people (Tshwane IDP, 2023-2024), which presents key markets for agricultural products and processing. Waste generation is a major environmental challenge in the province, including waste products from agri-industry. Finding alternatives to traditional waste disposal at landfill sites is essential. Diverting agricultural waste to the proposed biogas facility reduces the burden on the existing landfills.

The province is also considered the economic hub of the country; representing over a third of the country's Gross Domestic Product (Stats SA, 2017). Gauteng features a range of economic activities (e.g. mining, manufacturing, construction) that require significant energy. As of 2017, the City of Tshwane makes up 28.3% of Gauteng's GDP and 9.9% of the national GDP (Tshwane IDP, 2023-2024).

The latest statistics for energy demand by province indicates that Gauteng draws between 3 600 GWh and 5 200 GWh (Stats SA, February 2023). The province also has a well-developed road infrastructure network. This infrastructure is advantageous to transport waste / feedstock to the facility and to disseminate products (e.g. digestate).

Hence, an increase in the current energy supply options would improve the sustainability businesses in the province as well as the country's overall economic performance. The plant will see the circular green economy being enhanced in the Gauteng Province on an industrial scale.

Whilst the site falls within a zone in the Gauteng Environmental Management Framework (EMF) where noxious industry is an undesirable land use, biogas facilities assist in the diversion of organic waste from landfill sites thereby reducing the development of new landfill sites and the associated nuisance causing odours to already stretched communities.

6.4 Community development programmes

The community development programmes that BBP embarks on provide a much-needed development in the nearby community of Kanana. These projects, include the support to the local after care centre, skilling of local youth on solar photovoltaic systems design and installation as well as a learnership programme that commenced in July 2023.

The Sunderland Ridge Organic Biogas Plant will further extend community projects into the neighbouring communities around the site. These community projects will aim to promote social and economic upliftment. The nature of these projects will be informed by engagement with stakeholders and the outcomes of the Socio-Economic Assessment. This assessment includes: A Stakeholder Engagement Plan (SEP), Community Needs Assessment and Project-Specific Gender Analysis and Integration Action Plan.

6.4.1 A Stakeholder Engagement Plan

A SEP will be developed in accordance with IFC PS1 and associated guidance. The development of the SEP will take into account international and national frameworks, regulations and best practices governing stakeholder engagement. This will be designed to provide a framework for stakeholder engagement throughout the project construction, operation and decommissioning phases. It will ensure that project-affected communities are engaged with appropriately on project-related issues that could affect them. The development of the SEP and grievance mechanism will be gender-inclusive, taking into account the issues identified through participatory and gender-inclusive stakeholder engagement.

The SEP will describe the arrangements for conducting this engagement in a consistent, meaningful, inclusive and culturally appropriate manner. The SEP will also include a grievance mechanism that provides a process for managing complaints and grievances received by external stakeholders. The grievance mechanism will be aligned with the Effectiveness Criteria for non-judicial grievance mechanisms as described in Principle 31 of the UN Guiding Principles on Business and Human Rights (<https://www.unglobalcompact.org/library/2>).

Key barriers to, and opportunities for, gender-aware stakeholder engagement will be identified in the SEP. Equitable representation of women and their concerns will also be incorporated in the SEP and its development. The development of the SEP (as well as broader stakeholder engagement conducted as part of the ESIA) will support the promotion of women's participation in project activities.

6.4.2 Community Needs Assessment

In order to maximise opportunities for delivering E&S benefits, particularly to local communities in the project's area of influence, the socio-economic specialist will develop and implement a community development programme throughout the lifetime of the Project.

The community development programme will be developed on the basis of a community needs assessment, which will involve the following activities:

- Stakeholder mapping and analysis.
- Engagement with stakeholder groups to identify development options (opportunities and needs).
- Ranking and prioritisation of development options.
- Identification of potential implementation partners for prioritised community development initiatives.

The design and implementation of the project's community development programme will be guided by the following set of principles which Myezo Environmental Management Services (i.e. the socio-economic specialist) is expected to incorporate and ensure there's alignment with in conducting the community needs assessment:

- **Sustainable** - Community development will promote self-reliance and avoid dependency whilst creating opportunities for government support and partnerships with other development actors; they will have a clear sustainable exit strategy.
- **Community-Led** - Community development will be gender-inclusive, and initiatives will be designed, planned, implemented and managed in consultation with and with the participation of community members and beneficiaries, including those identified as vulnerable.
- **Inclusive** - Community development will involve engagement with national, regional and local governments, Non-governmental Organisations (NGOs) and Community Schemes Ombud Service (CSOs), development agencies and other local stakeholders active in community development, as relevant. This will seek to achieve a good fit with existing development activities in the area, and to be replicable across other communities as needed.
- **Transparent** -The development, implementation and management of all community development programmes will be governed by both BEH and the funders Responsible Investment Code and shall be transparent, auditable and open to internal and external scrutiny.
- **Measurable** - Key performance and impact indicators will be established to measure and evaluate the performance of the delivery partners and programme, and its impact on intended beneficiaries.

In addition, the Project community development programme will be designed to respond to gender and social inclusion opportunities. A gender lens will be applied and, where appropriate, specific interventions focused on women/girls will be designed. These may target women in governance, as workers and as entrepreneurs and may include women's enterprise development; professional and skills development in vocational activities relevant to the sector (e.g. sciences, engineering, financial management), and access to microfinance as well as skilled and unskilled women. The specific nature of the initiatives will be formed on the basis of stakeholder engagement and the assessment of community needs and opportunities.

6.4.3 Project-Specific Gender Analysis and Integration Action Plan

A local gender analysis and Project-specific gender integration action plan must be prepared for implementation throughout the project construction, operation and decommissioning phases.

The purpose is to present an overview of the gender and related energy issues in the area in which the project is located along with a set of project-specific actions and targets.

7 Alternatives

Item 2(1)(g) in Appendix 2 of GN 982, as amended stipulates that the Scoping Report must provide a full description of the process followed to reach the preferred activity, site and location of the development footprint within the site.

This Section meets the requirements of Items 2(1)(g)(i) and 2(1)(g)(x), by providing details of all the alternatives considered and a motivation where alternatives were not considered.

The following alternatives are discussed in the sub-sections below:

- Site locations.
- Process/technology alternatives.
- Layout alternatives.

7.1 Site locations

Land covering an area of 5ha has been identified for the proposed Project, approximately 22km south-east of Pretoria (**Figure 1-1**).

The identified land is 100% privately-owned by a commercial property developer who is establishing an Industrial Development Zone as a green sustainable commercial park. The rights to the land will be secured via a lease agreement with the landowner, with an option to purchase at a later stage.

Located in the Gauteng Province, the site is proximate to vast amounts of food waste, including animal manure and liquid waste. The site is also located close to the N14 and major road networks. This makes it accessible to waste companies wanting to dispose of their organic waste streams in a sustainable manner. Large food producing companies have zero waste-to-landfill policies but with limited solutions other than composting. The area of Centurion will be the first area south of Pretoria to have an industrial scale biogas facility.

The site also benefits from being in a built-up industrial area with a sewage treatment works within close proximity and a road infrastructure network that will enable ease of transportation of equipment and heavy-duty trucks to site. Furthermore, the site has a grid connection point to the nearby Rasslouw Substation. This limits the risks associated with obtaining way leaves for the medium voltage line. An 11/22kV power line will be required to connect the plant to the national grid.

7.2 Layout alternatives

The layout of the plant is currently being investigated and will be finalised during the EIA Phase of the Project. The proposed layout will consider all potential environmental risks, with recommended mitigation measures from specialists and the EAP.

The preliminary layout plan provided in this report (refer to **Figure 4-2**) is based on BEH's Cape Dairy Biogas Plant site that is in the final design stages. As the proposed Project will have a similar design, its layout plan is being used as a starting point. Existing site conditions and specialist investigations will be taken into consideration in the developing the final layout.

7.3 Process / technology alternatives

BEH are currently investigating two alternatives for the biogas. The first alternative is to convert the biogas to electricity and feed it into the national grid. The second alternative is to compress the gas and sell it to an off taker. The gas will either be trucked off site or piped off site via a new pipeline to the off taker. The sub-sections below provide more detail of the processes to be followed and provides the location of the various alternatives.

7.3.1 Power generation plant and powerline

Power generation

The gas fed into the gas engines are used in a Combined Heat Power process to generate electricity as well as to maintain the AD process. The gas is approximately 60-65% pure Methane, which is used to power four Caterpillar CHP engine/generators to produce electrical energy at 400V. The installed capacity of each engine will be approximately 2000 kW. A step-up transformer dedicated to each generator will increase the voltage to 11 kV/ 22kV, which matches the grid connection voltage. The generators will be housed in an engine room and will be supplied with the requisite engine cooling systems and electrical control systems/HMIs. Thermal energy from the engine cooling systems will be used to provide energy to the AD process.

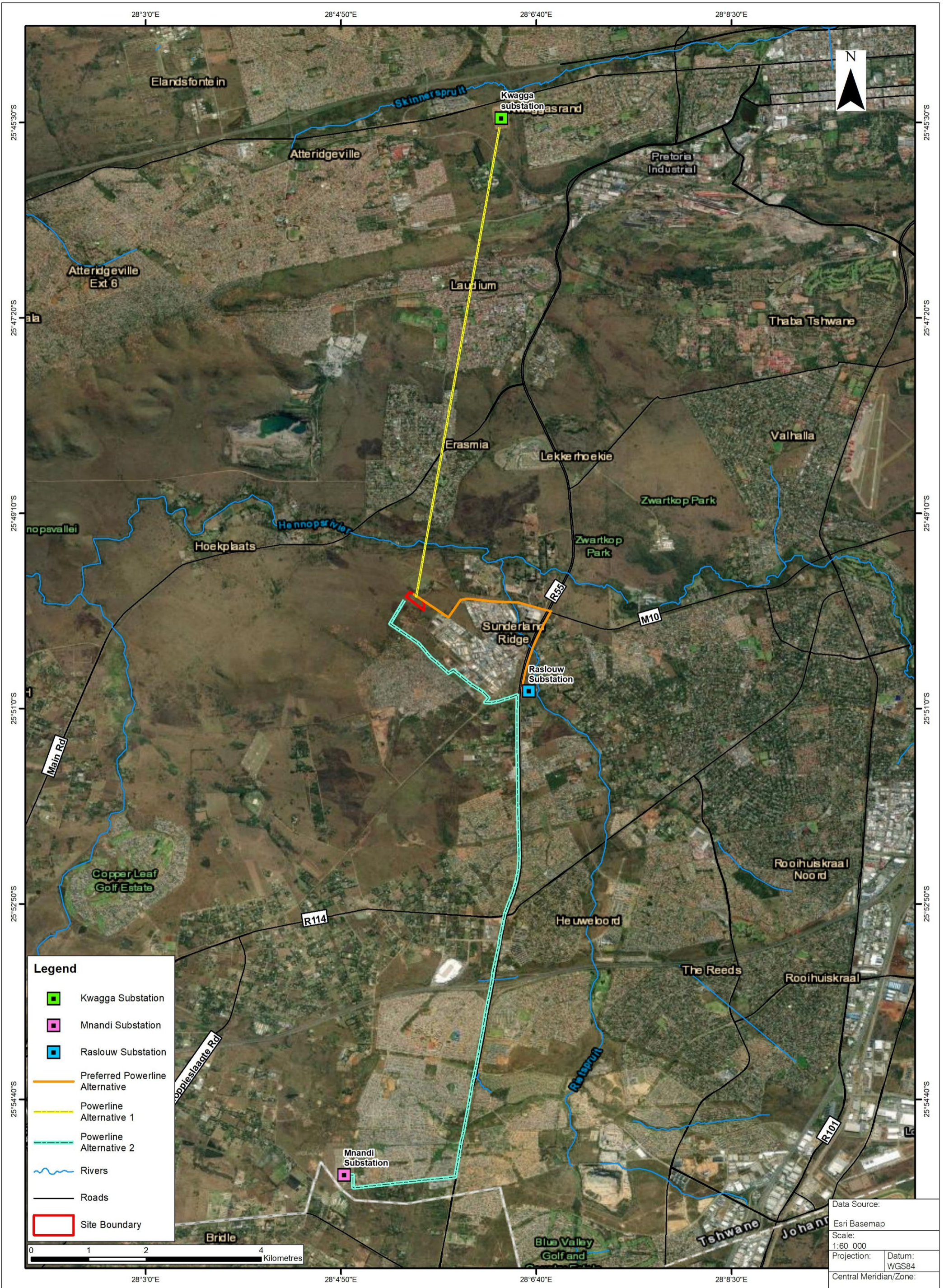
The power generated will be sold to ABInBev breweries in Rosslyn through a Power Purchase Agreement (PPA). The plant will have an installed capacity of up to 9.8MW and will have a footprint of approximately 5ha. A new overhead transmission line (either 11kV or 22kV) will connect the biogas plant to the existing Rasslow substation; the preferred substation and transmission line route have not been confirmed.

Powerline route alignments

A new overhead transmission line (either 11 or 22kV) is required to connect the Biogas Plant to an existing substation. Several route alignments and substations were considered in the screening phase of the project, namely (**Figure 7-1**):

- 1) Preferred powerline alternative: A powerline running east along the northern boundaries of the Sunderland Ridge Industrial Area, then south from the intersection of the R55 and Wierda Road to the Rasslow substation, approximately 4km in length was a third alternative considered. The pipeline will be approximately 4km in length and will fall largely within the road reserve.
- 2) Powerline alternative 1: A powerline to the Kwagga substation, north of the site approximately 8.5km in length was initially considered. This alternative required crossing at least 2 watercourses.
- 3) Powerline alternative 2: A powerline running due south-east towards the Raslow Substation, then due south to the Mnandi Substation, approximately 13.5km in length was another alternative considered.

Due to technical difficulties and concerns, the route alignments for Alternatives 1 and 2 were deemed to be unfeasible. The preferred powerline alternative is therefore the only alternative considered in this application.



Data Source:	
Esri Basemap	
Scale: 1:60 000	
Projection:	Datum: WGS84
Central Meridian/Zone:	
Date:	Compiled by:
26/09/2023	LEKT
Project No.	Fig No.
596240	
Revision: A Date: 28/09/2023	

7.3.2 Biogas compression

The alternative of compressing the biogas generated at the plant and selling directly to an off taker is being considered in this EIA process. The compressed gas will either be trucked off site or sent via a new pipeline.

The following two alternative route alignments for the pipeline have been investigated from a technical perspective (**Figure 7-2**):

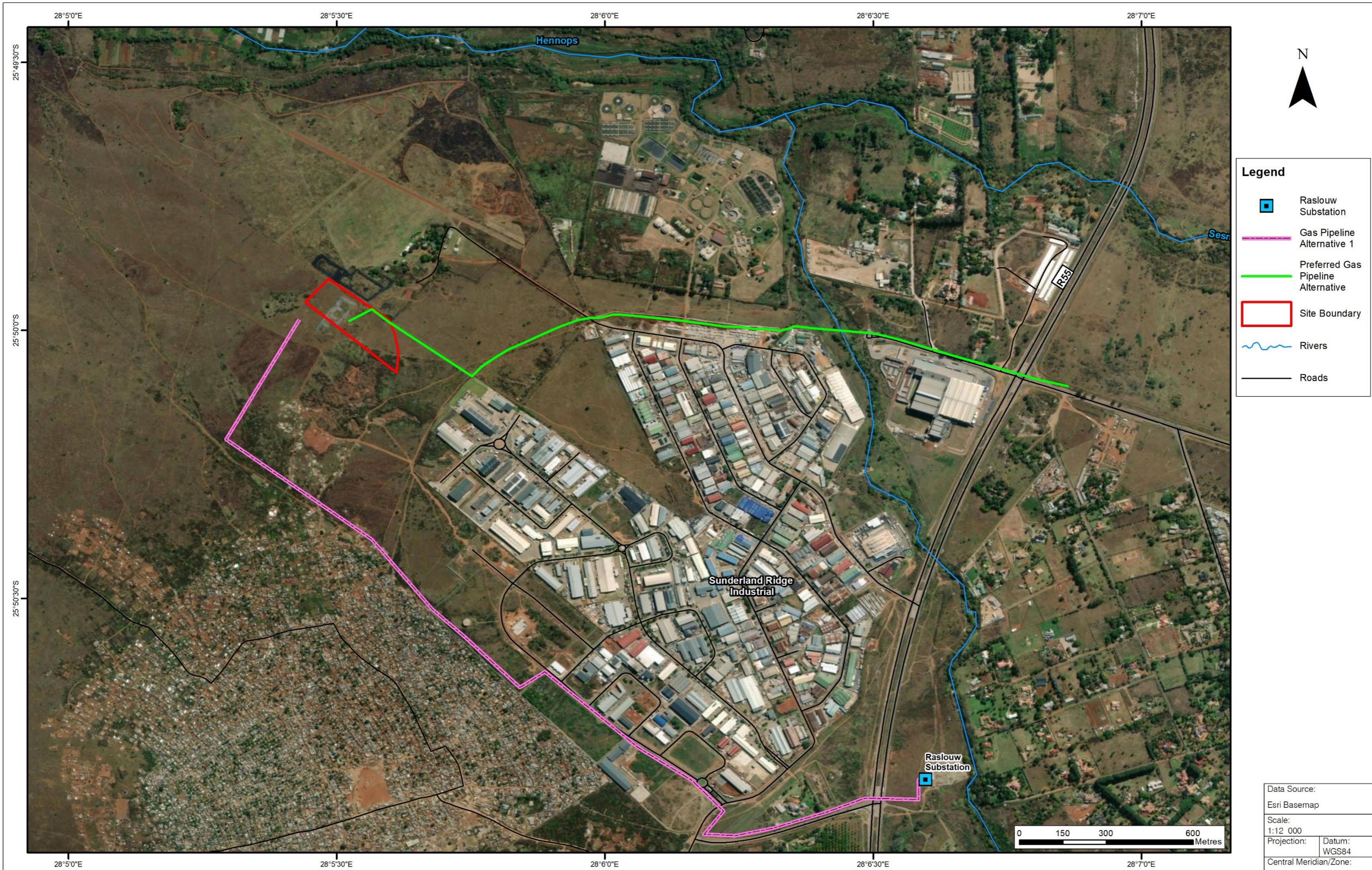
- 4) Preferred gas pipeline alternative: the pipeline will run east along the northern boundaries of the Sunderland Ridge Industrial Area and tie into the existing Sasol pipeline just past the R55 and Wierda Road intersection. The Sasol pipeline runs parallel to the R55. The pipeline will be approximately 2.4km in length and will fall within the road reserve.
- 5) Gas pipeline alternative 1: the pipeline runs south-east towards the Raslow Substation, along the southern boundary of the Sunderland Ridge Industrial Area. The pipeline would then be pipe-jacked under the R55 and tie into the existing Sasol pipeline. The pipeline will be approximately 3.4km in length and will fall within the road reserve.

Due to technical difficulties and concerns, the route alignments for Alternative 1 was deemed to be unfeasible. The preferred gas pipeline alternative is therefore the only alternative considered further in the application.

An emergency storage tank (approximately 500m³ storage capacity) will be included in the design of the facility. The purpose of this tank will be for emergency situations where there is a disruption to the removal of the gas from site, and temporary storage on site is required.

7.3.3 Wastewater disposal

The sewage generated on site will either be disposed of through the installation of a septic tank and soakaway system or connection to the existing Municipal sewage system. The preferred alternative will be finalised in the EIA Phase.



Legend

- Raslouw Substation
- Gas Pipeline Alternative 1
- Preferred Gas Pipeline Alternative
- Site Boundary
- Rivers
- Roads

Data Source:

Esri Basemap

Scale:

1:12 000

Projection:

Datum:

WGS84

Central Meridian/Zone:

Date:

Compiled by:

26/09/2023

LEKT

Project No:

Fig No:

596240

Revision: A Date: 28/09/2023

8 Environmental Attributes

This Section meets the requirements of Item 2(1)(g)(iv) in Appendix 2 of GN 982, as amended, by providing details of the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.

A general description of the status quo of the receiving environment in the project area provides the context within which the EIA is being conducted and allows for an appreciation of sensitive environmental features and possible receptors of the effects of the proposed project. The study area includes the development and construction footprint and the surrounding receiving environment, including the regional context of environmental features, where applicable, with a focus on the local surrounding environment.

This section has been informed by preliminary results obtained from specialist baseline investigations. The final specialist assessment reports will be provided in the EIA Phase.

Refer to **Section 10** for the identification of environmental issues and to **Section 12** for an initial assessment of potential impacts to the receiving environment.

8.1 Land use

Centurion is on the Highveld of South Africa, between the cities of Johannesburg and Pretoria. The site is currently not utilised. There are high levels of disturbance with evidence of illegal dumping on portions of the site, remnants of illegal tyre disposal is evident on site (**Plate 8-1**).

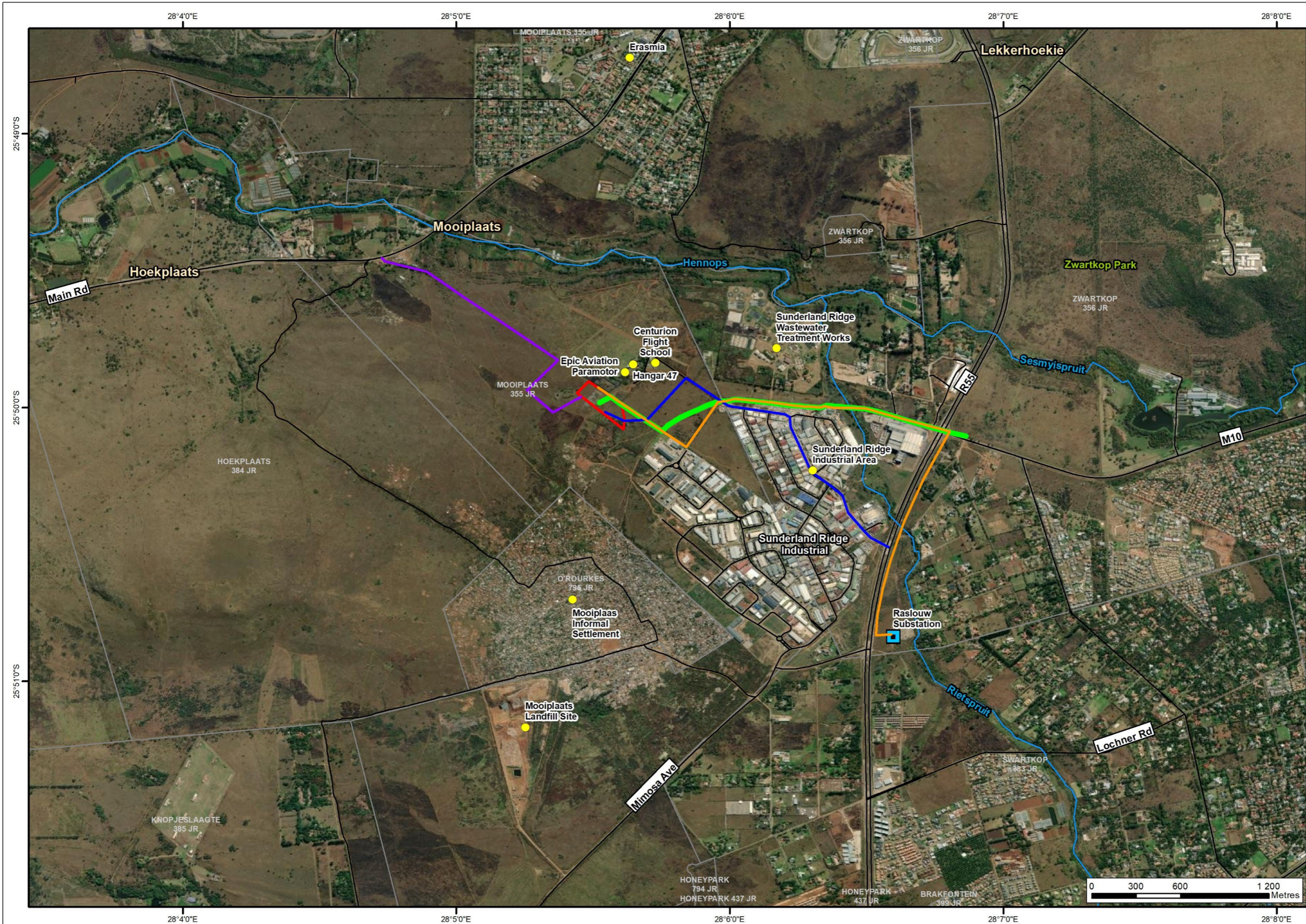
The proposed site, which is zoned Agriculture: Undetermined, is situated in close proximity to a number of light to heavy industries (e.g. Pump and Abrasion Technologies, Tru Trac Rollers) within the Sunderland Ridge Industrial Area. The Mooiplaats Landfill site and the Sunderland Ridge Wastewater Treatment Works are also located within close proximity of the proposed biogas site.

Located to the north of the site is Hangar 47, Epic Aviation Paramotor SA, the Centurion Flight School, the Erasmia residential community. To the south lies the Mooiplaas informal settlement, to the east the Sunderland Ridge Industrial Area. The proposed site is also partially surrounded by farmland to the west.

Figure 8-1 shows the surrounding land uses in relation to the site.



Plate 8-1: Evidence of illegal dumping across the site

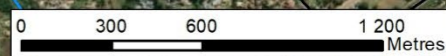


Legend

- Areas Of Interest
- Mnandi Substation
- Raslouw Substation
- Gas Pipeline
- Powerline Route
- Operation Access Route
- Construction Access Route
- ~ Rivers
- Roads
- Site Boundary
- Farm Boundaries



Data Source:	
Esri Basemap	
Scale:	
1:25 000	
Projection:	Datum:
	WGS84
Central Meridian/Zone:	
Date:	Compiled by:
16/08/2023	LEKT
Project No:	Fig No:
596240	
Revision: C Date: 28/09/2023	



8.2 Climate

The site experiences dry, sunny winters (max. daytime temperature around 20 °C dropping to an average minimum of 5 °C), and warm to hot summers (October – April) tempered by late-afternoon showers often accompanied by spectacular thunder and lightning. Hailstorms are not uncommon. Summer temperatures range from the mid-20s to the mid-30s (°Celsius). Centurion’s weather tends to follow the slightly warmer Pretoria, when compared to that of Johannesburg.

8.3 Geology and soils

This section has been informed by the preliminary hydrogeological study by Delta H (September 2023).

The area is characterised by late Archaean to early Proterozoic Transvaal Supergroup rocks. The Pretoria Group, forming part of the Transvaal Supergroup, consisting of the Chunniepoort formation, charactering the local geology at site. The Chunniespoort formation consist of the Malmani Subgroup, containing dolomite and chert rocks. Dolomite rocks are observed on site (**Plate 8-2**) and a stromatolite fossil has been identified within a dolomite bank (refer to **Section 8.12**).



Plate 8-2: Site photograph showing dolomite rock daylighting (Source: Delta H preliminary report, September 2023)

8.3.1 Transvaal Sequence

As described by Barnard (2000) and Foster (1984) this sequence consists mostly of volcanic rocks such as lava, tuff, andesite, basalt and rhyolite and sedimentary rocks which include quartzite, sandstone, shale, conglomerate, and dolomite. Diabase sills and dykes form part of the Transvaal sequence as well.

8.3.2 Chunniespoort Formation

Barnard (2000) and Foster (1984) indicate that the Chunniespoort Formation is characterised by its dolomite content where it consists of the Malmani group which again consists out of four other subgroups: the Oaktree, Monte Christo, Lyttleton and Eccles Formation.

8.3.3 Malmani Subgroup

According to Barnard (2000) and Foster (1984), the Chunniespoort Formation belonging to the Transvaal Supergroup, is mainly composed of dolomite rocks of the Malmani Subgroup. The Malmani Subgroup consists of four formations: the Oaktree, Monte Christo, Lyttleton and Eccles Formations, which differ in their chert content and the occurrence of algal fossils (Barnard, 2000). Dolomite ($MgCaCO_3$) is a carbonate mineral that forms as a sedimentary rock due to biological or chemical processes. It can originate from the evaporation of saline water or from the dolomitization of limestone, another carbonate rock. Dolomitization involves the replacement of calcium by magnesium in limestone due to the infiltration of magnesium-rich saline water. Dolomite rocks are susceptible to karstification, which is the dissolution of carbonate minerals by slightly acidic groundwater, resulting in underground caves and cavities. Stalactites and stalagmites are common features in these caves, formed by the deposition of carbonate minerals from dripping water. Associated with dolomite are chert. Chert is a fine-grained silica mineral that can be present in variable amounts in dolomite rocks. Chert can form from the precipitation of silica-rich fluids or from the infiltration of silica-enriched groundwater into the rock matrix.

8.4 Topography

The topography of the area can be described as a gently undulating landscape. The surface elevation varies between 1 205 meters above mean sea level (mamsl) and 1 610 mamsl within 15 km of the proposed site. Furthermore, areas of higher topography and mountain tops/ridges run north of the site from east to west.

8.5 Geohydrology

This section has been informed by the preliminary hydrogeological study by Delta H (September 2023).

Based on the conceptual hydrogeological understanding of the site, the following hydro-stratigraphic zones are differentiated within the model area:

1. Shallow alluvial and weathered aquifer.
2. Karst aquifer.

8.5.1 Weathered aquifer

The weathered zone of the dolomitic rock hosts the unconfined or semi-confined shallow weathered aquifer or hydro-stratigraphic zone. Due to direct rainfall recharge and dynamic groundwater flow through the unconfined aquifer in weathered dolomite rock, the water quality is generally good, but in the absence of an overlying confining layer also vulnerable to pollution. Localised perched aquifers, formed from secondary mineralised clay layers and ferri-crete layers, may occur. Water intersections in the weathered aquifer are mostly above or at the interface to fresh bedrock, where less permeable layers of weathering products and capillary forces limit the vertical percolation of water and promote lateral water movement.

8.5.2 Karst aquifer

Karst aquifers are associated with chemical derived sediments such as carbonate rocks. According to Barnard (2000) these sediments include chert rich and chert poor dolomites where groundwater is stored and transmitted through cavities and fractures. The Chunniespoort karst aquifer is one of South Africa's most important water sources for Gauteng due to its high storage capacity. Groundwater flow is governed by major cavities formed from dissolution of the host rock, as well as from secondary porosities like faults, fractures, joints, bedding planes or other geological contacts. The karst aquifer is considered an unconfined aquifer. Karst aquifers have typically a high hydraulic conductivity with yields higher yield than 10L/s.

8.5.3 Hydrocensus

A hydrocensus was conducted in the vicinity Sunderland Ridge Biogas Plant during August 2023. Part of the census was to verify existing boreholes at the proposed site. Geo-sites were verified comprising of private boreholes and a spring. No municipal service lines (water supply) are available at the site. As a result, groundwater is considered as the only resource for water supply to the area.

The neighbouring property, namely Hanger 47, has 2 boreholes on site (**Plate 8-3**). One borehole is currently in use, the other temporarily not working. Approx. 2 km northeast from site is the Hennops Venue, another groundwater user. The suburb-area of the Hennops Venue has no municipal services and seems to be dependent on groundwater and the Hennops river.

An active spring was identified approximately 2 km west of the Project site (**Plate 8-4**).

The Sunderland Ridge Industrial Complex located c.1.5km south-east of the site, obtain water from a municipal service line. The informal settlement, located 900 m south of the site, receive water from tankers supplied by the municipality. These tankers obtain water from a municipal service line at the Sunderland Ridge Industrial Complex. The service line and storage tanks for the informal settlement is shown in **Plate 8-5**.



Plate 8-3: Boreholes at the neighbouring property at Hangar 47 (Source: Delta H preliminary report, September 2023)

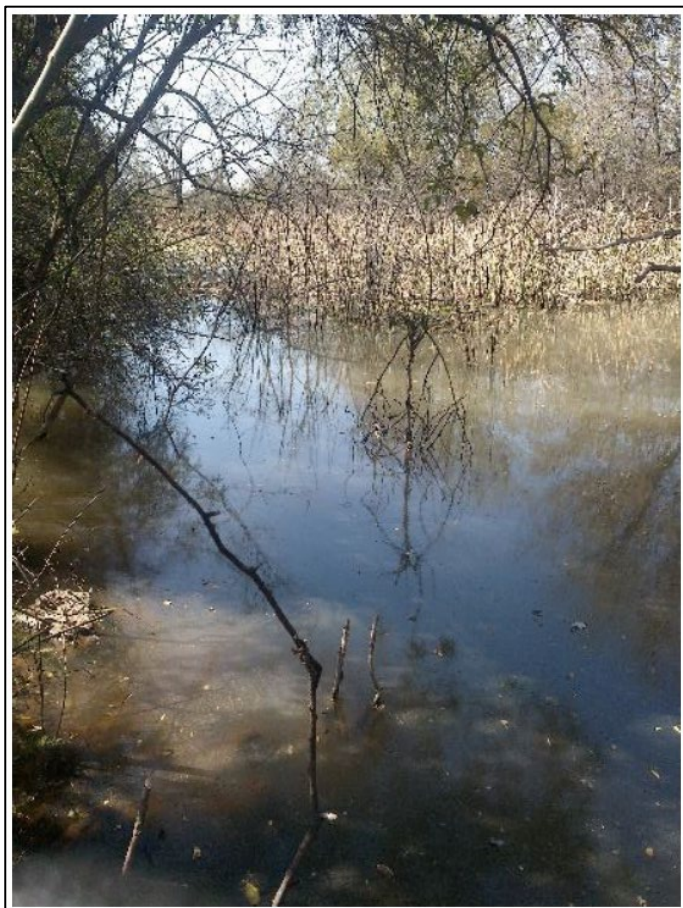


Plate 8-4: Active spring located 2km west of the Project site (Source: Delta H preliminary report, September 2023)



Plate 8-5: Water supply point at the Sunderland Ridge Industrial complex (left) and the storage facility at the informal settlement (right)(Source: Delta H preliminary report, September 2023)

A summary of the geo-sites (boreholes) obtained during the hydrocensus is provided in **Table 8-1**.

Table 8-1: Summary of the geo-sites (boreholes) obtained during the hydrocensus data

Name	Latitude	Longitude	Elevation [mamsl]	Owner	Status	Use	Water Level [mbgl]
SR spring	-25.8319	28.06988	1404	Government	none	Domestic & agricultural	0
SRBH1	-25.8315	28.09335	1397	Hanger47	Submersible Pump	Domestic use	
SRBH2	-25.8319	28.09355	1396	Hanger47	Submersible Pump (stolen)	Domestic use	17.88
SRBH3	-25.8298	28.1102	1418	Mr. Kalie v.d. Walt	Submersible Pump	Domestic use	
Water Supply	-25.8334	28.10168	1404	Informal Community	Yoyo Tank	Domestic use	
Water Storage	-25.8479	28.09535	1457	Industrial site	Municipal Water line	Domestic use	

8.6 Flora and fauna

In 2022 ERM undertook a Biodiversity Red Flags / Fatal Flaws Screening Assessment. This section has been informed by this study. In light of the results of the ERM study, a terrestrial biodiversity assessment is currently being undertaken for the site. the results of which will be presented in the EIR.

8.6.1 Historical vegetation

The site falls within a Critical Biodiversity Area (CBA) (refer to **Section 8.6.3**) and therefore required investigation as to the conservation value of the site. Historically the proposed site was covered by Carletonville Dolomite Grassland (currently classified as of Least Concern in terms of conservation importance). Carletonville Dolomite Grasslands occur on slightly undulating plains dissected by prominent rocky chert ridges, distributed mainly in the North-West Province and Gauteng. They are described as species-rich grasslands that form a complex mosaic pattern dominated by many species. Almost a quarter of the original extent was believed to be already transformed due to cultivation, urban sprawl or mining activities.

Whilst the primary vegetation may have been present at the time the CBA delineation for Gauteng was undertaken (2010-2011), the large majority of the site is currently transformed. Upon inspection of historical Google Earth imagery, it is evident that approximately 7ha of the site (mapped in **Figure 8-2**) was entirely altered on the eastern side of the Project area from 2015. Although some grassland may have re-established since the disturbances, this will not have the natural species composition, and most importantly will lack the typical component of geophytes and low shrubs, with a typically lower diversity of grasses and forbs (herbs, geophytes and suffrutices).

8.6.2 Protected and internationally recognised areas

The Magaliesberg Biosphere Reserve (**Figure 8-3**), which was registered as such with UNESCO in 2015, is located between the cities of Pretoria and Johannesburg to the east and Rustenburg to the west. The reserve lies at the interface of two great African biomes – the Central Grassland Plateaux and the sub-Saharan Savannah – and the remnants of a third biome, the Afro-Montane Forest. The exceptionally rich biodiversity includes flora with highly restricted ranges and fauna includes approximately 90 mammal species, at least 23 amphibian species, approximately 77 reptile species and at least 443 bird species representing 46.6% of total bird species in the southern African sub-region. The Biosphere Reserve accordingly been registered as a Key Biodiversity Area (KBA).

From maps available on the Reserve website, the Project site falls within the transition area (**Figure 8-3**). Due to the unsuitable habitat on site, it is not anticipated that the sensitive plant species will be identified on site. of the faunal species, only a low fraction of the species diversity may frequent the

area do to unsuitable habitat and anthropogenic disturbances. As far as the IFC PS6 is concerned, although the site is on the outer fringes of the KBA and Biosphere Reserve, a critical habitat assessment is required.

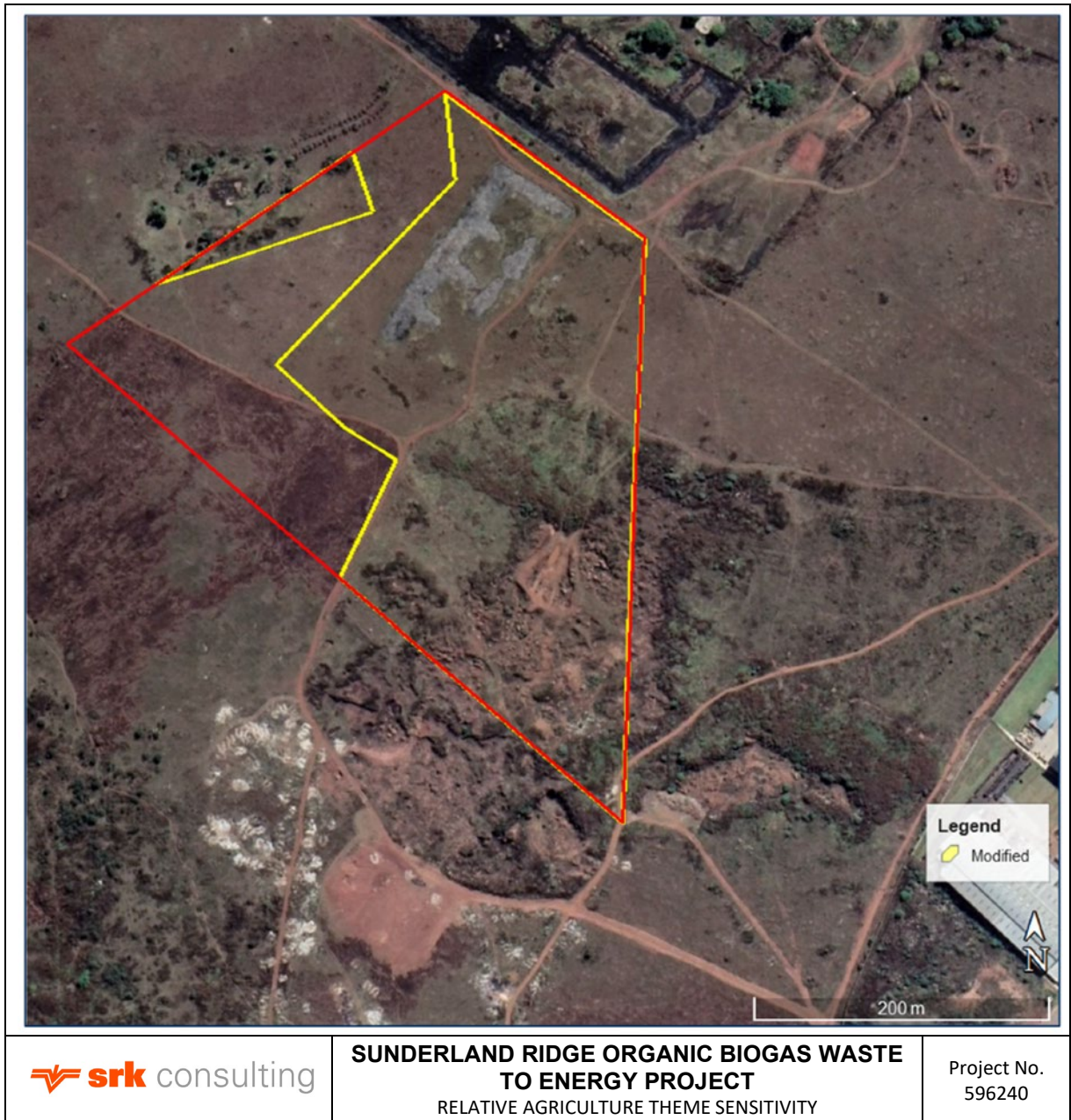


Figure 8-2: Extent of total modification (yellow line) traced since 2015 within the site (red line) (extracted from ERM, 2022)

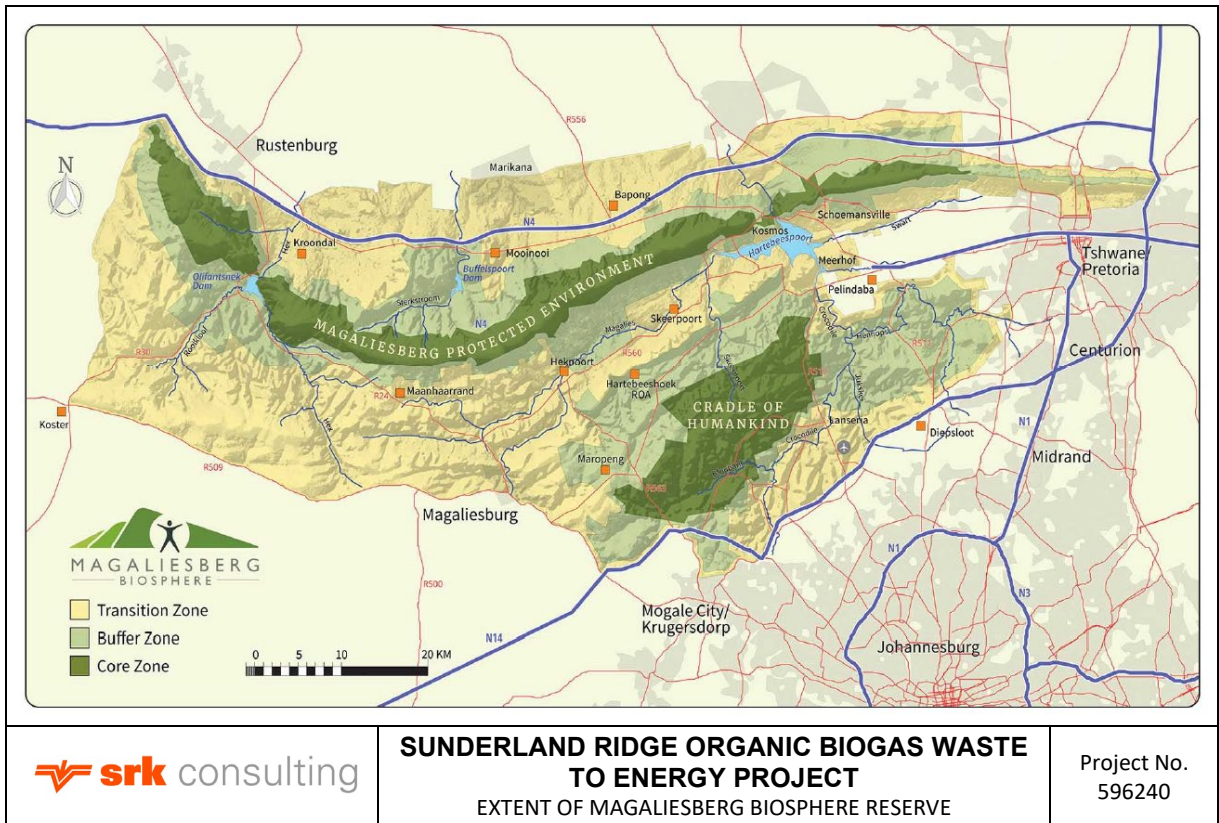


Figure 8-3: Full extent of the Magaliesberg Biosphere Reserve (extract from ERM, 2022)

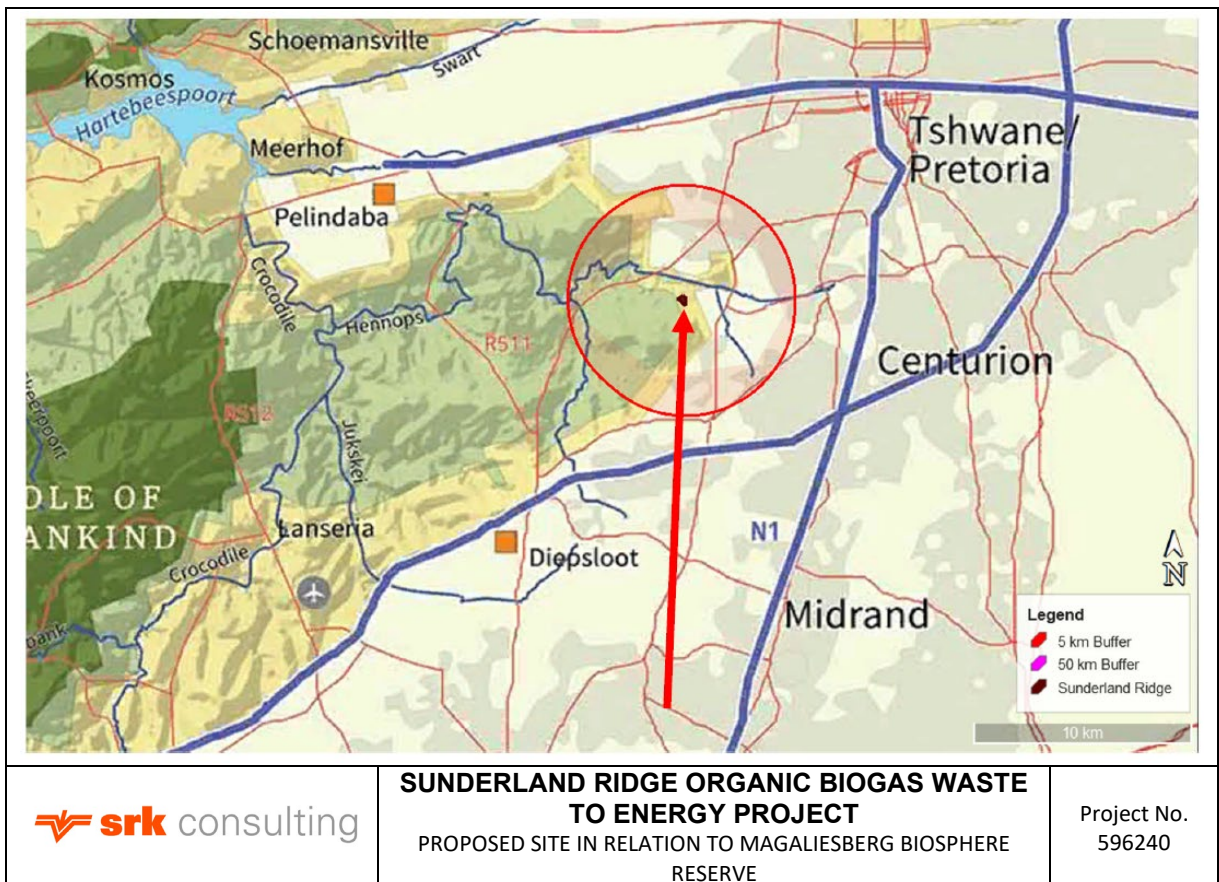


Figure 8-4: Proposed development site (red arrow) and 5km ‘buffer’ as overlay onto the georeferenced map downloaded from the Magaliesberg Biosphere Reserve website (extract from ERM, 2022)

8.6.3 National and provincial recognised areas

Under the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA) several ecosystems throughout South Africa have been gazetted as being threatened. According to the latest delineation of threatened ecosystems (2011), the Project site does not fall within a threatened ecosystem.

The systematic conservation plan for the Gauteng Province – the Gauteng Conservation Plan Version 3.3-1110 (Gauteng C-Plan v3.3,2011) – is a plan that aims to conserve as many representative samples of biodiversity patterns, including species and important ecological processes as necessary to maintain biodiversity conservation targets.

The two most important habitat categories in the plan that are relevant to the Project are:

- CBAs: areas that are required to meet biodiversity targets for species, ecosystems or ecological processes.
- Ecological Support Areas (ESAs): areas that are not essential for meeting biodiversity representation targets/thresholds, but which play an important role in supporting the ecological functioning of CBAs and/or in delivering ecosystem services that support socio-economic development.

According to the Gauteng C-Plan, the Project site falls mostly within CBA 1 (Figure 8-5). It is noted that the Gauteng C-Plan was delineated on the basis of analysis of remotely-sensed data with only limited verified data available. The actual state of many of the land parcels assigned to the various C-Plan-Classes had not been verified by extensive ground-truthing to date. Due to the extent of transformation of the Project site, the remaining portions of previously delineated CBA areas can potentially be entirely avoided.

It is noted that past delineation as a CBA1 does not automatically imply that Critical Habitat as per IFC PS6 definition is present on remaining primary vegetation, nor that any Net Gain or Offset will be required.

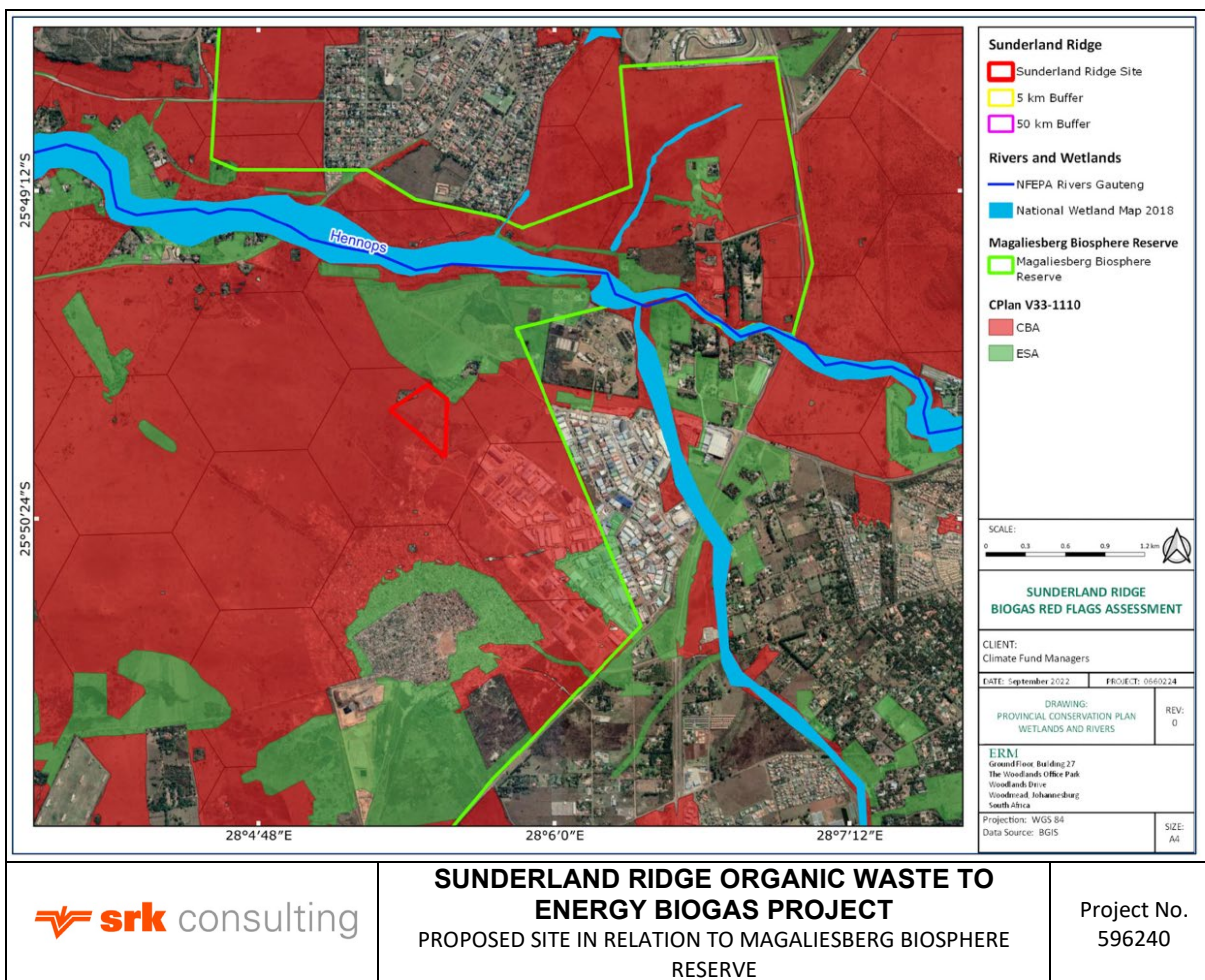


Figure 8-5: CBAs and ESAs as delineated in 2011, together with rivers and natural wetlands as delineated in 2018 (extract from ERM, 2022)

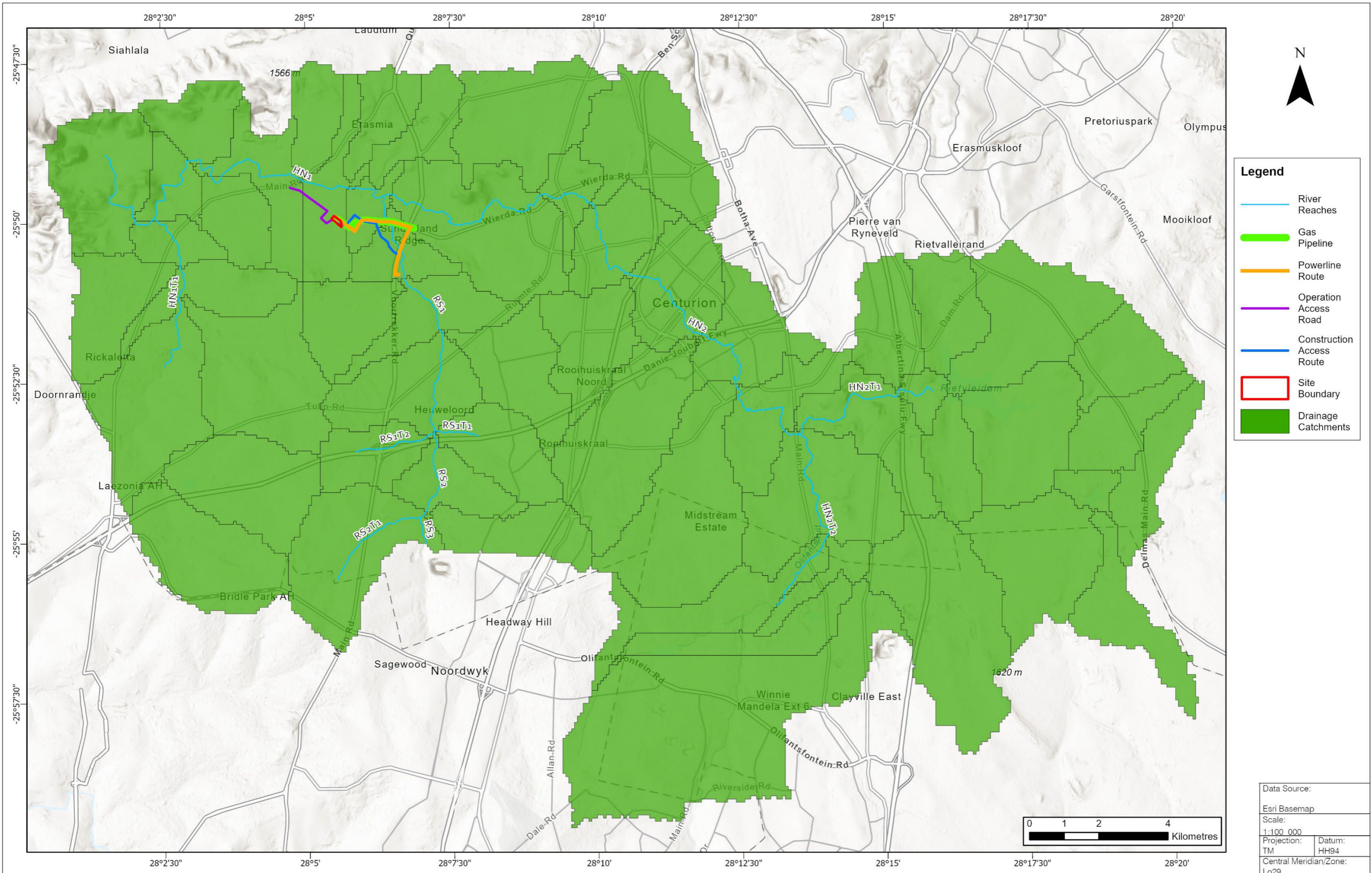
8.7 Wetlands and watercourses

This section has been informed by the preliminary Surface Water Assessment by SRK Consulting (September 2023) and the ERM study undertaken in 2022. The final Surface Water Assessment will be included in the EIR. Moreover, a Freshwater Assessment is currently being undertaken, the results of which will be included in the EIR.

The Hennops River lies approximately 750 m to the north of the site and flows through the heart of Centurion. The Rietspruit River flows approximately 1.3 km to the east of the site (Figure 8-5).

The site falls within the Hennops River Catchment and is part of a National Freshwater Ecosystem Priority Area (NFEPA). The Swarbooispruit and Rietspruit are the main tributaries of the Hennops River downstream of the Centurion Lake before the river eventually converges with the Crocodile River to feed the Hartbeespoort Dam. No wetland occur on site, as has been confirmed by Bokamoso (2013) (ERM, 2022).

The catchment area of the proposed project spans 442 km², covering substantial portions of urban and industrialized regions, along with smaller sections consisting of open fields and shrubby vegetation (Figure 8-6). The longest water course in the catchment extends over 41 km and directly influences the site. Overall, the development within Bio2Watt’s intended site is limited and primarily characterized by grassy areas with sloping topography. (SRK, 2023)



Legend

- River Reaches
- Gas Pipeline
- Powerline Route
- Operation Access Road
- Construction Access Route
- Site Boundary
- Drainage Catchments

Data Source:	
Esri Basemap	
Scale: 1:100 000	
Projection: TM	Datum: HH94
Central Meridian/Zone: Lo29	
Date: 19/07/2023	Compiled by: INJOH
Project No: 596240	Fig No:

8.8 Air quality

This section has been informed by the preliminary air quality study by SRK Consulting (September 2023). The final specialist assessment report will be provided in the EIA Phase.

8.8.1 Ambient air quality

The ambient baseline air quality for Particulate Matter (PM₁₀ and PM_{2.5}), sulphur dioxide (SO₂), nitrogen oxide (NO₂) and carbon monoxide (CO) was assessed for 2021-2022 using datasets sourced from the Olievenhoutbosch monitoring station. Higher PM₁₀ and PM_{2.5} concentrations were measured in 2021 and 2022 during winter compared to summer. Data anomalies are observed for 2021 and 2022, as indicated by the inconsistent peaks in the dataset, and is likely due to an instrument error. No exceedances of the relevant National Ambient Air Quality Standard (NAAQS) and World Health Organisation (WHO) guidelines were noted for CO and SO₂ concentrations for 2021 and 2022. While NO₂ concentrations were complaint against the NAAQS, these exceeded the maximum 24-hour and annual WHO guidelines for 2022.

8.8.2 Meteorological overview

Overall, higher rainfall is experienced during summer as compared to winter. During summer, high rainfall experienced at the project site is likely to result in lower ambient pollutant concentrations due to wet deposition of air pollution.

Prevailing wind directions at the site are predominantly from the northeast, east northeast and north northeast with lower occurrences from the south direction.

8.9 Noise

This section has been informed by the preliminary Noise Impact Assessment by SRK Consulting (September 2023). The final specialist assessment report will be provided in the EIA Phase.

Noise levels in the study area are currently generated mostly by vehicular traffic, surrounding industries, aircrafts overhead, people walking and talking, and bird activity. Noise impact may result during the construction phase such as the operation of machinery and equipment, as well as construction vehicle traffic noise. The construction and operational phases of the proposed Sunderland Ridge development are expected to have a low cumulative impact on the noise levels in the surrounding area. On-going noise monitoring to ensure compliance with legislated requirements will be included in the EMPr.

8.10 Visual landscape

This section has been informed by the preliminary Visual Impact Assessment by Eco Elementum (September 2023). The final specialist assessment report will be provided in the EIA Phase.

From a desktop study of satellite imagery and available national data, potential sensitive receptors were identified within 15 km of the proposed operations (). Using satellite imagery, homesteads; schools; residential areas and recreational facilities were identified as potential sensitive receptors to the proposed project. It should be noted that the sensitive receptors in the area may differ from those identified as not all areas may have been identified from the imagery successfully.

The users on the road networks surrounding the study area are considered as potential sensitive receptors due to their potential momentary views of the proposed development. The identified road network includes several main roads, national roads and secondary roads which service the identified visual receptors. The two main roads adjacent to the site are the M26 and the R55. The proposed powerline route runs along the R55 main road.

From the satellite imagery, several homesteads and formal and informal residential areas were noted to be prominent throughout the study area. The identified homesteads, schools, residential areas and recreational facilities are expected to experience higher levels of visual impacts due to their static views of the proposed development, as compared to travellers using the road networks who are expected to experience lower levels of visual impacts due to their momentary views of the proposed development.

In terms of recreation and tourism, a moderate density of tourist attractions (which includes recreational activities and accommodation areas) were noted within the study area. Tourists are also most likely to utilize the identified national and main roads to reach their destinations therefore, they may experience static and momentary views of the proposed development. Furthermore, conservation areas and protected areas are noted east and west of the study area. Visitors to these areas may have static views of the proposed development, especially if using optical instruments to view distant objects. The proposed development is furthermore located within the Magaliesberg Biosphere Reserve, which boasts several tourist attractions.

The expected sensitivity of the identified visual receptors was also considered in relation to existing mining and industrial activities within the area (refer to Figure 4.11). It is noted that several existing mining and industrial activities are present within the study area, along with existing railway lines and transmission lines. These mining and industrial activities are also noted to be located within the identified conversation area. It is also noted that several residential areas and transmission lines overlap the identified conservation and protected areas.

Overall, the identified sensitive receptors are categorized as high sensitivity sensitive receptors as they comprise of residential areas, nature reserves and scenic routes/trails (Oberholzer, 2005) However, given the existing mining activities, industrial activities and infrastructure within the study area, it is expected that the identified visual receptors will experience a low to moderate level of visual disturbance from the proposed activity.

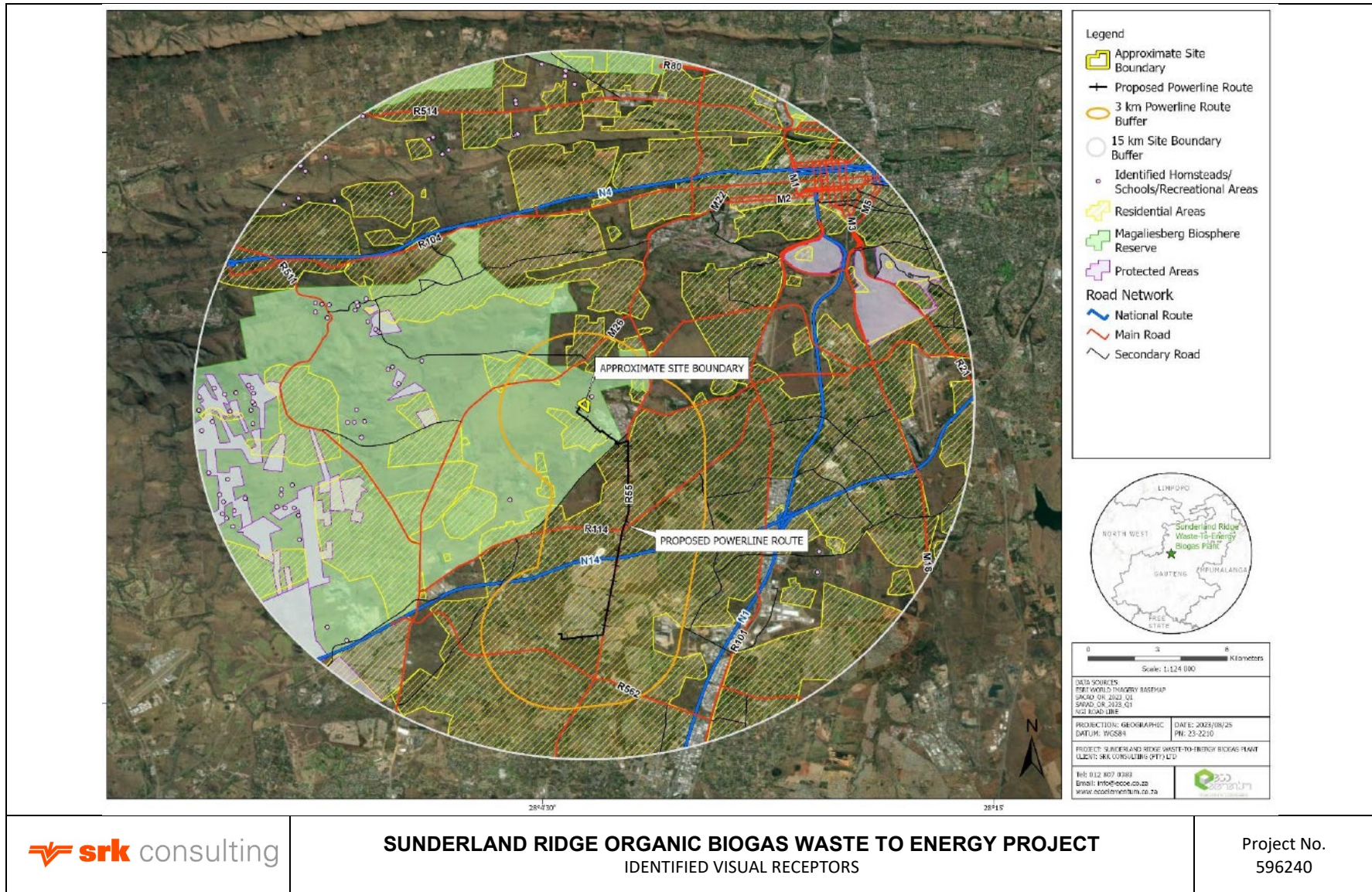


Figure 8-7: Identified visual receptors

8.11 Heritage resources

This section has been informed by the preliminary Heritage Impact Assessment by APAC (September 2023). The final specialist assessment report will be provided in the EIA Phase.

Background research indicates that there are some cultural heritage sites and features in the larger geographical area within which the study area falls. The field assessment did not identify any sites, features or material of cultural heritage origin or significance in the study and proposed development area.

The topography of the study and application area is for the most part fairly flat and open, although there are some low rocky outcrops present in parts and a section is located in on low ridge. The area would have been impacted in the historical and recent past through agricultural activities, while the areas adjoining had been severely impacted in the recent past through various other industrial and business developments. As a result, the original natural and historical landscape has been nearly completely altered. If any significant historical sites, features or material did exist here it would have been disturbed or destroyed to a large degree over recent years.

8.12 Paleontological resources

This section has been informed by the preliminary Paleontological Impact Assessment by Dr. Heidi Fourie (September 2023). The final specialist assessment report will be provided in the EIA Phase.

Fossils in South Africa mainly occur in rocks of sedimentary nature and not in rocks from igneous or metamorphic nature. Therefore, if there is geological strata the palaeontological sensitivity can generally be Very Low to Very High. The Project site is High for the Chuniespoort Group (refer to **Section 8.3.2**).

Chemical sediments such as fine-grained limestone and dolomite of the Malmani Subgroup is made up of deposits of organically derived carbonate shells, particles or precipitate. Dolomite is magnesium-rich limestone formed from algal beds and stromatolites (mineral structures built by microorganisms). These Early Proterozoic Transvaal stromatolitic dolomites formed and released free oxygen at supposedly 2900 – 2400 Ma. Stromatolites are common in the Malmani dolomites, accepted to be the fossil remnants of the simplest single-celled organisms. They are finely layered, concentric, mound-like structures formed by microscopic algal organisms (Norman and Whitfield 2006). Chert may contain fossils such as echinoids or sponges if nodular, although not common and is rated unlikely.

The field study undertaken in July 2023 identified a fossil, stromatolite, in a bank (outcrop) of dolomite and probably is quite deep underground. It may not be possible to excavate and recommendations by the specialist will need to be incorporated into the EIA Phase of the project.



Plate 8-6: Stromatolite identified within the Project site boundaries

8.13 Socio-economic environment

The Project falls within the Tshwane Metropolitan Municipality. This Section has been informed by the 2023-2024 Review of the City of Tshwane Integrated Development Plan (IDP) of May 2023.

The City of Tshwane is classified as a Category A municipality by the Municipal Demarcation Board and covers an area up to 6 345km². The City is the third-largest city in the world in terms of land area, the largest in Africa and makes up 30% of the Gauteng Province.

The City has a population of 3.65 million (in 2021), a labour force of 1.64 million people – 1.14 million employed and 30.6% unemployment (2017).

The principal languages include English, Sepedi, Afrikaans, Xitsonga and Setswana.

As of 2021, the principal economic activities are Government and Community Services (35%), finance (28%) and manufacturing (11%). The focus sectors include: advanced manufacturing, agri-business (agricultural production and processing), tourism and research and tourism.

The Socio-economic Assessment will provide further details on this component of the environment in the EIA Phase.

8.13.1 Population by gender, group and age

City of Tshwane Metropolitan Municipality's male/female split in population was 98.0 males per 100 females in 2021. The City of Tshwane Metropolitan Municipality appears to be a stable population with the share of female population (50.50%) being very similar to the national average of (51.10%). In total there were 1.84 million (50.50%) females and 1.81 million (49.50%) males. This is different from the Gauteng Province where the female population counted 7.49 million which constitutes 49.81% of the total population of 15 million.

In 2021, the City of Tshwane Metropolitan Municipality's population consisted of 79.33% African (2.9 million), 16.53% White (604 000), 2.06% Coloured (75 100) and 2.09% Asian (76 400) people. The largest share of population is within the young working age (25-44 years) age category with a total number of 1.25 million or 34.2% of the total population. The age category with the second largest number of people is the babies and kids (0-14 years) age category with a total share of 23.1%, followed by the older working age (45-64 years) age category with 772 000 people. The age category with the least number of people is the retired / old age (65 years and older) age category with only 264 000 people.

8.13.2 Economy

The economic state of City of Tshwane Metropolitan Municipality is put in perspective by comparing it on a spatial level with its neighbouring metropolitan municipalities, Gauteng Province, and South Africa. The section will also allude to the economic composition and contribution of the regions within City of Tshwane Metropolitan Municipality.

The City of Tshwane Metropolitan Municipality does not function in isolation from Gauteng, South Africa, and the world and now, more than ever, it is crucial to have reliable information on its economy for effective planning. Information is needed that will empower the municipality to plan and implement policies that will encourage the social development and economic growth of the people and industries in the municipality respectively.

With a GDP of R 614 billion in 2021 (up from R 330 billion in 2011), the City of Tshwane Metropolitan Municipality contributed 28.26% to the Gauteng Province GDP of R 2.17 trillion in 2021 increasing in the share of the Gauteng from 27.85% in 2011. The City of Tshwane Metropolitan Municipality contributes 9.91% to the GDP of South Africa which had a total GDP of R 6.19 trillion in 2021 (as measured in nominal or current prices). It's contribution to the national economy stayed similar in importance from 2011 when it contributed 9.91% to South Africa, but it is lower than the peak of 10.10% in 2019.

8.13.3 Employment

In 2021, City of Tshwane employed 1.12 million people which is 24.06% of the total employment in Gauteng Province (4.67 million), 7.60% of total employment in South Africa (14.8 million). Employment within City of Tshwane increased annually at an average rate of 0.78% from 2011 to 2021.

In 2021, there were a total number of 500 000 people unemployed in City of Tshwane, which is an increase of 185 000 from 315 000 in 2011. The total number of unemployed people within City of Tshwane constitutes 20.53% of the total number of unemployed people in Gauteng Province. The City of Tshwane Metropolitan Municipality experienced an average annual increase of 4.73% in the number of unemployed people, which is better than that of the Gauteng Province which had an average annual increase in unemployment of 4.87%.

In 2021, the unemployment rate in City of Tshwane Metropolitan Municipality (based on the official definition of unemployment) was 30.51%, which is an increase of 7.14 percentage points. The unemployment rate in City of Tshwane Metropolitan Municipality is lower than that of Gauteng. The unemployment rate for South Africa was 33.58% in 2021, which is an increase of -8.51 percentage points from 25.08% in 2011.

9 Public Participation

This Section meets the requirements of Item 2(1)(g)(ii) in Appendix 2 of GN 982, as amended, by providing details of the public participation process undertaken in terms of Regulation 41 of the Amendments to the 2014 EIA Regulations (GN 982, as amended) and includes copies of the supporting documents and inputs.

The purpose of the public participation process is to ensure that the issues, inputs and concerns of interested and affected parties (I&APs)⁷ (also referred to as 'stakeholders') are taken into account during the decision-making process. This requires the identification of I&APs (including authorities, technical specialists, vulnerable groups and the public), communication of the process and findings to these I&APs and the facilitation of their input and comment on the process and environmental impacts, including issues and alternatives that are to be investigated.

A successful public participation process is one that is inclusive, actively engages the public and provides ample opportunity for the public to participate in the application process. In alignment with GIIP requirements, this process will also take cognisance of IFC PS requirements, specifically PS 1 *Environmental and Social Risks and Impacts*, which notes that *stakeholder engagement is the basis for building strong, constructive, and responsive relationships that are essential for the successful management of a project's environmental and social impacts. Stakeholder engagement is an ongoing process that may involve, in varying degrees, the following elements: stakeholder analysis and planning, disclosure and dissemination of information, consultation and participation, grievance mechanism, and ongoing reporting to Affected Communities. The nature, frequency, and level of effort of stakeholder engagement may vary considerably and will be commensurate with the project's risks and adverse impacts, and the project's phase of development.*

SRK has taken cognisance of the requirements for public participation in terms of the EIA Regulations (GN 982, as amended), the Guideline on Public Participation in the EIA Process (GN 807, 10 October 2012) and IFC PS requirements and SRK has strived to ensure that the public participation principles are upheld. Refer to **Appendix C1**, which outlines how the public participation undertaken for this project meets the requirements of Chapter 6 of the 2014 EIA Regulations.

Activities undertaken as part of the public participation process are described in the sub-sections below.

It is noted that the EIA process is being undertaken in parallel to a Water Use License Application (WULA) and an Atmospheric Emission License (AEL). The public participation process has been combined and is being undertaken in compliance with the NEMA EIA Regulations, NWA WULA and Appeals Regulations and the NEM:AQA Regulations.

9.1 Pre-application meeting

A pre-application meeting was held on 6 July 2023 with the Gauteng Department of Agriculture and Rural Development (GDARDE). The purpose of the meeting was to:

- Introduce the proposed project to GDARDE.
- Confirm who the Competent Authority would be for the application.
- Discuss and confirm the listed activities applicable to the application.
- Discuss and confirm the specialist investigations required for the EIA process.
- Present the public participation approach.

⁷ It is noted that the phrase I&APs is utilised in the South African legislation, whereas the term stakeholder is used in international best practise. To ensure alignment with the South African legislation the term I&APs has been used in this report.

It was confirmed that GDARDE is the competent authority for the integrated EIA application in terms of the EIA Regulations. Refer to the meeting minutes and attendance register in **Appendix C2**.

9.2 Identification of Interested and Affected Parties

A process of I&AP analysis was undertaken to ascertain direct and indirect I&APs in relation to the project impact. This process included input from the SRK project team and the Socio-Economic specialist, Myezo Environmental Management Services.

The key I&APs identified include:

- Competent authority – GDARDE.
- Commenting authorities including: Department of Forestry, Fisheries and Environment (DFFE), Department of Water and Sanitation (DWS), Department of Transport.
- The Tshwane Metropolitan Municipality
- Adjacent landowners and occupiers.
- Local Rate Payers Association and ward councillor.
- Other key parties including local environmental associations.

The I&AP database will be updated on a regular basis during the course of the public participation process as additional I&APs are identified and/or register. Refer to the I&AP database in **Appendix C3**⁸.

9.3 Landowner consent

The project site is located in the Sunderland Ridge industrial zone on the Remainder 29A of Portion 122 of Erf 355-JR Mooiplaats and Portion 87 of Erf 355-JR Mooiplaats. The site is 100% privately-owned by a commercial property developer and the rights to the land will be secured via a lease agreement with the landowner, with an option to purchase at a later stage. The landowner provided consent in the signed application form, as required.

9.4 Project announcement

9.4.1 Newspaper advertisement

An advertisement will be placed in the Centurion Rekord on 3 October 2023 and a Tshwane Sun newspaper in October 2023 to notify the broader public of the proposed project and the availability of the Draft Scoping Report (DSR) for review and comment. The notice will provide details for I&APs to register, obtain further information and provide comment. Refer to **Appendix C4** for a copy of the contents of the advertisements to be placed⁹.

9.4.2 Public notices

Public notices in the form of A2-size colour laminated posters will be placed in locations conspicuous to and accessible by the public on site, and at the entrances to the Eldoraigne Library and Centurion's

⁸ In accordance with the Protection of Personal Information Act, 2013 (Act No. 3 of 2013)(POPIA) the stakeholder database cannot be made available to the public. This database will only be submitted to GDARD in compliance with the requirements of the NEMA EIA Regulations.

⁹ Proof of placement of the advertisement will be provided in the Final Scoping Report.

City of Tshwane Municipal offices . Refer to **Appendix C5** for a copy of the contents of the site notices to be placed.

9.4.3 Letters to key stakeholders and authorities

Relevant authorities, officials and key stakeholders will be sent notification letters via email inviting them to register, provide notification of the availability of the DSR and inviting submission of comments.

9.5 Distribution of reports for comment

9.5.1 Draft reports

Copies of the draft version of this Draft Scoping Report (DSR) will be distributed to the relevant authorities and key I&APs.

Hard copies of the DSR will be distributed as follows for public review and comment:

- Eldoraigne Library.
- Centurion City of Tshwane municipal offices.

Digital copies of the DSR will be submitted to all stakeholders on the I&AP database. The South African Heritage Resources Agency (SAHRA) will receive a copy via the SAHRA website.

Digital copies of the DSR will also made available on the SRK website and emailed to I&APs on request.

All registered I&APs and relevant authorities will be notified via written correspondence of the availability of the DSR for review and comment and provided with a period of 30 days to submit comments. Telephonic and written communications will be undertaken with I&APs as and when required. All comments received from I&APs will be recorded in a Comments and Responses Table and written comments, including responses to such comments and records of meetings will be appended to the Final Scoping Report (FSR).

The same procedure will be followed to obtain comments from registered I&APs on the Draft Environmental Impact Assessment Report (DEIAR) and meetings with key I&APs will be held as required.

9.5.2 Revised reports

All comments received on the DSR will be incorporated into this Final Scoping Report (FSR), which is to be submitted to GDARDE and will be made available on the SRK website for review by commenting authorities and I&APs.

All relevant authorities and registered I&APs will be notified of the submission of the FSR report to GDARDE. Should substantial changes be made in the FSR, I&APs will be afforded a further comment period of 30 days. Comments received on the FSR will be submitted directly to GDARDE for inclusion in the decision-making process.

The same procedure will be followed with the EIA Report during the EIA phase.

9.6 Decision notification

In accordance with section 4(2) of the EIA Regulations, all registered I&APs will be notified in writing within 14 days of the decision date and the appeal process.

10 Issues and Responses

In the FSR, this Section will meet the requirements of Item 2(1)(g)(iii) in Appendix 2 of GN 982, as amended, by providing a summary of the issues raised by I&APs and an indication of the manner in which the issues will be incorporated, or the reasons for not including them.

Preliminary lists of potential biophysical and socio-economic impacts, which may be positive or negative, that are being considered, assessed and mitigated by specialists is provided below.

The potential biophysical impacts include:

- Positive:
 - Decrease in greenhouse gas emissions (positive).
 - Prevention of uncontrolled and illegal dumping on site causing environmental issues.
 - Reduce waste to landfill sites.
- Negative:
 - Decrease in air quality.
 - Increased odour levels.
 - Increased noise levels.
 - Destruction of fauna and flora (including possible vulnerable, rare or endangered species).
 - Introduction of invader species.
 - Impact on wetland functioning.
 - Loss of agricultural potential.
 - Deterioration of groundwater and surface water quality.

The potential socio-economic impacts include:

- Positive:
 - Job creation.
 - Skills development.
 - Developing a new sector.
 - Testing new technologies.
 - Local economic opportunities.
 - Contributing to green energy
 - Community development programmes.
 - An open site with uncontrolled access presents a security risk to current neighbouring land users.
 - Reduces the risk of veld fires.
- Negative:
 - Destruction of heritage and/ or paleontological resources.
 - Visual impacts.
 - Risk and safety issues.
 - Traffic congestion.

Section 12 provides more detail on potential impacts that have been identified.

Although the project has several negative impacts to be managed, it is however unique as there are several developmental benefits.

11 Assessment Methodology

This Section meets the requirements of Item 2(1)(g)(vi) in Appendix 2 of GN 982, as amended, by providing the methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives.

The impact assessment methodology that will be utilised to assess and rank each of the potential environmental impacts and risks identified has been formulated to comply with the scope of assessment and content of EIA Reports as specified in Appendix 3 of the Amended 2014 EIA Regulations (refer to item 3(j) of Appendix 3 in Government Notice R982, as amended).

The required scope of assessment is provided in the box below:

11. An environmental impact assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include –

.....

(j) an assessment of each identified potentially significant impact and risk, including –

- (i) cumulative impacts;
- (ii) the nature, significance and consequences of the impact and risk;
- (iii) the extent and duration of the impact and risk;
- (iv) the probability of the impact and risk occurring;
- (v) the degree to which the impact and risk can be reversed;
- (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and
- (vii) the degree to which the impact and risk can be avoided, managed or mitigated;

.....

In line with the requirements outlined in the box above, each potentially significant impact /risk identified must be assessed in terms of the following:

- **Nature** (description): will the impact have a positive or negative outcome on the biophysical and/or social environment?
- **Extent** (spatial scale): will the impact affect the national, regional or local environment, or only that of the site?
- **Duration** (temporal scale): how long will the impact last?
- **Magnitude** (severity): will the impact be of high, moderate or low severity?
- **Probability** (likelihood of occurring): how likely is it that the impact may occur?

The impact assessment is to be based on sound validated scientific information and professional judgement in the context of the specific project and site conditions.

To enable a scientific approach for the determination of the environmental consequence and significance (importance) of each identified potential impact, a numerical value must be linked to each factor. The impact assessment is divided into issue identification, impact definition, and impact evaluation. The basic elements used in the evaluation of impact significance are described in **Table 11-1** and the characteristics that are used to describe the consequence of an impact are outlined in **Table 11-2**.

Table 11-1: Key elements in the evaluation of impact significance

Element	Description	Questions applied to the test of significance
Consequence	<p>An impact or effect can be described as the change in an environmental parameter, which results from a particular project activity or intervention. Here, the term “consequence” refers to:</p> <ul style="list-style-type: none"> (a) The sensitivity of the receiving environment, including its capacity to accommodate the kinds of changes the project may bring about. (b) The type of change and the key characteristics of the change (these are magnitude, extent and duration). (c) The importance of the change (the level of public concern/ value attached to environment by the stakeholders and the change effected by the project). <p>The following should be considered in the determination of impact consequence:</p> <ul style="list-style-type: none"> (a) Standards and guidelines (thresholds). (b) Scientific evidence and professional judgment. (c) Points of reference from comparable cases. (d) Levels of stakeholder concern. 	<p>Will there be a change in the biophysical and/or social environment?</p> <p>Is the change of consequence (of any importance)?</p>
Probability	Likelihood/chances of an impact occurring.	What is the likelihood of the change occurring?
Effectiveness of the management measures	<p>The significance of the impact needs to be determined both without management measures and with management measures.</p> <p>The significance of the unmanaged impact needs to be determined so there is an appreciation of what could occur in the absence of management measures and of the effectiveness of the proposed management measures.</p>	Will the management measures reduce the impact to an acceptable level?
Uncertainty/ Confidence	<p>Uncertainty in impact prediction and the effectiveness of the proposed management measures. Sources of uncertainty in impact prediction include:</p> <ul style="list-style-type: none"> (a) Scientific uncertainty – limited understanding of an ecosystem (or affected stakeholders) and the processes that govern change. (b) Data uncertainty – restrictions introduced by incomplete, contradictory or incomparable information, or by insufficient measurement techniques. (c) Policy uncertainty – unclear or disputed objectives, standards or guidelines. <p>There are a number of approaches that can be used to address uncertainty in impact prediction, including:</p> <ul style="list-style-type: none"> (a) ‘Best’ and ‘worst’ case prediction to illustrate the spread of uncertainty. (b) Attaching confidence limits to impact predictions. (c) Sensitivity analysis to determine the effect of small changes in impact magnitude. 	What is the degree of confidence in the significance ascribed to the impact?

Table 11-2: Characteristics used to describe impacts and impact consequence

Characteristics used to describe consequence	Sub-components	Terms used to describe the characteristic
Type		Biophysical, social or economic
Nature		Direct or indirect, cumulative etc.
Status		Positive (a benefit), negative (a cost) or neutral
Phase of project		During pre-construction (if applicable), construction, operation, decommissioning or post closure

Characteristics used to describe consequence	Sub-components	Terms used to describe the characteristic
Timing		Immediate, delayed
Magnitude	Sensitivity of the receiving environment/ receptors	High, medium or low sensitivity Low capacity to accommodate the change (impact)/ tolerant of the proposed change
	Severity/ intensity (degree of change measured against thresholds and/or professional judgment)	Gravity/ seriousness of the impact Intensity/ influence/ power/ strength
	Level of stakeholder concern	High, medium or low levels of concern All or some stakeholders are concerned about the change
Spatial extent or population affected The area/population affected by the impact The boundaries at local and regional extents will be different for biophysical and social impacts.		Area/ volume covered, distribution, population Site/Local (social impacts should distinguish between site and local), regional, national or international
Duration (and reversibility / sustainability) Length of time over which an impact occurs and potential for recovery of the endpoint from the impact		Short term, long term Intermittent, continuous Reversible, irreversibility (negative impacts) Sustainable, unsustainable (positive impacts) Temporary, permanent
Confidence		High, Medium, Low

11.1 Impact significance rating

Practicable management measures will be recommended that avoid, and if avoidance is not possible, then reduce, restore, compensate/offset negative impacts, enhance positive impacts and assist project design. The impact significance rating system is presented in **Table 11-3** and involves three parts:

- Part A: Defines impact consequence using the three primary impact characteristics of magnitude, spatial scale and duration.
- Part B: Uses the matrix to determine a rating for impact consequence based on the definitions identified in Part A.
- Part C: Uses the matrix to determine the impact significance rating, which is a function of the impact consequence rating (from Part B) and the probability of occurrence.

Table 11-3: Method for rating the significance of impacts

PART A: DEFINING CONSEQUENCE IN TERMS OF MAGNITUDE, DURATION AND SPATIAL SCALE <i>Use these definitions to define the consequence in Part B</i>		
Impact characteristics	Definition	Criteria
MAGNITUDE	Major -	Substantial deterioration or harm to receptors; receiving environment has an inherent value to stakeholders; receptors of impact are of conservation importance; or identified threshold often exceeded
	Moderate -	Moderate/measurable deterioration or harm to receptors; receiving environment moderately sensitive; or identified threshold occasionally exceeded
	Minor -	Minor deterioration (nuisance or minor deterioration) or harm to receptors; change to receiving environment not measurable; or identified threshold never exceeded
	Minor +	Minor improvement; change not measurable; or threshold never exceeded

PART A: DEFINING CONSEQUENCE IN TERMS OF MAGNITUDE, DURATION AND SPATIAL SCALE					
<i>Use these definitions to define the consequence in Part B</i>					
Impact characteristics	Definition	Criteria			
	Moderate +	Moderate improvement; within or better than the threshold; or no observed reaction			
	Major +	Substantial improvement; within or better than the threshold; or favourable publicity			
SPATIAL SCALE OR POPULATION	Site or local	Site specific or confined to the immediate project area			
	Regional	May be defined in various ways, e.g. cadastral, catchment, topographic			
	National/ International	Nationally or beyond			
DURATION	Short term	Up to 18 months.			
	Medium term	18 months to 5 years			
	Long term	Longer than 5 years			
PART B: DETERMINING CONSEQUENCE RATING					
<i>Rate consequence based on definition of magnitude, spatial extent and duration</i>					
			SPATIAL SCALE/ POPULATION		
			Site or Local	Regional	National/ international
MAGNITUDE					
Minor	DURATION	Long term	Medium	Medium	High
		Medium term	Low	Low	Medium
		Short term	Low	Low	Medium
Moderate	DURATION	Long term	Medium	High	High
		Medium term	Medium	Medium	High
		Short term	Low	Medium	Medium
Major	DURATION	Long term	High	High	High
		Medium term	Medium	Medium	High
		Short term	Medium	Medium	High
PART C: DETERMINING SIGNIFICANCE RATING					
<i>Rate significance based on consequence and probability</i>					
			CONSEQUENCE		
			Low	Medium	High
PROBABILITY (of exposure to impacts)	Definite		Medium	Medium	High
	Possible		Low	Medium	High
	Unlikely		Low	Low	Medium

Notes: + denotes a positive impact.

Using the matrix, the significance of each described impact is initially rated. This rating assumes the management measures inherent in the project design are in place.

Management recommendations and post management significance

Practicable management measures were then suggested:

“Recommendations for management should focus on *avoidance*, and if avoidance is not possible, then to *reduce, restore, compensate/offset negative impacts*, enhance positive impacts and assist project design.”

The significance of impacts was then re-assessed **with** assumed management measures in place (“**after management**”). Specialists also recommended and described appropriate **monitoring** and review programs to track the efficacy of management measures.

11.2 Cumulative impacts

Impacts cannot be assessed in isolation. An integrated approach to impact assessment requires that cumulative impacts be included in the assessment of individual impacts. Cumulative impacts must therefore be assessed de facto. A brief description of the cumulative nature of each impact will be provided.

12 Preliminary Assessment

This Section meets the requirements of Item 2(1)(g): (vii), (v), (viii), (ix) and (xi) in Appendix 2 of GN 982, as amended, relating to the potential impacts and risks which have informed the identification of the preferred alternatives.

An indication of the manner in which potential issues identified in Section 10 will be incorporated into the EIA Report is provided in **Table 12-1**.

Table 12-1: Issues and Impacts

Potential Issues	Response
Potential Biophysical Impacts	
Greenhouse gas emissions	The core purpose of the proposed project is to produce biogas and reduce greenhouse gas emissions. A climate change impact assessment is currently being undertaken, the results of which will be presented in the EIR.
Illegal dumping	Currently the site experiences illegal dumping, which has caused and is causing environmental impacts. The Project will see the site being established and fenced, thereby reducing the potential for illegal and uncontrolled dumping.
Air quality	Preliminary results from the air quality specialist indicate that the key sources of pollutants from the Project arise from the generator emissions with the key pollutants of concern being NO ₂ and CO. An Air Quality Impact Assessment (AQIA) is currently being undertaken, the results of which will be presented in the EIR. The site will receive large volumes of agricultural waste that can cause odour nuisance. An assessment of this potential issue has been included in the scope of the AQIA.
Noise	The project site will be an extension to a light industrial area and will be subject to noise monitoring in accordance with OHS Act Regulations. Based on information from similar facilities, the facility is not regarded as a noise nuisance in the context of its environmental setting, namely in an industrial area.
Terrestrial Biodiversity	A Terrestrial Biodiversity is currently being undertaken. Preliminary results from the biodiversity specialist indicate that there are no flora or faunal species of conservation concern within the site.
Freshwater / aquatic	A freshwater assessment is currently being undertaken. Preliminary results from the aquatic specialist indicate that there are no wetlands within the site. The proposed powerline and gas pipeline route alignments are still being investigated. The results of the specialist investigation will be presented in the EIR.
Soils	A land capability and agricultural potential assessment is currently being undertaken, the results of which will be included in the EIR. A geotechnical assessment will also be undertaken during the EIA Phase to confirm the suitability of the site for the proposed project.
Ground, surface and stormwater	The construction and operational activities have the potential to cause ground, surface and stormwater contamination. A surface water assessment and a geohydrological assessment are currently being undertaken, the results of which will be included in the EIR. A stormwater management plan will be compiled and included in the EIR.
Potential Socio-economic Impacts	
Job creation	Temporary employment opportunities will be available during the construction phase and permanent, skilled and unskilled, opportunities will be realised during the operational phase. A Socio-economic Impact Assessment is currently being undertaken to determine the potential social and economic impacts, both positive and negative, of the proposed project.
Skills development	Skills have been developed at the BBP through international specialist input. The skills acquired at the BBP will be transferred to the Project staff. This will enable local skills development.
New technologies and a new sector	Waste-to-energy organic biogas plants is a developing sector that is relatively new to the South African market. The Project sees the research and implementation of new technologies.

Potential Issues	Response
Heritage resources	A Heritage Impact Assessment (HIA) is currently being undertaken. Preliminary results from the heritage specialist indicate that no heritage resources have been identified on site. The results of the HIA will be included in the EIR.
Paleontological resources	A Paleontological Impact Assessment (PIA) is currently being undertaken. Preliminary results from the palaeontologist indicates that there is a fossil present on site, it is a stromatolite. The mitigation measures provided by the specialist will be incorporated into the EIR and the EMPr.
Visual	A Visual Impact Assessment (VIA) is currently being undertaken. Preliminary results from the specialist indicate that the potential visual receptors include: homesteads; schools; residential areas and recreational facilities. The users on the road networks surrounding the study area are considered as potential sensitive receptors due to their potential momentary views of the proposed development. The results of the VIA will be included in the EIR.
Risk and safety	The presence of the digesters within the footprint of the site poses a potential health and safety risk and the site may be deemed to be a Major Hazard Installation (MHI). A quantitative risk assessment will be undertaken, the results of which will be presented in the EIR.
Traffic	The proposed project will require the delivery of raw materials 24/7. Traffic congestion may result from the increase in trucks and light motor vehicles accessing the site, however, it is anticipated that the potential impact will be minor.
Services	Electricity required for the operational phase will be generated on site. The preferred alternative is to tie into the existing bulk water supply to source water for the construction and operational phases. Domestic waste will be disposed of via the municipal waste system. Confirmation from the relevant Service Providers of the required capacities will be included in the EIR.

Table 12-2 provides a concluding statement indicating the preferred alternatives.

Table 12-2: Preferred Alternatives

Alternatives	Preferred Option
Technology	There are three preferred alternatives at this stage: <ul style="list-style-type: none"> Alternative 1 is for the conversion of biogas to electricity, the installation of a new overhead transmission powerline and tying into the existing Raslouw Substation. Alternative 2 is for the biogas to be compressed, the installation of a new gas pipeline and tying into the existing Sasol pipeline. Alternative 3 is for the biogas to be compressed and taken off site via trucks. The preferred alternative will be determined during the EIA Phase.
Site location	Portion 122 of Erf 355-JR Mooiplaats and Portion 87 of Erf 355-JR Mooiplaats.
Layout	Refer to Figure 6-4 for the preliminary layout plan. The final layout will be provided in the EIA Phase.
Wastewater disposal	There are two preferred alternatives at this stage: <ul style="list-style-type: none"> Alternative 1 will be for a septic tank and soakaway to be constructed on site. Alternative 2 will be for the wastewater to be disposed of via the municipal sewer system. The preferred alternative will be determined in the EIA Phase.
No-go	To be assessed in the EIA Phase.

13 Plan of Study for EIA

In accordance with Item 2(1)(g) in Appendix 2 of GN R982, as amended, this Section provides a plan of study for the EIA process to be undertaken, including —

- (i) A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity.
- (ii) A description of the aspects to be assessed as part of the Environmental Impact Assessment process.
- (iii) Aspects to be assessed by specialists.
- (iv) A description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists.
- (v) A description of the proposed method of assessing duration and significance.
- (vi) An indication of the stages at which the competent authority will be consulted.
- (vii) Particulars of the public participation process that will be conducted during the environmental impact assessment process.
- (viii) A description of the tasks that will be undertaken as part of the environmental impact assessment process.
- (ix) *Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.*

13.1 Alternatives to be considered and assessed

The following alternatives will be assessed during the EIA phase:

- The preferred location alternative on Remainder 29 of Portion 122 of Erf 355-JR Mooiplaats (refer to **Figure 1-1**).
- Potential layout alternatives as recommended by specialists.
- Powerline and gas pipeline route preferred alternatives.

13.2 Description of aspects to be assessed

The following aspects will be assessed by specialists during the EIA phase:

- Biophysical aspects:
 - Air quality.
 - Climate change.
 - Water resources – surface water, hydrogeological and freshwater.
 - Terrestrial biodiversity.
 - Heritage and paleontological.
 - Land capability and agricultural potential.
 - Geotechnical conditions.
- Socio-economic aspects:
 - Health and safety risk.
 - Noise.
 - Employment and skills development.
 - Traffic.
 - Visual.

13.3 Method of assessing potential environmental aspects

Refer to **Section 11** for a description of the methodology to be used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives.

The proposed scope of work for the specialist studies is provided in the sub-sections below.

13.3.1 Air Quality Impact Assessment

The Air Quality Impact Assessment (AQIA) will be undertaken by Dr. Hasheel Tularam of SRK and will include the following:

- Baseline assessment:
 - Technical documentation regarding the proposed biogas plant provided by BEH was carefully reviewed to inform the assessment.
 - Meteorological input data for surface as well as upper air conditions from Lakes Environmental to be reviewed and processed. Prognostic Weather Research and Forecasting (WRF) data to be used to inform this assessment for the period 2020 – 2022.
 - Ambient air quality and meteorological data from the South African Air Quality Information System (SAAQIS) for the Olievenhoutbosch monitoring station to be obtained, reviewed and reported upon for the period 2020 – 2022.
- Development of an emissions inventory using equipment manufacture guarantees for the proposed operations.
- An air dispersion model using AERMOD (version 11.2.0) software will be used to assess the pollutants of concern that have been identified for the Project, which include:
 - Particulate Matter – PM10 and PM2.5.
 - Sulphur dioxide (SO₂).
 - Nitrogen dioxide (NO₂).
 - Carbon monoxide (CO).
 - Hydrogen sulphide (H₂S).
- The predicted ambient concentrations will be compared to the applicable National Ambient Air Quality Standards (NAAQS) and World Health Organization (WHO) Guidelines.

13.3.2 Climate Change Impact Assessment

The Climate Change Impact Assessment (CCIA) will be undertaken by Mr. Bish Sahadeo of SRK and the following approach and scope will be taken:

- Undertake a high-level assessment of GHG emissions including process and transport emissions and compare these to the baseline (no-Project) scenario for grid and/or diesel-generated electricity and organic waste disposal.
- The calculations will be done using a Tier 1/2 assessment approach (based on the South African methodology guidelines) and assessed against IFC requirements and the OECD DAC Rio Markers for Climate Handbook requirements to determine whether the results meet the Rio Marker 2 objective.

In order to complete the above, SRK will:

- Identify physical and operating boundaries for the plant to confirm emission sources.
- Develop and submit an information needs list to obtain additional information from the client required to quantify emissions based on the appropriate tier approach.
- Determine the appropriate emissions factors. Where technology specific parameters are not available using emissions factors as detailed in the methodological guidelines for GHG emissions quantification.
- Calculate the annual predicted emissions inventory of the process and compare this to the no-Project scenario.

- Identify opportunities to reduce GHG emissions, improve reporting and mitigate impacts.
- A report detailing the methodology, outcomes (Rio Marker compliance, Project to no-Project comparison, possible mitigation measures) will be compiled and submitted for one client review before finalisation.

13.3.3 Surface Water Assessment

The Surface Water Assessment will be undertaken by Ms. Manda Hinsch of SRK and the following activities will be undertaken to determine the floodlines along rivers within the intended construction site, powerline, and gas pipeline:

- Identification and delineation of the watercourse/s impacted by construction and site activities.
- Delineation of catchments draining into affected rivers.
- Verification of available rainfall data from rainfall stations in the vicinity of the site.
- Hydrological study to determine the latest peak flows emanating from catchments draining the site.
- Hydraulic modelling of flood peaks using backwater calculation method (GeoHECRAS) considering all factors within each river reach catchment that have the potential flooding impact along the riverbanks.
- Conduct a water quality assessment.
- Undertake a risk assessment.
- Compile a report and associated floodline drawing/s.

13.3.4 Hydrogeological Assessment

The Hydrogeological Assessment will be undertaken by Mr. Martin Holland of Delta H Water Systems Modelling. The scope of work of the groundwater study is sub-divided into the following tasks:

- Data Collection and Review: All available national/regional scale as well as local geological and hydrogeological information were collated and assessed. Furthermore, the national aquifer vulnerability (DRASTIC) and aquifer classification was assessed for the site as well. Groundwater vulnerability gives an indication of how susceptible an aquifer is to contamination. Aquifer vulnerability is used to represent the intrinsic characteristics that determine the sensitivity of various parts of an aquifer to being adversely affected by a contaminant load imposed from surface.
- Hydrocensus: The dataset will be augmented with a hydrocensus to establish the quality and quantity of the groundwater resource (including the measurement of groundwater levels) as well as actual utilisation thereof. The hydrocensus focused on a 1 km to 2km radius.
- Reporting: The final groundwater specialist report compiled will document all methodologies, findings, quantitative analysis, recommendations (proposed monitoring programme and recommended mitigation measures) and conclusions. The Impact assessment will be based on the Regulation 3 h(vi) of Appendix 2 of R.983 (2014), under the NEMA (1998), which requires an assessment of the nature (status), consequences (magnitude), extent, duration, probability, and significance of the identified potential environmental impacts of the proposed mining operation.

13.3.5 Freshwater Ecological Assessment

The Freshwater Ecological Assessment will be undertaken by Mr. Andrew Husted of The Biodiversity Company.

The areas will be traversed on foot to identify local freshwater resources. The following will be achieved to supplement the approach:

- A desktop assessment of all available datasets.
- GIS processing to preliminary identify water accumulation areas.
- The delineation of water resources in accordance with the DWAF (2005) guidelines, whereby the outer edges will be identified.
- A functional and integrity assessment of the water resources.

- The “Preliminary Guideline for the Determination of Buffer Zones for Rivers, Wetland and Estuaries” (Macfarlane et al., 2014) will be used to determine the appropriate buffer zone for the proposed activity.
- The risk assessment will be completed in accordance with the requirements of the DWS General Authorisation (GA) in terms of Section 39 of the NWA for water uses as defined in Section 21(c) or Section 21(i) (GN 509 of 2016).

13.3.6 Terrestrial Biodiversity Assessment

The Terrestrial Biodiversity Assessment will be undertaken by Dr. Lindi Steyn of The Biodiversity Company.

The terrestrial ecology survey will include the following:

- Compilation of an identified species list.
- Identify any Red Data or listed species present or potentially occurring in the area.
- A habitat assessment and delineation.
- Sampling techniques will be passive (sightings, calls and tracking) as well as active (trapping, cameras and searching).

The plant and vegetation surveys will include the following:

- A survey for Red and Orange Data plant species.
- Vegetation units will be identified, classified and delineated.
- Habitat types will be classified and delineated.

The habitat feature surveys will include the following:

- The identification of these features and delineation thereof.
- The location of any unique or protected habitat features

13.3.7 Heritage Impact Assessment

The Heritage Impact Assessment will be undertaken by Anton Pelsler of APAC and his terms of reference will be as follows:

- Identify all objects, sites, occurrences and structures of an archaeological or historical nature (cultural heritage sites) located on the portion of land that will be impacted upon by the proposed development.
- Assess the significance of the cultural resources in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value.
- Describe the possible impact of the proposed development on these cultural remains, according to a standard set of conventions.
- Propose suitable mitigation measures to minimize possible negative impacts on the cultural resources.
- Review applicable legislative requirements.

13.3.8 Paleontological Impact Assessment

The Paleontological Impact Assessment will be undertaken by Dr. Heidi Fourie, an independent palaeontologist, and the scope of the study will include a Phase 1 Assessment. This assessment includes a field survey of the affected portion includes photographs taken of the site with a digital camera. Additionally, Google Maps will be accessed on a cellular phone/tablet for navigation. A Global Positioning System (GPS) will be used to record fossiliferous finds and outcrops (bedrock) when the area is not covered with topsoil, subsoil, overburden, vegetation, grassland, trees or waste. A literature survey is included and the study relied heavily on geological maps. A Phase 2 assessment may be required, however, this will require input from the South African Heritage Resource Agency (SAHRA).

13.3.9 Land Capability and Agricultural Potential Assessment

The Land Capability and Agricultural Potential Assessment will be undertaken by The Biodiversity Company. Determining the land capability and agricultural potential of the site is determined by a combination of soil, terrain and climate features. Land capability is defined by the most intensive long term sustainable use of land under rain-fed conditions. At the same time an indication is given about the permanent limitations associated with the different land use classes.

The following process will be undertaken as part of this study:

- Land capability is divided into eight classes and these may be divided into three capability groups. The land classes and groups are arranged in order of decreasing capability and ranges of use. The risk of use increases from class I to class VIII (Smith, 2006).
- The land potential classes are determined by combining the land capability results and the climate capability of a region.
- Land use will be identified using aerial imagery and then ground-truthed while out in the field. The land use categories are split into:
 - Cultivated.
 - Grazing.
 - Natural.
 - Mines.
 - Urban Built-Up.
 - Waterbodies.

13.3.10 Geotechnical Investigation

The scope of work for this Geotechnical Investigation will include a desktop study of all available information followed by intrusive field investigations to assess the ground profile of the site. The purpose of this investigation will be to obtain information on the physical properties of the soil and rock within the site. This will inform the design earthworks and foundations for the proposed. Essentially, this investigation will determine the suitability of the soils on site for the Project and to identify any fatal flaws from a geotechnical perspective.

The specialist appointed to undertake the Geotechnical Investigation is still to be confirmed.

13.3.11 Health and Safety Risk Assessment

The Quantitative Risk Assessment to assess the health and safety risks of the proposed project will be undertaken by Mr. Mike Oberholzer of Riscom and will include the following:

- Review of revised designs of proposed processing units, inventories, routing and transport conditions for all alternatives.
- Development of accidental spill and fire scenarios for the facility.
- Using generic failure rate data (for tanks, pumps, valves, flanges, pipework, gantry, couplings and so forth), determination of the probability of each accident scenario.
- For each incident developed in Step 3, determination of consequences (such as thermal radiation, domino effects, toxic-cloud formation and so forth).
- For scenarios with off-site consequences (greater than 1% fatality off-site), calculation of maximum individual risk, taking into account all generic failure rates, initiating events (such as ignition), meteorological conditions and lethality.
- Assessing the risk assessment to the criteria of SANS 1641; and commenting on suitability of the project.
- Suggest mitigation, if possible, for successful implementation.
- Identification of any shortcomings and ranking of risks for possible risk reduction programmes.

13.3.12 Noise Impact Assessment

The Noise Impact Assessment will be undertaken by Dr. Hasheel Tularam of SRK and the following scope of work is associated with the study:

- Desktop review of project specific documentation.
- Review the relevant South African legislative framework.
- Identification of sensitive receptors (noise receivers) in the vicinity of the site.
- Baseline assessment of the current noise climate in the vicinity of the proposed Sunderland Ridge site. This includes day and night-time noise monitoring conducted at various predetermined monitoring locations (limited to 10) around the proposed site.
- A detailed inventory of all potential noise sources associated with the proposed site will be developed and will comprise of sound pressure levels for each of the proposed sources.
- Environmental acoustic modelling conducted using the internationally accredited noise modelling software, SoundPLAN (v5.1).
- Predicted gridded outputs from SoundPLAN (v5.1) inputted into ArcGIS (v10.8.1) to provide a visual representation (isopleth output) of noise levels throughout the region.
- The noise impact will be calculated and logarithmically added to the existing noise levels (monitored data) with comparisons being made to the SANS10103:2008 guidelines and IFC guidelines for noise.
- The current environmental Noise Impact Report detailing findings of the baseline assessment, ambient environmental acoustic monitoring, acoustic modelling results and impacts, as well as detailed recommendations that include mitigation measures and ongoing noise monitoring, if deemed necessary.

13.3.13 Socio-economic Impact Assessment

The Socio-economic Impact Assessment will be undertaken by Ms. Babalwa Fatyi of Myezo Environmental Management Services (Pty) Ltd. The scope of work will cover the following:

- Compile a Stakeholder Engagement Plan.
- Undertake a Community Needs Assessment.
- Compile a Project-Specific Gender Analysis and Integration Action Plan.
- Public Participation.

The approach to the items detailed above are provided in Figure 13-1 to Figure 13-4.

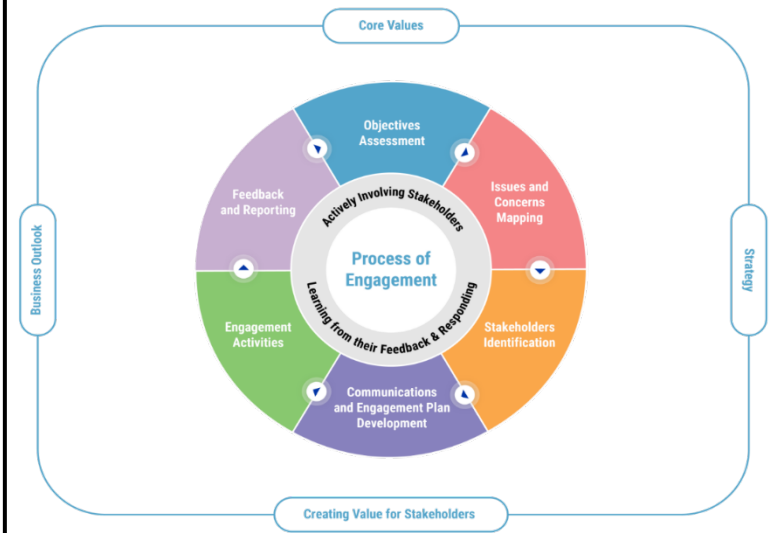
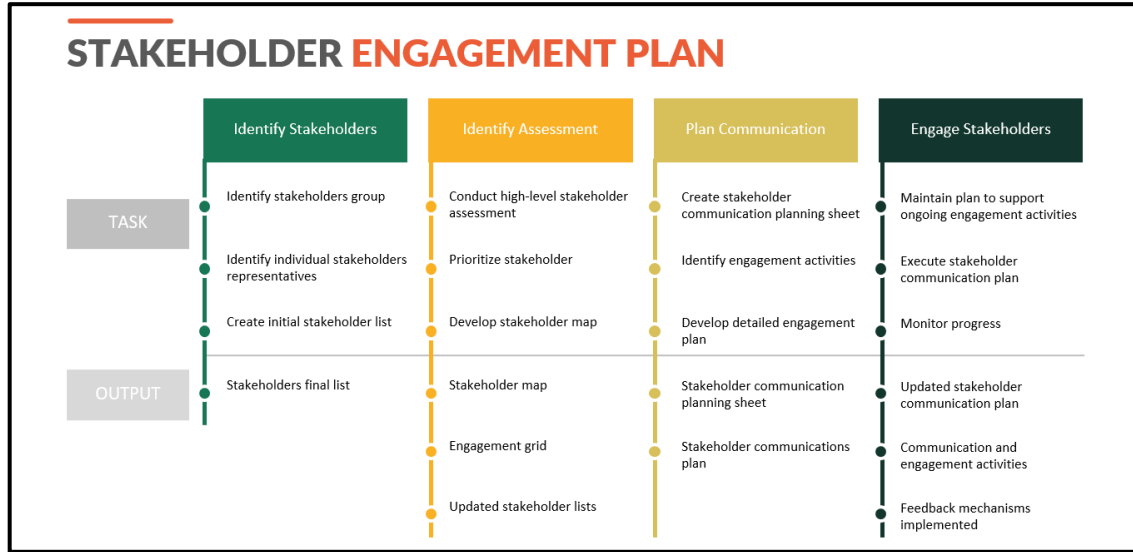


Figure 13-1: Stakeholder Engagement Plan Approach

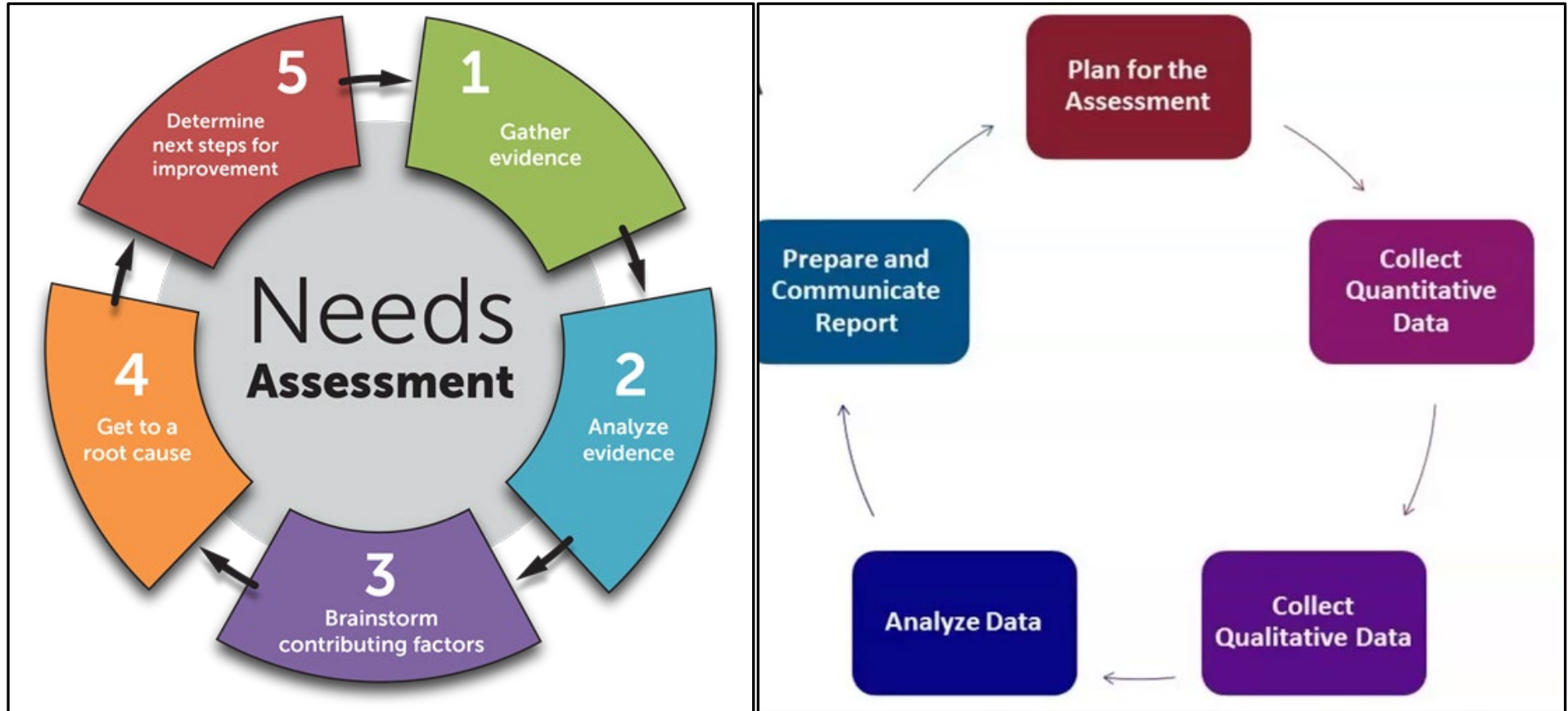


Figure 13-2: Community Needs Analysis Approach

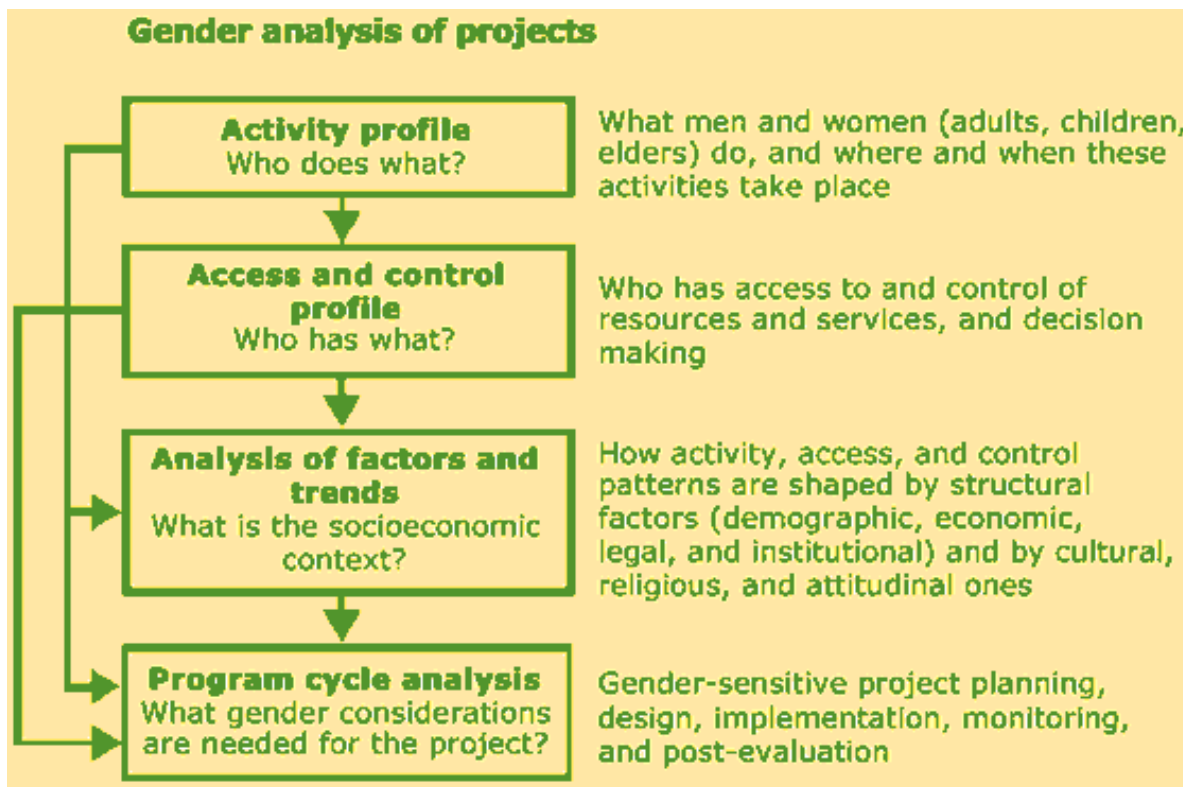


Figure 13-3: Project-Specific Gender Analysis and Integration Action Plan Approach

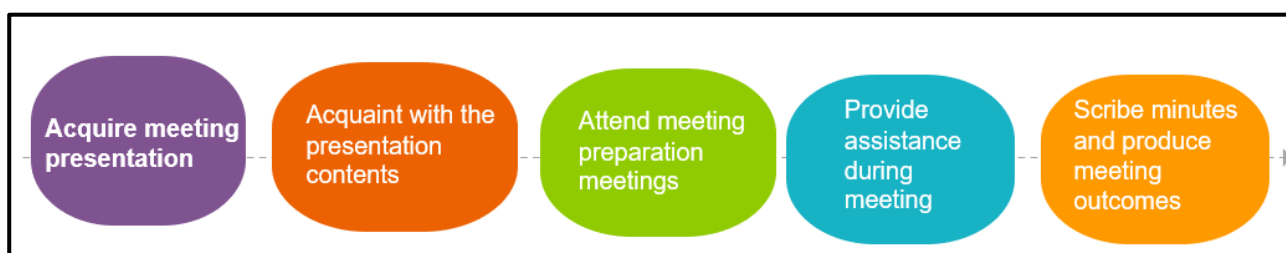


Figure 13-4: Public Participation Approach

13.3.14 Visual Impact Assessment

The Visual Impact Assessment (VIA) will be undertaken by Ms. Nakela Naidoo of Eco Elementum and will include the following:

The scope of work for the VIA will include the following:

- Describing the existing visual characteristics of the proposed site and its environment.
- Viewshed and viewing distance determination using Geographic Information System (GIS) analysis up to 15 Kilometres (km) from the proposed structures.
- Visual Exposure Analysis comprising the following aspects:
 - Terrain Slope: Slope angle is determined from the Digital Surface Model (DSM) and the location of the proposed structures given a ranking depending on the steepness of the slope.
 - Aspect of structure location: Aspect of the slope where the structures are to be built, are calculated from the DSM and given a ranking determined by the sun angle.
 - Landforms: Landform of the location of the proposed structures are determined from the DSM and ranked according to the type of landform. Structures built on certain landforms, e.g. ridges, will be more visible than structures built in valleys.
 - Slope Position of structure: Using GIS analysis, the position of the proposed structure is determined and ranked according to the position on the slope the structure is to be built.

- Relative elevation of structure: Using the DSM, the elevation of the proposed structures relative to the surrounding elevation is determined and ranked according to the difference in height of the surrounding areas.
- Terrain Ruggedness: The terrain ruggedness is determined from the DSM and given a ranking based on the homogeneousness of the terrain.
- Viewer Sensitivity: The viewer sensitivity ranking of the surrounding areas is determined using various land cover and land use datasets and ranked according to the sensitivity of the related structures to the environment.
- Overall Visual Impact: Combining all the above datasets, a final visual impact of the proposed structures is calculated.
- Impact Identification and Ratings
- Mitigation of Identified Visual Impacts

13.3.15 Traffic Impact Assessment

The Traffic Impact Assessment will be undertaken by Mr. Paul van der Westhuizen of Siyazi Limpopo Consulting Services (Pty) Ltd and will include the following:

- Gather and process all required information and conduct site visit.
- Conduct 12-hour manual vehicle traffic count at identified intersection.
- Conduct site assessment in terms of parking requirement, layout, and vehicle circulation and provide input in terms of proposed broader road network adjacent to proposed site.
- Conduct Trip Generation and Distribution calculations.
- Prepare letter containing findings and recommendations.
- Liaise with project team.

13.4 Proposed method of assessing duration and significance

Refer to **Section 11** for a description of the proposed assessment methodology, including the proposed method of assessing duration and significance.

13.5 Stages at which the Competent Authority will be consulted

The stages at which GDARDE will be consulted are:

- Pre-application meeting – held on 6 July 2023.
- Consultation during the comment period on the Draft Scoping Report.
- Consultation during the comment period on the Draft EIA Report and EMPr.

13.6 EIA Phase Public Participation Process

Refer to **Section 8** for the particulars of the public participation process during the EIA process.

13.7 Tasks to be undertaken in EIA process

The following tasks will be undertaken as part of the EIA process:

- Undertake the specialist studies as detailed in **Section 13.3**.
- Prepare the Draft EIA Report and Draft Environmental Management Programme (EMPr).
- Distribute the Draft EIA Report and Draft EMPr for review and comment.
- Notify registered I&APs of the availability of the Draft EIA Report and Draft EMPr for review and comment.
- Undertake consultation with I&APs as required.
- Prepare a Comments and Responses Table for inclusion in the Final EIA Report.
- Finalise the EIA Report and EMPr based on the comments received.

- Submit the Final EIA Report and EMPr to GDARDE for a decision on the application.
- Notify registered I&APs of the availability of the final report for review and comment.
- Notify I&APs of GDARDE's decision and the appeal process.

13.8 Measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks

Management and mitigation measures will be identified during the EIA. These measures will be designed to be suitable, practical, fit-for-purpose. The management measures will be informed by specialist investigations, national legal requirements and Good International Industry Practice (GIIP) specifications. They will be designed to avoid, mitigate and manage potential impacts during the Project construction and operation activities. These mitigation measures will be included in the Environmental Management Programme for the Project (in compliance with NEMA EIA Regulations, 2014) and the Environmental and Social Management System (ESMS) consistent with IFC PS 1.

14 EAP Affirmation

In accordance with Items 2(1)(i) and 2(1)(j) in Appendix 2 of GN 982, as amended, this Section provides an undertaking under oath or affirmation by the EAP in relation to—

- (i) The correctness of the information provided in the report.
- (ii) The inclusion of comments and inputs from stakeholders and interested and affected parties.
- (iii) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties.
- (iv) The level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment.

15 Other Requirements

In accordance with Items 2(1)(k) and 2(1)(l) and Item 2(2) in Appendix 2 of GN 982, as amended, this Section provides:

- (i) Where applicable, any specific information required by the competent authority.
- (ii) Any other matter required in terms of section 24(4)(a) and (b) of the Act.
- (iii) Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a scoping report, the requirements as indicated in such notice will apply.

Additional requirements have not been identified.

16 Conclusions and Recommendations

Based on the investigations undertaken during Scoping, SRK is of the opinion that the proposed activity is not in conflict with any prohibition contained in legislation. Furthermore, the Scoping Report complies substantially with Appendix 2 of Government Notice 982, as amended, and all identified applicable protocols and minimum information requirements and the applicant is willing and able to ensure compliance with these requirements within the prescribed timeframe.

SRK therefore recommends that the Scoping Report be accepted, with or without conditions, and that the applicant be allowed to continue with the tasks contemplated in the Plan of Study.

All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

Prepared by



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All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

Appendices

Appendix A: EAP CV

Appendix B: National Screening Tool Report

Appendix C: Record of Public Participation

Appendix C1: Record of Public Participation Process

Table 1: Requirements for Public Participation

Public Participation Requirements in terms of Chapter 6 of the Amended 2014 EIA Regulations (Regulations 39 - 44) (GN 982, as amended)		BEH Biogas Plant EIA Public Participation Process
39. Activity on land owned by person other than proponent		
(1)	If the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land.	The project site is located in the Sunderland Ridge industrial zone on the Remainder 29A of Portion 122 of Erf 355-JR Mooiplaats and Portion 87 of Erf 355-JR Mooiplaats.
(2)	Subregulation (1) does not apply in respect of- (a) linear activities; (b) activities constituting or activities directly related to prospecting or exploration of a mineral and petroleum resource or extraction and primary processing of a mineral or petroleum resource; and (c) strategic integrated projects as contemplated in the Infrastructure Development Act, 2014.	The site is 100% privately-owned by a commercial property developer. The rights to the land will be secured via a lease agreement with the landowner, with an option to purchase at a later stage. The landowner provided consent in the signed application form, as required.
40. Purpose of public participation		
(1)	The public participation process to which the- (a) basic assessment report and EMPr, and where applicable the closure plan, submitted in terms of regulation 19; and (b) scoping report submitted in terms of regulation 21 and the environmental impact assessment report and EMPr submitted in terms of regulation 23; was subjected to must give all potential or registered interested and affected parties, including the competent authority, a period of at least 30 days to submit comments on each of the basic assessment report, EMPr, scoping report and environmental impact assessment report, and where applicable the closure plan, as well as the report contemplated in regulation 32, if such reports or plans are submitted at different times.	Potential I&APs and relevant authorities will be notified of the application and the availability of the DSR for review and comment via an advert, site notices and notification letters; and will be provided with a comment period of 30 days to register and submit comments on the DSR. All registered I&APs and the relevant authorities will also be provided with a period of 30 days to submit comments on the Draft EIA Report (DEIAR).
(2)	The public participation process contemplated in this regulation must provide access to all information that reasonably has or may have the potential to influence any decision with regard to an application unless access to that information is protected by law and must include consultation with- (a) the competent authority; (b) every State department that administers a law relating to a matter affecting the environment relevant to an application for an environmental authorisation; (c) all organs of state which have jurisdiction in respect of the activity to which the application relates; and (d) all potential, or, where relevant, registered interested and affected parties.	The following consultation will be/has been undertaken: (a) Pre-application meeting with GDARDE on 6 July 2023 (Appendix B2). (b) Copies of the DSR will be sent to DFFE, DWS, XXXXX Municipality, XXXX District Municipality, GP DoT, GP DoH and SAHRA. (c) Potential I&APs including adjacent neighbours, the ward councillor and local ratepayer and environmental organisations. SRK has endeavoured to ensure that access is being provided to all information that SRK is aware of, that reasonably has or may have the potential to influence any decision with regard to this application.

Public Participation Requirements in terms of Chapter 6 of the Amended 2014 EIA Regulations (Regulations 39 - 44) (GN 982, as amended)		BEH Biogas Plant EIA Public Participation Process
(3)	Potential or registered interested and affected parties, including the competent authority, may be provided with an opportunity to comment on reports and plans contemplated in subregulation (1) prior to submission of an application but must be provided with an opportunity to comment on such reports once an application has been submitted to the competent authority.	Potential I&APs and relevant authorities are provided with an opportunity to comment on the DSR and will be provided with an opportunity to comment on the DEIAR.
41. Public participation process		
(1)	This regulation only applies in instances where adherence to the provisions of this regulation is specifically required.	This regulation does specifically apply to the applications – refer below.
(2)	<p>The person conducting a public participation must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of an application or proposed application which is subjected to public participation by-</p> <p>(a) fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of-</p> <ul style="list-style-type: none"> (i) the site where the activity to which the application or proposed application relates is or is to be undertaken; and (ii) any alternative site; <p>(b) giving written notice, in any of the manners provided for in section 470 of the Act, to-</p> <ul style="list-style-type: none"> (i) the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken; (ii) owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken; (iii) the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area; - the municipality which has jurisdiction in the area; (v) any organ of state having jurisdiction in respect of any aspect of the activity; and (vi) any other party as required by the competent authority; <p>(c) placing an advertisement in-</p> <ul style="list-style-type: none"> (i) one local newspaper; or (ii) any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations; <p>(d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii);and</p> <p>(e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to-</p>	<p>The DEA (2012) IEM Guideline Series 7: Public Participation in the EIA Process has been taken into account during this process.</p> <p>(a) Notice is given to potential I&APs of the application by fixing notice boards at key locations near the site.</p> <p>(b) Written notice was provided to-</p> <ul style="list-style-type: none"> (i) Adjacent landowners. (ii) The local ratepayers association and the relevant ward councillor. (iii) Tshwane Metropolitan Municipality. (iv) Organs of state: DFFE, DWS, GP DoT, GP DoH and SAHRA. (v) Other key parties: Local environmental organisations. <p>(c) An advertisement will be placed in the XXXXXX and the XXXXXX.</p> <p>(d) The activity will not have an environmental impact that extends beyond the boundaries of the district municipality in which it will be undertaken.</p> <p>(e) Assistance will be provided if required.</p>

Public Participation Requirements in terms of Chapter 6 of the Amended 2014 EIA Regulations (Regulations 39 - 44) (GN 982, as amended)	BEH Biogas Plant EIA Public Participation Process
<ul style="list-style-type: none"> (i) illiteracy; (ii) disability; or (iii) any other disadvantage. 	
<p>(3) A notice, notice board or advertisement referred to in subregulation (2) must-</p> <ul style="list-style-type: none"> (a) give details of the application or proposed application which is subjected to public participation; and (b) state- <ul style="list-style-type: none"> (i) whether basic assessment or S&EIR procedures are being applied to the application; (ii) the nature and location of the activity to which the application relates; (iii) where further information on the application or proposed application can be obtained; and (iv) the manner in which and the person to whom representations in respect of the application or proposed application may be made. 	<p>The notices, notice boards and advertisement will:</p> <ul style="list-style-type: none"> (a) Provide a description of the applications, including the applicant and the nature and location of the activity. (b) State that a S&EIR process is being applied to the application. (c) Provide contact details (names, postal addresses, phone, fax, email and website address) where further information on the applications could be obtained and representations in respect of the applications may be made.
<p>(4) A notice board referred to in subregulation (2) must-</p> <ul style="list-style-type: none"> (a) be of a size of at least 60cm by 42cm; and (b) display the required information in lettering and in a format as may be determined by the competent authority. 	<p>The notice boards will:</p> <ul style="list-style-type: none"> (a) Be A2-size and laminated; (b) Display the required information.
<p>(5) Where public participation is conducted in terms of this regulation for an application or proposed application, subregulation (2)(a), (b), (c) and (d) need not be complied with again during the additional public participation process contemplated in regulations 19(1)(b) or 23(1)(b) or the public participation process contemplated in regulation 21(2)(d), on condition that-</p> <ul style="list-style-type: none"> (a) such process has been preceded by a public participation process which included compliance with subregulation (2)(a), (b), (c) and (d); and (b) written notice is given to registered interested and affected parties regarding where the- <ul style="list-style-type: none"> (i) revised basic assessment report or, EMPr or closure plan, as contemplated in regulation 19(1)(b); (ii) revised environmental impact assessment report or EMPr as contemplated in regulation 23(1)(b); or (iii) environmental impact assessment report and EMPr as contemplated in regulation 21(2)(d); <p>may be obtained, the manner in which and the person to whom representations on these reports or plans may be made and the date on which such representations are due.</p>	<p>Written notice will be given to registered I&APs when the revised FSR and FEIAR are available for download from SRK's website and digital copies will be available on request from SRK.</p> <p>The notice will include the contact details, the manner in which representations on the revised documents may be made and a period of 30 days will be provided for the submission of representations.</p>
<p>(6) When complying with this regulation, the person conducting the public participation process must ensure that-</p> <ul style="list-style-type: none"> (a) information containing all relevant facts in respect of the application or proposed application is made available to potential interested and affected parties; and (b) participation by potential or registered interested and affected parties is facilitated in such a manner that all potential or registered interested and affected parties are provided with a reasonable opportunity to comment on the application or proposed application. 	<p>SRK has strived and will continue to strive to ensure that all information which contains relevant facts in respect of the application and of which SRK is aware, is made available to I&APs and that participation by I&APs is facilitated in such a manner that all potential I&APs are provided with a reasonable opportunity to comment on the application.</p>

Public Participation Requirements in terms of Chapter 6 of the Amended 2014 EIA Regulations (Regulations 39 - 44) (GN 982, as amended)		BEH Biogas Plant EIA Public Participation Process
(7)	Where an environmental authorisation is required in terms of these Regulations and an authorisation, permit or licence is required in terms of a specific environmental management Act, the public participation process contemplated in this Chapter may be combined with any public participation processes prescribed in terms of a specific environmental management Act, on condition that all relevant authorities agree to such combination of processes.	The EIA process is being undertaken in parallel to a Water Use License Application (WULA) and an Atmospheric Emission License (AEL). The public participation process for these processes is being combined, where possible.
42. Register of interested and affected parties		
(1)	A proponent or applicant must ensure the opening and maintenance of a register of interested and affected parties and submit such a register to the competent authority, which register must contain the names, contact details and addresses of- <ul style="list-style-type: none"> (a) all persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP; (b) all persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and (c) all organs of state which have jurisdiction in respect of the activity to which the application relates. 	A register of I&APs has been opened and will be maintained and updated. The I&AP Register contains the names, contact details and email addresses of all relevant organs of state and all persons who requested to be registered or who submitted written comments or attended meetings in respect of the application.
43. Registered interested and affected parties entitled to comment on reports and plans		
(1)	A registered interested and affected party is entitled to comment, in writing, on all reports or plans submitted to such party during the public participation process contemplated in these Regulations and to bring to the attention of the proponent or applicant any issues which that party believes may be of significance to the consideration of the application, provided that the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.	All registered I&APs will be provided with an opportunity to comment on the DSR and will be provided with an opportunity to comment on the DEIAR, as well as a further opportunity to comment on the revised/ final documents. All comments received have been included in the Comments and Responses Table.
(2)	In order to give effect to section 240 of the Act, any State department that administers a law relating to a matter affecting the environment must be requested, subject to regulation 7(2), to comment within 30 days.	All relevant state departments are requested by the EAP to comment on the reports within 30 days.
44. Comments of interested and affected parties to be recorded in reports and plans		
(1)	The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.	All comments of I&APs will be recorded in the Comments and Responses Table and written comments, including responses to such comments and records of meetings are attached to the final report.
(2)	Where a person desires but is unable to access written comments as contemplated in subregulation (1) due to- <ul style="list-style-type: none"> (a) a lack of skills to read or write; (b) disability; or (c) any other disadvantage; reasonable alternative methods of recording comments must be provided for.	This will be undertaken if required.

Appendix C2: Minutes of Pre-application Meeting

Appendix C3: I&AP Register

Appendix C4: Contents of Advertisement

Appendix C5: Contents of Site Notices