mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

NAME OF THE APPLICANTS:	**CUCHRON (PTY) LTD STEAMBOAT GRAPHITE (PTY) LTD**
REFERENCE NUMBER:	**LP 30/5/1/2/3/2/1(10193) EM**

DRAFT CONSOLIDATED SCOPING REPORT

FOR LISTED ACTIVITIES ASSOCIATED WITH A MINING RIGHT APPLICATION (CUCHRON (PTY) LTD) AND A MINERAL BENEFICIATION PLANT (STEAMBOAT GRAPHITE (PTY) LTD)

SUBMITTED FOR ENVIRONMENTAL AUTHORISATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (ACT 28 of 2002) (AS AMENDED).

3 DECEMBER 2020

Compiled by: Diphororo Development (Pty) Ltd

PO Box 13509, Sinoville, 0129
Tel: (012) 543 9093
Fax: 086 602 5566
Email: steamboat@participation.co.za

IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining "will not result in unacceptable pollution, ecological degradation or damage to the environment".

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is, therefore, **an instruction** that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or permit are submitted in the exact format of, and provide all the information required in terms of, this template.
Furthermore, please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner (EAP) must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

OBJECTIVE OF THE SCOPING PROCESS

1) The objective of the scoping process is to, through a consultative process:

a) identify the relevant policies and legislation applicable to the activity;

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;

c) identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;

d) identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;

e) identify the key issues to be addressed in the assessment phase;

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; and

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.

In terms of the NEMA 2014 EIA Regulations contained in GN R982 of 04 December 2014 (as amended in 2017) the Scoping Report must comply with Appendix 2 of the NEMA 2014 EIA Regulations (GN R982 of 04 December 2014).

LEGAL REQUIREMENT		**RELEVANT SECTION**
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
(a)	Details of- (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	Section 2
(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 terms (i) and (ii) and is not available, the coordinates of the boundary of the property or properties;	Section 3
(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 6-4
(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 7
(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 4
(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 5
	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 the alternatives considered;	Section 6
	(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 11
	(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 reason for not including them;	Section 11.6
	(iv) the environmental attributes associated with the alternative focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 8
	(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-	Section 9

LEGAL REQUIREMENT		RELEVANT SECTION
	(aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (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;	Section 10.4
	(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;	Section 9.13.1
	(viii) the possible mitigation measures that could be applied and level of residual risk;	Section 9.13.2
	(ix) the outcome of the site selection matrix;	Section 6
	(x) if no alternative, including alternative locations for the activity were investigated, the motivation for not considering such; and	Section 6
	(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	Section 6.2
(h)	a plan of study for undertaking the environmental impact assessment process to be undertaken, including-	Section 10
	(i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;	Section 10.1
	(ii) a description of the aspects to be assessed as part of the environmental impact assessment process;	Section 10.2
	(iii) aspects to be assessed by specialists;	Section 10.3
	(iv) a description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists;	Section 10.3
	(v) a description of the proposed method of assessing duration and significance;	Section 10.4
	(vi) an indication of the stages at which the competent authority will be consulted;	Section 10.5
	(vii) particulars of the public participation process that will be conducted during the environmental impact assessment process;	Section 11
	(viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process; and	Section 4.3
	(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 controlled.	Section 9.13.2
(i)	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; and (iii) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	Section 13
(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
(k)	where applicable, any specific information that may be required by the competent authority; and	Section 12
(l)	any other matters required in terms of section 24(4)(a) and (b) of the Act.	

LIST OF ACRONYMS

B-BBEE: Broad-Based Black Economic Empowerment

BID: Background Information Document

BLM: Blouberg Local Municipality

LEDET: Limpopo Department of Economic Development Environment and Tourism

DMRE: Department of Mineral Resources and Energy

DWA: Department of Water Affairs

DWS: Department of Water and Sanitation

EA: Environmental Authorisation

EAP: Environmental Assessment Practitioner

EIA: Environmental Impact Assessment

EIAR: Environmental Impact Assessment Report

EMP: Environmental Management Plan

EMPr: Environmental Management Programme

GNR: Government Notice Regulation

ha: Hectare

HIA: Heritage Impact Assessment

I&APs: Interested and Affected Parties

CRR: Comments and Response Register

IWUL: Integrated Water Use Licence

Diphororo: Diphororo Development (Pty) Ltd

km: Kilometer

LOM: Life of Mine

MAE: Mean Annual Evaporation

MAP: Mean Annual Precipitation

mbsl: Metres below sea level

m: Meter

mm: Millimeter

m_2: Square meter

m_3: Cubic meter

MWP: Mining Work Programme

CDM: Capricorn District Municipality

NEMA: National Environmental Management Act, 1998 (Act No. 107 of 1998)

NEMBA: National Environmental Management: Biodiversity Act, 2004 (Act No.10 of 2004)

NEMWA: National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)

NWA: National Water Act, 1998 (Act 36 of 1998)

PCD: Pollution Control Dam

PP: Public Participation

PPE: Personal Protective Equipment

PPP: Public Participation Process

RDL: Red Data List

ROM: Run of Mine

RWQO: Resource Water Quality Objectives

SAHRA: South African Heritage Resources Agency

SCC: Species of Conservation Concern

S&EIR: Scoping & Environmental Impact Reporting

SLP: Social and Labour Plan

StatsSA: Statistics South Africa

WML: Waste Management Licence

WUL: Water Use Licence

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1 INTRODUCTION

The project name is the Steamboat Project, related to the farm name “Steamboat”. Cuchron holds a valid Prospecting Right No LP/5/1/1/2/10321PR for Graphite over the farm's Steamboat 306MR and Inkom 305MR, covering an area of 1,453 hectares, situated along the Mogalakwena River in the Province of Limpopo.

Steamboat Graphite will establish a Beneficiation Plant in proximity to the mine, to beneficiate and process the graphite for a broader market.

A Mining Right Application has been submitted by Cuchron for the mine development, and acceptance was received on 12 November 2020.

Two Environmental Authorisation Applications has been submitted:

- Cuchron has applied for Environmental Authorisation for the Mine Development and Associated Infrastructure
- Steamboat Graphite has applied for the Environmental Authorisation for the Beneficiation Plant and associated infrastructure.

Approval has been received from DMR to follow a joint and consolidated approach to the Environmental Impact Assessment Process, and produce combined reports for the two applications as envisaged in terms of Regulation 11(4) of the EIA regulations 2014 (as amended) which states “*if one or more proponents intend undertaking interrelated activities at the same or different locations within the area of jurisdiction of a competent authority, the competent authority may, in writing, agree that the proponent or proponents submit a single application in respect of all of those activities and to conduct a consolidated assessment process but the potential environmental impacts of each activity, including its cumulative impacts, must be considered in terms of the location where the activity is to be undertaken*”.

Project Sections	**Mining**	**Beneficiation**
Name of Company / Applicant	Cuchron (Pty) Ltd	Steamboat Graphite (Pty) Ltd
Name of the Mine / Production Operation	Steamboat Graphite Mine	Steamboat Graphite Beneficiation
Responsible Person	Dawn Makwakwa	Wenzel Kerremans
Physical Address	174 Veale Street, Nieuw Muckleneuk, Pretoria 0181	20 The Gallops Drive, Blue Hills Country Estate, Beaulieu, Midrand 1684, Johannesburg

Project Sections	Mining	Beneficiation
Postal Address	PO Box 96023, Waterkloof Village 0146	PO Box 98407, Sloane Park, 2152
Cell Number	082 267 1321	082 444 8792
Telephone Number	082 267 1321	082 444 8792
Fax Number	086 602 5566	086 602 5566
Email:	dmakwakwa@gmail.com	wenzelk@mweb.co.za

2 ENVIRONMENTAL ASSESSMENT PRACTITIONER

Cuchron (Pty) Ltd and Steamboat Graphite (Pty) Ltd has appointed Lizinda Dickson as the Environmental Assessment Practitioner.

EAP:	Mrs Lizinda Dickson		
Professional affiliation/registration:	EAPASA awaiting approval IAIA & AP2		
Contact person (if different from EAP):	Mrs Lizinda Dickson		
Company:	Diphororo Development		
Physical address:	151 Sefako Makgatho Drive, Sinoville		
Postal address:	PO Box 13509, Sinoville		
Postal code:	0129	Cell:	082 922 2261
Telephone:	012 543 9093	Fax:	086 602 5566
E-mail:	lizinda@diphororo.com		

The CV of Lizinda Dickson is attached at Appendix A.

3 LOCALITY OF THE PROJECT

3.1 Location

The projects are located on the farm's Steamboat 306MR and Inkom 305MR, which is situated approximately 36km south-west of Alldays and 54km north-west of Vivo in the Blouberg Local Municipality, Capricorn District of Limpopo Province. The total extent of the properties is 1453.5761ha. The projects will require the following footprints:

- Mining Open Pit and Associated infrastructure: 14ha (1% of properties)
- Beneficiation Plant and Associated infrastructure: 13ha (1% of properties)

The combined size of the two projects is 27ha in total.

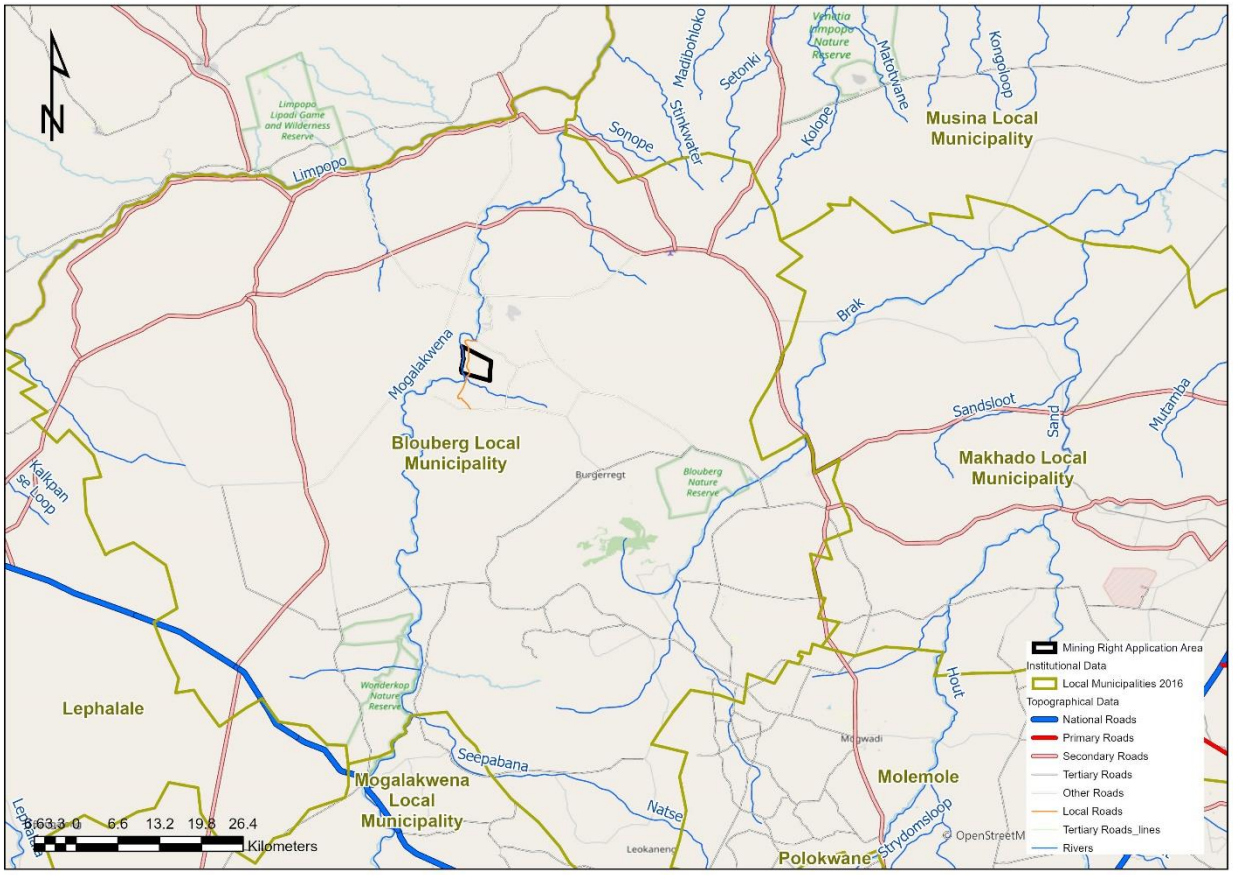


Figure 3-1: Locality Map

The projects are located within Ward 17 with Ward 16 bordering the project area to the south.

3.2 Description of the Properties

Steamboat 306MR and Inkom 305MR are state-owned under the jurisdiction of the Ga-Kibi tribe and is currently utilised for livestock grazing.

Table 3-1: Project Properties

Properties	Size (ha)	Title deed	Landowner
Steamboat 306MR	663.7223	T24557/1952PTA	National Government of the Republic of South Africa
Inkom 305MR	789.8538	T24557/1952PTA	National Government of the Republic of South Africa
Total	**1453.5761**		

3.3 Adjacent Properties

The following adjacent properties are present:

Table 3-2: Adjacent Properties

Properties	Direction	Landowner	Comment
Arrie 308 MR	North	Government of the Republic of South Africa	Part of the Ga-Kibi Traditional Authority area
Zondagfontein 300 MR Ptn 1	West	Government of the Republic of South Africa	
Zondagfontein 300 MR Ptn 3	West	Roman Catholic Church	
Zondagfontein 300 RE	West	Ramakwa Project Trust	LRAD community project
Goudmyn 327 MS RE	South	Government of Lebowa	Part of Bahananwa Traditional Authority
Royston 326 RE	East	Government of the Republic of South Africa	Part of the Ga-Kibi Traditional Authority area
Voorhout 310 RE	East	Government of the Republic of South Africa	Part of the Ga-Kibi Traditional Authority area

3.4 Municipal areas

The project is located within the Blouberg Municipal area that forms part of the Capricorn District Municipality in Limpopo Province. The project area is situated in Ward 17 and neighbored to the south by Ward 16.

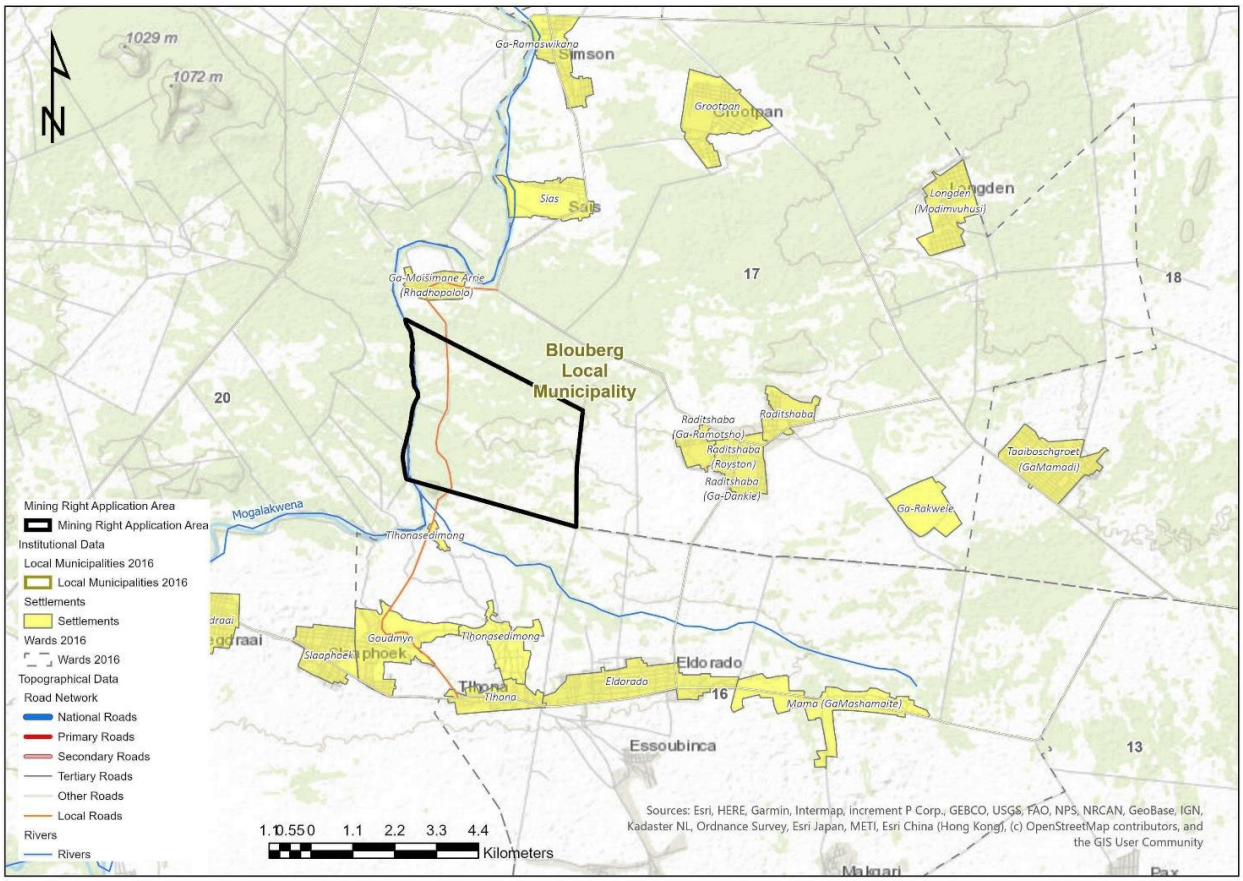


Figure 3-2: Municipal Boundaries

3.5 Settlements

The principal settlement in Blouberg LM is the All-days town, with a large area of rural settlements under Traditional Authority jurisdiction.

Table 3-3: Settlements with distances from the operation

TOWN / AREA	APPROXIMATE DIRECT DISTANCE	DIRECTION
GA-MOISAMANE ARRIE	2.5KM	NORTH
THONASEDIMONG	2.9KM	SOUTH
Alldays	35km	North-east
Botswana Border	34km	North-West
Bochum/Senwabarwana	55km	South-east
Groblersbrug	85km	West
Louis Trichardt/Makhado	117km	East
Musina	137km	North-East
Polokwane	134km	South-east

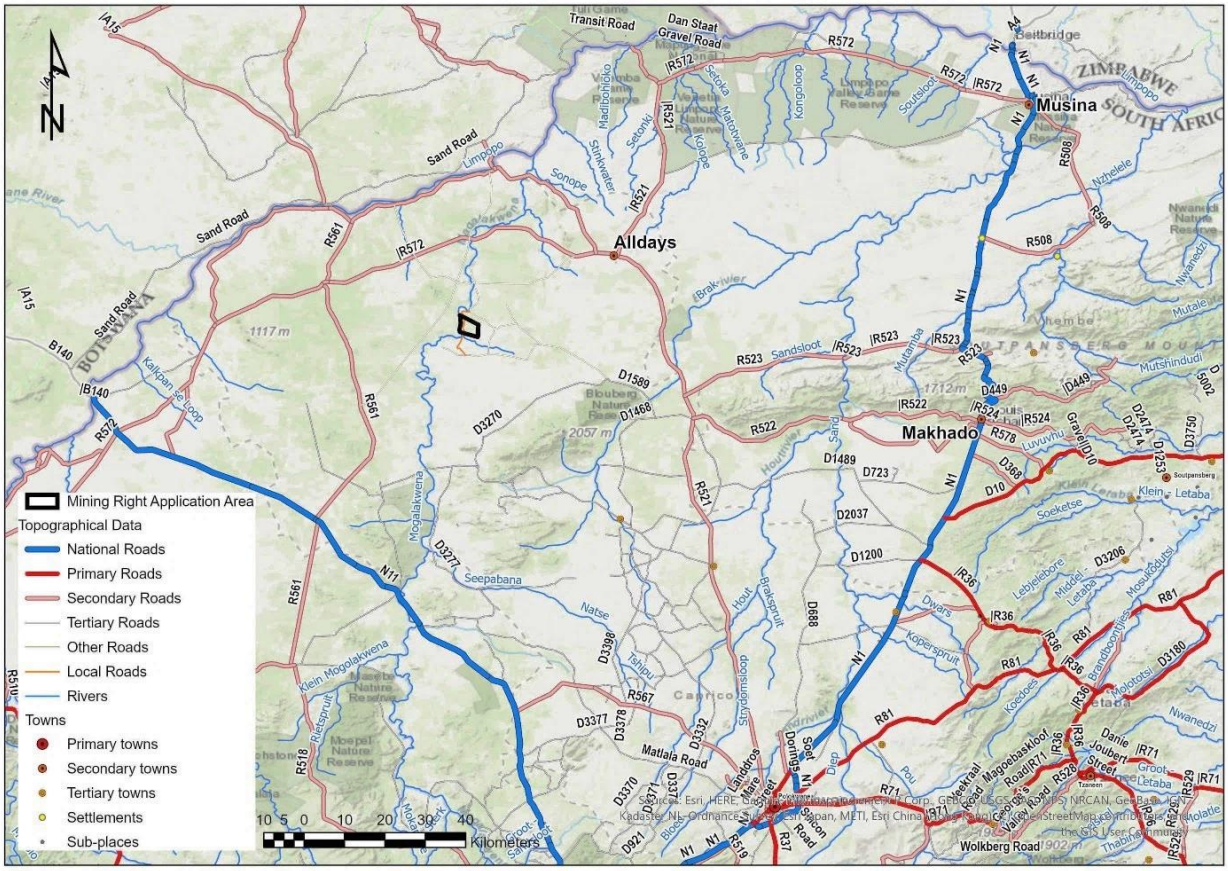


Figure 3-3: Main Towns

3.5.1 Traditional Authority Areas

The operations are located within the Bahanawa-Ba-Kibi Traditional Authority area. The Bahananoa Traditional Authority borders the MRA to the south.

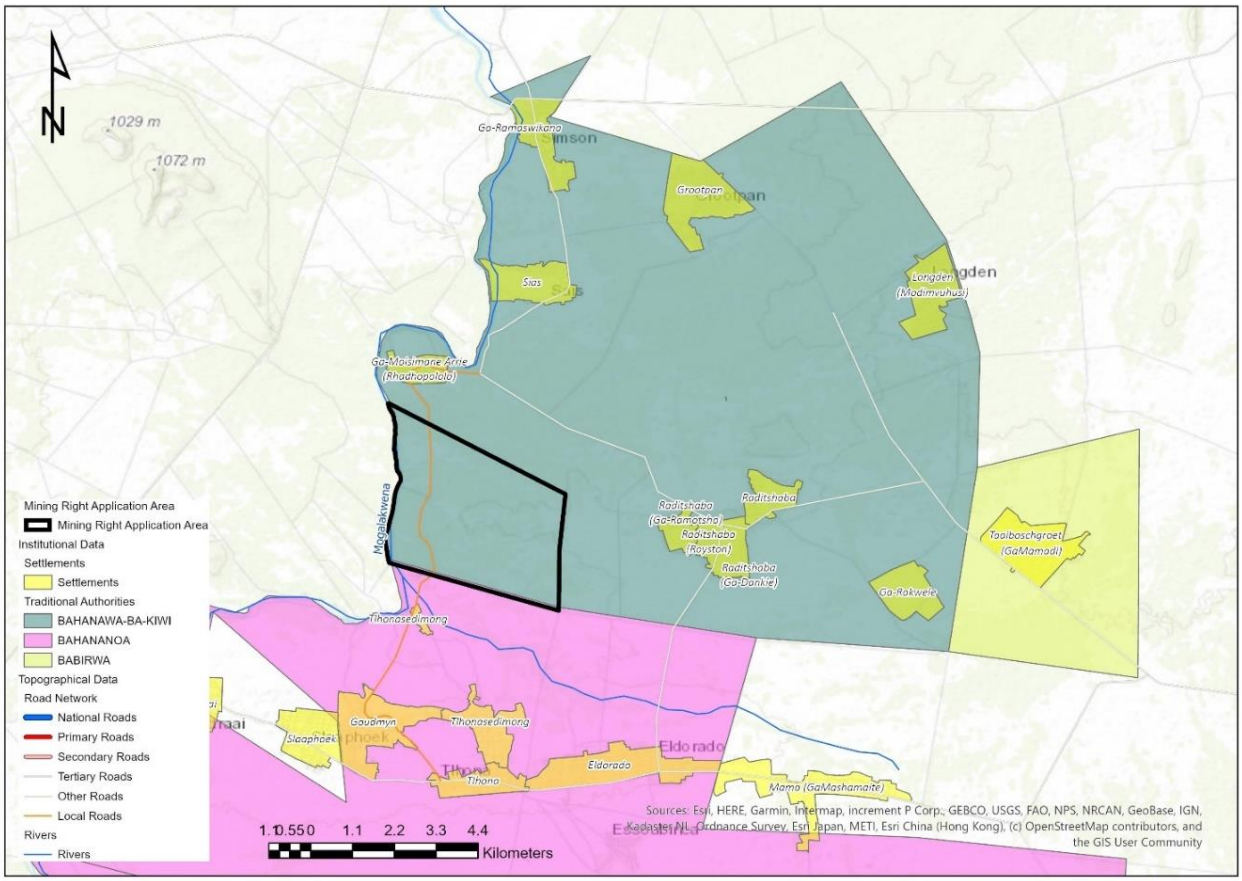


Figure 3-4: Traditional Authorities

3.6 Road Network

Local and tertiary roads mostly serve the project area. Community roads link the project site with the D3297, D217 to the D572 to the north. The community roads link with the D3287, D3308, D1589 to the R521 to the east. See figure below.

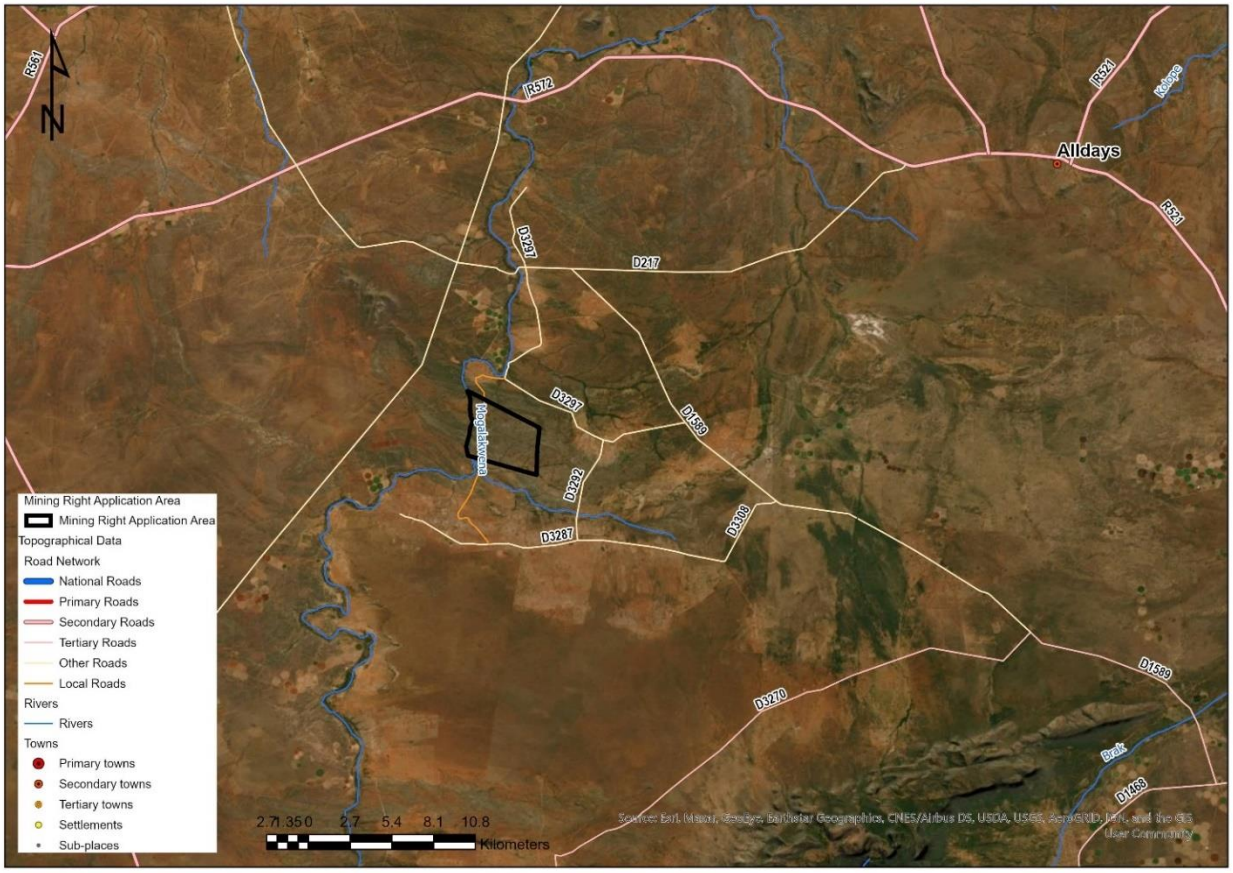


Figure 3-5: Road Network

4 POLICY AND LEGISLATIVE CONTEXT

4.1 Listed Activities

4.1.1 Mine Listed Activities - Cuchron (Pty) Ltd

NAME OF ACTIVITY	Aerial extent of the Activity (Ha or m²)	LISTED ACTIVITY	APPLICABLE LISTING NOTICE	WASTE MANAGEMENT AUTHORISATION
Open Pit with a size of 110,000m2 (11ha) Including water management infrastructure: Potable Water Pipelines: 1000m x 5. = 5 000m2, Dewatering Pipeline: 1000m x 5m = 5 000m2 and a Dewatering dam: 250m2, volume: 500m3 (0.5Ml). Pipelines will have a throughput below 120 litres per second and an	120 250m2 (12.025 ha)	X R983 (R327) R984 (R325) R985 (R324)	R983 (R327): - Activity 9 - Activity 12 - Activity 19 - Activity 27 - Activity 28 R984 (R325): -Activity 17 R985 (R324):	

NAME OF ACTIVITY	Aerial extent of the Activity (Ha or m²)	LISTED ACTIVITY	APPLICABLE LISTING NOTICE	WASTE MANAGEMENT AUTHORISATION
internal diameter that is below 0.36 metres.			- Activity 2 - Activity 12 - Activity 14	
Mining Office, Workshop and Storage Area	10 000m2 (1ha)	X R983 (R327) R984 (R325) R985 (R324)	R983 (R327): - Activity 14 - Activity 27 R984 (R325): -Activity 17 R985 (R324): - Activity 2 - Activity 10 - Activity 12 - Activity 14	
Access and Haul Roads: Construct internal service roads: 400m x 8m = 3200m2	Size of all new roads: 3,200m2 (0.32ha) Total length of roads: 400m Width of roads with shoulder: 8m	X R983 (R327) R985 (R324)	R983 (R327): - Activity 12 - Activity 19 - Activity 24 R985 (R324): - Activity 4 - Activity 12 - Activity 14	

4.1.2 Beneficiation Plant Listed Activities – Steamboat Graphite (Pty) Ltd

NAME OF ACTIVITY	Aerial extent of the Activity (Ha or m²)	LISTED ACTIVITY	APPLICABLE LISTING NOTICE	WASTE MANAGEMENT AUTHORISATION
Graphite Beneficiation Plant with a size of 20,000m2 (2ha) Including water management infrastructure: Process Water Pipeline: 2000m x 5m = 10 000m2, Potable Water Pipelines: 1000m x 5. = 5 000m2 and a Pollution Control Dam: 500m2, volume: 1000m3 (1Ml). Pipelines will have a throughput below 120 litres per second and an internal diameter that is below 0.36 metres.	38 500m2 (3.85ha)	**X** R983 (R327) R984 (R325) R985 (R324)	R983 (R327): - Activity 9 - Activity 10 - Activity 12 - Activity 27 - Activity 28 R984 (R325): - Activity 6 - Activity 21 R985 (R324): - Activity 2 R985 (R324): - Activity 12 - Activity 14	**X** Category B Activity 11
Electricity Generation Facility with a generation capacity of 3MW, utilising non-renewable resources	Size: 3ha Output: 3MW	**X** R983 (R327) R985 (R324)	R983 (R327): - Activity 2 - Activity 12 R985 (R324): - Activity 12 - Activity 14	**X** Category A Activity 5, 6, 12 Category C Activity 1
Discard Dump including stormwater management	Dump Size: 32, 000m2 and Volume: 570 tonnes	**X** R983 (R327)	R983 (R327): - Activity 9	**X** Category B Activity 11

NAME OF ACTIVITY	Aerial extent of the Activity (Ha or m²)	LISTED ACTIVITY	APPLICABLE LISTING NOTICE	WASTE MANAGEMENT AUTHORISATION
	total Stormwater channels of 1500m x 2m = 3 000m2	R985 (R324)	- Activity 12 - Activity 19 - Activity 27 R985 (R324): - Activity 12 - Activity 14	
Access and Haul Roads: Construct internal service roads: 350m x 8m = 2800m2 and a new Access Road: 800m x 8m = 6,400m2	Size of all new roads: 9,200m2 (0.9ha) Total length of roads: 1150m Width of roads with shoulder: 8m	X R983 (R327) R985 (R324)	R983 (R327): - Activity 12 - Activity 19 - Activity 24 - Activity 27 R985 (R324): - Activity 4 - Activity 12 - Activity 14	
Product Transport Roads: The upgrade of existing roads, alternative is 800m x 8m = 6,400m2 and alternative 2 200m x 8m = 17,600m2	17,600m2 (1.76ha) Length 3000m Widening of road with 4m	X R985 (R324)	R985 (R324): - Activity 4 - Activity 18	
Hazardous storage of Waste: Diesel tanks and Emulsion/Chemical stores that exceed 500m3 Electricity Generation Facility processing waste of more than 10 tons per day but less than 100 tons	Stores capacity: 1000m3 Waste processing: 99 tons per day	X R983 (R327) R984 (R325) R985 (R324)	R983 (R327): - Activity 14 R984 (R325) -Activity 4 R985 (R324): - Activity 10 - Activity 12	X Category A Activity 5, 6, 12 Category C Activity 1

4.2 Applicable Legislation, Policies and Strategies

The legal frameworks within which the mining development, beneficiation development and associated infrastructure aspects operate are complex and include many acts, associated regulations, standards, principle, guidelines, conventions and treaties on an international, national, provincial and local level. The main legal frameworks that require compliance in terms of Environmental Authorisation are:

- Act No. 28 of 2002: Mineral and Petroleum Resources Development Act (MPRDA), as amended
- Act No. 107 of 1998: National Environmental Management Act (NEMA), as amended
- Act No. 36 of 1998: National Water Act (NWA), as amended
- Act No. 25 of 2014: National Environmental Management Laws Amendment Act (NEMLAA)

Other legislative frameworks applicable to the Project include (list not exhaustive):

- Act No. 108 of 1996: The Constitution of South Africa
- Act No. 25 of 1999: National Heritage Resources Act (NHRA)
- Act No. 10 of 2004: NEMA: Biodiversity Act (NEMBA)
- Act No. 43 of 1983: Conservation of Agricultural Resources Act (CARA)
- Act No. 84 of 1998: National Forests Act (NFA)
- Act No. 39 of 2004: National Environmental Management: Air Quality Act (AQA)
- Act No. 57 of 2003: National Environmental Management: Protected Areas Act
- Act No. 59 of 2008: National Environmental Management: Waste Act (NEMWA)
- Act No. 26 of 2014: National Environmental Management Act: Waste Amendment Act
- Act No. 101 of 1998: National Veld and Forest Fire Act
- Act No. 15 of 1973: Hazardous Substances Act
- GN No. 704 of 4 June 1999: Regulation on use of water for mining and related activities aimed at the protection of water resources
- GN No. R. 982-986 of 4 December 2014: NEMA: EIA Regulations, as amended in 2017
- GN No. 634 of 23 August 2013: NEMWA: Waste Classification and Management Regulations
- GN No. R. 921 of 2013: NEMWA: Waste Management Activities, as amended by GN No. R.332 of 2 May 2014 and GN No. R.633 of 24 July 2015
- GN No. R.248 of 31 March 2010: AQA: Atmospheric Emissions Activities, as amended in 2013
- GN No. R.152 of 2007: NEMBA: Threatened or Protected Species (TOPS) Regulations
- GN No. R.1147 of 20 November 2015: Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations
- Act No. 7 of 2003: Limpopo Environmental Management Act (LEMA)
- Act No. 29 of 1996: Mine Health and Safety Act
- Act No. 125 of 1991: Physical Planning Act
- Act No. 16 of 2013: Spatial Planning and Land Use Management Act (SPLUMA)
- Act No. 16 of 2014: Special Economic Zones Act
- Act No. 117 of 1998: Municipal Structures Act
- Act No. 32 of 2000: Municipal Systems Act
- Act No. 2 of 2000: Promotion of Access to Information Act
- Act No. 3 of 2000: Promotion of Administrative Justice
- Act No. 75 of 1997: Basic Conditions of Employment Act
- Act No. 66 of 1995: The Labour Relations Act
- Act No. 4 of 2000: Promotion of Equality and Prevention of Unfair Discrimination Act

- Act No. 85 of 1993: Occupational Health and Safety Act
- Act No. 53 of 2003: Broad Based Black Economic Empowerment Act
- Act No. 9 of 1972: National Road Safety Act
- Act No. 93 of 1996: National Road Traffic Act
- Act No. 19 of 1998: Prevention of Illegal Eviction from and Unlawful Occupation of Land Act
- Act No. 3 of 1996: Restitution of Land Rights Act
- Act No. 112 of 1991: Amendment of the Upgrading of Land Tenure Rights Act

Strategies, guidelines and other documents of importance to this project (list not exhaustive) are:

- National Protected Areas Expansion Strategy, 2010 (NPAES)
- National List of Threatened Terrestrial Ecosystems for South Africa, 2011
- National Biodiversity Assessment, 2011 (NBA)
- Mining and Biodiversity Guideline: Mainstreaming Biodiversity into the Mining Sector, 2013
- Implementation Manual for Freshwater Ecosystem Priority Areas, 2011
- Important Bird Areas, BirdLife South Africa
- Limpopo Conservation Plan Version 2, 2013 (LEMA)
- Good Practice Guidance for Mining and Biodiversity: International Council on Mining and Metals
- Convention on Biological Diversity (1995)
- Convention on International Trade in Endangered Species (CITES) of Wild Fauna and Flora
- International Union for Conservation of Nature (IUCN)
- World Summit for Sustainable Development (2002)
- National Climate Change Adaption Strategy, 2017
- Limpopo Development Plan (LDP), 2015-2019
- Waterberg District and Lephalale Local Municipal Spatial Development Framework
- Waterberg District and Lephalale Local Municipal Integrated Development Plan

4.3 Approach to Environmental Authorisation and Stakeholder Engagement

Government's "One Environmental Management System" commenced on 8 December 2014 when the new Environmental Impact Assessment (EIA) Regulations (Government Notice Nos R.982 to R.985 of 2014) came into effect. These regulations have streamlined the licensing

processes for Environmental Authorisation, such that the licensing processes for the different regulatory regimes are served by a single EIA process.

The mine and beneficiation developments are located on the same properties, Steamboat 305MR and Inkom 306MR, but applications have been submitted separately for the mine development (Cuchron Pty Ltd) and the beneficiation plant (Steamboat Graphite).

In terms of Regulation 11(4) “if one or more proponents intend undertaking interrelated activities at the same or different locations within the area of jurisdiction of a competent authority, the competent authority may, in writing, agree that the proponent or proponents submit a single application in respect of all of those activities and to conduct a consolidated assessment process but the potential environmental impacts of each activity, including its cumulative impacts, must be considered in terms of the location where the activity is to be undertaken.

A consolidated assessment will thus be followed for the Environmental Authorisations (EA) for the two activities. The Waste Management Licence (WML) and Integrated Water Use Licence Applications will be submitted as soon as detail designs are completed and the Water Resource for the project has been finalised.

The applications will follow timeframes as stipulated in the 2014 EIA Regulations (as amended in 2017). The proposed consolidated project triggers a Scoping and Environmental Impact Reporting (S&EIR) process, which entails the following key tasks:

- Applications: Submission of two application forms to the relevant Competent Authority, in this case, the Limpopo Department of Mineral Resources and Energy (DMRE) for the Mine Development EA and the Beneficiation Plant EA.
- Scoping Phase: Compilation of a draft consolidated Scoping Report (DSR) and providing it for comment to all registered Interested and Affected Parties (IAPs). The DSR will identify the key issues and alternatives to be assessed and recommend the approach to be followed during the EIA Phase to follow. Comments received from IAPs are incorporated in the DSR, and the Final Scoping Report (FSR) is submitted to the Competent Authority, whereupon they accept or refuse it.
- EIA Phase: Upon Authority acceptance of the FSR, the EIA Phase can commence. This includes the preparation of the consolidated Environmental Impact Assessment Report (EIAR), which provides detailed assessments of the significance of biophysical and social

impacts, as well as a Environmental Management Programme (EMPr) for each of the developments, i.e. Mine Development and Beneficiation Plant. The draft consolidated EIAR and separate EMPrs are again provided to registered IAPs for comment and comments are responded to in the Final EIAR and EMPrs, which is submitted to the Competent Authority for decision-making.

- Authority review and decision-making: The Competent Authority reviews the information and recommendations provided in the Final EIAR and EMPrs and is required to issue a decision to authorise (or refuse to authorise) the project within 107 days of submission of the documents.

The total time frame for the "non-substantive" S&EIR process is legislated to take no more than 300 calendar days (excluding public holidays and the December break). This implies a process where all issues could be satisfactorily resolved, and no substantive changes need to be made, or new and unexpected information needs to be added to the environmental reports.

In parallel to the EIA process, a comprehensive Public Participation process must be conducted. This offers stakeholders the opportunity to learn about the projects, to raise issues that they are concerned about, and to make suggestions for enhanced project benefits.

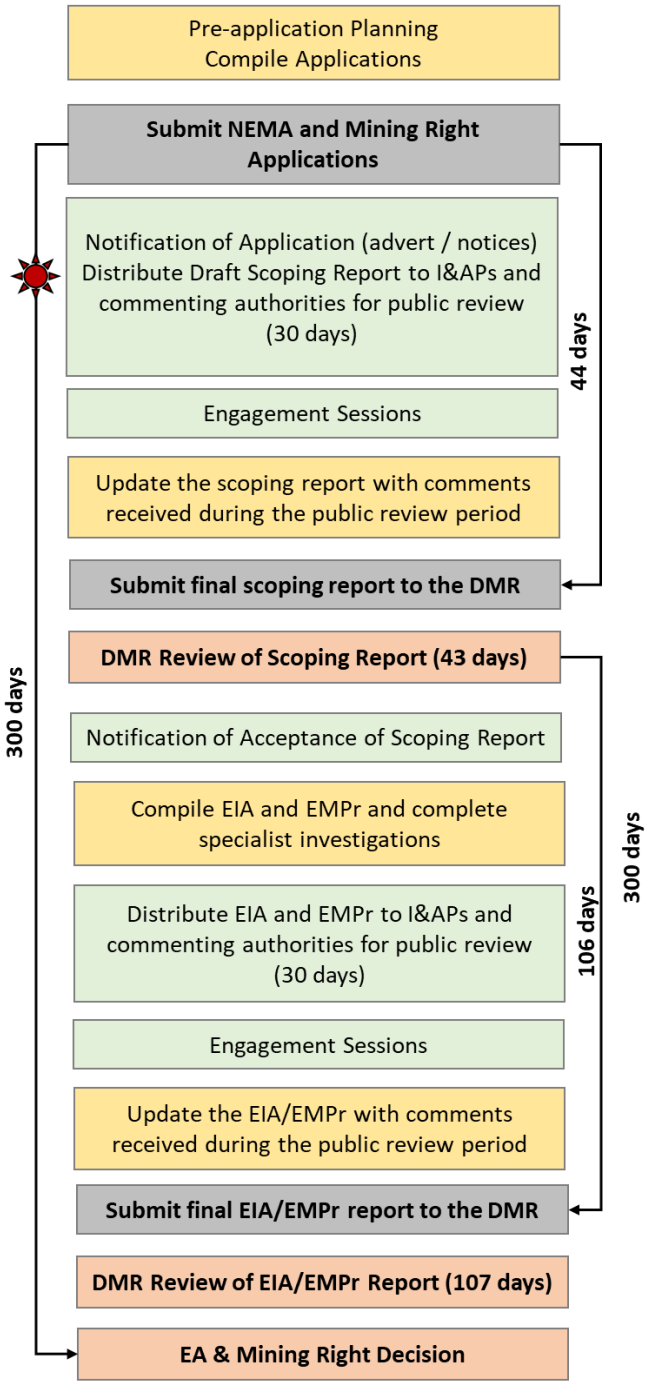


Figure 4-1: EA Process

4.4 Licensing Requirements

The following preliminary licencing requirements have been identified:

Legislation	Comment	Requirement
MPRDA	Cuchron (Pty) Ltd to apply for a Mining Right	Submission of Mining Right Application (MRA) to Limpopo DMR
NEMA, EIA Regulations (2014), as amended in 2017	A number of listed activities are Applicable to both Cuchron and Steamboat Graphite, the majority is triggering the threshold limit for a Full EIA required in terms of GN984.	Application for Environmental Authorisation to Limpopo DMRE for the mine development and associated infrastructure. Application for Environmental Authorisation to Limpopo DMRE for the beneficiation development and associated infrastructure.
NEMWA, Waste Regulations (2013)	A number of waste management activities are triggered by the proposed development, including mining waste.	Application for Waste Management Licence to Limpopo DMR in due course.
NWA, S21	Licences will be required for a number of water uses.	WULA and IWWMP for submission to Limpopo DWA in due course.
Forest Act	Permits required for the destruction and/or relocation of protected tree species.	Permit application to DAFF if applicable
NEM:BA, TOPS regulations	Permits required for the destruction and/or relocation of protected species.	Permit application to LEDET if applicable
NHRA	Permits required for Phase 1B and Phase 2 studies.	Permit application to SAHRA if applicable

Note: The list is not exhaustive and will be finalised during the EIA Phase as the specialist impact studies and associated impact assessments become available.

It is important to note that the approach for the consolidated Project is to first apply for the mining right and associated EA in terms of the NEMA: 2014 regulations. Once this process is completed and the applicant has conducted further feasibility studies and detail designs in respect of its development, the application for the Water Use Licence in terms of the NWA and Waste Management License in terms of NEMWA will be submitted to the relevant authorities.

5 NEED AND DESIRABILITY OF THE PROJECT

5.1 Specialist Market Analysis

The product will be delivered to the local market, exclusively to the stand-alone Beneficiation Plant.

The local graphite market consists of the sales of feed grade graphite bearing ore & compounds to entities for beneficiation and are thereafter used in refractory materials, the chemicals and composite material industries, electrical applications, batteries and mechanical applications.

Feed grade graphite ore is a non-metallic mineral consisting of graphitic carbon. Most commercial feed grade graphite ore is mined and often contains other minerals requiring mineral processing such as froth flotation to concentrate the graphite. Graphite is a good conductor of heat and electricity. It is stable over a wide range of temperatures and highly refractory with a high melting point at 3650°C. Beneficiated graphite is mainly used in brake linings, foundry operations, lubricants, refractory applications and steelmaking.

Mining legend Robert Friedland likes to point out that if the world is going to sustain its push to green technologies, it will need specialist minerals. Graphite is one of them, and southeastern Africa is home to some of the largest untapped deposits in the world. Like Mozambique, Tanzania and other southern African countries, South Africa has very few graphite resources, **none of which have as yet been exploited**. **The Steamboat graphite deposit will be the first graphite deposit to be exploited in South Africa.**

The mining of the Steamboat Graphite in South Africa will also stimulate the beneficiation and further manufacturing industries in South Africa.

The uses of beneficiated graphite lend itself to the development of inter alia industries in composite materials, batteries, building materials, insulation materials, pipes, agricultural and mining support struts and other products.

The global graphite market reached a value of nearly $1,282.7 million in 2018, having declined at a compound annual growth rate (CAGR) of -0.9% since 2014. The decline in the historical period

was mainly due to the drastic fall in graphite prices during 2015 and a slight decrease in graphite production volumes in 2016, partially due to low demand from the steel sector. Post-2016, the global market started a gradual recovery supported by increasing demand from various end-user industries and rising prices. Asia-Pacific was the largest region in the global graphite market, accounting for 70.2% of the global market in 2018. It was followed by Western Europe, North America and then the other regions. The opportunity exists for Eastern Europe, and African graphite market to grow.

As a result of the Covid-19 pandemic resulting in a worldwide economic slowdown, the market for graphite has however suffered greatly. It is, however, anticipated that the market should start seeing a recovery from the second quarter of 2022.

Going forward, growing demand for electric vehicles, the opening of new graphite mines is expected to ensure steady and strong supply, rising commercial applications of graphene (made from graphite), and growing demand for energy storage will drive growth. Factors that could hinder the growth of the graphite market in the future include reductions in free trade and innovations in lubrication technology.

5.2 Social Development

The National Development Plan 2030 Executive Summary (NDP) notes 10 critical actions on the road to success for South Africa. They are:

1) A social compact to reduce poverty and inequality and raise employment and investment.
2) A strategy to address poverty and its impacts by broadening access to employment, strengthening the social wage, improving public transport and raising rural incomes.
3) Steps by the state to professionalise the public service, strengthen accountability, improve coordination and prosecute corruption.
4) Boost private investment in labour-intensive areas, competitiveness and exports, with adjustments to lower the risk of hiring younger workers.
5) An education accountability chain, with lines of responsibility from state to classroom.
6) Phase in national health insurance, with a focus on upgrading public health facilities, producing more health professionals and reducing the relative cost of private health care.
7) Public infrastructure investment at 10 percent of Gross Domestic Product (GDP), financed through tariffs, public-private partnerships, taxes and loans and focused on transport, energy and water.

8) Interventions to ensure environmental sustainability and resilience to future shocks.
9) New spatial norms and standards – densifying cities, improving transport, locating jobs where people live, upgrading informal settlements and fixing housing market gaps.
10) Reduce crime by strengthening criminal justice and improving community environments.

Both Cuchron (Pty) Ltd and Steamboat Graphite (Pty) Ltd is committed to the above actions in the form of:

- Job creation;
- Human resource development;
- Human and community development;
- Environmental sustainability; and
- Governance and policy.

5.3 Economic Benefits

The following economic benefits may be anticipated:

- Capital Investment and expected Revenue generation with a contribution to economic growth.
- Employment and the generation of household income for the duration of the mining activities, including indirect and induced impacts within the local and regional economies.
- Secondary benefits in the creation of electricity to supply the domestic demand. In addition to the quantifiable economic benefits that will result from this development, there are also a number of benefits that are not measurable in the same way, but that should be considered.

These benefits could include:

- Technology: Technology used on the mine will work towards improving knowledge on available technologies and skills in using such technology. This may enable local communities to run their own successful businesses in the future.
- Skills development: Local community members who may not have any marketable skills other than a basic education will be able to acquire skills through employment on the mine. In addition to technical skills, there will be numerous roles imparting valuable management and leadership skills as well.
- Asset base: The capital expenditure outlaid into the land in the area will result in an asset base upon which future development can occur. In addition to this, the asset base adds value to the municipality itself and provides a starting point for future developments.

- Local procurement and SMME opportunities: Local communities will be enabled and provided with opportunities to participate in contracts and other new businesses that would become available during the construction and operational phases.

5.4 Cuchron's Social and Labour Plan

Cuchron (Pty Ltd is committed to optimise opportunities in the local communities through the implementation of the Social and Labour Plan (SLP). The SLP implementation will only commence once a decision has been made by the DMR on the granting of the Mining Right.

5.5 Job Creation

The Cuchron and Steamboat Graphite Projects will create a combined number of approximately 82 temporary job opportunities at authorisation and commencement of construction. Within the first year of mining, there is an opportunity to create a combined estimated 78 permanent positions once both projects are operational. These will be made up as follows:

- Employment for the first phase of mining is not huge, approximately 10 – 20 employees including managers, technical / mining skilled, operators and support
- Employment for the beneficiation plant is approximately 58 permanent employees including managers, engineers, foreman, fitters, boilermakers, electricians, technicians, operators, storemen, cleaners, general workers and support in finance, admin and human resources.

Both Cuchron and Steamboat Graphite has signed a cooperation agreement with the Ga-Kibi Community with a commitment to localise recruitment as far as possible, provided sufficient skills are available.

5.6 Workforce Development

Both Cuchron and Steamboat Graphite plans to implement a comprehensive workforce development plan through adult basic education and training, core business training, artisan training, learnerships, bursaries and internships programmes. These will be supported by career-path planning and mentorship.

5.7 Community Development

To further support local communities, Cuchron is proposing Community Development projects and supporting small business development. The community will be further engaged to finalise the specific Community Development projects based on the needs within the community.

Although not required from a beneficiation project as part of an SLP, Steamboat Graphite plans to further implement Community Development Programmes in agreement with the local communities.

6 PROJECT ALTERNATIVES

The identification and investigation of alternatives is a key aspect during the S&EIA process. All reasonable and feasible alternatives must be identified and assessed during the Scoping Phase to determine the most suitable alternatives to consider and assess during the EIA Phase. There are, however, some significant constraints that have to be considered when identifying alternatives for a project of this scope. Such constraints include social, financial and environmental issues, which will be discussed in the evaluation of the alternatives. The preferred option is to be highlighted and presented to the authorities.

Alternatives can typically be identified according to:

- Location alternatives;
- Process alternatives;
- Technological alternatives; and
- Activity alternatives (including the No-go option).

For any alternative to be considered feasible, such an alternative must meet the need and purpose of the development proposal without presenting significantly high associated impacts. The alternatives are described, and the advantages and disadvantages are presented. It is further indicated which alternatives are considered feasible from a technical and environmental perspective. Incremental alternatives typically arise during the EIA process and are usually suggested as a means of addressing identified impacts. These alternatives are closely linked to the identification of mitigation measures and are not specifically identified as distinct alternatives. This section provides information on the development footprint alternatives, the properties considered, as well as the type of activity, activity layout, technological and operational aspects of the activity.

6.1 Development Alternatives Considered

6.1.1 Mining Development and Associated Infrastructure by Cuchron

6.1.1.1 Site and Infrastructure Location

Refer to Figure 6-1 for the placement of site location alternatives.

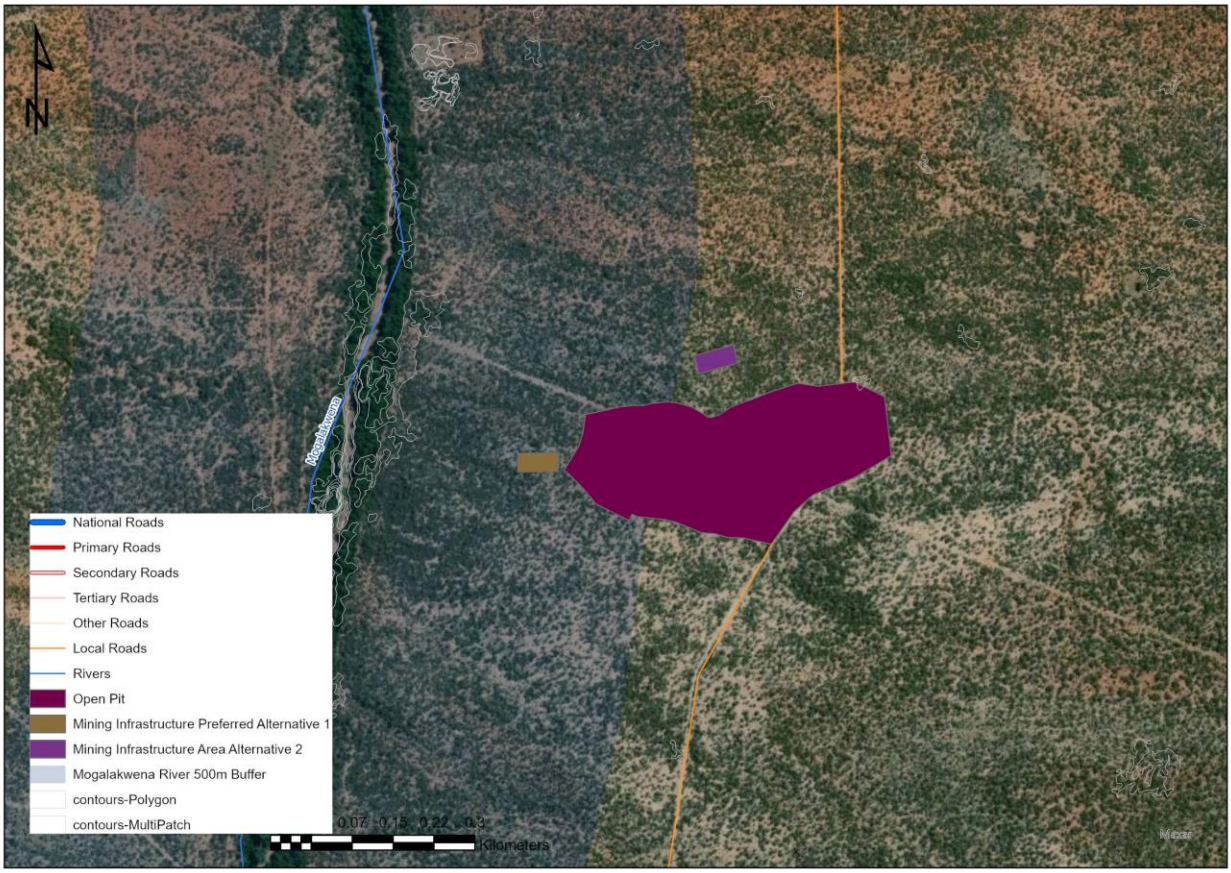


Figure 6-1: Mine Infrastructure Site Location Alternatives

- **Open Pit Mining**: No site location alternatives have been considered as mining can only be undertaken in areas where economically mineable resources occur. This area was established through extensive prospecting and geological modelling.

- **Mining Workshops and Offices**: Two alternative positions are being considered for the placement of the mine workshops and offices. These alternatives will be further evaluated during the EIA phase. Selection of the two alternatives were based on:
  - Access of the Open pit
  - Underlying mineral resources

- Access to services (road, water and electricity)
- Preliminary environmental factors such as topography, hydrology, sensitivity of the sites

6.1.1.2 Mining Methodology

Mining method selection is one of the most critical activities of mining engineering. The factors that have a major impact on the mining method selection include:

- Physical and mechanical characteristics of the deposit such as ground conditions of the mineral deposit, nature of overlying strata and parting between seams, type and strength of roof and floor rocks, deposit thickness, general shape, the orientation of deposit, plunge, depth of mineral below the surface, quality and strength of mineral, etc. The basic components that define the ground conditions are rock material shear strength, natural fractures and discontinuities, orientation, length, spacing and location of major geologic structures, in situ stress, hydrologic conditions, etc.;
- Economic factors such as capital cost, operating cost, mineable tons, quality and value;
- Technical factors such as mine recovery, the flexibility of methods, machinery, and mining rate; and
- Productivity factors such as annual productivity, equipment, efficiency, and environmental considerations.

The selected mining method for this project is an open-pit truck and shovel operation. This mining method has been employed extensively in numerous similar deposits globally. The selection of this mining method is based on the following four key criteria:

- Production targets - required graphite and waste tonnes to be excavated;
- The geometry of the graphite deposit;
- Anticipated in-pit mining conditions; and
- Flexibility of mining multiple benches within the defined open pit operation.

Underground mining is not considered feasible due to the shallow nature of the resource, which is only conducive to open-pit mining operations. These types of operations lead to optimal resource extraction, which results in lower operating costs.

6.1.2 Beneficiation Development and Associated Infrastructure by Steamboat Graphite

6.1.2.1 Site and Infrastructure Location

Refer to Figure 6-2 for the placement of site location alternatives.

Figure 6-2: Beneficiation Plant & Infrastructure and Discard Stockpile Site Location Alternatives

Two site location alternatives were considered for both the Beneficiation Plant and its associated infrastructure, and the discard stockpile. These alternatives will be further evaluated during the EIA phase. Selection of the two alternatives was based on:

- Vicinity to primary product source (Open pit)
- Underlying mineral resources
- Required capacity and footprint extent
- Preliminary environmental factors such as topography, hydrology, the sensitivity of the sites

6.1.2.2 Product Transport

Refer to Figure 6-3 for the product transport alternatives.

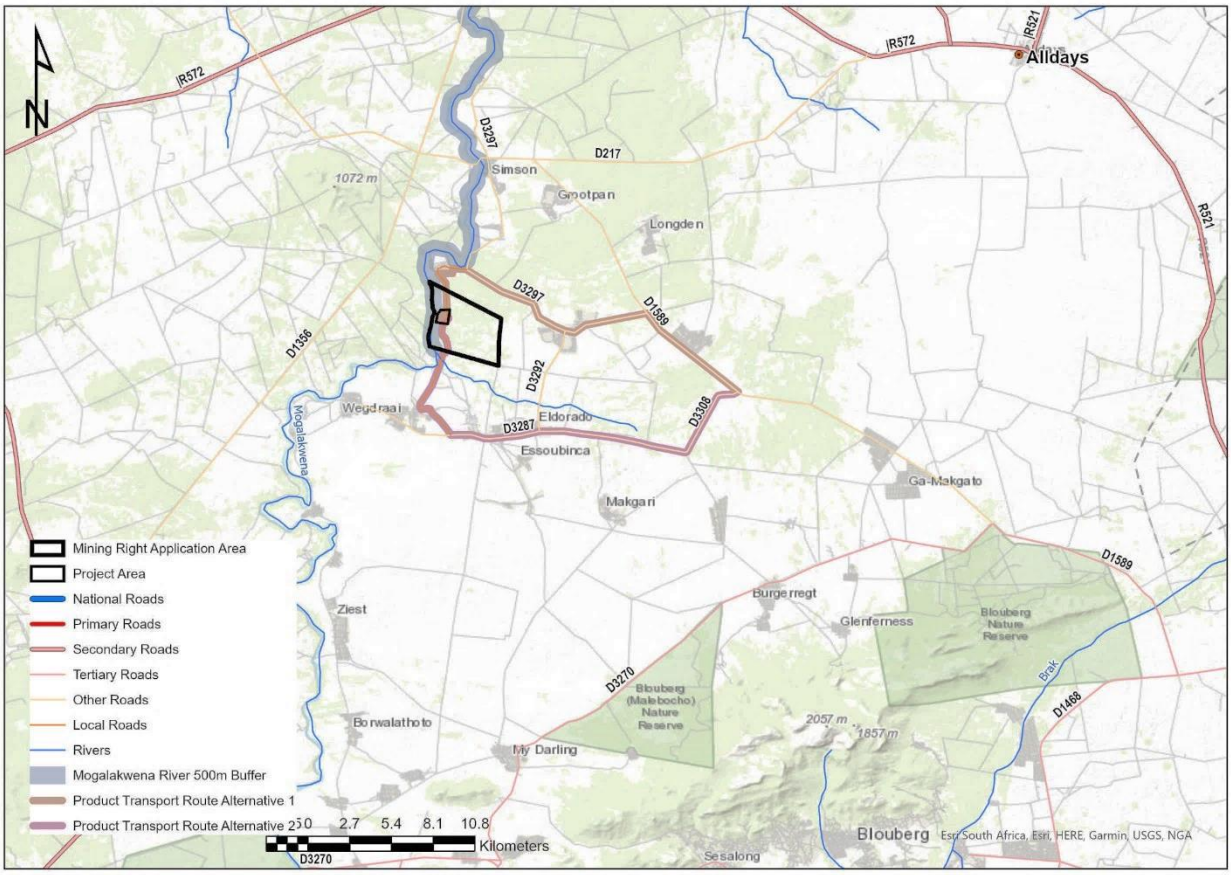


Figure 6-3: Product Transport Alternatives

Two alternative routes for Product Transport will be considered, one route follows a northern direction from the site and then turns east towards Polokwane utilising existing roads, the second alternative follows a southern direction from the site and then turns east towards Polokwane.

These alternatives will be further evaluated during the EIA phase. Selection of the two alternatives was based on:

- The distance of the product transport route
- Quality of the existing roads
- Environmental and Social constraints

6.1.3 Land Use Alternatives

The property is currently utilised for grazing, as part of the Socio-economic Assessment two alternative land use options will be considered, that of mining the property and that of continuing with livestock farming.

6.1.4 No-Go Option

The main consequence of the No-Go Option is the loss of opportunity to develop a viable mineral resource with an estimated LOM of 20 years or more which has the potential for increased economic benefits on the local, provincial and national level in terms of employment and the contribution to the GDP. Other socio-economic benefits that will be lost include the skills development opportunities, Local Economic Development projects (SLP) and Local procurement and SMME opportunities.

6.2 Statement Motivating the Preferred Site

Based on the preliminary assessment, the following are the preferred site locations for both the Cuchron Mine Development and the Steamboat Beneficiation Project and their associated infrastructure.

Figure 6-4: Preferred Alternative

The selected preferred alternative supports the technical requirements, while also avoiding environmental and socially sensitive areas to some extent.

7 DESCRIPTION OF THE PROPOSED OVERALL ACTIVITY

7.1 Open Pit Mining and Associated Infrastructure – Cuchron (Pty) Ltd

7.1.1 Open Pit Mining

Conventional open-pit mining techniques will be used for this mine. Topsoil will be removed at a rate of 2000m^3 per annum. The ore will be accessed through drilling and blasting, and effectively involve the removal of blocks of ore, dug from the open pit of the deposit.

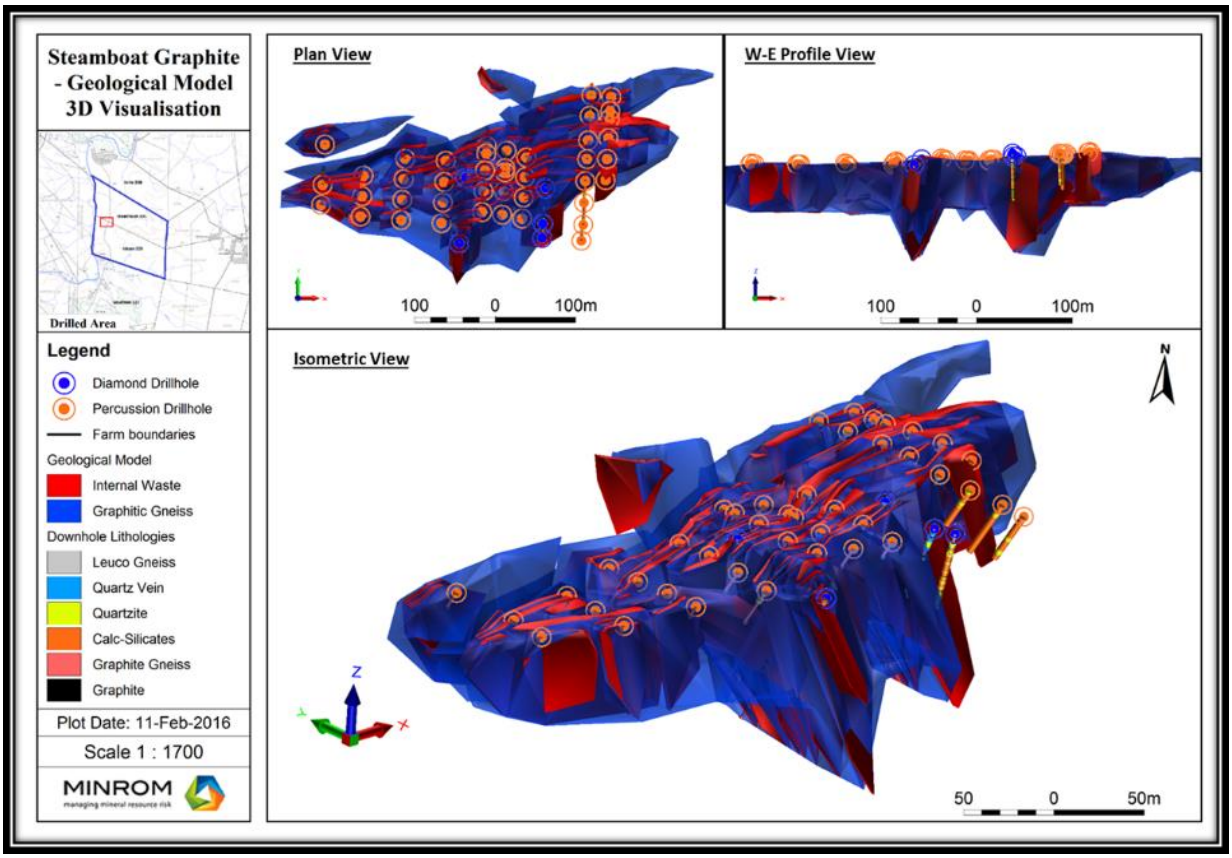


Figure 7-1: Open Pit 3D model

RoM Graphite Feed Grade will be delivered to the customer. It is envisaged that production will be ramped-up from just over 100,000 tonnes per annum in the first year of production to the 500,000 tonnes per annum in the third year of production. The initial Life of Mine (LoM) is

estimated at 20 years at the planned mining rate. The life of mine may be expanded as further resources are identified on the properties. The following figure provides the production schedule.

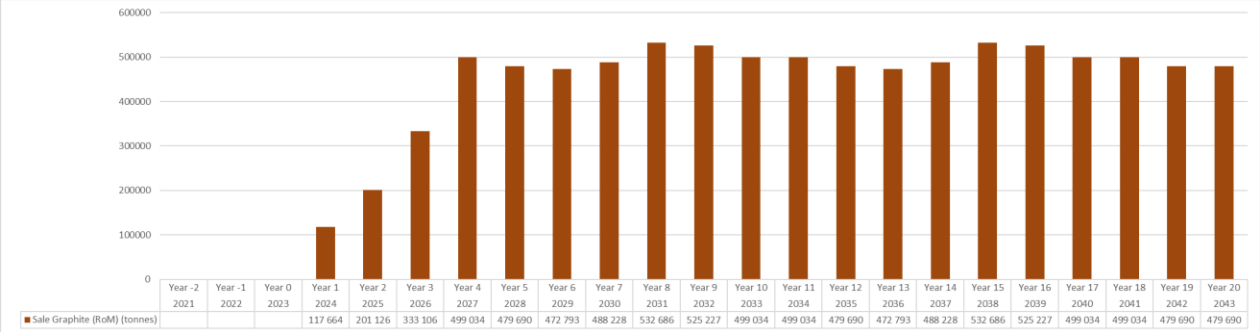


Figure 7-2: LOM Production profile

7.1.2 Mining Office, Workshop and Storage Area

Mining offices will be established close to the open pit to support mine development.

7.1.3 Internal Roads

It is expected that 40t capacity trucks with 115t excavators may be used to load ore onto trucks and to haul it to the ROM pad. Ancillary equipment required to support the mining operation include graders and water trucks to maintain the mine road. Minor maintenance of equipment will be completed in the open pit, and more major maintenance will be completed in a maintenance workshop located adjacent to the processing plant and offices.

7.2 Beneficiation Plant and Associated Infrastructure – Steamboat Graphite (Pty) Ltd

7.2.1 Beneficiation Plant

Steamboat Graphite will establish a beneficiation plant for the further processing and beneficiating of the raw graphite ore. The main aspects of the beneficiation process are:

- Primary, Secondary and Tertiary Crushing
- Primary Milling and Flash Flotation
- Rougher Flotation
- Primary Concentrate Cleaning Circuit
- Fine-Flake Concentrate Cleaning Circuit

- Final Concentrate Attritioning and Cleaning Circuit
- Concentrate leaching
- Concentrate Handling
- Concentrate Screening and Bagging
- Final Tailings Handling and Disposal

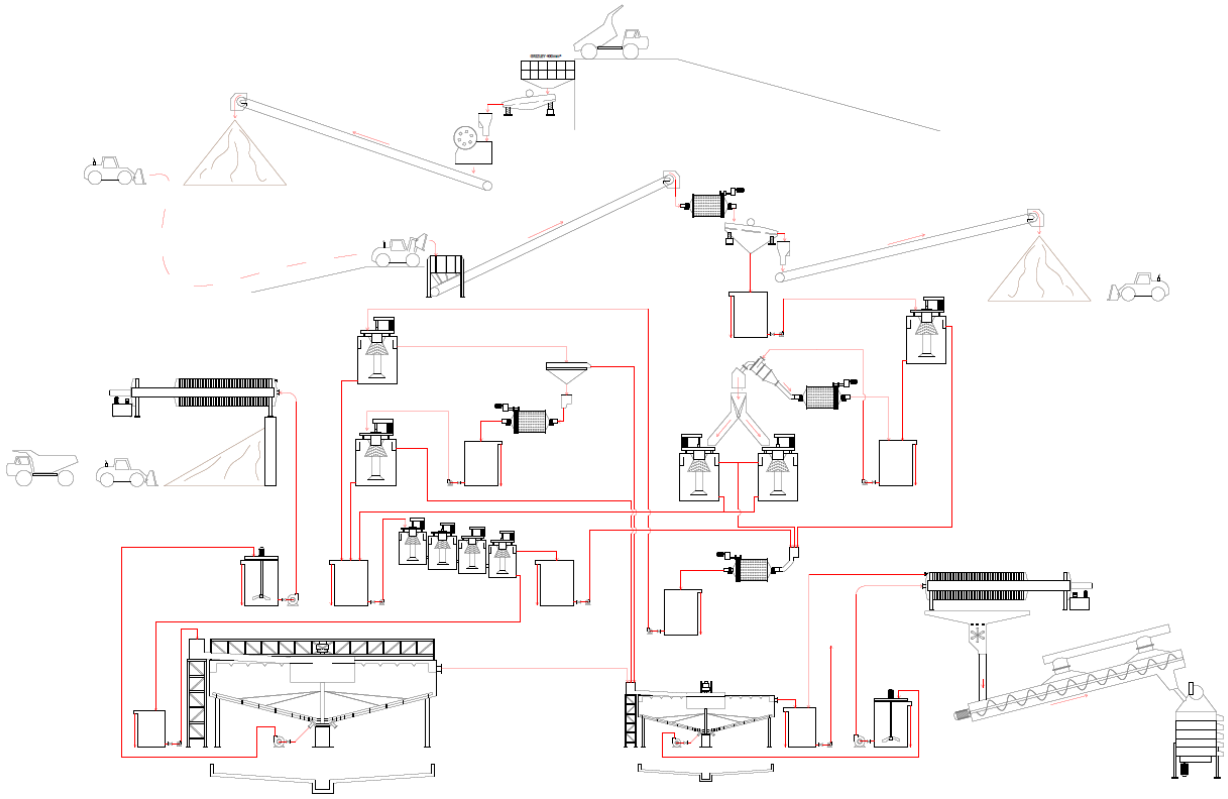


Figure 7-3: Processing Flow Chart

These processes are explained more fully below.

- **Primary, Secondary and Tertiary Crushing**: The crusher circuit is fed with ROM material using a front-end loader (FEL) at a rate of 100 t/h. The ROM material is screened using a ROM static grizzly screen, located at the top of the primary crusher bin to reject rocks larger than 300 mm (oversize material). The oversize material shall be stockpiled near the feed bin and may be manually crushed using rock breakers. The static grizzly undersize material (-300 mm) is further screened using the grizzly feeder, which is fitted with 70 mm openings; the oversize material (+70 mm) is discharged into the jaw crusher. The crusher is set to a Closed Side Setting CSS value of 75 mm and is expected to produce 100% -120 mm material. The

crusher product and the grizzly undersize are discharged onto the primary crusher discharge conveyor. The primary crusher product is fed to the classification screen via the classification screen feed conveyor. The classification screen is fitted with two decks; the top deck is fitted with 35 mm screen panels while the bottom deck is fitted with 16 mm panels. Oversize from the top deck (+35 mm) discharge into the secondary crusher feed bin and is fed to the secondary crusher via a feed conveyor and the secondary crusher feeder. Oversize material from the bottom deck (-35+16 mm size fraction) flows by gravity into the tertiary crusher feed bin and is fed to the tertiary crusher via the tertiary crusher feed conveyor and the tertiary crusher feeder. Products from the secondary and tertiary crushers are combined and recycled back to the classification screen. The bottom deck screen undersize (-16 mm size fraction) from the classification screen is fed to the mill feed bin via the mill feed conveyor.

- **Primary Milling and Flash Flotation**: The crushed material from primary mill feed bin is fed to the primary mill scalping screen at the flowrate of 30 t/h via the mill feed bin feeder and the primary mill feed conveyor. The scalping screen is fitted with 2 mm aperture panels. Oversize from the screen (+2 mm) flows into the primary ball mill by gravity. Spillage material in the primary milling circuit is pumped to the scalping screen through the mill area spillage pump. The mill is expected to produce a product with a grind of 80% passing 500 microns; this product is discharged into the primary ball mill discharge sump. Slurry from the mill discharge sump is pumped (via the primary mill discharge pump to the primary mill screen which is fitted with a 600 µm aperture panels and discharges the oversize (+600 µm) back into the primary mill. The -2 mm material from the scalping screen flows by gravity into the flash flotation cell; the flash flotation cell is installed to recover graphite flakes liberated at coarse particle sizes. Flash flotation produces a concentrate at a mass yield of 3%. Flash flotation tailings are pumped into the primary mill discharge sump via the flash flotation tails pump.

- **Rougher Flotation**: The rougher flotation feed slurry (-600 µm), which consists of the combination of flash flotation tailings and the primary mill product, flows into the rougher flotation bank by gravity at the solid's flowrate of 29 t/h. Frother and collector reagents are added into rougher cell no.1 and rougher cell no.3. Rougher concentrate mass pull is expected to be 8%. The flash flotation concentrate and primary rougher concentrate are combined in the total concentrate sump and pumped to the primary concentrate cleaning circuit using the pumps. The tailings from the rougher flotation circuit are discharged into the combined tailings sump; the combined tailings stream is then pumped to the final tailing's thickener using the

combined tailings pump. Any spillage from the rougher flotation section is pumped to the primary ball mill scalping screen using the rougher flotation spillage pump.

- **Primary Concentrate Cleaning Circuit**: The combined concentrate is screened on the primary cleaner dewatering screen; the screen is fitted with 74 µm panels. The oversize from the dewatering screen is discharged into the primary polishing mill. The mill discharge and the dewatering screen undersize are discharged into the primary polishing mill discharge sump. The primary mill discharge sump slurry is pumped to the primary cleaner column cell using the primary polishing mill discharge sump pump. The column flotation cell tailings are pumped to the primary cleaner flotation bank; the tailings stream from this bank is discharged into the primary cleaner scavenging flotation cell bank, which consists of three flotation cells. The primary cleaner flotation concentrate is recirculated back to the primary cleaner column cell. The cleaner scavenger concentrate is recycled back to the polishing mill feed classification screen, while the tails are pumped to the combined tails sump in the rougher flotation area via the final cleaner tails' sump and the final cleaner tails pump. The concentrate from the primary cleaner column cell is screened on the primary column flotation cell concentrate screen, which is fitted with 212 µm screen panels. The oversize from this screen flows by gravity into the fine flake cleaning circuit while the undersize is pumped to this circuit using the primary column cell concentrate undersize pump.

- **Fine-Flake Concentrate Cleaning Circuit**: The undersize from the primary column flotation cell concentrate (fine flakes stream) is dewatered at 75 µm on the fine flake dewatering screen. Oversize from the dewatering screen flows into the fine flake polishing mill; the discharge from the mill and the dewatering screen undersize are discharged into the fine flake polishing mill discharge sump. The sump slurry is pumped to the fine flake column cell using the fine flake polishing mill discharge pump to produce a concentrate at a mass pull of about 7%. The fine flake column concentrate is combined with the primary flotation column screen oversize stream from the primary cleaning circuit; this combined stream is pumped to the attrition cleaning circuit using the combined cleaner concentrate pump. The fine flake column flotation tailings are subjected to cleaning and scavenging flotation. Concentrate from the cleaner cells is recycled back to the fine flake column cell by gravity while the scavenger concentrate is pumped back to the fine flake dewatering screen. The tailings from the scavenger cells flow by gravity back into the final cleaner tails' sump in the primary concentrate cleaning circuit.

- **Final Concentrate Attritioning and Cleaning Circuit**: The cleaner concentrate stream is subjected to thickening in the attrition concentrate thickener; overflow from the thickener is discharged into the process and storm water tank in the water services area. The underflow, which has a density of 1.19 RD, is pumped to the attrition mill. Product from the attrition mill flows into the attrition mill discharge sump and this is pumped to the attrition cleaner column flotation cell using the attrition mill discharge pump. Tailings from the attrition column flotation cell are pumped to the attrition cleaner and scavenging flotation cells. The concentrate from the cleaners is recirculated by gravity back to the attrition column flotation cell while the scavenger concentrate is pumped back to the attrition concentrate thickener. The tailings from the scavenger cells are recycled by gravity back to the final cleaner tails' sump in the primary concentrate cleaning circuit.

- **Concentrate leaching:** A percentage of the flake product may need to be a higher percentage of graphitic content than that can be obtained by physical separation. This does not apply to all the graphite Flake**,** only a certain percentage of the larger flake material as determined by market demand will be treated chemically to remove 2.4% additional, non Graphitic impurities.

  It orders to increase the purity of the graphite from 93.6% to 96% the final concentrate is leached with sulphuric acid to remove impurities. Leaching is done for 120 minutes at a liquid/solids ratio of 5 in 10% sulfuric acid concentration at 85 degrees Celsius.

  In order to be environmentally neutral a process to recycle this spent sulfuric acid is planned, this proven process has considerable cost savings for raw material and effluent disposal using the De Dietrich Process.

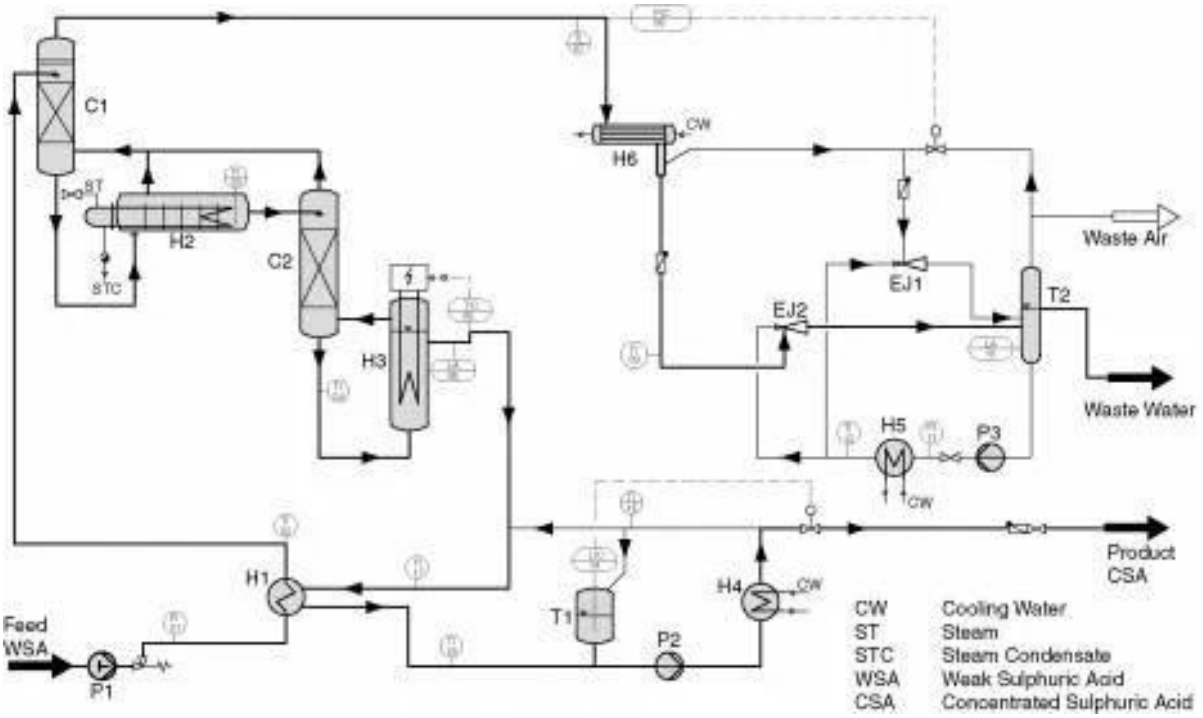


Figure 7-4: DDPS standard plant

The DDPS standard plant for concentration of sulfuric acid is depicted in the flowsheet shown above. Weak sulfuric acid, e.g. sulfuric acid of 80 wt.-% H_2SO^4, is fed by dosing pump P1 via recuperator H1, into scrubbing column C1.

In H1 the acid is preheated by means of the of concentrated product acid, e.g. sulfuric acid of 96 wt.-% H_2SO^4. In scrubbing column C1 the acidic content of the vapour, produced in evaporator H2 and scrubbing column C2, is washed out. Next, the acid enters the horizontal evaporator H2 at one end and leaves it with higher concentration at the other. Evaporator H2 is designed as a horizontal vessel made of borosilicate glass.

The lower part of the evaporator is equipped with baffles in the transverse direction. Inflow direction the baffles approximate to a chamber cascade, and the acid is concentrated step by step within the chambers.

Discharge of higher concentrated acid out of horizontal evaporator H2 is done via free overflow, and the acid is fed to the top of scrubbing column C2. The aim of column C2 is the first step purification of the vapour rising from evaporator H3. The further scrubbing of acidic

content from the vapour out of evaporator H3 is carried out together with the vapour out of evaporator H2 in scrubbing column C1.

Intermediate strength acid from column C2 enters evaporator H3 and leaves this vessel with the desired concentration. The heating of evaporator H3 is maintained electrically by immersion heating units made of quartz, enabling operation at temperatures of 180-220°C. Discharge of high concentrated product acid from evaporator H3 to recuperator H1 is done via the free overflow. The horizontal concept of both evaporators and of the free flow acid discharge eliminates the need for any pump in the hot process section.

Vapour from scrubbing column C1 is condensed in condenser H6. Arising condensate leaves the plant via free overflow out of separator T2. Vacuum generation is achieved by a liquid jet pump where the arising condensate is used as working fluid.

Due to the use of condensate as the working fluid, additional waste streams are avoided. QVF standard plants for sulfuric acid concentration are equipped with automated process control systems, and the operation is through "on-screen" control.

- **Concentrate Handling:** The final concentrate is thickened in the final concentrate thickener. The thickener overflow is discharged into the process water dam, whereas the underflow is filtered in the final concentrate filter press, which is expected to produce a filter cake with less than 20% moisture. The filtrate is pumped back to the final concentrate while the filter cake is discharged onto the final concentrate filter cake conveyor and fed to the final concentrate drying and bagging circuit.

- **Concentrate Screening and Bagging**: The filter cake concentrate from the filter is fed into a diesel-fired dryer via a conveyor. The filter cake is dried to a moisture content of lower than 1% (w/w). The dry concentrate is then screened into four size fractions: +400, -400+200, -200+150 and -150 micron. Each of the size fractions is bagged separately as the final product. The area will be located within a closed building with dust collection and filtering systems to contain all airborne dust and Graphite.

7.2.2 Discard and Tailings Facilities

In-pit waste dumping will be utilised as far as practically possible, and the remaining waste to be accommodated on the surface near pit exit in a combined discard and tailings facility. The tailings from the beneficiation plant will be dewatered and co-disposed onto the discard dump facility using the paddock theory. Tailings stream from the combined tailings sump in the rougher flotation circuit is thickened in the final tailing's thickener. The thickener underflow from the thickener, which has a slurry density of 1.51 RD, is pumped to the final tailing's filtration circuit and disposal circuit through the final tails' thickener underflow pump and the final tails pump. The thickener overflow stream flows into the process and stormwater tank in the water services area. This part of the circuit is operated in a semi-batch manner and is expected to produce a filter cake with 15% moisture. The final tailings thickener underflow material from the final filtration feed tank is pumped to the final tails filter; the filtrate is discharged into the final tails filtrate tank and recycled to the final tails thickener while the filter cake is stockpiled and discarded by an FEL. During the active waste-tipping phase the waste dump will be contoured to 18 degrees to allow for slope stability and re-vegetation. The waste dump will progress by tipping from a higher level against a window and progressively pushing the waste out with a dozer. Waste dumps should be progressively rehabilitated with topsoil, where possible. Low-grade and ore stockpile dumps will be constructed in close vicinity to the primary crusher tipping point in order to minimise the reclamation costs.

7.2.3 Sewage Facility

The only sewage expected to be generated on the mine is from the ablution facilities and washrooms at the plant area. It is envisaged that this sewage will be treated in a package plant, fed by gravity from the various facilities. The proposed sewage treatment works will be a semi-package plant design. The proposed plant has already been utilised on many mines and carries the approval of the Department of Human Settlements, Water and Sanitation (DHWS). The processes included in the proposed plant are:

- Primary settling
- Anaerobic digestion
- Aerobic digestion
- Final settling
- Disinfection

7.2.4 Power Supply

Although ESKOM power supply is available, the capacity and reliability of this supply are not confirmed. Consequently, a self-generation model will be used by establishing a 3MW Biomass/Coal Gasification Facility. This facility will provide 100% of the mine site requirements on a continuous basis. High voltage power will be reticulated around the mine with the reticulation voltage to be determined from the results of final power studies. The facility will involve the installation of a gasifier that will produce syngas from a feedstock of mainly biomass supplemented with coal. The syngas will be used as a fuel for 2 sets of gas turbines to produce a combined approximate 3 MWe Electricity.

The main targets of this project are to:

- Generate electricity through the gasification of biomass
- Reduce fossil fuel dependency for the production of clean energy.
- Reduce industry dependency on the national electricity grid.
- Possible utilisation of ash/char by-product as fertiliser or in cement production pending chemical analysis.

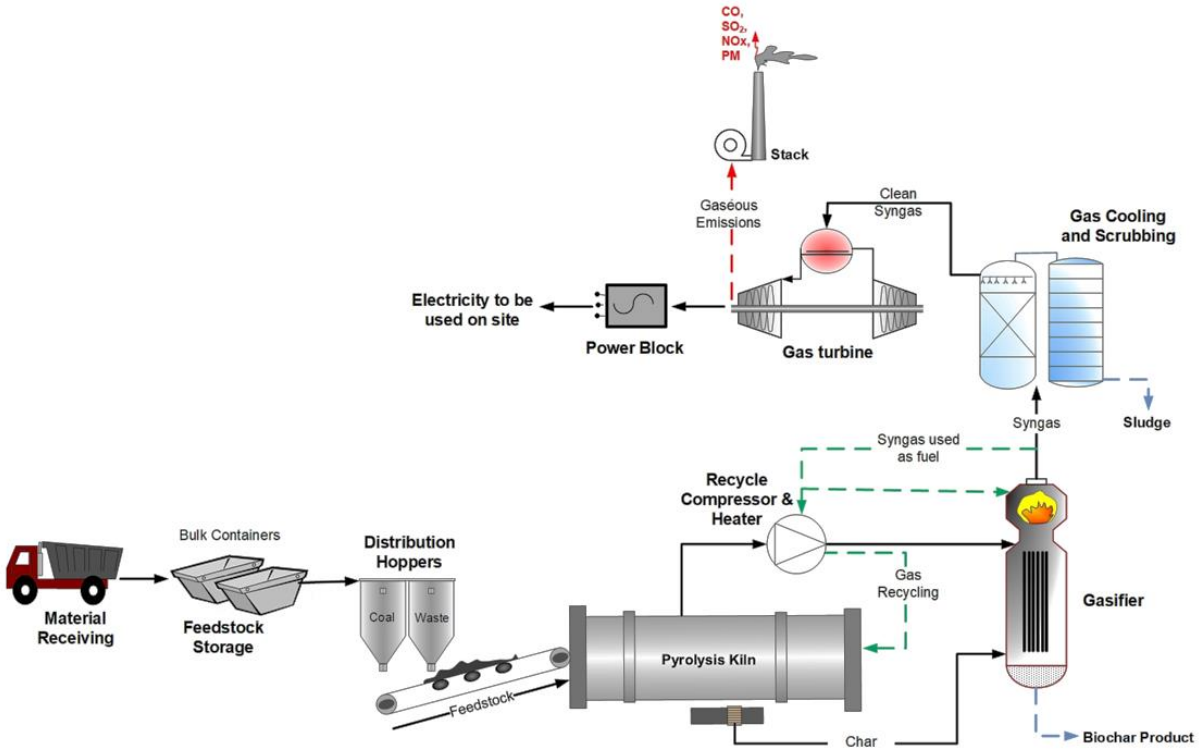


Figure 7-5: Gasification Facility Process Flowchart

The following aspects regarding the facility should be noted:

- **Waste Receiving and Processing**: Biomass and other solid wastes will be sourced locally and delivered to the site via trucks. The waste is to be stored in water-resistant, flexible bulk containers on an impermeable floor. Coal that will supplement waste feeds will also be delivered to site via road either pre-blended with the feedstock or stored in a hopper. From storage, the waste will be fed into a receiving hopper of a variable speed incline conveyor system that will feed the material into a pyrolysis kiln. The coal will be used only as feedstock security and will be fed proportionally with the feedstock onto the conveyor as required.

- **Gasification Process**: The pyrolysis kiln is a heated, oxygen-starved environment which drives off moisture and volatile gases contained in the feedstock. Pyrolysis produces carbon char and ash that moves into a separate, externally heated gasification reactor, which converts the solid carbon molecule into a gaseous state. Gasification is accomplished with heat, pressure, and the injection of ionised water. The injection of ionised water in a process known as steam reformation creates a water shift reaction to produce syngas. The hot syngas is water quenched and cleansed of its impurities in a scrubber system, thus delivering a clean, dry syngas with no liquid discharge from the plant operation.

- **Electricity Production**: The clean syngas will be directed into an internal combustion engine coupled with a generator to produce up to 3MWe electricity, to be used within an industrial complex.

- **Energy Use**: All feedstock is to be processed in an enclosed and sealed reactor, allowing contaminants to be efficiently captured and disposed of in ash collectors or through water scrubbing processes. Pollutants are not to be released into the atmosphere in this process, as they would be in a combustion-centric process. A gas recycles compressor will allow for some gas from the pyrolysis kiln to be recycled back to power the kiln. The gasifier will be able to utilise the syngas to fire the burner and will recycle the process water such that the facility has zero liquid discharge. Ash recovered from the system can be further processed to recover elements contained in the ash, and/or the ash can be used in the production of cement or used as a fertiliser. A portion of the ash can be recovered as a bio-char and used as a soil amendment, which provides for carbon capture and sequestration in addition to improved crop performance.

- **Waste Hierarchy**: The proposed project is in line with the national waste management strategy and the promotion of the waste hierarchy through the recovery of waste and subsequent reduction of waste being disposed of to landfill. The Project is aligned with Goal 1 of the National Waste Management Strategy: Goal 1: to Promote waste minimisation, reuse, recycling and recovery of waste. The establishment of the gasification plant will effectively result in:
  - Recovery of waste where such materials might otherwise be disposed of
  - Generation of electricity through the gasification of biomass and other wastes
  - Reduction of solid waste being disposed of to landfill

7.2.5 Internal Roads

Internal roads will be constructed between the Beneficiation Plant and the Discard Dump. All roads will be gravel with dust suppression management.

7.2.6 Product Transport

The product will be transport to the market via road. It is expected that the destination of the product will be Polokwane. The road network is provided in the figure below.

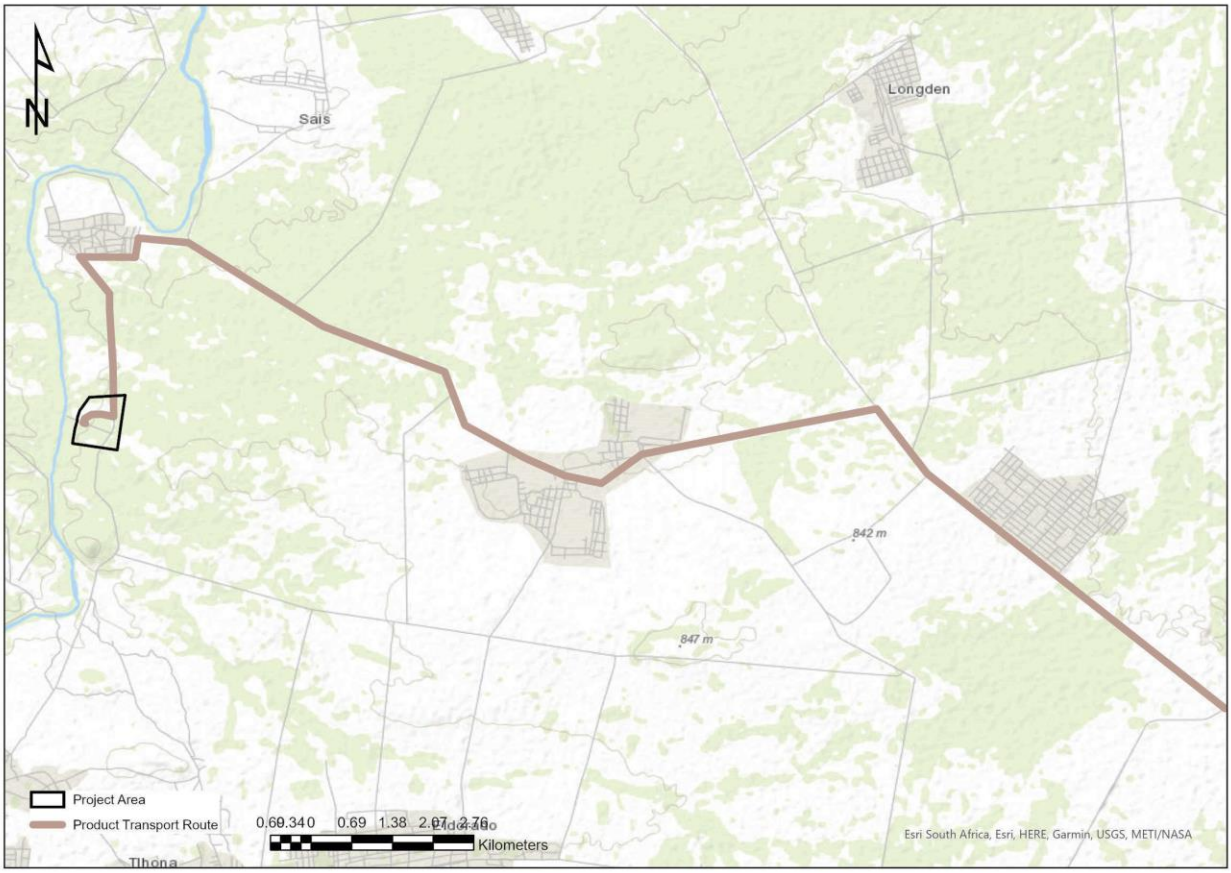


Figure 7-6: Product Transport Route

The following product trips are expected:

Table 7-1: Transport Trips

Description	Per Day
Product Transport	
Outbound	3
Inbound	3
Total Product Transport trips	6
Other trips	
Suppliers	2
Staff	3
Total Other Trips	5
Total All trips	11

7.2.7 Security and Access Control

Perimeter fencing is planned around the infrastructure areas. These fences would be maintained for the duration of the project. Access control and a security office would be established at the entrance to the infrastructure and operational areas. Safety barriers will be placed around the perimeter of the open-pit mining areas.

8 DESCRIPTION OF THE PRE-MINING ENVIRONMENT

The existing status as reflected in this section is based on desk-top information sourced from published documents and available data. During the EIA Phase further detail field surveys and additional literature / legal reviews will be undertaken to verify the baseline information as well as the potential impacts identified in Section 10 of this report.

8.1 Geology

The graphite mineralisation on the farm Steamboat 306MR and Inkom 305MR is located within the Gumbu Group of the Beit Bridge Complex. The Gumbu Group is characterised by predominantly calc-silicate rocks and marbles, and the occurrence of fine-grained metapelites. Quartzites and quartzofeldspathic gneisses are rare whereas marbles grading into calc-silicate rocks and compositional banding of layers richer and poorer in silicate are common. Rocks may contain calcite, dolomite, olivine, phlogopite, diopside, plagioclase, microcline, quartz and graphite, depending on their composition. Recent studies indicated that carbonate rocks from the Gumbu Group in the area east of Mesina in part display a positive carbon isotope anomaly that occurs worldwide in strata between 2000 and 2200 Ma old. As a result, lithostratigraphic units of the Gumbu Group seem to be of early Proterozoic age. (Kramers et al., 2006)

The rocks in the area have been intensely deformed and sheared. Folding is abundant and occurs as tight, isoclinal folds. This is especially evident in the northern most units of the area. As described by Germiquet et al. (1991), graphite mineralisation of the proposed deposit occurs within a graphitic gneiss unit which is found in an E-W trending structure. The gneiss is enveloped on one side by a narrow amphibolite layer, and the entire sequence is enclosed in more competent calc-silicates and amphibolites which outcrop in the area of farm Steamboat 306MR and Inkom 305MR. The graphite gneiss contains narrow quartz veins, pegmatites and occasional scapolite 5 bands. The general dip of the lithologies in the area ranges between 60° to 80° towards the south with a strike between 85° and 95°.

The graphite ore body is interpreted as westerly plunging anticlinal structure, which is overturned towards the north. The southern limb of the overturned anticline is truncated by an ENE-trending fault. The northern limb, on the other hand, has been traced for 2.5km towards ENE using electromagnetic surveying. In the eastern part of the graphite deposit, the 5m wide graphite

horizon has been displaced 20m towards the north by faulting. The graphite deposits are usually elliptically in shape and rarely extend more than 200m on the surface.

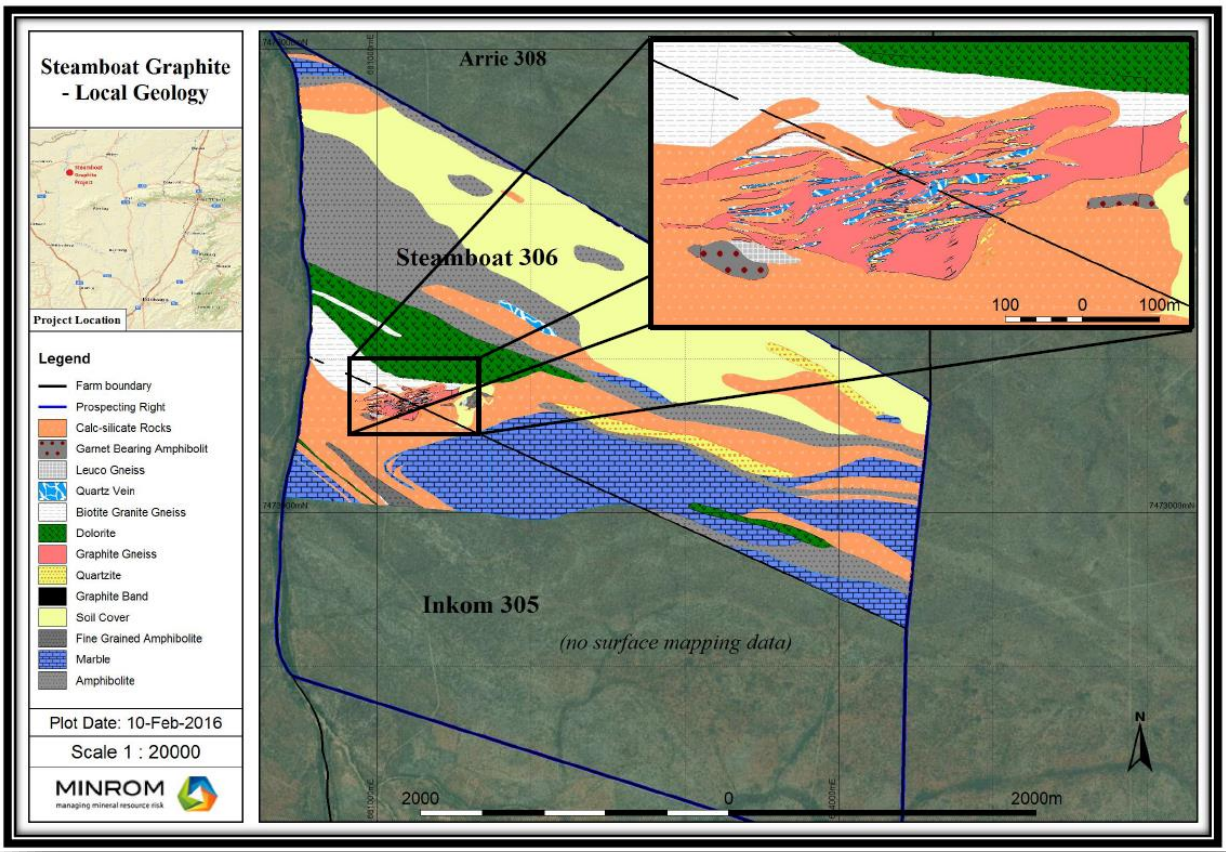


Figure 8-1: Locality Specific Geological Map

The properties subject to this application forms part of the Achaean Gneissic Terrain. The graphite occurs in marble, graphitic gneisses of the Gumbu Group, Beitbridge Complex. Graphite occurs within the graphite gneiss as disseminated flakes up to 2mm in size, but the flakes are not necessarily orientated concordantly with the foliation of the surrounding rocks. In places, graphite is present in the form of nodules of pure or mixed graphite ranging from 5mm to 20mm in diameter.

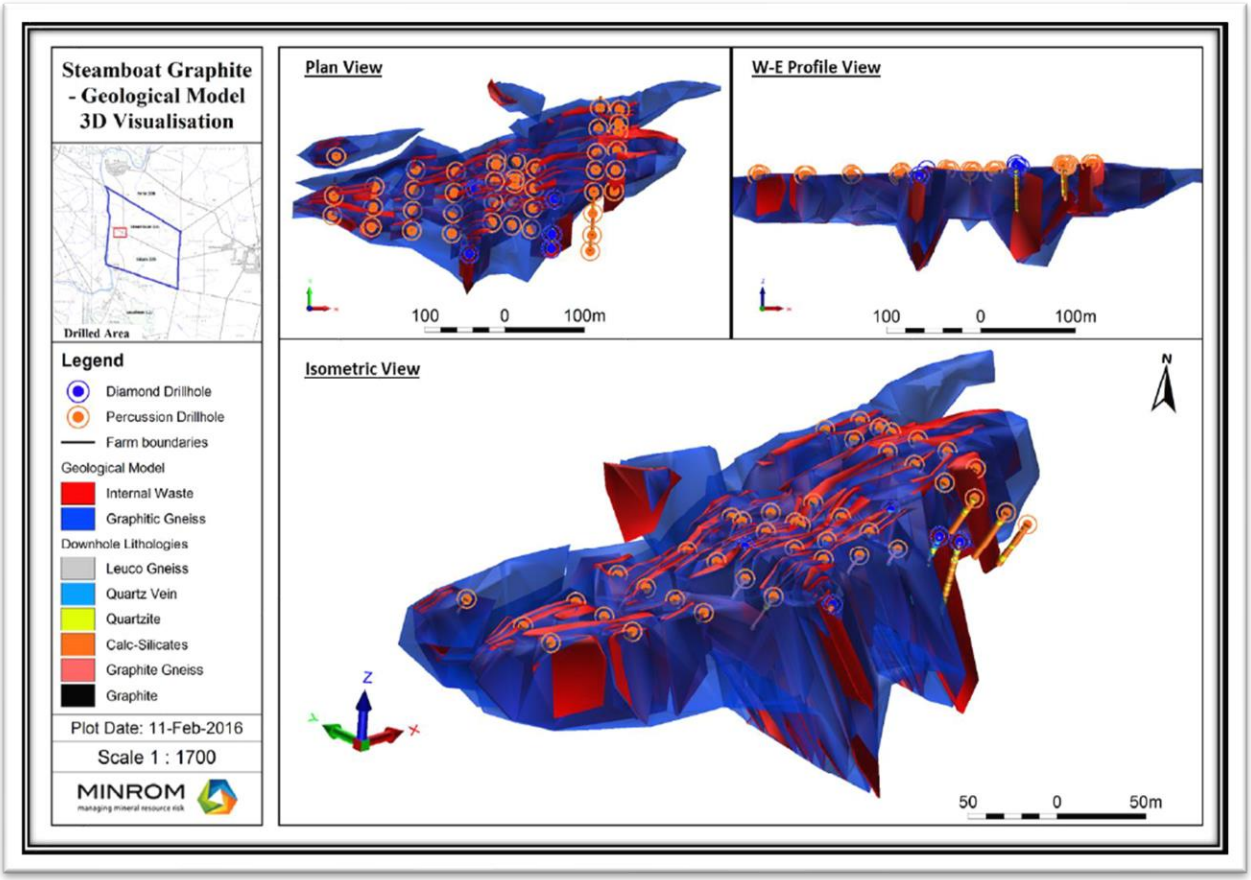


Figure 8-2: Mineral Resource Map

8.2 Topography

The topography of the site can be described as generally flat with a gentle slope towards the Mogalakwena river and to the south of the site.

The figures below indicate the elevations from a north-south perspective and east-west perspective:

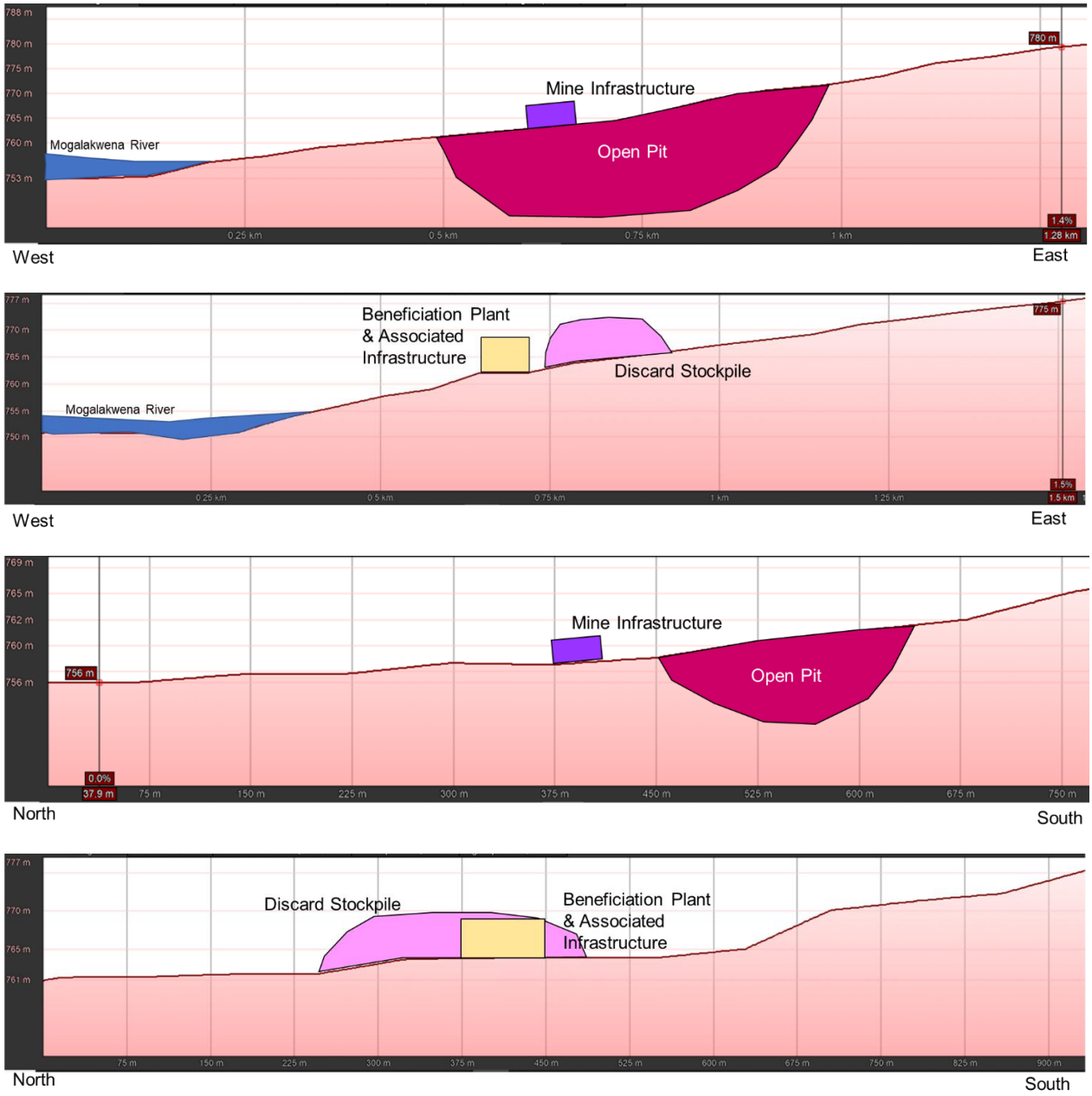


Figure 8-3: Site Topography

Surface elevations vary between approximately ±750 meters above sea level (mamsl) in the west at the Mogalakwena River to ± 780 mamsl in the east, and then from ±756 mamsl in the north to ± 777 mamsl in the south.

8.3 Climate

8.3.1 Regional Climate

Limpopo falls in the summer rainfall region, with the western part semi-arid and the eastern part largely sub-tropical. The western and far northern parts experience frequent droughts. Winter throughout Limpopo is mild and mostly frost-free. The climatic conditions vary within the Limpopo Water Management Area (WMA), which ranges from the Waterberg Mountains in the south, northwards to the hot, dry Limpopo River valley on the border with Zimbabwe and Botswana. The mean annual temperature ranges between 16°C in the south to more than 22°C in the north. with an average of 20°C for the catchment as a whole. Maximum temperatures are usually experienced in January, and minimum temperatures occur on average in July.

8.3.2 Rainfall

The largest portion of the Limpopo Province has a mean annual rainfall of between 300 and 500 mm. The south-western part has an annual rainfall of up to 700 mm, and in the Lowveld, the rainfall can exceed 1 000 mm a year in places. The BLM, in which the projects will be located, is a hot area, with annual rainfall varying between 380 and 550mm. Most rainfall is experienced during the summer months. During the rainy season, a maximum of 8 to 12 rain days per month is typically expected, whilst in the dry season, a maximum of 1 rain day may be expected per month. The rainfall is mainly in the form of thunderstorms. Hail, which is often associated with thunderstorms, does occur during the hot summer months. In accordance with the rainfall patterns, the relative humidity is higher in summer than in winter. Humidity is generally highest in February (the daily mean ranges from 64% in the west to above 70% in the east). The average monthly precipitation is indicated in the figure below:

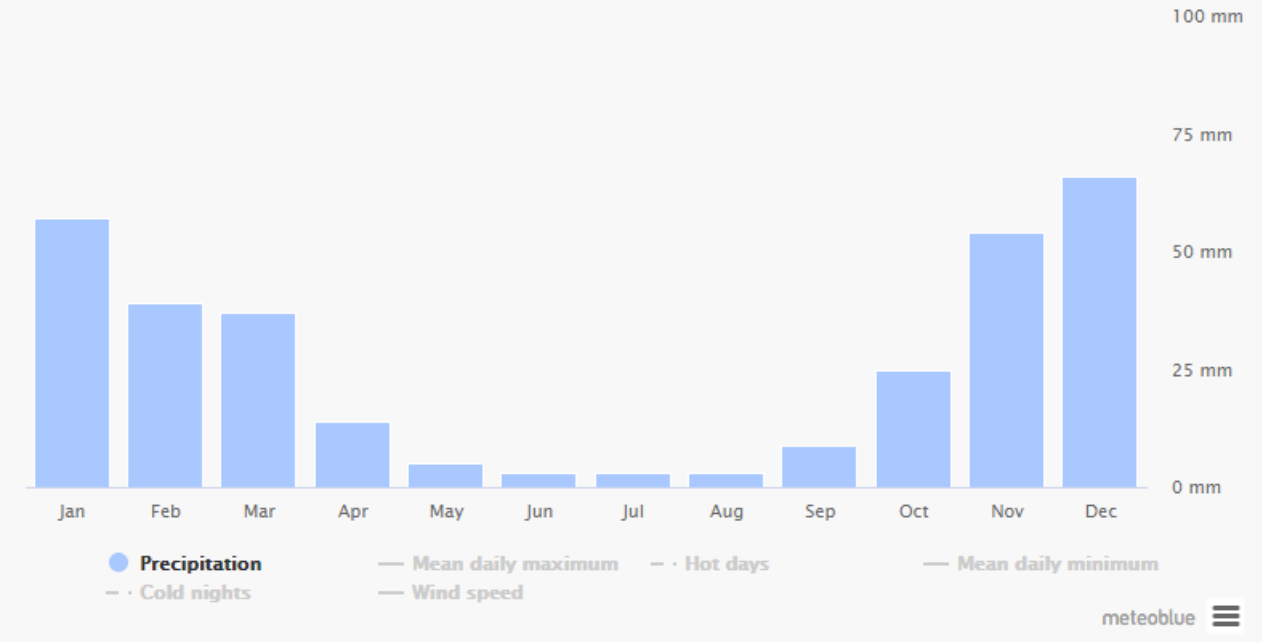


Figure 8-4: Precipitation

8.3.3 Temperature

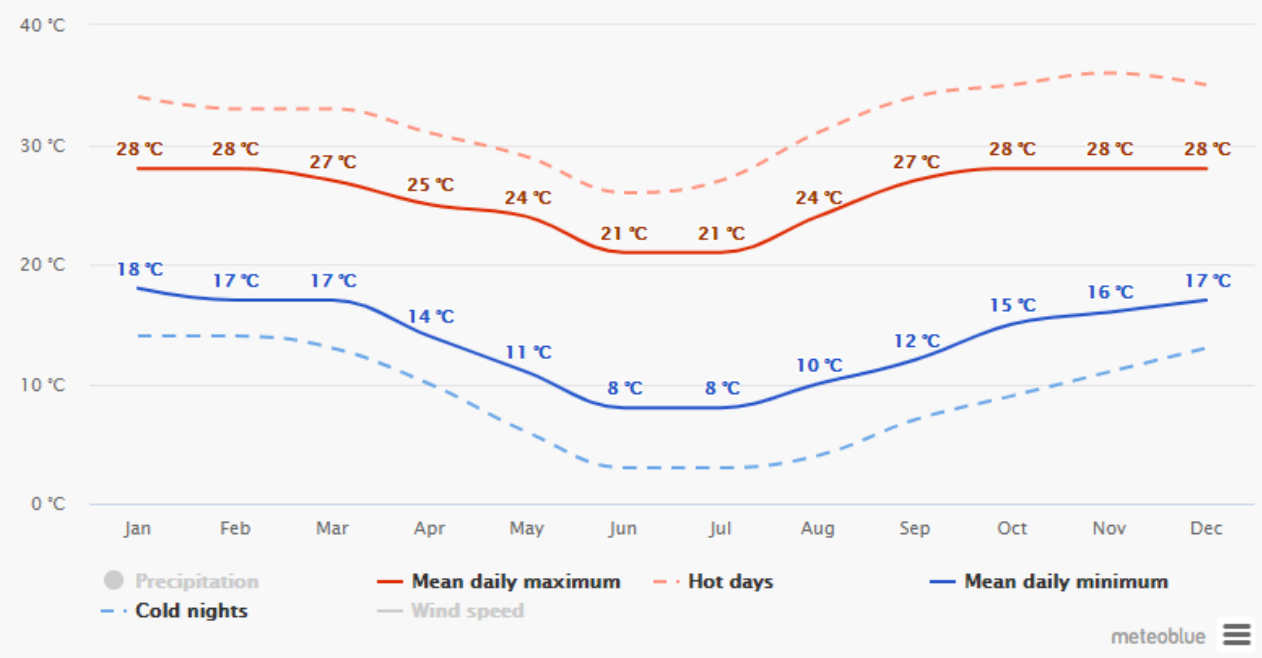


Figure 8-5: Minimum and Maximum Temperatures

The "mean daily maximum" (solid red line) shows the maximum temperature of an average day for every month for the project area. Likewise, "mean daily minimum" (solid blue line) shows the

average minimum temperature. Hot days and cold nights (dashed red and blue lines) show the average of the hottest day and coldest night of each month of the last 30 years.

8.3.4 Wind

The predominant wind direction is from north-northwest, with the secondary component from the northwest and west northwest. Contributions from the north and northeast quadrant are observed. Wind class frequency distribution per sector is given in Figure 8-6.

Wind speeds vary between 6 – 11 kilometers per hour.

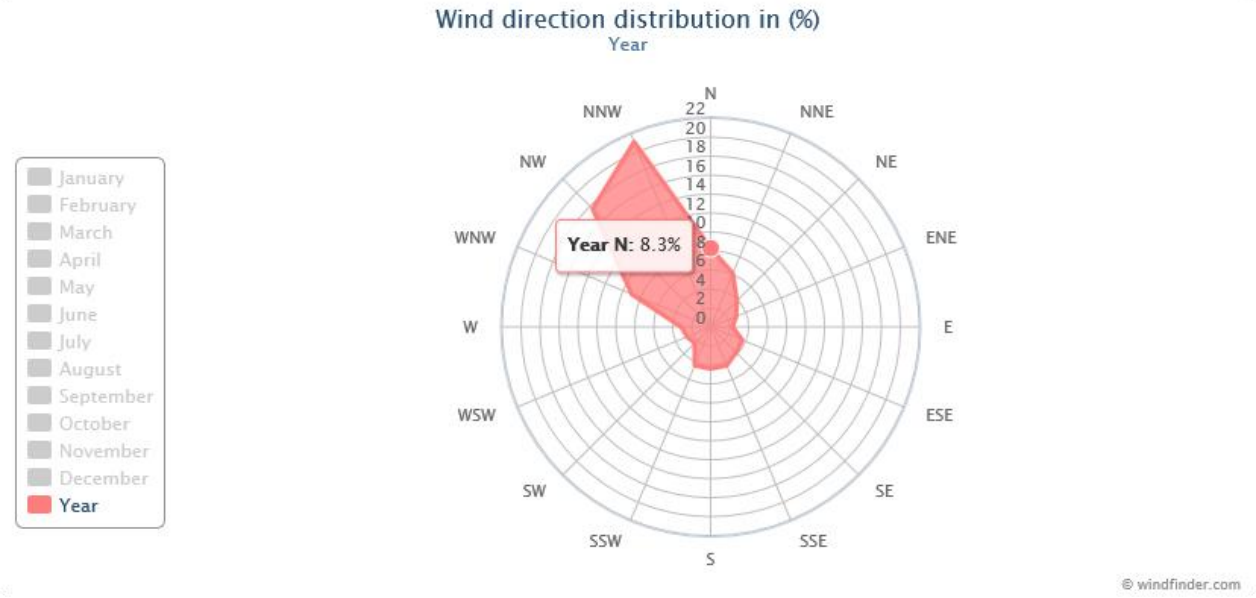


Figure 8-6: Wind direction distribution

8.3.5 Evaporation

As shown in Table 8-1: Annual maximum, minimum and average monthly evaporation, the annual maximum, minimum and average monthly evaporation rates for the project area averages at about 2 – 5mm per day. The highest monthly maximum evaporation (322 mm) occurs for October. The rate decreases significantly down to 109 mm in June. The monthly minimum evaporation ranges between 180 mm in October and 68 mm in April.

Table 8-1: Annual maximum, minimum and average monthly evaporation

Evaporation (mm)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Monthly max	289	262	224	190	223	244	257	261	288	322	277	320	289
Monthly min	88	120	93	68	79	70	85	111	155	180	178	128	88
Monthly ave	206	177	171	141	124	109	126	170	224	253	224	212	206

8.3.6 Extreme weather conditions

Thunderstorms occur frequently in summer and are usually accompanied by lightning, heavy rain, strong winds and occasional hail.

Periods of extreme heat during summer months occur frequently. This can be accompanied by drought conditions.

8.4 Soils and Land Capability

8.4.1 Soils

The dominant soils in the project area are soils with minimal development, usually shallow, on hard or weathering rock, with or without intermittent diverse soils of the Mispah and Glenrosa forms without lime. Soils are shallow, red or yellow coloured, eutrophic, well-drained and interspersed with numerous sections of conglomerate outcrops. Soils in drainage depressions are also predominantly red and only soils in watercourses exhibit structure and brown to dark brown colours.

8.4.2 Pre-Mining Land Use

Current Land use is subsistence grazing for livestock from the local Ga-Kibi Communities residing in Ga-Ramotsho (Voorhout) and Ga-Dankie (Royston) Communities.

Development in the immediate region is mainly limited to low-density residential dwellings and related outbuildings.

8.4.3 Land Capability

Land Capability is evaluated in 8 classes as depicted in the table below:

Table 8-2: Land capability classes for assessment of land

Land Capability Class	Definition	Conservation Need	Use suitability
I	No or few limitations. Very high arable potential. Very low erosion hazard.	Good agronomic practice.	Annual cropping
II	Slight limitations. High arable potential.	Low erosion hazard. Adequate run-off control.	Annual cropping with special tillage or ley (25%)
III	Moderate limitations. Some erosion hazards.	Special conservation practice and tillage methods.	Rotation of crops and ley (50 %).
IV	Severe limitations. Low arable potential. High erosion hazard.	Intensive conservation practice.	Long term leys (75 %)
V	Watercourse and land with wetness limitations.	Protection and control of water table.	Improved pastures or Wildlife
VI	Limitations preclude cultivation. Suitable for perennial vegetation.	Protection measures for establishment e.g. Sodseeding	Veld and/or afforestation
VII	Very severe limitations. Suitable only for natural vegetation.	Adequate management for natural vegetation.	Natural veld grazing and afforestation
VIII	Extremely severe limitations. Not suitable for grazing or afforestation.	Total protection from agriculture.	Wildlife

The project area is located within category VII which is non-arable, grazing and woodland. The figure below indicates land capability in the broader region.

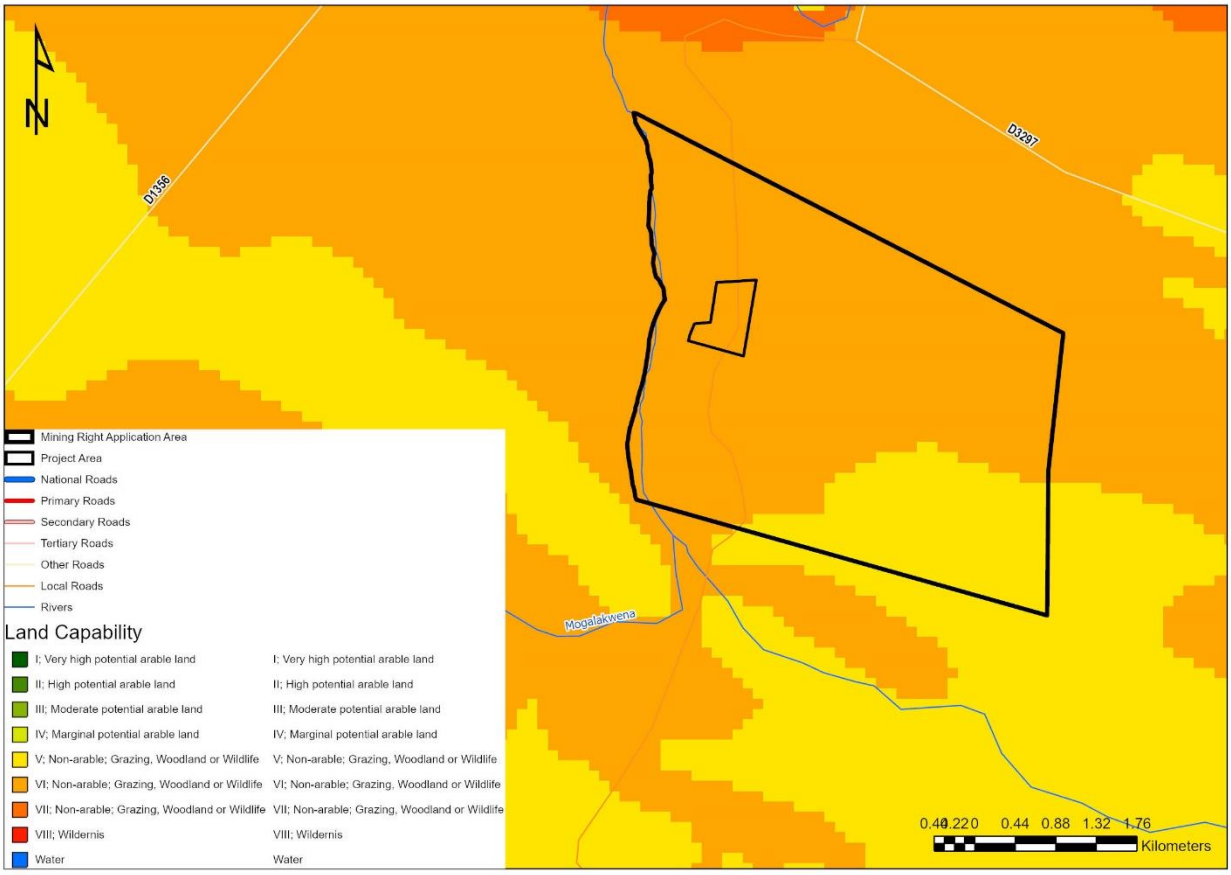


Figure 8-7: Land Capability

8.5 Terrestrial Ecology

8.5.1 Conservation Characteristics

Based on the preliminary desktop assessment, the proposed study area is not located within any protected areas, or threatened ecosystems. The study area is considered important for meeting biodiversity targets in Limpopo seeing that it falls within a Critical Biodiversity Area 2 (CBA2). The CBA 2 primarily refers to the Mogalakwena river corridor and the aquatic sensitivity of this area.

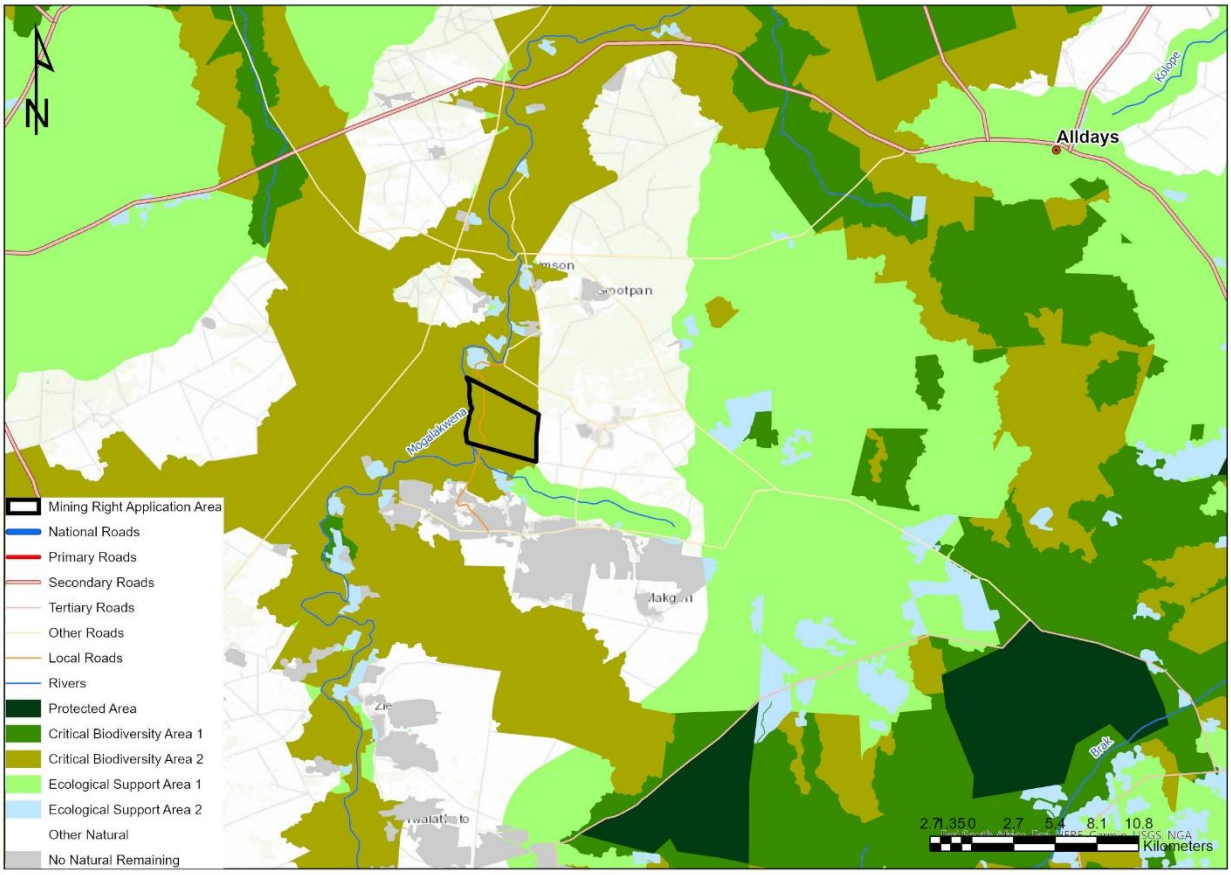


Figure 8-8: Limpopo Conservation Plan 2

There is further no Important Bird and Biodiversity Areas (IBA) located within 10 km of the study area.

8.5.2 Flora

Except for the riverine area the total study area consists mostly of one large woodland vegetation unit but has been divided into two vegetation units based mainly on the topography and the soil present namely: 1) Low-lying woodland; 2) Rocky woodland, and 3) Riverine area

Table 8-3: Vegetation Types

Type	Low-lying woodland (Unit 1)	Rocky woodland (Unit 2)	Riverine area (Unit 3)
Status	Degraded woodland (68.7 ha of MRA)	Natural encroached woodland (78.5 ha of MRA)	Mostly natural (10.4 ha)
Vegetation Structure	Open to closed woodland	Dense woodland	Tall riverine forest
Topography	Level to slight southern slopes (30)	Level to undulating	River valley
Soil	Shallow rocky	Shallow rocky - sodic	Deep clay and sand
Rock cover	10%	10-35%	5%
Need for rehabilitation	Medium-high	Medium	Medium
Conservation Priority	Low-medium	Medium	High
Typical Species	Terminalia prunelloides, Dichrostachys cinerea, Grewia flava, Grewia flavescens, Vachellia tortilis and Dovyalis caffra are prominent throughout this unit in the woody layer. The herbaceous layer is sparse and include the grasses Enneapogon scoparius, Schmidtia pappophoroides, Aristida stipitata and the forbs Blepharis subvolubilis, Evolvulus alsinoides, Thesium utile, Bidens pilosa, Sansevieria aethiopica, Kyphocarpa angustifolia and Ipomoea crassipes.	Wooded species: Vachellia tortilis, Terminalia prunelloides, Dichrostachys cinerea, Catophractes alexandri, Vachellia robusta, Senegalia senegal, while Senegalia nigrescens, Combretum apiculatum and Cadaba aphylla are locally prominent. The herbaceous layer is degraded though patches of the grasses Enneapogon scoparius, Schmidtia pappophoroides and Eragrostis lehmanniana Forb Species: Hermbstaedtia odorata, Indigofera filipes, Leonotis ocymifolia, Chenopodium album and Selaginella dregei.	Trees: Combretum erythrophyllum, Faidherbia albida, Ficus sur, and Senegalia ataxacantha, while the tree Ziziphus mucronata is prominent. Herbaceous layer is degraded with the alien invasive weed Ricinus communis and Xanthium strumarium forming dense clumps all along the embankments. Other species present include the woody species Senegalia erubescens, Gymnosporia buxifolia, Terminalia prunelloides, the grasses Brachiaria deflexa, Panicum maximum, Urochloa panicoides, and the forbs Alternanthera pungens, Gomphocarpus fruticosus, and Gomphrena celosioides.
Red Data Species	No red data species or suitable habitat were found within this unit, and it is unlikely that such species would be present due to the degraded condition thereof.	No red data species were found within this unit, and it is not thought that the habitat is suitable for such species due to the degraded herbaceous layer.	No red data species were noted within this unit.
Protected Species	One protected tree species, Boscia albitrunca was found within this unit.	Boscia albitrunca	

Type	Low-lying woodland (Unit 1)	Rocky woodland (Unit 2)	Riverine area (Unit 3)
Alien Plant Species	Opuntia stricta	Opuntia stricta	Crotalaria agatiflora, Verbena bonariensis, Ricinus communis, Xanthium strumarium
Medicinal Species			Gomphocarpus fruticosus, Ziziphus mucronata

The figure below indicates the location of the units.

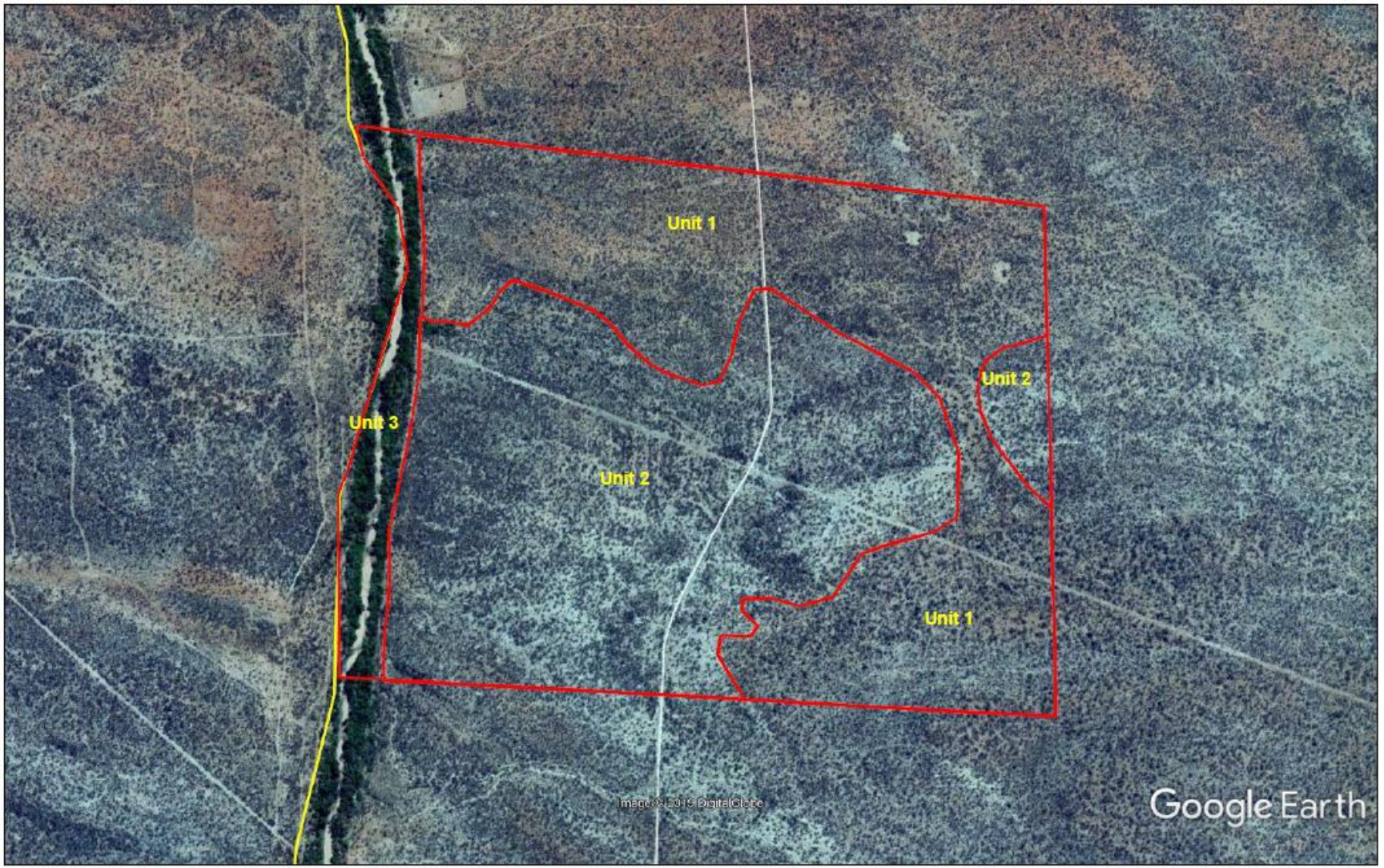


Figure 8-9: Vegetation types and distribution

8.5.3 Fauna

The current land use on the farm is that of cattle grazing. The following species may occur in the study area:

- **Amphibians**:
  - Bushveld Rain Frogs (*Breviceps adspersus*), Tremelo Sand Frogs (*Tomopterna cryptotis*), Olive Toad (*Sclerophrys garmani*), Snoring Puddle Frogs (*Phrynobatrachus natalensis*), Banded Rubber Frogs (*Phrynomantis bifasciatus*), Common Caco (*Cacosternum boettgeri*), Tremelo Sand Frogs (*Tomopterna cryptotis*), Common Platanna (*Xenopus laevis laevis*) and Guttural Toads (*Sclerophrys gutturalis*), Southern Foam Nest Frog (*Chiromantis xerampelina*), Plain Grass Frog (*Ptychadena anchietae*).
- **Reptiles**:
  - The degraded Senegalia nigrescens-Terminalia prunoides sweet Bushveld with scattered logs and rocks offers suitable habitat for Cape Gecko (*Pachydactylus capensis*), Transvaal Thick-toed Gecko (*Pachydactylus affinis*), Eastern ground Agama (*Agama aculeata distanti*), Variable Skink (*Trachylepis varia*), Striped Skink (*Trachylepis striata*), Speckled Rock Skink (*Trachylepis punctatissima*), Rainbow Skink (*Trachylepis margaritifer*), Cape Skink (*Trachylepis capensis*), Yellow-throated Plated Lizard (*Gerrhosaurus flavigularis*), Spotted Sand Lizard (*Pedioplanis lineoocellata lineoocellata*), Spotted Sandveld Lizard (*Nucras intertexta*), Common Rough Scaled or Savanna Lizard (*Meroles squamulosus*). The sand soils, rocky outcrops on the site and logs provide suitable habitat for the fossorial Sundevall's Writhing Skink (*Mochlus sundevallii sundevallii*).
  - The adjacent rocky hill to the south of the mining site, as well as low-lying rocky extrusions, provide suitable habitat for rupicolous (living on or amongst rocks) reptile species including several species of snakes, skinks and geckos such as Turner's Gecko (*Pachydactylus turneri*). Snake species likely to occur include Bibron's Blind Snake (*Afrotyphlops bibronii*), Boomslang (*Dispholidus typus*), Spotted Bush-Snake (*Philothamnus semivariegatus*), Puff Adder (*Bitis arietans arietans*), Horned adder (*Bitis caudalis*), Southern African Python (*Python natalensis*), Western Yellow-bellied Sand Snake (*Psammophis subtaeniatus*) Striped Grass Snake (*Psammophylax tritaeniatus*), Mole Snake (*Pseudaspis cana*), Black Mamba (*Dendroaspis polylepis*), Snouted Cobra (*Naja annulifera*), Mozambique Spitting

Cobra (*Naja mossambica*), Common House Snake (*Boaedon capensis*), Rhombic Egg-Eater (*Dasypeltis scabra*) and Rhombic Night Adder (*Causus rhombeatus*).

- The closed woodland riparian zone including the flood-bench of the Mogalakwena River provides suitable habitat for arboreal reptile species including Southern Tree Agama (*Acanthocercus atricollis*), Common Dwarf Gecko (*Lygodactylus capensis capensis*), Flap-necked Chameleon (*Chamaeleo dilepis dilepis*), Spotted Bush Snake (*Philothamnus semivariegatus*), Boomslang (*Dispholidus typus typus*). The termite mounds within the closed riparian woodland, as well as seasonal pools, provides suitable habitat for the "protected' Southern African Python (*Python natalensis*), Nile Monitor (Varanus niloticus) as well as White-throated or Southern Rock Monitor (*Varanus albigularis*). The pools within the Mogalakwena River provide suitable habitat for Cape or Marsh Terrapin (*Pelomedusa subrufa*).

- **Mammals**
  - Larger carnivores likely to occur in the area especially within the adjacent private conservation areas include Leopard (*Panthera pardus*), Brown Hyaena (*Parahyaena brunnea*), Caracal (*Caracal caracal*), Serval (*Leptailurus serval*), Honey Badger (*Poecilogale albinucha*), and Blacked-backed Jackal (*Canis mesomelas*). Antelope species likely to be recorded from the study area include Kudu (*Tragelaphus strepsiceros*), Bushbuck (*Tragelaphus scriptus*), Impala (*Aepyceros melampus*), Reedbuck (*Redunca arundinum*), Grey Rhebok (*Pelea capreolus*), Klipspringer (*Oreotragus oreotragus*), Steenbok (*Raphicerus campestris*) and Bush Duiker (*Sylvicapra grimmia*). The population sizes will depend on the current levels of hunting and poaching within the site and adjacent neighbouring properties.
  - Mammal species recorded within the Mogalakwena River and riparian zone included Kudu (*Tragelaphus strepsiceros*), Bushbuck (*Tragelaphus scriptus*), Steenbok (*Raphicerus campestris*) and Common Duiker (*Sylvicapra grimmia*). A Scrub hare (*Lepus saxatilis*) was flushed from a small Senegalia erubescens. The quills of a Cape Porcupine (*Hystrix africaeaustralis*) were observed within the closed riparian woodland. Abandoned Warthog (*Phacochoerus aethiopicus*) burrows were observed within the site as well as digging activities within the active channel of the Mogalakwena River. The majority of the larger mammals will use the site on a transient basis and due to high levels of anthropogenic disturbances associated with the livestock grazing and hunting are not resident.
  - The rocky hill to the south of the proposed mining area and low-lying rocky extrusions or outcrops provide suitable habitat for several rupicolous mammal species such as

Namaqua Rock Mouse (*Aethomys namaquensis*), Spiny Mouse (*Acomys spinosissimus*), Eastern Rock Elephant Shrew (*Elephantulus myurus*) and Chacma Baboon (*Papio ursinus*). Rodent species likely to occur within the open woodlands on the site include Tree Squirrel (*Paraxerus cepapi*), Springhare (*Pedetes capensis*), Bushveld Gerbil (*Tatera leucogaster*), Acacia Rat (*Thallomys paedulcus*), Black-tailed Rat (*Thallomys nigricauda*), Southern Multimammate Mouse (*Mastomys coucha*), Striped mouse (*Rhabdomys pumilio*), Namaqua Rock Mouse (*Micaelamys namaquensis*), Woodland Dormouse (*Graphiurus murinus*), Red Veld Rat (*Aethomys chrysophilus*). Bat species recorded from the area include Egyptian Free-tailed Bat (*Tadarida aegyptiaca*), Rusty Pipistrelle (*Pipistrellus rusticus*), Cape serotine bat (*Eptisecus capensis*), Schreiber's Long-fingered Bat (*Miniopterus schreibersii*), Yellow House Bat (*Scotophilus dinganii*), Common Slit-faced Bat (*Nycteris thebaica*). No bat surveys are planned during the faunal habitat assessment.

- Avifauna
  - The savanna biome, and specifically short open woodland as well as thickets of Senegalia erubescens, Senegalia mellifera and Dichrostachys cinerea, is particularly well represented in the study area. The degraded short open woodland tends to have fewer species than the adjacent tall moist closed woodland or riparian zone of the Mogalakwena River. Whilst much of the distribution and abundance of the bird species in the study area can be explained by the description of vegetation types above, it is even more important to examine the microhabitats available to birds.
  - Recent records of Cape Vulture and Whitebacked Vulture from the 2245_2845 pentad during the current South African Bird Atlas Project (SABAP2). Apart from Red Data species, the study area provides habitat for several non-Red Data raptor species, such as Wahlberg's Eagle, African Hawk Eagle, Steppe Eagle, Brown Snake Eagle, Black-chested Snake-Eagle and a multitude of medium-sized raptors, for example, the migratory Steppe Buzzard, Gabar Goshawk, Dark Chanting Goshawk, Southern pale Goshawk African Goshawk, African Harrier Hawk (Gymnogene),. The smaller raptors observed included a Little Sparrowhawk foraging within the closed woodland, riparian zone. The degraded short open woodland offers suitable habitat for the migratory European Roller which is listed as 'Near-threatened'.
  - The Mogalakwena River and closed wooded riparian zone (flood-bench) are important habitats for remaining birds in the area. The Mogalakwena River and closed wooded riparian zone offer suitable habitat for African Fish Eagle and stork species such as African

Openbill, Marabou Stork, Black Stork and Yellowbilled Stork and a variety of other waterbirds. The riparian habitat along the Mogalakwena River provides refuge for shy and skulking species such as the African Finfoot and possibly Whitebacked Night Heron. The eroded macro-channel banks of the Mogalakwena River could provide favourable nesting, foraging and dispersal habitat for the Half-Collared Kingfisher.

8.6 Aquatic Ecosystems

8.6.1 Catchment

The Project area is located Drainage Region A, within the Limpopo WMA and the Mogalakwena River Catchment – A6 (figure below), more specifically within Quaternary Catchment A63B.

The Mogalakwena catchment has limited surface water resources but large groundwater resources, which have already been extensively exploited by the irrigation sector. There is a rapid expansion of mines in the area, and the water supply to these mines must be secured as a matter of priority. Additional water resources are groundwater and transfers from the Olifants River catchment.

8.6.2 Freshwater Features

The project area has no watercourses present on it, but the Mogalakwena River passes to the west of the project site.

In terms of the National Freshwater Ecosystem Priority Areas of South Africa, the Mogalakwena River has a Present Ecological state of Largely Modified.

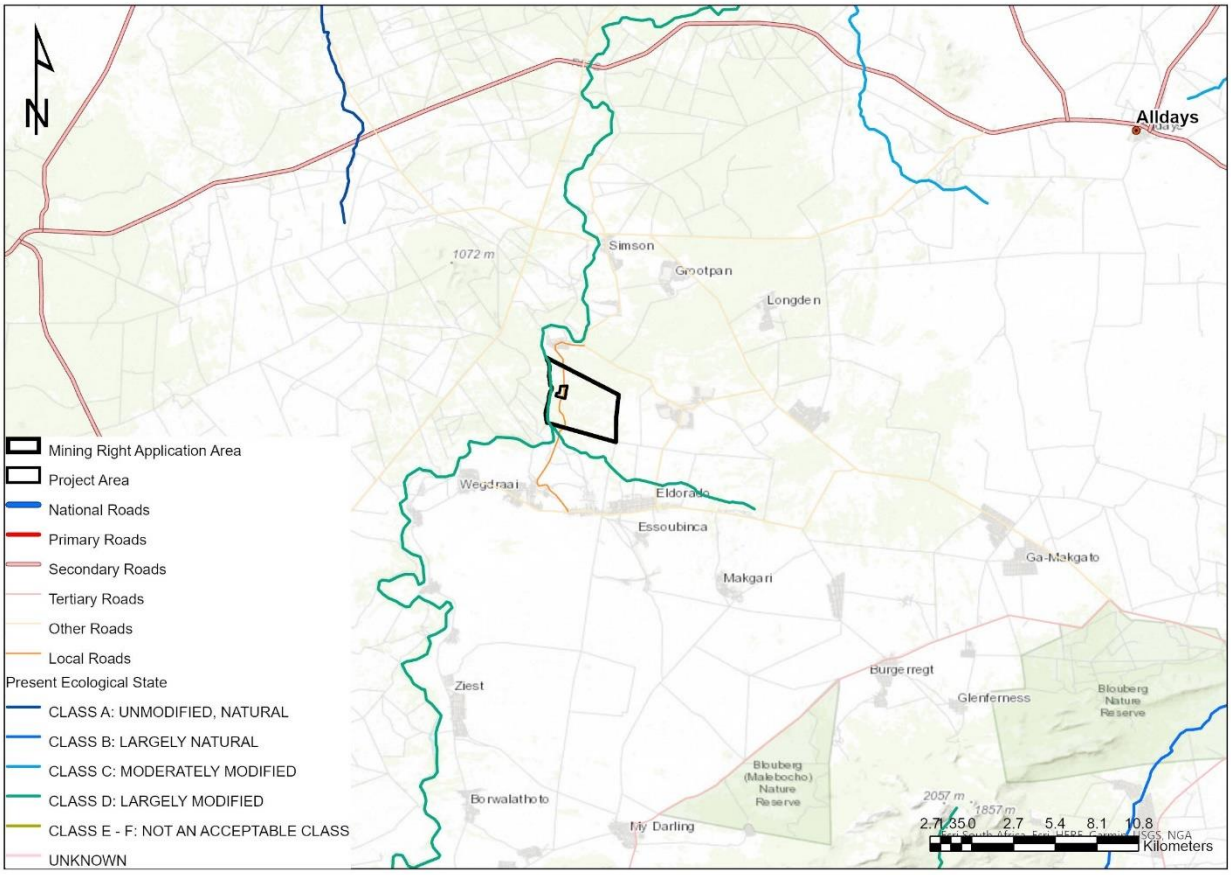


Figure 8-10: NFEPA Rivers

8.6.3 Surface Water Quality

This part of the catchment is populated with rural settlements that are mainly supplied from groundwater. This poses a risk for surface water quality, as well as groundwater quality due to the high concentration of pit latrines. This can lead to long-term contamination of underlying aquifers with E.coli and nitrate as well as unsafe concentrations of bacteria, viruses and chemicals. Large scale irrigation around the dams in this catchment can lead to deterioration of water quality due to runoff of potential agrochemical pollutants into the water source.

8.6.4 Mean Annual Runoff

The mean annual run-off (MAR) for the catchment is 5.4, and the mean annual precipitation (MAP) is 393.9mm.

8.6.5 Flood Lines, Peaks and Volumes

The flood lines for the Mogalakwena River will be determined during the EIA phase. The map below indicates the 500m buffer.

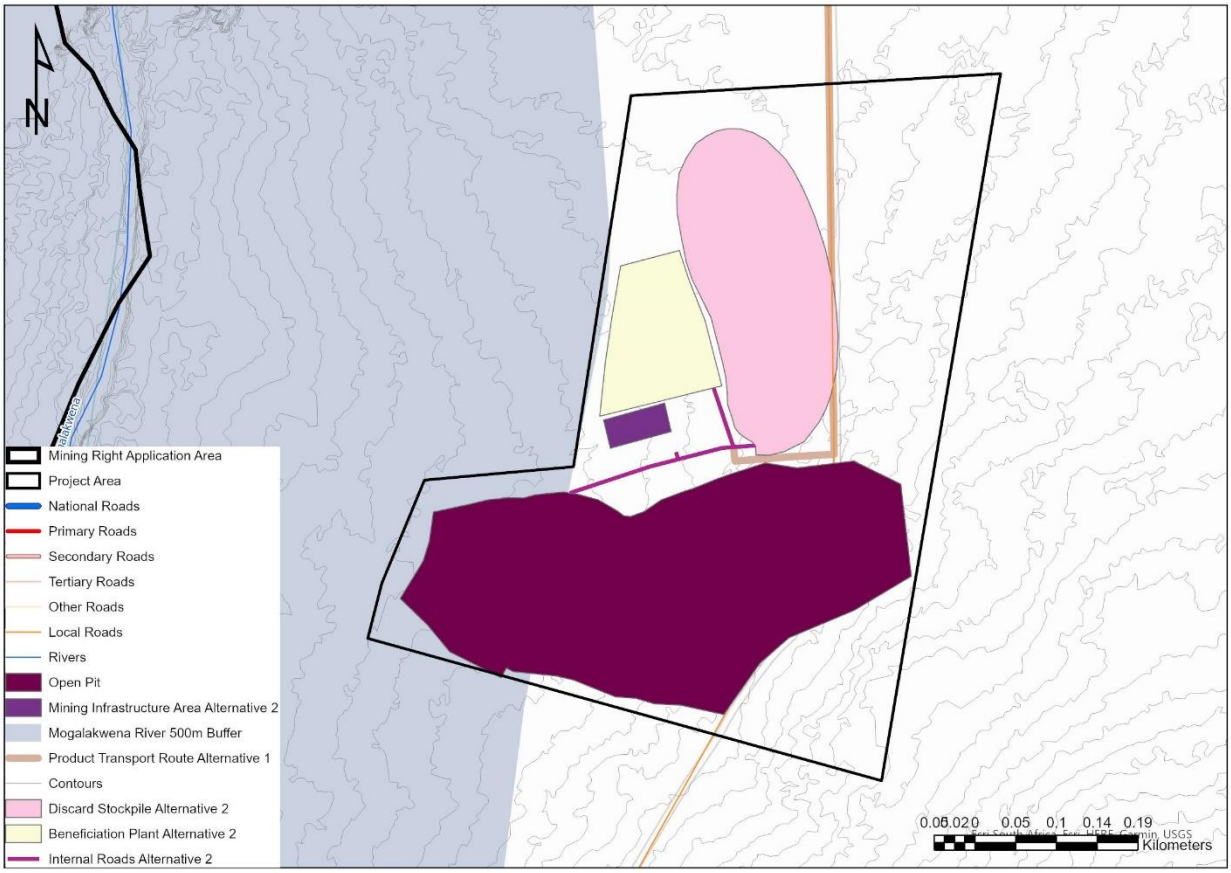


Figure 8-11: Mogalakwena river with 500m Buffer

8.6.6 River Diversions

No river diversions are considered.

8.6.7 Water Authority

Department of Water and Sanitation: Limpopo Regional Office.

8.6.8 Surface Water Use

Current neighbouring surface water use is largely domestic and livestock use. Irrigation takes place to the north, downstream from the project area.

8.6.9 Wetlands

No evidence of any natural wetlands such as valley bottom wetlands or seasonal pans/depressions were observed on the site.

8.7 Groundwater

8.7.1 Groundwater Use

Local communities surrounding the project area utilise groundwater for domestic water supply as well as livestock watering and subsistence arable farming.

8.7.2 Hydrocensus

A hydrocensus will be conducted and the results presented in the EIA Report.

8.7.3 Groundwater Quality

The general water quality in the BLM is marginal to poor with mean Total Dissolved Solids (TDS) of 843.8 mg/l. The high salt content reduces water quality, in terms of the South African National Standards drinking water quality guidelines, to Class 2 due to elevated chloride, sodium and fluoride. In some cases, elevated magnesium and nitrates reduce the quality further (Class 3). Water quality is influenced by the underlying geology and the impact of human activities in the surrounding communities.

Groundwater is threatened by naturally occurring fluorides emanating from the underlining granite in some areas. The wide-spread use of pit latrines may also have an influence on groundwater quality.

8.7.4 Aquifer Types

The geology the BLM is predominantly from the Swazian era, consisting of Alldays gneiss, with portions of Mount Dowe Quartzite and Messina Anorthosite, Serpentinite and Pyroxinite. The lithology is described as undifferentiated rocks of various mixed lithologies, predominantly meta-arenaceous rocks. Groundwater occurs in the intergranular and fractured rocks.

8.7.5 Groundwater Levels

Regionally, the water table of the BLM ranges between 5 – 20m below ground level and groundwater flow is generally in a south-south-westerly direction, at a velocity of less than 1 m/day. The formation below 50m contains very little water and below 250m may be considered dry.

8.7.6 Groundwater Recharge

The project area is dominated by an Intergranular and fractured aquifer, which has an approximate recharge of 0.1 – 0.5 litres per second. To the north and south of the project area is an aquifer with a potential recharge of 0.5 – 2.0 litres per second

8.8 Air Quality

8.8.1 National Ambient Air Quality Standards

Air quality guidelines and standards are fundamental to effective air quality management, providing the link between the source of atmospheric emissions and the user of that air at the downstream receptor site. The ambient air quality guideline values indicate safe daily exposure levels for the majority of the population, including the very young and the elderly, throughout an individual's lifetime. Air quality guidelines and standards are normally given for specific averaging periods. These averaging periods refer to the time-span over which the air concentration of the pollutant was monitored at a location. Generally, five averaging periods are applicable, namely an instantaneous peak, 1-hour average, 24-hour average, 1-month average, and annual average. The Department of Environmental Affairs and Tourism issued ambient air quality guidelines to support receiving environment management practices. Ambient air quality guidelines are only available for such criteria pollutants which are commonly emitted, such as Particulates, SO2, Pb, NOx, benzene and CO. The guidelines specific to the relevant pollutants during this assessment are detailed in the sections below.

8.8.2 Particulate matter

Particulate matter is the collective name for fine solid or liquid particles added to the atmosphere by processes at the earth's surface. Particulate matter includes dust, smoke, soot, pollen and soil particles. Particulate matter has been linked to a range of serious respiratory and cardiovascular health problems. The key effects associated with exposure to ambient particulate matter include

premature mortality, aggravation of the respiratory and cardiovascular disease, aggravated asthma, acute respiratory symptoms, chronic bronchitis, decreased lung function, and an increased risk of myocardial infarction.

Particulate matter represents a broad class of chemically and physically diverse substances. Particles can be described by size, formation mechanism, origin, chemical composition, atmospheric behaviour and method of measurement. The concentration of particles in the air varies across space and time and is related to the source of the particles and the transformations that occur in the atmosphere.

Particulate Matter can be principally characterised as discrete particles spanning several orders of magnitude in size, with inhalable particles falling into the following general size fractions:

- PM_{10} (generally defined as all particles equal to and less than 10 microns in aerodynamic diameter; particles larger than this are not generally deposited in the lung);
- $PM_{2.5}$, also known as fine fraction particles (generally defined as those particles with an aerodynamic diameter of 2.5 microns or less)
- $PM_{10\text{-}2.5}$, also known as coarse fraction particles (generally defined as those particles with an aerodynamic diameter greater than 2.5 microns, but equal to or less than a nominal 10 microns); and
- Ultra-fine particles generally defined as those less than 0.1 microns.
- Fine and coarse particles are distinct in terms of the emission sources, formation processes, chemical composition, atmospheric residence times, transport distances and other parameters. Fine particles are directly emitted from combustion sources and are also formed secondarily from gaseous precursors such as sulphur dioxide, nitrogen oxides, or organic compounds. Fine particles are generally composed of sulphate, nitrate, chloride and ammonium compounds, organic and elemental carbon, and metals.

Table 8-4: Ambient air quality standards and guidelines for particulate matter

Pollutant	Averaging period (µg/m^3)	Guideline (µg/m^3)	Number of Exceedance Allowed Per Year
PM_{10}	Daily average	75	4 4
	Annual average	40	0 0
$PM_{2.5}$	Daily average	65 (1) 40 (2) 25 (3)	4 4 4
	Annual average	25 (1) 20 (2) 15 (3)	0 0 0

Notes: 1 – Come into effect immediately until December 2015

2 – Come into effect 1 January 2016 until 31 December 2029

3 – Come into effect 1 January 2030

8.8.3 Nuisance Dust

On the 7th of December 2012, the Minister of Water and Environmental Affairs published the new National Dust Control Regulations. This document now enforces the monitoring of dust fallout from activities that are suspected of contributing significantly to dust fallout in its region. The regulation provides a set standard for dust fallout to comply to, enforces that a baseline should be established

to projects that would give rise to increased dust fallout, specifications for dust fallout monitoring and the format of reports if the activity should exceed the thresholds.

If an activity exceeds the standard, the entity must submit a dust monitoring report to the air quality officer (local authority), before December 2013 (Section 4, GN1007 of 2012). The entity must develop a dust management plan, within three months after the submission of a dust monitoring report (Section 5, GN1007 of 2012). If the dust fallout is continued to be exceeded, the authority may request that continuous PM10 monitoring be conducted at the site.

Table 8-5: Acceptable Dust fallout rates as measured at and beyond the boundary of the premises where dust originates

Restriction area	Dustfall rate, D (mg/m^2/day, 30-day average)	Comment
Residential	D < 600	Two within a year, not sequential months.
Non-residential	600 < D < 1200	Two within a year, not sequential months.

8.8.4 Existing sources of pollution

Currently, a detailed emissions inventory for the area under investigation has not been undertaken. Based on an aerial photo and site description of the area, the following sources of potential air pollution have been identified:

- Veld fires;
- Domestic fuel burning;
- Vehicle entrainment; and
- Agriculture;

A qualitative discussion on each of these source types is provided in the subsections which follow. These subsections aim to highlight the possible extent of cumulative impacts which may result due to the proposed operations.

8.9 Noise

Potential background noise at the project site can be attributed to the following:

- Vehicles using the gravel road that extends through the site as well as other gravel roads in the immediate area; and
- Agricultural activities associated with the various farms on-site and the immediate surrounding area;

8.10 Traffic

Will be confirmed during the EIA phase.

8.11 Sensitive Landscapes

Sensitive landscapes are identified as the Critical Biodiversity Area 2, site verification of the sensitivity of the site will be conducted in the EIA phase.

8.12 Sites of Archaeological and Cultural Interest

Will be confirmed during the EIA phase.

8.13 Socio-economic Structure

8.13.1 Demographics

The BLM will include the local mine communities, local employees within these communities, as well as local suppliers. The population of BLM is estimated at a total of 172,602 people, where 45% are male, and 55% are female.

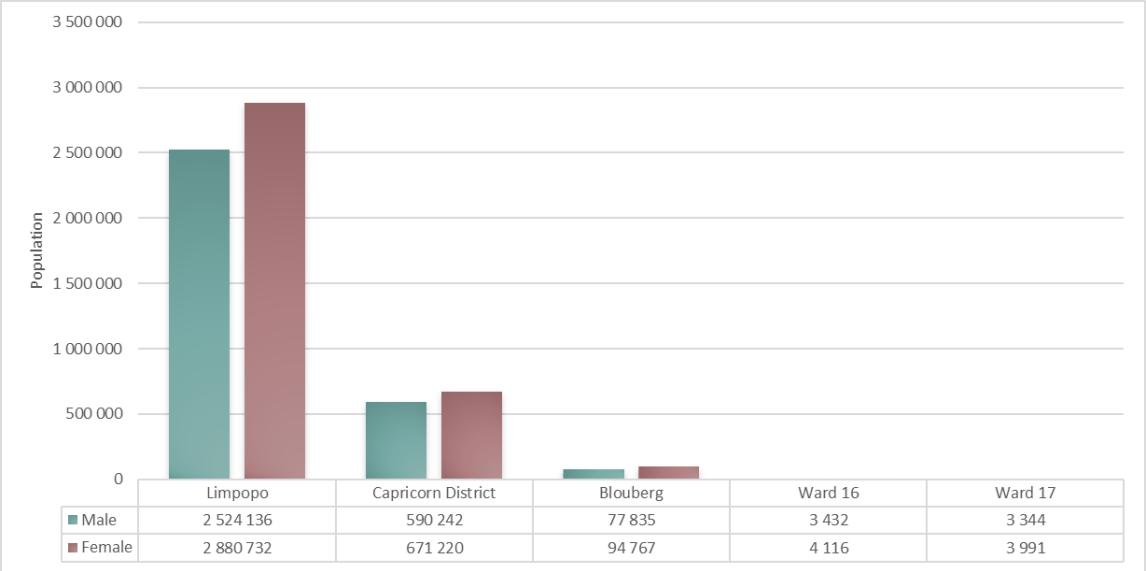
Table 8-6: Population and households

AREA	POPULATION	HOUSEHOLDS	MEMBERS PER HOUSEHOLD
Limpopo	5,404,868	1,418,100	3.8
Capricorn District	1 330 436	378 301	3.5
Blouberg	172 602	43 747	3.9
Ward 16	7 548	1 855	4
Ward 17	7 334	1 830	4

Spatially, Blouberg is the largest municipality within the Capricorn DM. Yet, the total population of 172,602 (Community Survey, 2016) accounts for only 12% of the District's population and 11.5% of its household numbers. The population in Capricorn DM has increased by 0.95% from 1 261 462 in 2011. The population of Blouberg declined from 194 119 in 2007 to 175 085 in 2011, thereafter declined further to 172 602 in 2016. Of the four constituent municipalities of Capricorn District, Blouberg is the only municipality that saw a decline in its population. This decline can be attributed to among other things, the low fertility rate, high mortality rate compared to birth rate or the out-migration by the economically active population to the industrial centres such as Polokwane and Gauteng to seek better economic prospects. Households, however, had increased steadily over the past 20 years from 33 468 in 2001 to 43 747 in 2016. Household sizes decreased from an average of 5 members per household in 2001 to 4 members per household in 2016.

The majority (98%) of the people in the Blouberg LM are Black African of whom the majority stay in the rural tribal areas. Sepedi is the language most spoken in the LM.

8.13.2 Gender Profile



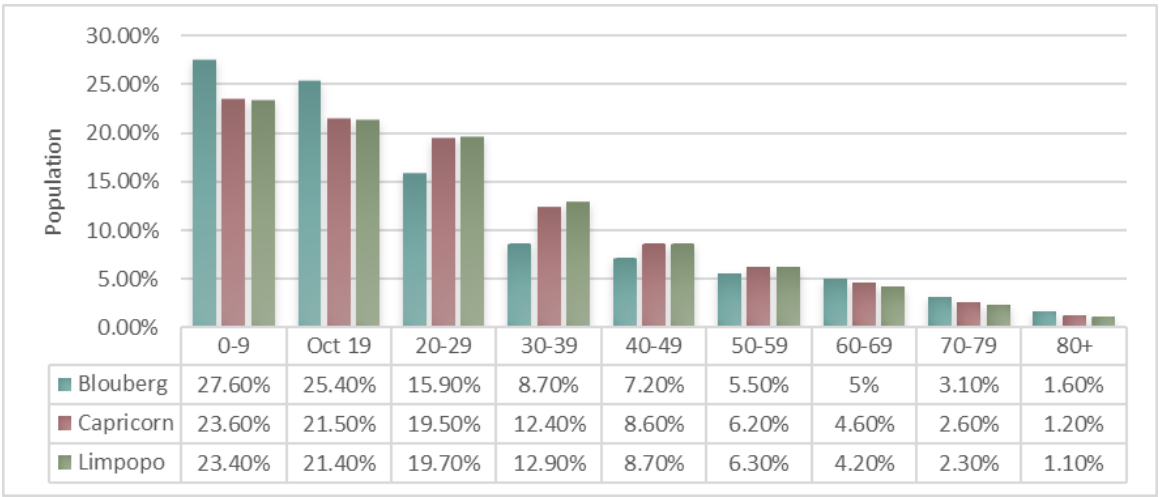
	Limpopo	Capricorn District	Blouberg	Ward 16	Ward 17
Male	2 524 136	590 242	77 835	3 432	3 344
Female	2 880 732	671 220	94 767	4 116	3 991

Figure 8-12: Gender Profile

The predominant gender in the CDM and Blouberg LM is female. In the Blouberg LM, the female population (55%) exceeds the male population (45%). The gender distribution in Ward 16 consists of 45.5% males and 54.5% females.

8.13.3 Age Profile

The age structure in CDM and Blouberg LM has remained relatively constant since 2011. However, there has been a slight increase in the number of young people (0-9 years) in the local municipality. The number of older adults in the District has decreased slightly.



	0-9	Oct 19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Blouberg	27.60%	25.40%	15.90%	8.70%	7.20%	5.50%	5%	3.10%	1.60%
Capricorn	23.60%	21.50%	19.50%	12.40%	8.60%	6.20%	4.60%	2.60%	1.20%
Limpopo	23.40%	21.40%	19.70%	12.90%	8.70%	6.30%	4.20%	2.30%	1.10%

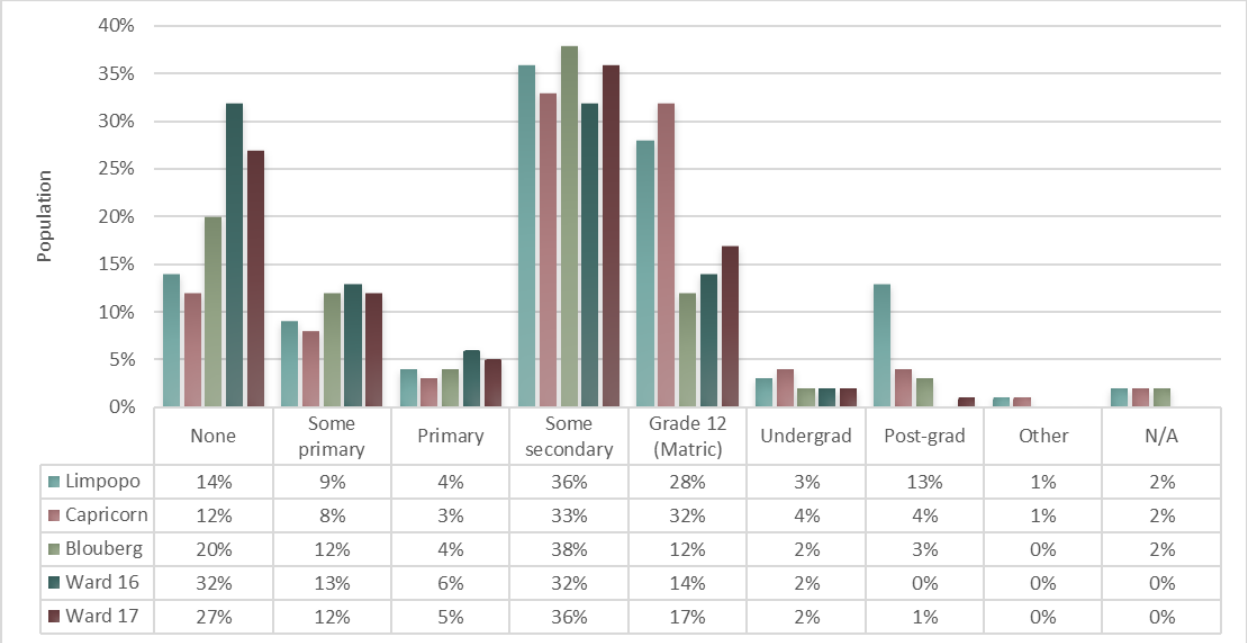
Figure 8-13: Age Profile

The younger generation (aged between 10 and 39 years) make up the majority of the people living in the Blouberg LM (50%), followed by the group between the ages of 0 and 9 years with 27.6%. The majority of people in Ward 16 are aged 10 – 19 years (29%), followed by 0 – 9 years (28%) and 20 – 29 years (13%). The majority of people in Ward 17 are aged 0 – 9 years (30%), followed by 10 – 19 years (27%) and 20 – 29 years (12%).

The population in the DM area is characterised by a high dependency ratio (53.5%). 45.1% of the population are within the ages of 0 to 19 and 8.4% are over 65 years old. The implications of this population structure are higher demand for the provision of social and physical facilities, like schools, primary health care centres, etc.

8.13.4 Education Profile

In terms of Education levels, 30% of the population is currently passed Matric. Apart from this group, the balance of the population has the following education profile:



	None	Some primary	Primary	Some secondary	Grade 12 (Matric)	Undergrad	Post-grad	Other	N/A
Limpopo	14%	9%	4%	36%	28%	3%	13%	1%	2%
Capricorn	12%	8%	3%	33%	32%	4%	4%	1%	2%
Blouberg	20%	12%	4%	38%	12%	2%	3%	0%	2%
Ward 16	32%	13%	6%	32%	14%	2%	0%	0%	0%
Ward 17	27%	12%	5%	36%	17%	2%	1%	0%	0%

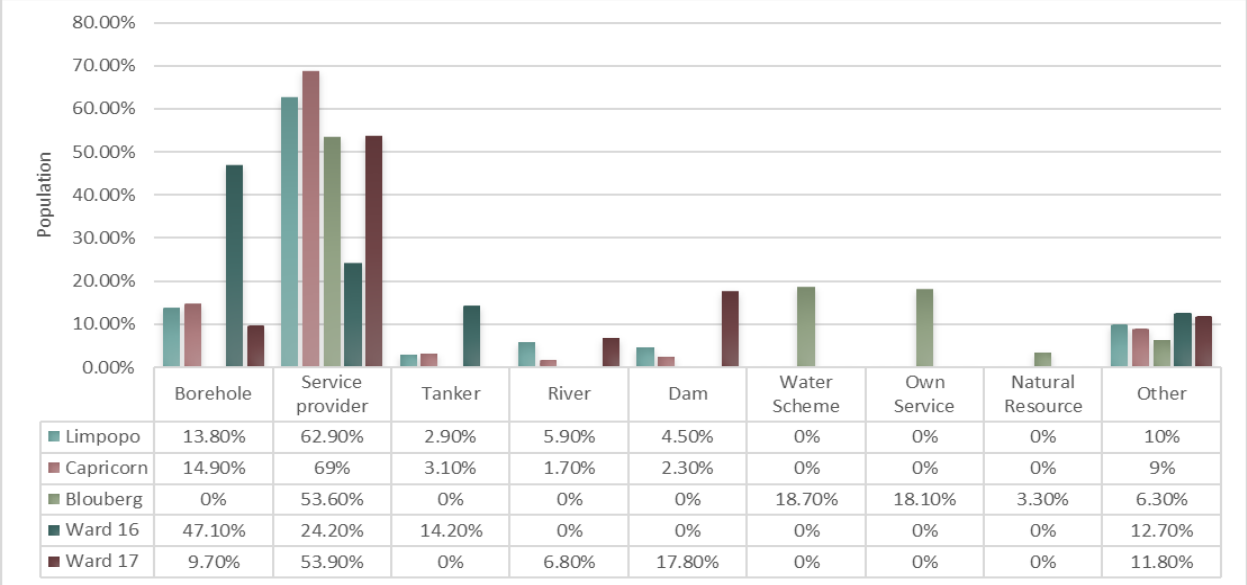
Figure 8-14:Education Profile

In terms of education levels in the LM, 20% of the adult population (over 20 years of age) have no education at all, while 54% have primary or secondary level education (Community Survey, 2016). Those with Matric and higher educational qualifications accounted for 17% of the population. In Ward 16 32% and Ward 17, 27% of the population of individuals older than 20 has no formal schooling. 20% of the population aged 20 and older within the Blouberg LM area has

no education, and only 17% of the individuals aged 20 and older have completed Matric or have a higher education qualification.

8.13.5 Basic Service Delivery

8.13.5.1 Access to Water



	Borehole	Service provider	Tanker	River	Dam	Water Scheme	Own Service	Natural Resource	Other
Limpopo	13.80%	62.90%	2.90%	5.90%	4.50%	0%	0%	0%	10%
Capricorn	14.90%	69%	3.10%	1.70%	2.30%	0%	0%	0%	9%
Blouberg	0%	53.60%	0%	0%	0%	18.70%	18.10%	3.30%	6.30%
Ward 16	47.10%	24.20%	14.20%	0%	0%	0%	0%	0%	12.70%
Ward 17	9.70%	53.90%	0%	6.80%	17.80%	0%	0%	0%	11.80%

Figure 8-15: Access to Water

South Africa's policy frameworks for basic services are aimed at the rights of all citizens to basic services, including access to water and sanitation, energy and waste services. South Africa has set itself a target of achieving access to improved drinking water services to all its citizens.

According to the stats (Wazimap, 2016), the majority (53.6%) of people in the Blouberg LM area get their water from a service provider, followed receiving water from a water scheme (18.7%) and making use of their own services (18.1%).

8.13.5.2 Sanitation

Pit latrines are mostly used in rural areas where there is no proper piped water system. The sanitation backlog requires a considerable amount of money to bring up to date. The scarcity of water resources exacerbates it, which poses a challenge to implement waterborne sanitation systems and to expand the reticulated water networks. Little improvement has taken place in the Blouberg LM during the period 2011 to 2016.

8.13.5.3 Electricity

The 2016 census estimates that 97.8% of the Blouberg LM has access to electricity, meaning 2.2% use energy sources such as gas, paraffin, candles, solar and so forth. Challenges that are experienced include illegal connections, cable theft, vandalism of transformers, the cutting of trees leads to deforestation and soil erosion, limited Eskom capacities and budgetary constraints.

8.13.5.4 Refuse Removal

Most of the people in the Municipal area are in rural areas. They do not have access to a formal refuse removal system. There is no plan to manage the waste generated in these areas. Many people do their own refuse removal as the refuse generated in rural areas is of insignificant proportions. The municipality requires a Waste Management Plan, especially for rural areas due to the high concentration of people with much refuse generated. Only 14.6% of the households in the Blouberg LM have access to refuse removal services regularly, while 83% depend mainly on backyard or communal dumping sites. The provision of the service is very limited in rural areas.

8.13.6 Status of Infrastructure

8.13.6.1 Road infrastructure and public transport

Blouberg Local Municipality is a predominantly rural municipality situated to the northwestern boundary of the Republic of South Africa, with Botswana and Zimbabwe. Roads R521 (P94/1 and P94/2) provides a north-south link between Blouberg and Molemole, Polokwane and Makhado municipality. To the east, the municipality is served by road R523 (D1200) that allows access to the towns such as Mogwadi, Morebeng, Duiwelskloof, Tzaneen and Lephalale. There is another critical road (N11) from Mokopane town to Botswana that passes through the municipality, which has the potential to stimulate the economy.

The roads network serves as essential vital linkages, which serve as corridors and gateways to major economic destinations. Inadequate roads are one of the five leading challenges faced by municipalities in Limpopo (CS 2016). According to the BLM IDP, their current focus is on improving access to the appropriate plant and machinery for the maintenance and improvement of existing roads.

Public transport in the municipal area is predominately minibus taxi's as bus services have been suspended. Another transport mode is donkey carts and bicycles mostly used by the communities.

8.13.6.2 Social Infrastructure

Access to social infrastructure is indicative of a community's development. Social infrastructure inclusive of educational, social and health facilities, police stations, and recreational and sports facilities are determining factors concerning a community's welfare and ability to develop sustainably. The existence of a platform for dialogue between communities and local government is equally indicative of a community's social development. The figure below indicates the social infrastructure in the vicinity of the project area.

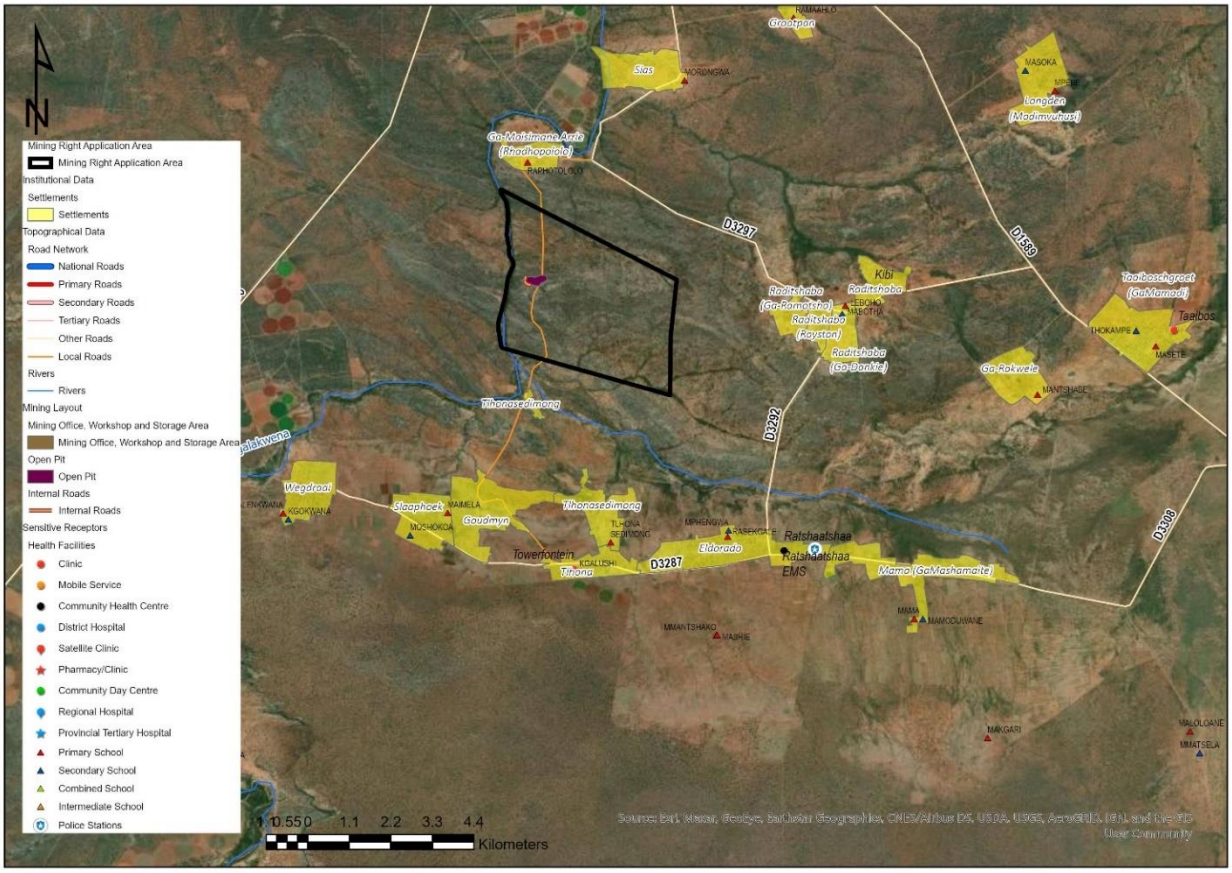
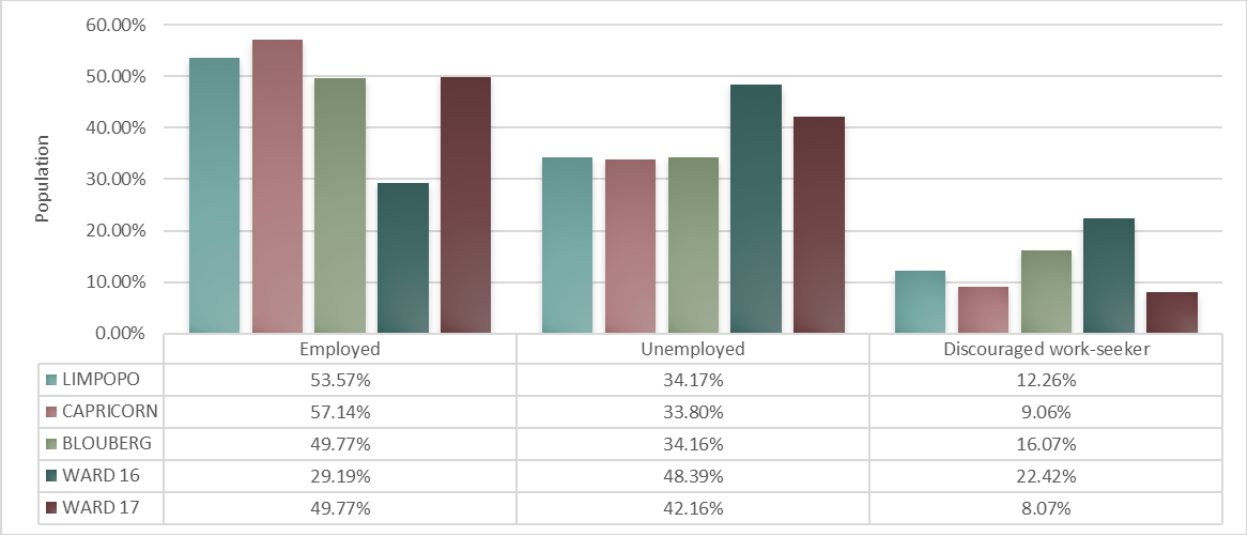


Figure 8-16: Social Infrastructure

8.14 Economic Profile[1]

8.14.1 Employment Profile



	Employed	Unemployed	Discouraged work-seeker
LIMPOPO	53.57%	34.17%	12.26%
CAPRICORN	57.14%	33.80%	9.06%
BLOUBERG	49.77%	34.16%	16.07%
WARD 16	29.19%	48.39%	22.42%
WARD 17	49.77%	42.16%	8.07%

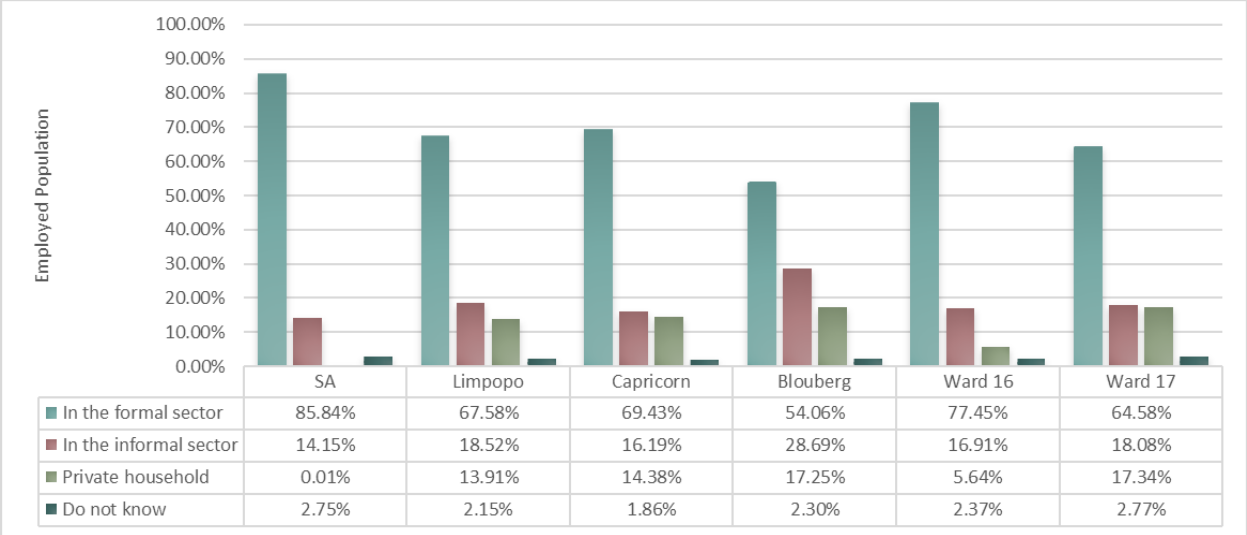
Figure 8-17: Employment Profile (Census, 2011)

Employment is the primary means by which individuals who are of working age may earn an income that will enable them to provide for their basic needs and improve their standard of living. As such, employment and unemployment rates are important indicators of socio-economic well-being.

The Census 2011 data indicates that the Blouberg LM had about 93,647 people within the working-age population (54.3% of the total population). Of these, 17.7% of the people were economically active; 17.9% are unemployed or discouraged work seekers, and 64.4% of the working-age population was not economically active (NEA). The employed labour in the LM was estimated at 16,602. In contrast, the unemployed and discouraged work-seeker population was estimated at 16,756, reflecting an actual unemployment rate of 50.2% (excluding the non-economically active population). This is higher than the Limpopo real unemployment rate of 46.4%.

The situation in the project area Wards are even worse with 70.8% actual unemployment rate in Ward 16 (which is just south of the MRA), and 50.2% real unemployment rate in Ward 17. This relates to 1 363 people being unemployed in the two Wards.

[1] *Regulation 46 (c) (ii)*



	SA	Limpopo	Capricorn	Blouberg	Ward 16	Ward 17
In the formal sector	85.84%	67.58%	69.43%	54.06%	77.45%	64.58%
In the informal sector	14.15%	18.52%	16.19%	28.69%	16.91%	18.08%
Private household	0.01%	13.91%	14.38%	17.25%	5.64%	17.34%
Do not know	2.75%	2.15%	1.86%	2.30%	2.37%	2.77%

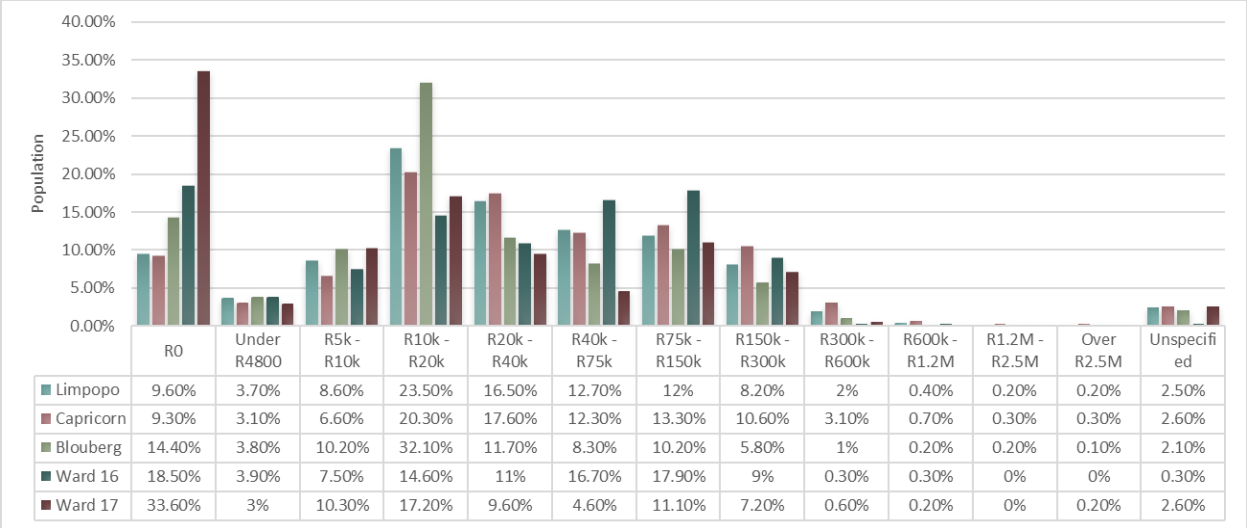
Figure 8-18: Sector Employment

Of those employed within the municipality, 54.06% are employed in the formal sector, and 28.7% are employed in the informal sector. In the project wards, 77.5% in Ward 16 and 64.6% in Ward 17 are employed in the formal sector. The total employment in the informal sector increased by 8.3% between 2000 and 2010 and grew further by 7% in 2016 (BLM IDP, 2020). The year on year growth in the informal sector reflects a growing economy that is, however, not able to accommodate all the economically active population.

When considering the various economic sectors in South Africa, the General government & community, social and personal services generate the most jobs, followed by Trade, Financial and Business Services and then the Agriculture Sector. Within the project Wards, General government & Community, social and personal services generate the most jobs.

8.14.2 Income Profile

To determine the people's living standards, as well as their ability to pay for basic services such as water and sanitation, the income levels of the population, are analysed and compared to the income level in the province in general.



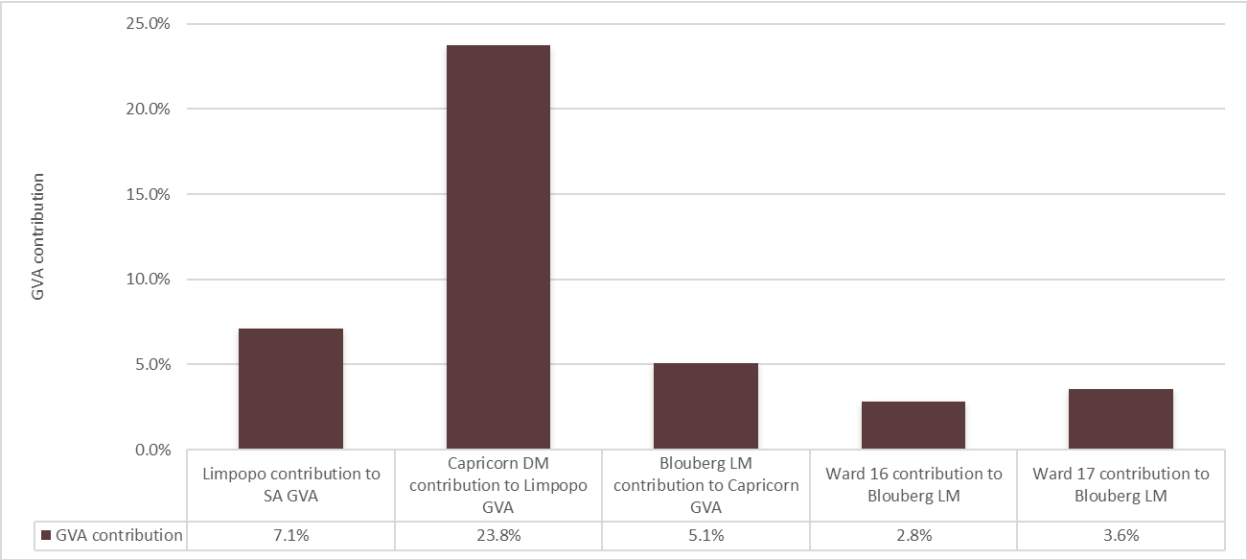
	R0	Under R4800	R5k - R10k	R10k - R20k	R20k - R40k	R40k - R75k	R75k - R150k	R150k - R300k	R300k - R600k	R600k - R1.2M	R1.2M - R2.5M	Over R2.5M	Unspecified
Limpopo	9.60%	3.70%	8.60%	23.50%	16.50%	12.70%	12%	8.20%	2%	0.40%	0.20%	0.20%	2.50%
Capricorn	9.30%	3.10%	6.60%	20.30%	17.60%	12.30%	13.30%	10.60%	3.10%	0.70%	0.30%	0.30%	2.60%
Blouberg	14.40%	3.80%	10.20%	32.10%	11.70%	8.30%	10.20%	5.80%	1%	0.20%	0.20%	0.10%	2.10%
Ward 16	18.50%	3.90%	7.50%	14.60%	11%	16.70%	17.90%	9%	0.30%	0.30%	0%	0%	0.30%
Ward 17	33.60%	3%	10.30%	17.20%	9.60%	4.60%	11.10%	7.20%	0.60%	0.20%	0%	0.20%	2.60%

Figure 8-19: Income Profile of Employable population

The average household income in the Blouberg LM is about R15,000 per annum, with 14.4% of the households earning no income at all. On average, 83.6% of the income bearing population brings an income into the household; this includes pensions and social grants.

8.14.3 Economic Contribution and Activities

The contribution from the Wards, Local Municipality and District to each other and the Limpopo Province and South Africa's Gross Value Added, which is similar to the Gross Domestic Product, can be seen in the figure below.



	Limpopo contribution to SA GVA	Capricorn DM contribution to Limpopo GVA	Blouberg LM contribution to Capricorn GVA	Ward 16 contribution to Blouberg LM	Ward 17 contribution to Blouberg LM
GVA contribution	7.1%	23.8%	5.1%	2.8%	3.6%

Figure 8-20: GVA contribution (Quantec, 2016)

Ward 16 and 17 contribute 2.8% and 3.6% to the Blouberg Local Municipality, which in turn contributes 5.1% to the Capricorn District Municipality. Capricorn contributes about 23.8% to the Limpopo Province, which only provides approximately 7.1% to the National GVA.

The various contributing sectors within Blouberg is dominated by the General government & community, social and personal services sector, trade, financial and business services and then Agriculture. Mining only contributes about 3.9% to the Blouberg GVA.

According to the Limpopo Agro-Processing Strategy (2012), Blouberg Municipality is one of the biggest producers and exporters of tomatoes, onions and potatoes in the Limpopo Province alongside Molemole, and Makhado Municipalities. The strategy furthermore proposes that such products should be expanded. What is lacking is that the processing of these products is not made in the respective municipalities but mainly in the province of Gauteng where finished products are sold at higher prices to these exporting municipalities. Furthermore, the strategy also identifies tobacco farming as one of the strong pillars of agricultural development in the Blouberg area.

Blouberg has the lowest mining activities of the four constituent's municipalities in the Capricorn district. The most significant mining activities take place in Polokwane, followed by Lepelle-Nkumpi and Molemole municipalities. Blouberg mining activities are still at the exploration stage, which upon maturity will undoubtedly increase the mining GVA and employment (BLM IDP 2020).

8.14.4 Poverty Index

The National Development Plan strives to eliminate poverty by 2030. Poverty is measured through the reduction of people living below the poverty line (food poverty) that the NDP states are currently at US$2.34 per capita per day (which relates at the current exchange rate to approximately R40 per person per day). This is a household income of roughly R4,800 per month or R57, 600 per annum.

The Statistics SA Poverty Report (2017) revealed that despite an increase in the social grant system covering almost 17 million people, poverty has worsened and nearly half of the population currently lives below the poverty line.

In the Blouberg LM, 60.5% of the population has an average income of R15,000 per annum or less, which relates to about R10.42 or US$0.62 per person per day. A further 11.7% have a household income between R20,000 – R40,000 per annum. 25.8% of the households within Blouberg is above the poverty line and 72.2% below.

9 ANTICIPATED ENVIRONMENTAL, SOCIAL AND CULTURAL IMPACTS

The assessment of impacts will be addressed by using standards in terms of the scale of the impact, the duration, probability of occurrence and the nature of the impact. These standards are widely used and vary to a certain extent from project to project depending on the environment and implementing agent. It is, however, a practical tool to ascertain and determine qualitatively what impact the project has on the total environment.

9.1 Geology and Topography

Potential risks to the receiving environment by the proposed project have been identified and are presented in the bullets below:

- Disturbance of natural geology: Mining and associated activities will alter the geology of the site. Risk of subsidence and sterilisation of mineral resources are also a possibility
- Alteration of topography: The development of the opencast pit and infrastructure will alter the topography of the proposed project area.

Impact	Construction	Operational	Decommissioning	Closure
Disturbance of natural geology	Yes	Yes	No	No
Alteration of topography	Yes	Yes	Yes	No

The preliminary impact assessment is rated as follows:

Potential Impact	Nature of Impact	Extent	Duration	Intensity	Probability	Weighting Factor	Significance Rating (WOM)	Mitigation Efficiency	Significance Rating (WM)
Disturbance of natural geology	Negative	Site specific	Permanent	High	Definite	Medium	Medium	Medium N	Low to Medium
Alteration of topography	Negative	Site specific	Permanent	Medium	Definite	Medium	Medium	Medium N	Low to Medium

Potential mitigation measures have been identified:

- No mitigation is possible for the changes in the geological profile however subsidence can be controlled/prevented. Compaction of overburden and discards placed in the bottom of the pits to limit the potential for subsidence on the rehabilitated open pit.
- Sterilisation of mineral resources can be mitigated by optimal infrastructure design.
- Rehabilitating the area as close to the pre-mining area as close as possible or reach an agreement for post-mining land use. The rehabilitated area must be vegetated with indigenous flora.

9.2 Soils, Land Capability and Land Use

The nature of the impact of opencast mining on the soil environment include the stripping and stockpiling of topsoil (consisting of A and B soil horizons) and the compaction of soils during the construction of facilities such as discard dumps, overburden stockpiles, pollution and run-off control dams and any other possible footprint structures. Heavy machinery traffic on the soil surface and possible chemical pollution of soil through polluted water or seepage from certain geological materials could constitute further impacts on soil.

Stripping and stockpiling of topsoil will result in:

- Loss of the original spatial distribution of natural soil forms and horizon sequences which cannot be reconstructed similarly during rehabilitation.
- Loss of natural topography and drainage pattern.
- Loss of original soil depth and soil volume.
- Loss of original fertility and organic carbon content.
- Soil compaction from heavy machinery
- Exposure of soils to weathering, compaction, erosion, and chemical alteration of nutrients, particularly nitrogen.
- Alteration of land use and capability of the project area (27ha)

Impact	Construction	Operational	Decommissioning	Closure
Loss of the original spatial distribution of natural soil forms and horizon sequences which cannot be reconstructed similarly during rehabilitation	Yes	Yes	No	No
Loss of original soil depth and soil volume	Yes	Yes	Yes	No
Loss of original fertility and organic carbon content	Yes	Yes	Yes	No
Soil compaction from heavy machinery	Yes	Yes	Yes	No
Alteration of land use and capability of the project area (27ha)	Yes	Yes	Yes	No

The preliminary impact assessment is rated as follows:

Potential Impact	Nature of Impact	Extent	Duration	Intensity	Probability	Weighting Factor	Significance Rating (WOM)	Mitigation Efficiency	Significance Rating (WM)
Loss of the original spatial distribution of natural soil forms and horizon sequences which cannot be reconstructed similarly during rehabilitation.	Negative	Site specific	Long term	High	Definite	Medium	Medium	Medium N	Low to Medium
Loss of original soil depth and soil volume.	Negative	Site specific	Long term	High	Definite	Medium	Medium	Medium N	Low to Medium
Loss of original fertility and organic carbon content.	Negative	Site specific	Long term	High	Definite	Medium	Medium	Medium N	Low to Medium
Soil compaction from heavy machinery	Negative	Site specific	Long term	High	Definite	Medium	Medium	Medium N	Low to Medium
Alteration of land use and capability of the project area (27ha)	Negative	Site specific	Long term	Medium	Definite	Low to Medium	Low to Medium	Medium N	Low

Potential mitigation measures have been identified:

- The available topsoil will be stripped prior to construction for final rehabilitation.
- A soil analysis will be performed prior to seeding (post-rehabilitation) and the soil fertility rectified (if necessary) to facilitate vigorous growth.
- Organic fertilisers will be used as far as possible.
- Develop a final land use plan and implementation programme as part of the closure plan, taking into account important issues such as ongoing operational and maintenance requirements and long-term responsibilities and ownership.
- Set final closure objectives and standards to ensure conformance to the final land use plan, the requirements of the IAPs and relevant environmental legislation.

9.3 Terrestrial Ecology

Potential risks to the receiving environment by the proposed project have been identified and are presented in the bullets below:

- Loss of habitat and biodiversity
- Loss of animal, plant and medicinal species
- Increased soil erosion
- Alien plant invasion

Impact	Construction	Operational	Decommissioning	Closure
Loss of habitat and biodiversity	Yes	Yes	Yes	No
Loss of animal, plant and medicinal species	Yes	Yes	Yes	No
Increased soil erosion	Yes	Yes	Yes	No
Alien plant invasion	Yes	Yes	Yes	No

The preliminary impact assessment is rated as follows:

Potential Impact	Nature of Impact	Extent	Duration	Intensity	Probability	Weighting Factor	Significance Rating (WOM)	Mitigation Efficiency	Significance Rating (WM)
Loss of habitat and biodiversity	Negative	Site specific	Long term	Low	Definite	Low to Medium	Low to Medium	Medium P	Medium
Loss of animal, plant and medicinal species	Negative	Site specific	Long term	Low	Definite	Low to Medium	Low to Medium	Medium P	Medium
Increased soil erosion	Negative	Site specific	Medium term	Low	Definite	Low	Low	Medium P	Low to Medium
Alien plant invasion	Negative	Site specific	Medium term	Low	Definite	Low	Low	Medium N	Low

Potential mitigation measures have been identified:

- Any bulbous or succulent plant species encountered should be removed and temporarily planted in a suitable container and replanted in the area after mining has been completed. No unnecessary removal of plants must take place.
- Where vegetation needs to be “opened” to gain access, it is recommended that the herbaceous species are cut short rather than removing them. That will ensure that they regrow during the growing season and also protect the soil against erosion.
- The removal of indigenous woody species should be avoided as far as possible
- The topsoil should be stored adjacent to the mining area and must be used to restore the area after mining has ceased. All temporary stockpile areas, litter and dumped material and rubble, must be removed during and on completion of mining activities.
- Vegetation clearance should be restricted to the mining areas allowing remaining animals an opportunity to move away from the disturbance.
- No animals should be intentionally killed or destroyed, and poaching and hunting should not be permitted on the site.
- No hunting with firearms (shotguns, air rifles or pellet guns) or catapults should be permitted on the property as well as neighbouring areas.
- A Re-vegetation and Rehabilitation Manual should be prepared for the use of contractors, landscape architects and groundsmen to rehabilitate areas that became degraded due to mining activities.
- All alien vegetation should be eradicated within the study site and invasive species, as listed in this report should be given the highest priority.

9.4 Surface Water Resources

The following surface water potential risks are anticipated:

- Reduction in stormwater runoff
- Decrease of surface water quality

Impact	Construction	Operational	Decommissioning	Closure
Reduction in storm water runoff	Yes	Yes	Yes	Yes
Decrease of surface water quality	Yes	Yes	Yes	Yes
Pollution as a result of leachate and runoff from the stockpile	No	Yes	Yes	Yes

The preliminary impact assessment is rated as follows:

Potential Impact	Nature of Impact	Extent	Duration	Intensity	Probability	Weighting Factor	Significance Rating (WOM)	Mitigation Efficiency	Significance Rating (WM)
Reduction in storm water runoff	Negative	Site specific	Long term	High	Highly Probable	Low to Medium	Low to Medium	Low to Medium N	Low to Medium
Decrease of surface water quality	Negative	Site specific	Long term	High	Highly Probable	Low to Medium	Low to Medium	Low to Medium N	Low to Medium
Pollution as a result of leachate and runoff from the stockpile	Negative	Site specific	Long term	High	Probable	Medium to High	Medium	Low to Medium N	Low to Medium

Potential mitigation measures have been identified:

- No discharge of dirty water into the natural environment.
- Separation of clean and dirty water through implementation of the SWMP.
- Directing and containment of dirty water runoff to dirty water dams and providing silt traps.
- Design dirty water management infrastructure for the 1:50 year flood event.
- Appropriate geo-liners to be constructed for the stockpile, depending on the waste classification of this material.
- Provision of berms and/or paddocks at discard stockpile to contain runoff.
- Reuse of this water for dust suppression on and around the stockpile area.

9.5 Groundwater

The following potential risks to groundwater are anticipated:

- Decrease in groundwater quantity and quality: Leaching or seeping of contaminants into sub-surface, which will negatively impact the groundwater quality as a result of the construction and operation of the mine.

Impact	Construction	Operational	Decommissioning	Closure
Lowering of groundwater levels	No	Yes	Yes	No
Effect on groundwater quality due to infiltration of poor-quality water/effluent from wet sources (PCDs, etc.)	Yes	Yes	Yes	No
Effect on groundwater quality due to poor quality leachate generated through stockpile	Yes	Yes	Yes	No

The preliminary impact assessment is rated as follows:

Potential Impact	Nature of Impact	Extent	Duration	Intensity	Probability	Weighting Factor	Significance Rating (WOM)	Mitigation Efficiency	Significance Rating (WM)
Lowering of groundwater levels	Negative	Local	Long term	Medium	Highly Probable	Medium	Low to Medium	Medium N	Low to Medium
Effect on groundwater quality due to infiltration of poor-quality water/effluent from wet sources (PCDs, etc.)	Negative	Site specific	Long term	Medium	Highly Probable	Medium	Low to Medium	Medium to High N	Low
Effect on groundwater quality due to poor quality leachate generated through stockpile	Negative	Site specific	Long term	Medium	Highly Probable	Medium	Low to Medium	Medium to High N	Low

Potential mitigation measures have been identified:

- Groundwater Levels
  - Implementation of a monitoring programme to confirm impact predictions.
  - Compensate or provide alternative water supply to affected groundwater users.
- Groundwater Quality
  - In the case of hazardous waste disposal sites, the design must make provision for containment of hazardous waste. This implies the complete separation of the waste body and any associated leachate from the surrounding soil or rock strata, by means of a liner and a leachate collection system.
  - Monitoring boreholes will be installed in appropriately selected sites prior to commencement of mining to detect changes in water quality and water levels with time.
  - All drains must be maintained and kept clean from debris/sediment.
- Stockpile management
  - Appropriate geo-liners to be constructed for the stockpile, depending on the waste classification of this material.
  - Stockpiles will be compacted to minimise infiltration

9.6 Air Quality

The following potential risks to air quality are anticipated:

- Increased of dust levels because of construction and hauling operations

- Increased Particulate Matter, Sulphur Dioxide, Oxides or Nitrogen from the Syngas facility

Impact	Construction	Operational	Decommissioning	Closure
Increased of dust levels because of construction and hauling operations	Yes	Yes	Yes	No
Increased Particulate Matter, Sulphur Dioxide, Oxides or Nitrogen from the Syngas facility	No	Yes	No	No

The preliminary impact assessment is rated as follows:

Potential Impact	Nature of Impact	Extent	Duration	Intensity	Probability	Weighting Factor	Significance Rating (WOM)	Mitigation Efficiency	Significance Rating (WM)
Increased of dust levels because of construction and hauling operations	Negative	Site specific	Long term	Medium	Highly Probable	Medium	Low to Medium	High N	Low
Increased Particulate Matter, Sulphur Dioxide, Oxides or Nitrogen from the Syngas facility	Negative	Site specific	Long term	Low	Probable	Medium	Low to Medium	Medium N	Low

Potential mitigation measures have been identified:

- Set the speed limit for on-site hauling vehicles and other vehicles to 40 km/h, and off-site hauling vehicles to 60 km/h on unpaved roads. Actively enforce the speed limits specified.
- Dust suppression to be conducted on a regular basis. Chemical treatment of access roads to
- Minimise dust generation, for example ‘Dust-a-side’.

9.7 Ambient Noise

The following potential risks to ambient noise are anticipated:

- Increased total noise levels in the area, changing existing ambient sound levels at receptors

Impact	Construction	Operational	Decommissioning	Closure
Increased total noise levels in the area, changing existing ambient sound levels at receptors	Yes	Yes	Yes	No

The preliminary impact assessment is rated as follows:

Potential Impact	Nature of Impact	Extent	Duration	Intensity	Probability	Weighting Factor	Significance Rating (WOM)	Mitigation Efficiency	Significance Rating (WM)
Increased total noise levels in the area, changing existing ambient sound levels at receptors	Negative	Site specific	Long term	Low	Probable	Low	Low	Medium N	Low

Potential mitigation measures have been identified:

- Machinery and vehicles can be fitted with silencers/mufflers to reduce noise. All staff/contractors on-site are required to wear the PPE. Identify sensitive receptors and conducted noise monitoring if required.
- Use of low-noise generation plant and equipment.
- All plant, equipment and vehicles are to be kept in good repair.
- Off-site hauling of the product should be limited to daylight hours.

9.8 Archaeological and Cultural Interest

The following potential risks to ambient noise are anticipated:

- Deterioration/damage of archaeological and cultural interest: The HIA must still be conducted but it is possible for graves to be present. This will be confirmed during the EIA phase.
- Impact on undetected sub-surface heritage resources

Impact	Construction	Operational	Decommissioning	Closure
Deterioration/damage of archaeological and cultural interest	Yes	Yes	Yes	No
Impact on undetected sub-surface heritage resources	Yes	Yes	No	No

The preliminary impact assessment is rated as follows:

Potential Impact	Nature of Impact	Extent	Duration	Intensity	Probability	Weighting Factor	Significance Rating (WOM)	Mitigation Efficiency	Significance Rating (WM)
Deterioration/damage of archaeological and cultural interest	Negative	Site specific	Long term	Medium	Improbable	Medium	Low to Medium	Medium N	Low
Impact on undetected sub-surface heritage resources	Negative	Site specific	Medium term	Medium	Probable	Medium	Low to Medium	Medium N	Low

Potential mitigation measures have been identified:

- Avoid any damage to graves present on site. If any archaeological artefacts are discovered upon excavations, construction must immediately cease. SAHRA must be notified of the discovery and a specialist must be consulted.
- The discovery of undetected heritage remains must be reported to the archaeologist or the Heritage Authority.

9.9 Visual Aspects

The following potential risk to visual aspects is anticipated:

- The visual intrusion of mining activities, impacting on the sense of place
- Impact due to night-time lighting

Impact	Construction	Operational	Decommissioning	Closure
The visual intrusion of mining activities, impacting on the sense of place	Yes	Yes	Yes	No
Impact due to night-time lighting	Yes	Yes	Yes	No

The preliminary impact assessment is rated as follows:

Potential Impact	Nature of Impact	Extent	Duration	Intensity	Probability	Weighting Factor	Significance Rating (WOM)	Mitigation Efficiency	Significance Rating (WM)
Visual intrusion of mining activities, impacting on the sense of place	Negative	Local	Long term	Medium	Highly Probable	Medium	Low to Medium	High N	Low
Impact due to night-time lighting	Negative	Local	Long term	Medium	Highly Probable	Medium	Low to Medium	High N	Low

Potential mitigation measures have been identified:

- The development footprint and disturbed areas are to be kept as small as possible and the areas cleared of natural vegetation must be kept to a minimum.
- The height of infrastructure and stockpiles should be kept as low as possible.
- Infrastructure such as the stockpile must be shaped and rounded to blend in with the surrounding undulating landscape.
- Natural colours should be used in all instances and the use of highly reflective material should be avoided. Any metal surfaces should be painted to fit in with the natural environment in a colour that blends in effectively with the background. White structures are to be avoided as these will contrast significantly with the natural surroundings.
- In areas where screening topography and vegetation are absent, natural-looking constructed landforms and vegetative or architectural screening may be used to minimise visual impacts. Care should however be taken to avoid additional surface disturbance.
- Outdoor lighting must be strictly controlled.
- High light masts should be avoided. Any high lighting masts should be covered to reduce the glow.
- Lighting fixtures must be selected and placed so that they direct their light on the intended area only, to avoid light spill and offsite light trespass.
- Light sources must be shielded by physical barriers.

- The use of low-pressure sodium lamps, yellow LED lighting, or an equivalent reduces sky-glow and wildlife impacts. Bluish-white lighting is more likely to cause glare and attract insects and is associated with other human physiological issues.

9.10 Socio-economic Aspects

The following potential risks and benefits to the socio-economic environment are anticipated:

- Increase in available employment opportunities locally
- Increase in skills development programmes and therefore skill levels of the local communities
- Empowerment of local business through procurement and capacity building
- Empowerment of the local community through ownership participation
- Impact on land use and livelihoods from the reduction in the grazing area
- An influx of Job seekers and Population growth pressures

Impact	Construction	Operational	Decommissioning	Closure
Increase in available employment opportunities locally	Yes	Yes	Yes	No
Increase in skills development programmes and therefore skill levels of the local communities	Yes	Yes	Yes	No
Empowerment of local business through procurement and capacity building	Yes	Yes	Yes	Yes
Empowerment of local community through ownership participation	No	Yes	Yes	No
Impact on land use and livelihoods from reduction in grazing area	Yes	Yes	Yes	No
Influx of Job seekers and Population growth pressures	Yes	Yes	No	No

The preliminary impact assessment is rated as follows:

Potential Impact	Nature of Impact	Extent	Duration	Intensity	Probability	Weighting Factor	Significance Rating (WOM)	Mitigation Efficiency	Significance Rating (WM)
Increase in available employment opportunities locally	Positive	Local	Long term	Medium	Definite	Medium to High	P-Medium	Medium P	P-High
Increase in skills development programmes and therefore skill levels of the local communities	Positive	Local	Long term	Medium	Definite	Medium to High	P-Medium	Medium P	P-High
Empowerment of local business through procurement and capacity building	Positive	Local	Long term	Medium	Definite	Medium to High	P-Medium	Medium P	P-High
Empowerment of local community through ownership participation	Positive	Local	Long term	High	Definite	High	P-Medium	Medium P	P-High
Impact on land use and livelihoods from reduction in grazing area	Negative	Site specific	Long term	Medium	Definite	Low to Medium	Low to Medium	Medium N	Low
Influx of Job seekers and Population growth pressures	Negative	Local	Long term	Medium	Highly Probable	Low to Medium	Low to Medium	Medium N	Low

Potential mitigation measures have been identified:

- Source the maximum number of employees from the local area for job opportunities.

- Implement skills development programmes in the areas where most job opportunities will be created, i.e. operators and drivers.
- Make available bursary opportunities to build skill capital in the region.
- Establish a database of local people with information on qualifications and skills, utilize this database to develop skills plans and recruit local people.
- Implement portable skills development programmes.
- Implementation of programmes to minimize and mitigate the impact of downscaling and retrenchment.
- Establish a database of local businesses, utilize this database to establish partnerships between local and larger service providers as well as locally preferred work packages.
- Consultation and feedback on results on a regular basis.
- Implementation of capacity building programmes to minimize and mitigate the impact of mine downscaling and closure.

9.11 Traffic

The following potential risk to traffic aspects is anticipated:

- Increased traffic on the Product Transport Route
- Disruption of daily living and movement patterns and safety of road users

Impact	Construction	Operational	Decommissioning	Closure
Increased traffic on the Product Transport Route	Yes	Yes	No	No
Disruption of daily living and movement patterns and safety of road users	Yes	Yes	No	No

The preliminary impact assessment is rated as follows:

Potential Impact	Nature of Impact	Extent	Duration	Intensity	Probability	Weighting Factor	Significance Rating (WOM)	Mitigation Efficiency	Significance Rating (WM)
Increased traffic on the Product Transport Route	Negative	District	Long term	Medium	Highly Probable	Low to Medium	Low to Medium	Medium N	Low
Disruption of daily living and movement patterns and safety of road users	Negative	Local	Long term	Medium	Probable	Low to Medium	Low to Medium	Medium N	Low

Potential mitigation measures have been identified:

- Mitigation to control traffic and ensure safety such as speed limits as well as road signs.
- All heavy vehicles must be restricted to designated routes and not permitted on other roads.
- Off-site hauling of product should be limited to daylight hours.

- Set the speed limit for off-site hauling vehicles to 60 km/h on gravel roads and enforce the speed limits specified.
- Include speed-bumps where appropriate to control the speed limits.
- Trucks transporting product will be covered, with tarpaulins, to minimise the generation of dust and the impact on ambient air quality. The covers/tarpaulin used to cover the transported material will be secured.
- Trucks will be weighed on site before departing to limit the risk of product spillage.

9.12 Cumulative Impact Assessment

Other development projects in the region are limited to agricultural development. No other mining or industrial development is planned or existing within a 5 km radius of the project area.

Cumulative impacts between the mine development and the beneficiation plant will be assessed during the Environmental Impact Assessment and may include any or all of the above-listed impacts.

9.13 Environmental Impact Evaluation and Mitigation Measures

9.13.1 Impact Risk Matrix

ID	Aspect	Potential Impact	Nature of Impact	Extent	Duration	Intensity	Probability	Weighting Factor	Significance Rating (WOM)	Mitigation Efficiency	Significance Rating (WM)
1	Geology	Disturbance of natural geology	Negative	Site specific	Permanent	High	Definite	Medium	Medium	Medium N	Low to Medium
2	Topography	Alteration of topography	Negative	Site specific	Permanent	Medium	Definite	Medium	Medium	Medium N	Low to Medium
3	Soils, Land use and Capability	Loss of the original spatial distribution of natural soil forms and horizon sequences which cannot be reconstructed similarly during rehabilitation.	Negative	Site specific	Long term	High	Definite	Medium	Medium	Medium N	Low to Medium
4	Soils, Land use and Capability	Loss of original soil depth and soil volume.	Negative	Site specific	Long term	High	Definite	Medium	Medium	Medium N	Low to Medium
5	Soils, Land use and Capability	Loss of original fertility and organic carbon content.	Negative	Site specific	Long term	High	Definite	Medium	Medium	Medium N	Low to Medium
6	Soils, Land use and Capability	Soil compaction from heavy machinery	Negative	Site specific	Long term	High	Definite	Medium	Medium	Medium N	Low to Medium
7	Soils, Land use and Capability	Alteration of land use and capability of the project area (27ha)	Negative	Site specific	Long term	Medium	Definite	Low to Medium	Low to Medium	High N	Low
8	Terrestrial Ecology	Loss of habitat and biodiversity	Negative	Site specific	Long term	Low	Definite	Low to Medium	Low to Medium	Medium P	Medium
9	Terrestrial Ecology	Loss of animal, plant and medicinal species	Negative	Site specific	Long term	Low	Definite	Low to Medium	Low to Medium	Medium P	Medium
10	Terrestrial Ecology	Increased soil erosion	Negative	Site specific	Medium term	Low	Definite	Low	Low	Medium P	Low to Medium
11	Terrestrial Ecology	Alien plant invasion	Negative	Site specific	Medium term	Low	Definite	Low	Low	Medium N	Low
12	Surface Water	Reduction in storm water runoff	Negative	Site specific	Long term	High	Highly Probable	Low to Medium	Low to Medium	Low to Medium N	Low to Medium

ID	Aspect	Potential Impact	Nature of Impact	Extent	Duration	Intensity	Probability	Weighting Factor	Significance Rating (WOM)	Mitigation Efficiency	Significance Rating (WM)
13	Surface Water	Decrease of surface water quality	Negative	Site specific	Long term	High	Highly Probable	Low to Medium	Low to Medium	Low to Medium N	Low to Medium
14	Surface Water	Pollution as a result of leachate and runoff from the stockpile	Negative	Site specific	Long term	High	Probable	Medium to High	Medium	Low to Medium N	Low to Medium
15	Groundwater	Lowering of groundwater levels	Negative	Local	Long term	Medium	Highly Probable	Medium	Low to Medium	Medium N	Low to Medium
16	Groundwater	Effect on groundwater quality due to infiltration of poor-quality water/effluent from wet sources (PCDs, etc.)	Negative	Site specific	Long term	Medium	Highly Probable	Medium	Low to Medium	Medium to High N	Low
17	Groundwater	Effect on groundwater quality due to poor quality leachate generated through stockpile	Negative	Site specific	Long term	Medium	Highly Probable	Medium	Low to Medium	Medium to High N	Low
18	Air Quality	Increased of dust levels because of construction and hauling operations	Negative	Site specific	Long term	Medium	Highly Probable	Medium	Low to Medium	High N	Low
19	Air Quality	Increased Particulate Matter, Sulphur Dioxide, Oxides or Nitrogen from the Syngas facility	Negative	Site specific	Long term	Low	Probable	Medium	Low to Medium	Medium N	Low
20	Noise	Increased total noise levels in the area, changing existing ambient sound levels at receptors	Negative	Site specific	Long term	Low	Probable	Low	Low	Medium N	Low
21	Archaeological and Cultural Interest	Deterioration/damage of archaeological and cultural interest	Negative	Site specific	Long term	Medium	Improbable	Medium	Low to Medium	Medium N	Low
22	Archaeological and Cultural Interest	Impact on undetected sub-surface heritage resources	Negative	Site specific	Medium term	Medium	Probable	Medium	Low to Medium	Medium N	Low
23	Visual	Visual intrusion of mining activities, impacting on the sense of place	Negative	Local	Long term	Medium	Highly Probable	Medium	Low to Medium	High N	Low
24	Visual	Impact due to night-time lighting	Negative	Local	Long term	Medium	Highly Probable	Medium	Low to Medium	High N	Low

ID	Aspect	Potential Impact	Nature of Impact	Extent	Duration	Intensity	Probability	Weighting Factor	Significance Rating (WOM)	Mitigation Efficiency	Significance Rating (WM)
25	Socio-economic Aspects	Increase in available employment opportunities locally	Positive	Local	Long term	Medium	Definite	Medium to High	P-Medium	Medium P	P-High
26	Socio-economic Aspects	Increase in skills development programmes and therefore skill levels of the local communities	Positive	Local	Long term	Medium	Definite	Medium to High	P-Medium	Medium P	P-High
27	Socio-economic Aspects	Empowerment of local business through procurement and capacity building	Positive	Local	Long term	Medium	Definite	Medium to High	P-Medium	Medium P	P-High
28	Socio-economic Aspects	Empowerment of local community through ownership participation	Positive	Local	Long term	High	Definite	High	P-Medium	Medium P	P-High
29	Socio-economic Aspects	Impact on land use and livelihoods from reduction in grazing area	Negative	Site specific	Long term	Medium	Definite	Low to Medium	Low to Medium	Medium N	Low
30	Socio-economic Aspects	Influx of Job seekers and Population growth pressures	Negative	Local	Long term	Medium	Highly Probable	Low to Medium	Low to Medium	Medium N	Low
31	Traffic	Increased traffic on the Product Transport Route	Negative	District	Long term	Medium	Highly Probable	Low to Medium	Low to Medium	Medium N	Low
32	Traffic	Disruption of daily living and movement patterns and safety of road users	Negative	Local	Long term	Medium	Probable	Low to Medium	Low to Medium	Medium N	Low

9.13.2 Mitigation Measures

Infrastructure	Impact Groups	Mitigation Measures
Open Pit, Internal Roads, Mine Office, Workshop & Storage Area	Geological Impacts	• No mitigation is possible for the changes in the geological profile however subsidence can be controlled/prevented. Compaction of overburden and discards placed in the bottom of the pits to limit the potential for subsidence on the rehabilitated open pit. • Sterilisation of mineral resources can be mitigated by optimal infrastructure design.
Open Pit, Internal Roads, Mine Office, Workshop & Storage Area Beneficiation Plant Area, Discard Stockpile	Topographical Impacts	• Rehabilitating the area as close to the pre-mining area as close as possible or reach an agreement for post-mining land use. The rehabilitated area must be vegetated with indigenous flora.
Open Pit, Internal Roads, Mine Office, Workshop & Storage Area Beneficiation Plant Area, Discard Stockpile	Impacts on soils, Land use and Capability	• The available topsoil will be stripped prior to construction for final rehabilitation. • Soil analysis will be performed prior to seeding (post rehabilitation) and the soil fertility rectified (if necessary) to facilitate vigorous growth. • Organic fertilisers will be used as far as possible. • Develop a final land use plan and implementation programme as part of the closure plan, taking into account important issues such as ongoing operational and maintenance requirements and long-term responsibilities and ownership. • Set final closure objectives and standards to ensure conformance to the final land use plan, the requirements of the IAPs and relevant environmental legislation.
Open Pit, Internal Roads, Mine Office, Workshop & Storage Area Beneficiation Plant Area, Discard Stockpile	Impacts on Terrestrial Ecology	• Any bulbous or succulent plant species encountered should be removed and temporarily planted in a suitable container and replanted in the area after mining has been completed. No unnecessary removal of plants must take place. • Where vegetation needs to be “opened” to gain access it is recommended that the herbaceous species are cut short rather than removing them. That will ensure that they regrow during the growing season and also protect the soil against erosion. • The removal of indigenous woody species should be avoided as far as possible • The topsoil should be stored adjacent to the mining area and must be used to restore the area after mining has ceased. All temporary stockpile areas, litter and dumped material and rubble must be removed during and on completion of mining activities. • Vegetation clearance should be restricted to the mining areas allowing remaining animals opportunity to move away from the disturbance. • No animals should be intentionally killed or destroyed and poaching and hunting should not be permitted on the site. • No hunting with firearms (shotguns, air rifles or pellet guns) or catapults should be permitted on the property as well as neighbouring areas. • A Re-vegetation and Rehabilitation Manual should be prepared for the use of contractors, landscape architects and groundsmen to rehabilitate areas that became degraded due to mining activities. • All alien vegetation should be eradicated within the study site and invasive species as listed in this report should be given the highest priority.
Open Pit, Internal Roads, Mine Office, Workshop & Storage Area Beneficiation Plant Area, Discard Stockpile	Impacts on Surface Water	• No discharge of dirty water into the natural environment. • Separation of clean and dirty water through implementation of the SWMP. • Directing and containment of dirty water runoff to dirty water dams and providing silt traps. • Design dirty water management infrastructure for the 1:50 year flood event. • Appropriate geo-liners to be constructed for the stockpile, depending on the waste classification of this material. • Provision of berms and/or paddocks at discard stockpile to contain runoff.

Infrastructure	Impact Groups	Mitigation Measures
		• • Reuse of this water for dust suppression on and around the stockpile area.
Open Pit, Internal Roads, Mine Office, Workshop & Storage Area	Impacts on Groundwater	• Groundwater Levels • Implementation of a monitoring programme to confirm impact predictions. • Compensate or provide alternative water supply to affected groundwater users. • Groundwater Quality • In the case of hazardous waste disposal sites, the design must make provision for containment of hazardous waste. This implies the complete separation of the waste body and any associated leachate from the surrounding soil or rock strata, by means of a liner and a leachate collection system. • Monitoring boreholes will be installed in appropriately selected sites prior to commencement of mining to detect changes in water quality and water levels with time. • All drains must be maintained and kept clean from debris/sediment. • Stockpile management • Appropriate geo-liners to be constructed for the stockpile, depending on the waste classification of this material. • Stockpiles will be compacted to minimise infiltration
Beneficiation Plant Area, Discard Stockpile		
Beneficiation Plant Area, Discard Stockpile	Impacts on Air Quality	• Set the speed limit for on-site hauling vehicles and other vehicles to 40 km/h, and off-site hauling vehicles to 60 km/h on unpaved roads. Actively enforce the speed limits specified. • Dust suppression to be conducted on a regular basis. Chemical treatment of access roads to • Minimise dust generation for example 'Dust-a-side'.
Open Pit, Internal Roads, Mine Office, Workshop & Storage Area	Impacts on Ambient Noise	• Machinery and vehicles can be fitted with silencers/mufflers to reduce noise. All staff/contractors on site are required to wear the PPE. Identify sensitive receptors and conducted noise monitoring if required. • Use of low-noise generation plant and equipment. • All plant, equipment and vehicles are to be kept in good repair. • Off-site hauling of product should be limited to daylight hours.
Beneficiation Plant Area, Discard Stockpile		
Open Pit, Internal Roads, Mine Office, Workshop & Storage Area	Impacts on Archaeological and Cultural Interest	• Avoid any damage to graves present on site. If any archaeological artefacts are discovered upon excavations, construction must immediately cease. SAHRA must be notified of the discovery and a specialist must be consulted. • The discovery of undetected heritage remains must be reported to the archaeologist or the Heritage Authority.
Beneficiation Plant Area, Discard Stockpile		
Open Pit, Internal Roads, Mine Office, Workshop & Storage Area	Impacts Visual Aesthetic	• The development footprint and disturbed areas are to be kept as small as possible and the areas cleared of natural vegetation must be kept to a minimum. • The height of infrastructure and stockpiles should be kept as low as possible. • Infrastructure such as the stockpile must be shaped and rounded to blend in with the surrounding undulating landscape. • Natural colours should be used in all instances and the use of highly reflective material should be avoided. Any metal surfaces should be painted to fit in with the natural environment in a colour that blends in effectively with the background. White structures are to be avoided as these will contrast significantly with the natural surroundings. • In areas where screening topography and vegetation are absent, natural-looking constructed landforms and vegetative or architectural screening may be used to minimise visual impacts. Care should however be taken to avoid additional surface disturbance. • Outdoor lighting must be strictly controlled. • High light masts should be avoided. Any high lighting masts should be covered to reduce the glow. • Lighting fixtures must be selected and placed so that they direct their light on the intended area only, to avoid light spill and offsite light trespass. • Light sources must be shielded by physical barriers.
Beneficiation Plant Area, Discard Stockpile		

Infrastructure	Impact Groups	Mitigation Measures
		• The use of low-pressure sodium lamps, yellow LED lighting, or an equivalent reduces sky-glow and wildlife impacts. Bluish-white lighting is more likely to cause glare and attract insects and is associated with other human physiological issues.
Open Pit, Internal Roads, Mine Office, Workshop & Storage Area Beneficiation Plant Area, Discard Stockpile	Impact on Socio-economic Environment	• Source the maximum number of employees from the local area for job opportunities. • Implement skills development programmes in the areas where most job opportunities will be created, i.e. operators and drivers. • Make available bursary opportunities to build skill capital in the region. • Establish a database of local people with information on qualifications and skills, utilize this database to develop skills plans and recruit local people. • Implement portable skills development programmes. • Implementation of programmes to minimize and mitigate the impact of downscaling and retrenchment. • Establish a database of local businesses, utilize this database to establish partnerships between local and larger service providers as well as locally preferred work packages. • Consultation and feedback on results on a regular basis. • Implementation of capacity building programmes to minimize and mitigate the impact of mine downscaling and closure.
Beneficiation Plant Area, Discard Stockpile	Traffic impacts	• Mitigation to control traffic and ensure safety such as speed limits as well as road signs. • All heavy vehicles must be restricted to designated routes and not permitted on other roads. • Off-site hauling of product should be limited to daylight hours. • Set the speed limit for off-site hauling vehicles to 60 km/h on gravel roads and enforce the speed limits specified. • Include speed-bumps where appropriate to control the speed limits. • Trucks transporting product will be covered, with tarpaulins, to minimise the generation of dust and the impact on ambient air quality. The covers/tarpaulin used to cover the transported material will be secured. • Trucks will be weighed on site before departing to limit the risk of product spillage. • As part of the development there will be road geometric improvements made to the road network. These upgrades are focused on improving the safety of the road and will hence have a positive impact on other road users.

10 PLAN OF STUDY

10.1 Description of alternatives to be considered including the option of not going ahead with the activity

The following alternative land use options have been identified:

- Livestock farming: Although livestock farming is decreasing in the area, grazing by domestic animals (cattle, goats) will be evaluated as an alternative to mining.
- A combination of livestock and game farming for hunting purposes will be evaluated as the No-Go option as this represents the current land use.

The viability of these alternative land use options will be determined during the EIA Phase by utilising the collected site-specific data to determine the comparative feasibility of the project and the impact on local activities. The basic function of this evaluation would be to determine whether the Project will enhance net societal welfare. At a broad level, investigating impacts on overall welfare requires considering the efficiency, equity and sustainability of the project. Keeping these principles in mind, the core concept applied by the economist when considering trade-offs is “opportunity cost” - the net benefit that would have been yielded by the next best alternative. It is vital information for the decision-makers to understand the trade-offs involved in projects. A key part of considering opportunity costs is commonly to highlight the impacts of doing nothing, i.e. the “no-go alternative” or also referred to as the “economic baseline”.

10.2 Description of the aspects to be assessed as part of the environmental impact assessment process

The EAP hereby undertakes to assess the aspects affected by each individual activity for both the mining and beneficiation processes, whether listed or not, including activities such as:

Main Activities	Associated Activities
Mining Development	Mine Workshop, Office and Storage Internal Roads Mine water management Stormwater management Dust suppression Closure planning and rehabilitation Topsoil stockpiles
Beneficiation plant, Syngas Facility, Discard Stockpile & infrastructure	Beneficiation Plant Infrastructure: Crushers, Stockpiles, Water Management, Workshops & Wash-bay, Offices & stores

Main Activities	Associated Activities
	Discard Stockpile Syngas Electricity Generation Facility
Product Transport	Product Transport Route

The impacts associated with the above activities will be investigated during the EIA Phase as far as practically possible, and where the necessary technical information is available.

In accordance with GNR 982 of NEMA, cumulative impacts are defined as: “in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating form the similar or diverse activities.”

Taking into consideration the above definition, the cumulative impacts for the projects will be assessed by considering the current impacts at the mine and the beneficiation plant.

10.3 Description of aspects to be assessed by specialists

The impact assessment is divided into several fields of specialist study. Informed by the DEA Screening Report (attached as Appendix C) and the receiving environment the following specialist inputs to the EIA process will be embarked upon:

- Soil, Land Use, and Land Capability - The Scope of Work will include:
  - Mapping of soils and assessing impacts, providing mitigation measures
  - Assessment of land capability and existing land use, which will inform the EIA of the potential impact on existing agricultural practices
- Terrestrial Ecological Impact Assessment (including Faunal and Floral);
  - Areas not suitable for development, to be avoided during construction and operation (where relevant);
  - Additional environmental impacts expected from the proposed development based on those already evident on the site and a discussion on the cumulative impacts;
  - Impact management actions and impact management outcomes proposed by the specialist for inclusion in the EMPr;
- Surface Water Assessment;
  - Determination of the Mogalakwena Flood lines and Wetland Systems
  - Assessment of surface water impacts and mitigation measures
- Groundwater Assessment;

  - Hydrocensus
  - Drilling and geochemical characterisation
  - Pump tests
  - Geochemical results and model
- Heritage Assessment - Phase 1 Heritage Impact Assessment
- Palaeontology Impact Assessment – Desktop study as required by SAHRA
- Socio-economic Assessment:
  - Field Assessment via interviews with community representatives and land users
  - Land use alternative assessment
  - Impact Assessment, mitigation measures and social management plans

The following specialist areas will be addressed in the Environmental Impact Assessment, but due to the expected insignificant or low impacts, it is not deemed necessary to conduct full specialist studies in these fields:

- Visual Impact Assessment: The nearest settlement or other sensitive receptor is more than 1km away from the development.
- Noise Impact Assessment: The nearest settlement or other sensitive receptor is more than 1km away from the development. It is not anticipated that a significant noise impact will be experienced at the nearest receptors. Mitigation measures and monitoring will be included in the EIA.
- Air Quality Impact Assessment: The main air quality impacts will be associated with dust, mitigation measures and monitoring will be included in the EIA. Recent technical information on air quality emissions conducted by an independent specialist for the Syngas Electrical Plant will be provided. This study has indicated that emissions are extremely low and insignificant. This will be included in the EIA.
- Radioactivity Impact Assessment: The mineral and associated mineral has a neutral risk for Natural Occurring Radiation. In fact, graphite is utilised in Nuclear Plants to neutralise radiation due to its properties.
- Traffic Impact Assessment: The product transport will generate an additional 6 trips per day, this will have a low impact as existing roads will be utilised. The existing status of the roads and potential impacts on maintenance, safety and traffic management will be addressed as part of the EIA.
- Seismicity Assessment: Seismic activity due to mining is more prevalent in underground or very deep open cast mines. The Graphite mine will not exceed 150m at its deepest point, and therefore the risk of Seismic Activity is minimal.

The plan of study is to complete the S&EIR process. Public participation will continue throughout the process, and the envisaged key milestones of the programme for the EIA Phase of the project is included in Chapter 11.

10.4 Proposed Method of Assessing Significance

According to the NEMA Regulations, 'significant impact means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment'. In line with the Regulations, and based on the qualitative findings of the activities undertaken, each potentially significant impact has been assessed with regard to:

- the nature and status of the impact
- the extent and duration of the impact
- the probability of the impact occurring
- the effect of significance on decision-making
- the weight of significance
- The mitigation efficiency

10.4.1 Nature and Status

The 'nature' of the impact describes what is being affected and how. The 'status' is based on whether the impact is positive, negative or neutral.

10.4.2 Spatial Extent

'Spatial Extent' defines the spatial or geographical scale of the impact.

CATEGORY	RATE	DESCRIPTOR
Site	1	Site of the proposed development
Local	2	Limited to site and/or immediate surrounds (500m zone of influence)
District	3	Local Municipal area
Region	4	District Municipal area
Provincial	5	Limpopo Province
National	6	South Africa
International	7	Beyond South African borders

10.4.3 Duration

'Duration' gives the temporal scale of the impact.

CATEGORY	RATE	DESCRIPTOR
Temporary	1	0 – 1 years
Short term	2	1 – 5 years
Medium term	3	5 – 15 years

CATEGORY	RATE	DESCRIPTOR
Long term	4	Where the impact will cease after the operational life of the activity either because of natural process or by human intervention
Permanent	5	Where mitigation either by natural processes or by human intervention will not occur in such a way or in such a time span that the impact can be considered as transient

10.4.4 Probability

The 'probability' describes the likelihood of the impact actually occurring.

CATEGORY	RATE	DESCRIPTOR
Rare	1	Where the impact may occur in exceptional circumstances only
Improbable	2	Where the possibility of the impact materialising is very low either because of design or historic experience
Probable	3	Where there is a distinct possibility that the impact will occur
Highly probable	4	Where it is most likely that the impact will occur
Definite	5	Where the impact will occur regardless of any prevention measures

10.4.5 Intensity

'Intensity' defines whether the impact is destructive or benign, in other words the level of impact on the environment.

CATEGORY	RATE	DESCRIPTOR
Insignificant	1	Where the impact affects the environment is such a way that natural, cultural and social functions and processes are not affected. Localised impact and a small percentage of the population is affected
Low	2	Where the impact affects the environment is such a way that natural, cultural and social functions and processes are affected to a limited extent
Medium	3	Where the affected environment is altered in terms of natural, cultural and social functions and processes continue albeit in a modified way
High	4	Where natural, cultural or social functions or processes are altered to the extent that they will temporarily or permanently cease
Very High	5	Where natural, cultural or social functions or processes are altered to the extent that they will permanently cease and it is not possible to mitigate or remedy the impact

10.4.6 Ranking, Weighting and Scaling

The weight of significance defines the level or limit at which point an impact changes from low to medium significance, or medium to high significance. The purpose of assigning such weights serves to highlight those aspects that are considered the most critical to the various stakeholders and ensure that the element of bias is taken into account. These weights are often determined by current societal values or alternatively by scientific evidence (norms, etc.) that define what would be acceptable or unacceptable to society and may be expressed in the form of legislated standards, guidelines or objectives.

The weighting factor provides a means whereby the impact assessor can successfully deal with the complexities that exist between the different impacts and associated aspect criteria.

Spatial Extent	Duration	Intensity / Severity	Probability	Weighting factor	Significance Rating (SR - WOM) Pre-mitigation	Mitigation Efficiency (ME)	Significance Rating (SR-WM) Post Mitigation
Site (1)	Short term (1)	Insignificant (1)	Rare (1)	Low (1)	Low (0 – 19)	High (0.2)	Low (0 – 19)
Local (2)	Short to Medium-term (2)	Minor (2)	Unlikely (2)	Low to Medium (2)	Low to Medium (20 – 39)	Medium to High (0.4)	Low to Medium (20 – 39)
District (3)							
Regional (4)	Medium term (3)	Medium (3)	Possible (3)	Medium (3)	Medium (40 – 59)	Medium (0.6)	Medium (40 – 59)
Provincial (5)	Long term (4)	High (4)	Likely (4)	Medium to High (4)	Medium to High (60 – 79)	Low to Medium (0.8)	Medium to High (60 – 79)
National (6)							
International (7)	Permanent (5)	Very high (5)	Almost certain (5)	High (5)	High (80 – 110)	Low (1.0)	High (80 – 110)

10.4.7 Impact Significance without Mitigation (WOM)

Following the assignment of the necessary weights to the respective aspects, criteria are summed and multiplied by their assigned weightings, resulting in a value for each impact (prior to the implementation of mitigation measures).

Equation 1:
Significance Rating (WOM) = (Extent + Intensity + Duration + Probability) x Weighting Factor

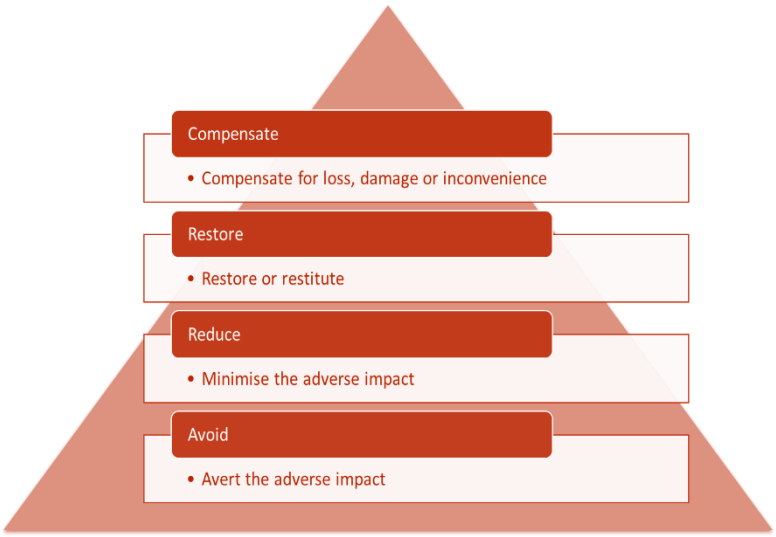
10.4.8 Effect of Significance on Decision-makings

Significance is determined through a synthesis of impact characteristics as described in the above paragraphs. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact "without mitigation" is the prime determinant of the nature and degree of mitigation required. Table 7 below will determine whether the significance rating will have an effect on decision-making or not.

RATING		DESCRIPTOR
Negligible	0	The impact is non-existent or insignificant, is of no or little importance to decision making.
Low	1-19	The impact is limited in extent, even if the intensity is major; the probability of occurrence is low and the impact will not have a significant influence on decision-making and is unlikely to require management intervention bearing significant costs.
Low to Medium	20 – 39	The impact is of importance, however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels. The impact and proposed mitigation measures can be considered in the decision-making process
Medium	40 – 59	The impact is significant to one or more affected stakeholder, and its intensity will be medium or high; but can be avoided or mitigated and therefore reduced to acceptable levels. The impact and mitigation proposed should have an influence on the decision.
Medium to High	60 -79	The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels.
High	80 – 110	The impact could render development options controversial or the entire project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor and must influence decision-making.

10.4.9 Mitigation

"Mitigation" is a broad term that covers all components of the 'mitigation hierarchy' defined hereunder. It involves selecting and implementing measures, amongst others protecting the users of the environment from adverse impacts as a result of mining or any other land use. The aim is to prevent adverse impacts from occurring or, where this is unavoidable, to limit their significance to an acceptable level. Offsetting of impacts is considered the last option in the mitigation hierarchy for any project.



The mitigation hierarchy in general consists of the following in order of which impacts should be mitigated:

- **Avoid/prevent impact**: Can be done through utilising alternative sites, technology and scale of projects to prevent impacts. In some cases, if impacts are expected to be too high the "no project" option should also be considered, especially where it is expected that the lower levels of mitigation will not be adequate to limit impacts.
- **Minimise (reduce) impact**: Can be done through the utilisation of alternatives that will ensure that impacts on the environment and eco-services provision are reduced. Impact minimisation is considered an essential part of any development project.
- **Manage (restore) impact**: Applicable to aspects where impact avoidance and minimisation are unavoidable and where an attempt to re-instate impacted aspects and return them to conditions which are similar to the pre-project conditions.
- **Offset (compensate) impact**: Compensating for latent or unavoidable negative impacts on the environment. Offsetting should take place to address any impacts deemed to be unacceptable, which cannot be mitigated through the other mechanisms in the mitigation hierarchy.

According to the DMR (2013), “Closure” refers to the process for ensuring that mining operations are closed in an environmentally responsible manner, usually with the dual objectives of ensuring sustainable post-mining land uses and remedying negative impacts on biodiversity and ecosystem services.

The significance of residual impacts should be identified on a regional as well as national scale when considering biodiversity conservation initiatives. If the residual impacts lead to irreversible loss of irreplaceable biodiversity, the residual impacts should be considered to be of very high significance and when residual impacts are considered to be of very high significance, offset initiatives are not considered an appropriate way to deal with the magnitude and/or significance of the biodiversity loss. In the case of residual impacts determined to have medium to high significance, an offset initiative may be investigated. If the residual biodiversity impacts are considered of low significance, no biodiversity offset is required.

10.4.10 Impact Significance with Measures (WM)

In order to gain a comprehensive understanding of the overall significance of the impact, after implementation of the mitigation measures, it was necessary to re-evaluate the impact.

10.4.11 Mitigation Efficiency (ME)

The most effective means of deriving a quantitative value of mitigated impacts is to assign each significance rating value (WOM) mitigation effectiveness (ME) rating. The allocation of such a rating is a measure of the efficiency and effectiveness, as identified through professional experience and empirical evidence of how effectively the proposed mitigation measures will manage the impact. Thus, the lower the assigned value, the greater the effectiveness of the proposed mitigation measures and subsequently, the lower the impacts with mitigation.

Equation 2:
Significance Rating (WM) = Significance Rating (WOM) x Mitigation Efficiency (ME)

Mitigation Efficiency is rated out of 1 as follows:

CATEGORY	RATE	DESCRIPTOR
Not Efficient (Low)	1	Mitigation cannot make a difference to the impact
Low to Medium	0.8	Mitigation will minimize impact slightly
Medium	0.6	Mitigation will minimize impact to such an extent that it becomes within acceptable standards
Medium to High	0.4	Mitigation will minimize impact to such an extent that it is below acceptable standards
High	0.2	Mitigation will minimize impact to such an extent that it becomes insignificant

10.4.12 Significance Following Mitigation (SFM)

The significance of the impact after the mitigation measures is taken into consideration. The efficiency of the mitigation measure determines the significance of the impact. The level of impact is therefore seen in its entirety with all considerations taken into account.

10.5 Stages at Which the CA Will Be Consulted

The CA will be consulted after submission of the draft EIAR/EMPr and upon receipt of comments from organs of state and registered IAPs.

11 PUBLIC PARTICIPATION PROCESS

11.1 Register of Interested and Affected Parties

A register of Interested and Affected Parties has been established and will be maintained throughout the process.

A copy is attached as Appendix B1.

11.2 Notifications

Notification of the applications submitted, and the availability of the Draft Scoping Report was sent out on 3 December 2020. A Scoping Report summary was provided with the notification. A copy of the notice is attached as Appendix B2.

Future notifications will include:

- Engagement sessions
- Final Scoping Report
- Acceptance of Scoping Report
- Draft Environmental Impact Assessment Report and Environmental Management Programme Reports (EIAR/EMPrs)
- Final EIAR/EMPRs
- Record of Decision

11.3 Advertisements and On-site Notifications

An advertisement has been placed in the Polokwane Observer on 3 December 2020. The advertisement provided information on registrations as and I&AP, the applications, project, availability of the Scoping Report and where more information can be accessed.

A copy of the advertisement will be attached to the final Scoping Report. The proforma advertisement is included as Appendix B3.

11.4 Availability of Project Documentation

The Draft Scoping Report has been made available for 30 days from 3 December 2020 to 23 January 2021.

11.5 IAP Engagements and Meetings

Engagements have been held with the Kibi Traditional Authority and Traditional Community.

A community function was held to introduce the project on 24 October 2020.

A workshop on the process was held on 2 November 2020 with the Traditional Authority and Community Representatives.

Minute notes and Attendance Registers are attached as Appendix B4.

11.6 Summary of Issues Raised By IAPS

The main issues raised to date include:

- The timeframe for the development to commence
- Increase in job opportunities
- Business opportunities
- Community projects
- Impact on grazing and livestock

11.7 Particulars of the Public Participation Plan

11.7.1 Methods of Public Participation

The following methods will be utilised throughout the Public Participation process, as required:

- Advertisements and Notices;
- Authority meetings;
- Community Committee meetings;
- Public Meetings and/or Open Days;
- One-on-One interviews/engagements;

- Electronic and email correspondence; and
- Other Methods.

11.7.2 Scoping Phase

11.7.2.1 Authority Engagement

The draft Scoping Report will be provided to all relevant Departments (including District and Local Municipal representatives) for their comments and inputs.

11.7.2.2 Comments and responses on the Draft Scoping Report

A CRR will be compiled from all the comments received on the Draft Scoping Report. This report will be included in the Final Scoping Report.

11.7.2.3 Notification of the final Scoping Report

Registered IAPs will be notified of the availability of the final Scoping Report.

11.7.3 EIA Phase

11.7.3.1 EIA results information dissemination

The results from the specialist studies will be presented at a Public Meeting with translation into Sepedi. The draft EIA/EMPr will be accompanied with a Non-Technical Executive Summary.

11.7.4 Further IAP Engagement Sessions

11.7.4.1 Authority Engagement

The draft EIAR/EMPr will be provided to all relevant Departments (including District and Local Municipal representatives) for their comments and inputs.

11.7.4.2 Community Engagement

The EIAR information document will be distributed in the local community, and community members invited to the meeting.

The Community Committee will be workshopped on the results of the EIAR, then a combined Community and Public Meeting will be held where all IAPs will be provided with an opportunity to raise concerns, make comments and or suggestions to the EAP and the Applicant. The meeting will be held within the Municipal area in proximity to the communities.

11.7.4.3 Availability of the EIAR/EMPrs

The draft EIAR/EMPr will be made available for 30 calendar days. Notification will be sent to all registered IAPs indicating where copies of the report can be accessed. Hard copies of the reports will be submitted to relevant Authorities and will also be placed in the Public Places. The report will be available for download or a Compact Disc can be posted on request. Provision will be made to facilitate access to the report by communities.

11.7.4.4 Comments and Responses

All comments received during the Scoping and EIA Phases will be included in the CRR for the project and process. Responses to questions and comments will be provided in these reports, and where relevant, inputs will be incorporated into the final EIAR/EMPr.

11.7.5 Decision-making Phase

11.7.5.1 Notification of DMRE Decision

All registered I&APs will be notified of the decision.

12 OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

12.1 Impact on the Socio-Economic Conditions of any Directly Affected Party

Refer to Section 9.10 of this report.

12.2 Impact on Any National Estate

Refer to Section 8.13 of this report.

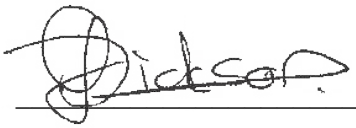
12.3 Other Matters Required in Terms of Sections 24(4)(A) And (B) Of the Act

This report adheres to the requirements stipulated in the NEMA and the recently published EIA Regulations 2014. The NEMA Appendix 2 guidelines were used as framework.

13 UNDERTAKING

The EAP herewith confirms

a) the correctness of the information provided in the reports;
b) the inclusion of comments and inputs from stakeholders and I&APs ;
c) the inclusion of inputs and recommendations from the specialist reports where relevant; and
d) the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed



Lizinda Dickson

Diphororo Development (Pty) Ltd

APPENDIX A: EAP CURRICULUM VITAE

154 Blyde ave, Sinoville, 0182
PO Box 13509, Sinoville, 0129
Tel: (012) 543 9093
Fax: 086 602 5566
Email: lizinda@diphororo.com
Reg nr: 2004/012381/07

CURRICULUM VITAE	Surname:	Dickson (previously Grobbelaar)
	First Name:	Lizinda
	Contact:	0829222261 / lizinda@diphororo.com
	Birth date:	11 Nov 1975
	Nationality:	South African
	Gender:	Female
Profession	Project Director: Social Assessment, Management and Facilitation	
Education	BA Degree specialising in Geography / GIS; University of Stellenbosch; 1994 – 1996 BA (Hons) specialisting in Environmental Management & Analysis; University of Pretoria; 1997 – 1998 Masters specialisting in Environment and Society; University of Pretoria; commenced 2013/2014, still in progress	
Other Formal Training / Education	Certificate in Database management; Microsoft Accredited Certificate in Geographic Information Systems: ArcGIS; ESRI Accredited Certificate in Geographic Information Systems: PlanetGIS; PlanetGIS Accredited HIV/AIDS Peer educator; SETA Accredited Certificate	
Professional Societies	Member of the International Association of Impact Assessments Member of the International Resettlement Specialist Association	
Publications	van Koppen, B., Joubert, C. & Grobbelaar(Dickson), L (2000). Gender and Irrigation in Mathabatha Land. South Africa Working Paper. Colombo, Sri Lanka: International Water Management Institute (IWMI)	
Employment Record	University of Pretoria; Research Assistant; 1996 – 1997 Naledi Development; Project Assistant; 1998 – 2000 Naledi Development; Project Leader / Manager; 2000 – 2004 Diphororo Development; Director / Owner; 2004 – 2017	
Language Proficiency	English – excellent	
Computer Aptitude	Windows 8, 10; Adobe Acrobat Reader / Writer 2017 Microsoft Office 2003, 2007, 2010, 2016; Microsoft Project 2003, 2007, 2010 Microsoft Access 2003, 2007, 2010, 2016 Corel Office and Corel Draw Mapping: ESRI ArcGIS; Planet GIS; QGIS; Global Mapper SAS Statistical analysis (database management)	

Client	Project	Environmental Assessment / Management	Social Assessment / Management	Housing Resettlement Planning / Implementation	Stakeholder Engagement / Management	Geographic Information Systems	Social Development and labour Plans	Land access / acquisition facilitation
Consol Glass	Rietkol Project		X		X	X		
ESKOM	Neptune Poseidon 400kV Transmission Line		X	X	X	X	X	X
Subiflex	The Duel Project		X	X	X	X	X	
BHP Billiton / South 32	Khutala Life Extension Project		X	X		X		
BHP Billiton / South 32	Leandra Underground Coal Project		X		X	X	X	
Ibutho Coal	Fuleni Coal Project		X	X	X	X	X	
Taung Gold	Evander Project		X			X		
Coal of Africa Limited	Greater Soutpansberg Mining Right Applications		X		X	X	X	X
Department of Housing / Urban Dynamics	Bekkersdal Urban Renewal		X	X	X		X	X
Coal of Africa Limited	Makhado Colliery		X	X	X	X	X	X
Coal of Africa Limited	Vele Colliery		X		X		X	
Glencore	Goedgevonden Colliery Expansion		X		X	X		
Sefateng Chrome	Sefateng Chrome Mine		X	X	X	X	X	X
Ergosat	Ergosat Project	X	X	X	X	X	X	X
Tivani (Pty) Ltd	Tivani Project	X	X	X	X	X	X	X
Coal of Africa Limited	Mooiplaats Colliery / Vuna Colliery						X	
Glencore	Vlakfontein Colliery		X		X		X	
Tivani (Pty) Ltd	Mohlabas Localtion	X	X	X	X	X	X	X
Bengwenyama Minerals	Eerstegeluk Project	X	X		X		X	X
Barrick Gold	Sedibelo project		X	X	X	X		X
Magalies Water	Drought relief programme	X			X			
Sekhukhune District Municipality	Mooihoek Burgersfort Bulk Water Scheme	X	X		X			X
Department of Housing	Affordable Rental Accommodation		X	X	X		X	
Department of Housing	Hostel regeneration		X	X	X		X	
Department of Housing	Bekkersdal Urban Renewal		X	X	X		X	
Lebabelo Water User Association	Lebalelo Bulk Water Scheme		X		X	X	X	X

Client	Project	Environmental Assessment / Management	Social Assessment / Management	Housing Resettlement Planning / Implementation	Stakeholder Engagement / Management	Geographic Information Systems	Social Development and labour Plans	Land access / acquisition facilitation
VILDEV	Taung Commercial Project	X	X		X			
Anglo American	Twickenham Platinum Mine	X	X	X	X	X	X	X
Anglo American	Brakfontein Project		X	X	X	X	X	X
Impala Platinum	OR Tambo Essential Oil Project	X	X			X	X	X
Impala Platinum	Marula Platinum		X	X	X	X		
Tip Trans Resources	Sand mining projects	X	X		X	X		
SAMREC (Pty) Ltd	Annesley Andulusite Mine Development		X	X	X	X		
Boitumelo Diamonds	Boitumelo Diamonds						X	
Peermont Global Resort	Limpopo Casino Development	X	X		X	X		
Mbombela Local Municipality	Mbombela Sport Stadium		X		X	X		
NWPTB	Taung Dam Protected Area development	X	X		X	X	X	
Desert Charm Trading	Giyani Mining Development	X			X			X
Great Basin Gold	Burnstone Mine Development				X		X	
Wandma Consulting	Lothlokwane Power line		X		X			
Department of Water Affairs	Rooipoort Dam Development	X	X	X	X	X		X
Department of Water Affairs	Flag Boshielo Dam Development		X	X	X	X		X
Mbombela Local Municipality	Mbombela Sport Stadium		X				X	
Grant Thornton	Polokwane Stadium		X				X	
Department of Water Affairs	Crocodile-West Catchment Management Agency		X		X		X	
Department of Water Affairs	Letaba / Luvhuvhu Catchment Management Agency		X		X		X	
Mvula Trust	Seroka / Rapitsi Upgrading of Water Supply		X		X		X	
Mvula Trust	Sanitation Awareness & Education in Schools		X		X		X	
National Road Agency	Capricorn Toll Plaza		X		X			X
Margate Local Municipality	Margate Landfil Site Rehabilitation	X	X		X			
Mini-Waste	Mooiplaats Landfill Site	X	X		X			

Client	**Project**	**Environmental Assessment / Management**	**Social Assessment / Management**	**Housing Resettlement Planning / Implementation**	**Stakeholder Engagement / Management**	**Geographic Information Systems**	**Social Development and labour Plans**	**Land access / acquisition facilitation**
Department of Water Affairs	Olifants River In stream Flow Requirements		X		X			
Department of Water Affairs	Nondweni Weir		X		X			X
Department of Water Affairs	Lebowakgomo Water "Turnaround" Projects -		X		X	X		X
National Road Agency	Baobab Toll Plaza		X		X			X
Lefika	Coronation Park Development		X			X		
National Road Agency	Diamond Hill Toll Plaza		X		X			X

APPENDIX B: PUBLIC PARTICIPATION RECORDS

Appendix B1: Interested and Affected Party List

Category	Stakeholder	Title	Initials	First Name	Last Name	Designation	Organisation
Local Government	Mrs C Maphodi	Mrs	C	Charity	Maphodi	Director Economic Development & Planning	Blouberg Local Municipality
Local Government	S.O. Makgoshing	Mr	MJ	Junias	Machaba	Municipal Manager	Blouberg Local Municipality
Local Government	Mr MJ Masama	Mr	MJ	MJ	Masama	IDP Manager	Blouberg Local Municipality
Local Government	Mr MS Moremi	Mr	MS	Stanford	Moremi	Snr Manager Economic Development & Planning	Blouberg Local Municipality
Local Government	M.B. Ramahuma		MB	MB	Ramahuma	Environmental Officer	Blouberg Local Municipality
Local Government	Mr F Mafa	Mr	F	Frank	Mafa	Environmental Management Inspector	Capricorn District Municipality
Local Government	Ms N Mazibuko	Ms	N	Nokuthula	Mazibuko	Municipal Manager	Capricorn District Municipality
Local Government	Mr M Mojapelo	Mr	M	Mahlako	Mojapelo	Spatial Planning and Land Use Management	Capricorn District Municipality
Local Government	Mr T van Rooyen	Mr	T	Theo	van Rooyen		Capricorn District Municipality
Provincial Government	Mr T S Ndove	Mr	T S	Terry Salanie	Ndove	Acting HOD	Department of Agriculture
Provincial Government	Mr R Selemela	Mr	R	Richard	Selemela	Senior Manager	Department of Agriculture
Provincial Government	Mr F Mahlakoane	Mr	F	Foletji	Mahlakoane	Director	Department of Agriculture Forestry & Fisheries (DAFF)
Provincial Government	Mr N Nchabeleng	Mr	N	Nape	Nchabeleng	Acting HOD	Department of Cooperative Governance, Human Settlement & Traditional Affairs
Provincial Government	Mr S Kgopong	Mr	S	Solly	Kgopong	HOD	Department of Economic Development, Environment & Tourism (LEDET)
Provincial Government	Ms L Maja	Ms	L	Lilly	Maja	Acting General Manager: Economic Development	Department of Economic Development, Environment & Tourism (LEDET)
Provincial Government	Mr V M Mongwe	Mr	V M	Victor Mafemane	Mongwe	Senior Manager – Environmental Impact Management	Department of Economic Development, Environment & Tourism (LEDET)
Provincial Government	Mr R Mthombeni	Mr	R	Rhulani	Mthombeni	Manager Capricorn and Greater Sekhukhune	Department of Economic Development, Environment & Tourism (LEDET)
Provincial Government	Mr T Kolani	Mr	T	Thivhulawi	Kolani	Assistant Director: Environment	Department of Mineral Resources (DMR)
Provincial Government	B Hlatshwayo		B	Bongani	Hlatshwayo	Case Officer	Department of Mineral Resources (DMR)
Provincial Government	Mr J Mashaphu	Mr	J	Julius	Mashaphu	HoD PSSC Office Limpopo	Department of Rural Development and Land Reform
Provincial Government	Mrs M Ramaila	Mrs	M	Maphuti	Ramaila	Director: Capricorn District	Department of Rural Development and Land Reform
Provincial Government	Mr O Aiseng	Mr	O	Olebogeng	Aiseng	Deputy Director: Capricorn District	Department of Rural Development and Land Reform
Provincial Government	Mr T Maphoto	Mr	T	Tele	Maphoto	HoD: Restitution	Department of Rural Development and Land Reform
Provincial Government	Mr D H Mabada	Mr	D H	Donald Hangwani	Mabada	Deputy Director : W&U	Department of Water Affairs (DWA) Mpumalanga
Provincial Government	Mr W Phuluwa	Mr	W	Winnie	Phuluwa	Environmental Officer	Department of Water Affairs (DWA) Mpumalanga
NGO/Civil Society	Mr N Khumalo	Mr	N	Nokukhanya	Khumalo	Heritage Officer	South African Heritage Resources Agency (SAHRA)
Provincial Government	Mr D Lithole	Mr	D	Donald	Lithole	Senior Manager	Limpopo Heritage Resource Agency (LIHRA)
Community Members	Ms Antoinette Pale	Ms	A	Antoinette	Pale	Committee Member	Donkerhoek Kibi Tribal
Community Members	Ms Lebogang Mashola	Ms	L	Lebogang	Mashola	Committee Member	Moisimane (Arrie)
Community Members	M Madraye		M	Mosta	Madraye	The Glade	The Glade
Community Members	KP Mokwena		KP	KP	Mokwena	Chairperson: Mining Negotiating Committee	GaKibi Traditional Authority
Community Members	ML Mosena		ML	ML	Mosena	Kibi Tribe Spokesperson	GaKibi Traditional Authority
Community Members	Ms G Makhura	Ms	G	Gloria	Makhura	Kibi Tribal Princess (Kgadi)	GaKibi Traditional Authority
Community Members	Mr M Tlebjane	Mr	M	Malaodi	Tlebjane	Chairperson Committee	Longden
Community Members	Mr C Rapanyane	Ms	C	Carlifonia	Rapanyane	Committee Member	Edwinsdale
Community Members	Mr J Mpashe	Mr	J	Jerry	Mpashe	Committee Member	Devrede
Community Members	Ms M Leboho	Ms	M	Mmoloki	Leboho	Committee Member	GaKibi Traditional Authority
Community Members	Mr M Bennet	Mr	M	Malema	Bennet	Committee Member	GaKibi Traditional Authority
Community Members	Mr S Sekuba	Mr	S	Sydney	Sekuba	Committee Member	GaKibi Ramotsho
Community Members	Mr MN Sepaela	Mr	MN	Motlatsho Nicolas	Sepaela	Mining Committee Member	Simpson / Ramaswikana
Community Members	Dr M Leboho	Dr	M	Mukatshelwa	Leboho	Mmakghoshi	GaKibi Traditional Authority
Community Members	Ms MD Morongoa	Ms	MD	Masha Doris	Morongoa	Committee Member	GaKibi Traditional Authority
Community Members	Mr J Mosena	Mr	J	Jacob	Mosena	Committee Member	
Community Members	Mr I Mabote	Mr	I	Israel	Mabote	Committee Member	Edwinsdale
Community Members	Mr C Rapanyane	Ms	C	Carlifonia	Rapanyane	Committee Member	Edwinsdale (Mokwena)
Community Members	Mr J Maputle	Mr	J	Justice	Maputle	Raystan	GaKibi Traditional Authority
Neigbour	Government of the Republic of South Africa	Mr	J	Julius	Mashaphu	Arrie 308 MR	Department of Rural Development and Land Reform
Neigbour	Government of the Republic	Mr	J	Julius	Mashaphu	Zondagfontein 300 MR Ptn 1	Department of Rural Development and Land Reform
Neigbour	Roman Catholic Church					Zondagfontein 300 MR Ptn 3	
Neigbour	Ramakwa Project Trust					Zondagfontein 300 MR RE	
Neigbour	Government of Lebowa	Mr	J	Julius	Mashaphu	Goudmyn 327 MR RE	Department of Rural Development and Land Reform

Appendix B2: Notification & Scoping Report Summary

STEAMBOAT PROJECT

Ref nr: LP 30/5/1/2/3/2/1(10193) EM 3 December 2020

PUBLIC PARTICIPATION NOTIFICATION

APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE CUCHRON MINE DEVELOPMENT AND THE STEAMBOAT BENEFICIATION PLANT

Dear Stakeholder,

You are hereby notified of the submission of a Mining Right and Environmental Authorisation Application by Cuchron (Pty) Ltd and an Environmental Authorisation Application by Steamboat Graphite (Pty) Ltd.

The Mining Right Application was submitted in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) and two Environmental Authorisation Applications in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and the Environment Impact Assessment Regulations promulgated in Government Notice No. R. 982-986 of 4 December 2014, as amended in 2017 by Government Notice No. 324-327 of 7 April 2017 (EIA Regulations).

The Two Environmental Authorisation Applications submitted include:

- Cuchron (Pty) Ltd has applied for Environmental Authorisation for the Mine Development and Associated Infrastructure; and
- Steamboat Graphite (Pty) Ltd has applied for the Environmental Authorisation for the Beneficiation Plant and associated infrastructure.

Approval has been received from DMRE to follow a joint and consolidated approach for the two Applications and therefore conduct a combined Environmental Impact Assessment Process in terms of Regulation 11(4) of the EIA regulations 2014 (as amended).

The projects are located on the farms Steamboat 306MR and Inkom 305MR, which is situated approximately 36km south-west of Alldays and 54km north-west of Vivo in the Blouberg Local Municipality, Capricorn District of Limpopo Province. The total extent of the properties is 1453.5761ha. The projects will require the following footprints: a) Mining Open Pit and Associated infrastructure: 14ha (1% of properties); and b) Beneficiation Plant and Associated infrastructure: 13ha (1% of properties). The combined size of the two projects are 27ha in total.

The application for a Mining Right and the two Environmental Authorisation applications triggers a number of listed activities, and therefore require a Scoping and Environmental Impact Reporting (S&EIR) process as contemplated in regulation 21 to regulation 24 of the EIA Regulations.

Interested and Affected Parties (IAPs) are hereby notified of the applications, are requested to register as an Interested and Affected Party, and are notified of the availability of the Draft Scoping Report for comment. Access to the Scoping Report can be requested from the Public Participation Office, and comments should be submitted on or before **23 January 2021.**

For further information on the applications or to register as an IAP, please contact or send your information to the Public Participation Office: 012 543 9093 (t); 086 602 5566 6243 (f) or email at steamboat@participation.co.za

Regards
Lizinda Dickson
Environmental Assessment Practitioner

SCOPING REPORT SUMMARY INFORMATION DOCUMENT

APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE CUCHRON MINE DEVELOPMENT AND THE STEAMBOAT BENEFICIATION PLANT

1 INTRODUCTION

Notice of the Mining Right Application in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) and two Environmental Authorisation Applications in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and the Environment Impact Assessment Regulations promulgated in Government Notice No. R. 982-986 of 4 December 2014, as amended in 2017 by Government Notice No. 324-327 of 7 April 2017 (EIA Regulations).

The Two Environmental Authorisation Applications submitted include:

- Cuchron (Pty) Ltd has applied for Environmental Authorisation for the Mine Development and Associated Infrastructure; and
- Steamboat Graphite (Pty) Ltd has applied for the Environmental Authorisation for the Beneficiation Plant and associated infrastructure.

Approval has been received from DMR to follow a joint and consolidated approach for the two Applications and there conduct a combined Environmental Impact Assessment Process in terms of Regulation 11(4) of the EIA regulations 2014 (as amended)

2 PROJECT LOCATION

The projects are located on the farms Steamboat 306MR and Inkom 305MR, which is situated approximately 36km south-west of Alldays and 54km north-west of Vivo in the Blouberg Local Municipality, Capricorn District of Limpopo Province. The total extent of the properties is 1453.5761ha. The projects will require the following footprints: a) Mining Open Pit and Associated infrastructure: 14ha (1% of properties); and b) Beneficiation Plant and Associated infrastructure: 13ha (1% of properties). The combined size of the two projects are 27ha in total.

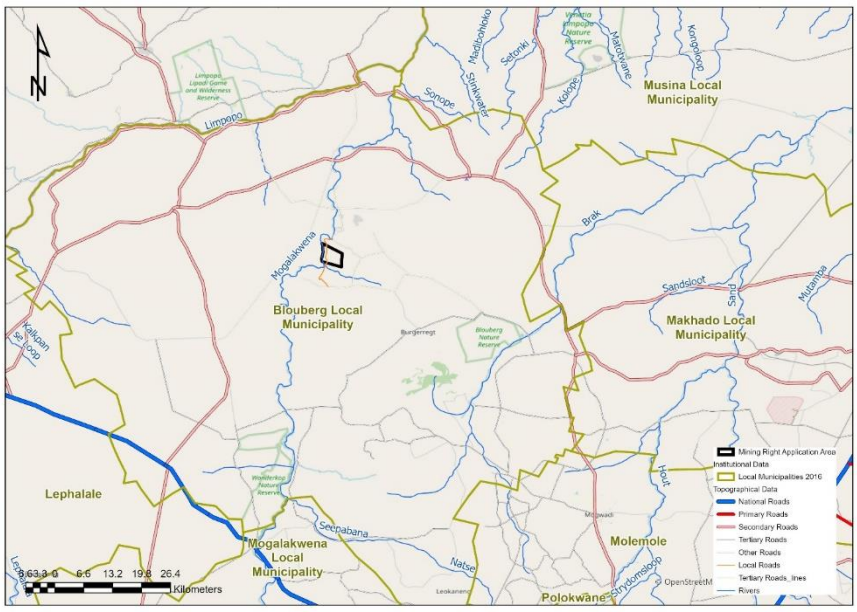


Figure 1: Locality Map

3 PROJECT DESCRIPTION

3.1 Mine Development – Cuchron (Pty) Ltd

In support of its application to the Department of Mineral Resources for a mining right over Steamboat 306MR and Inkom 305MR. Cuchron submitted the application for an environmental authorisation for opencast mining and ancillary surface activities. The following components are included:

- Open pit;
- Internal Roads;
- Mining Office, Workshop and Storage Area
- Access Road;
- Storm water and pollution control infrastructure;
- Pipelines for transportation of clean water;
- Potable water storage facilities;

Alternative Locations of the infrastructure will be considered.

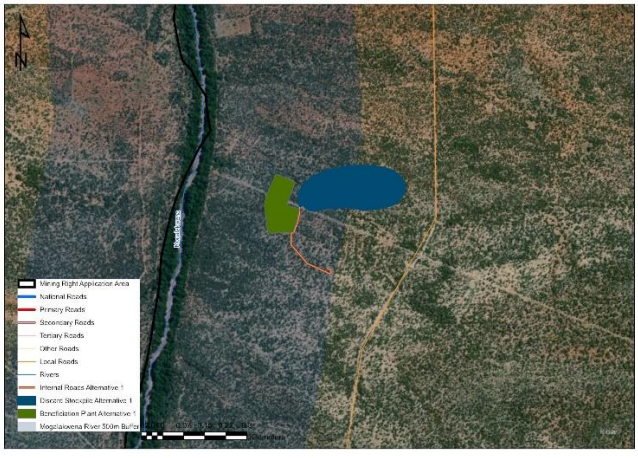
3.2 Beneficiation Plant – Steamboat Graphite (Pty) Ltd

In addition, and related to an application to the Department of Mineral Resources for a mining right by Cuchron (Pty) Ltd over Steamboat 306MR and Inkom 305MR, Steamboat Graphite will be the primary customer of Cuchron, and will establish the Graphite Beneficiation Plant on the Mining Right Area. Steamboat Graphite submitted the application for an environmental authorisation for the Graphite Beneficiation Plant and associated infrastructure. The following components are included:

- Graphite Beneficiation Plant
- Electricity Generation Facility
- Discard Dump
- Potable Water Pipelines
- Stormwater channels
- Process Water Pipeline
- Pollution Control Dam
- Internal Service Roads
- New Access Road
- Upgrade of existing Access Road

Alternative Locations of the infrastructure will be considered.

Alternative 1

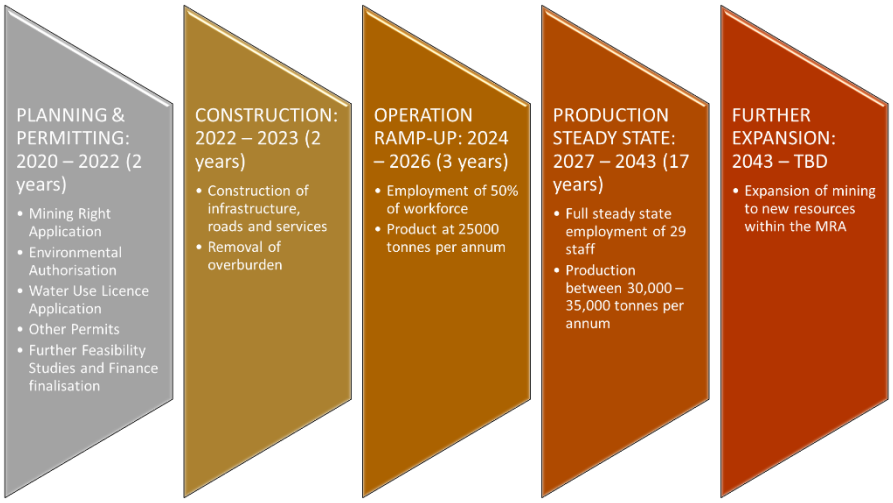


Alternative 2 (preferred)

3.3 Project Development Timeframes

The diagram below indicates that the mine will only commence operating during Stage 3, estimated to be around 2024, mainly due to licencing and construction of infrastructure for the Mine. This is only an estimated timeframe and may be earlier, depending on the approval process.

The project is divided into different stages:



4 LEGISLATIVE PROCESS

The project will trigger activities under the Environmental Impact Assessment (EIA) Regulations of 2014 (as amended) promulgated under the National Environmental Management Act, No. 1998 (Act 107 of 1998) (NEMA), and therefore the Applicant is required to conduct a Scoping and EIA (S&EIA) process and compile the associated Scoping and EIA Reports (EIAR) that need to be submitted to the DMR for adjudication.

There are three phases, namely the application / scoping phase, the EIA phase and the Authority review and decision-making phase.

Application and Scoping Phase: Notification of Interested and Affected Parties (IAPs) of the submission of the Application and the availability of the draft Scoping Report (DSR) to communities and registered IAPs. The DSR will identify the key issues and alternatives to be assessed and recommend the approach to be followed during the EIA Phase to follow (Plan of Study). Comments received from IAPs are incorporated in the DSR and the Final Scoping Report (FSR) is submitted to the Competent Authority, whereupon they accept or refuse it.

EIA Phase: Upon acceptance of the FSR and Plan of Study, the EIA Phase can commence. This includes the preparation of the Environmental Impact Assessment Report (EIAR), which provides detailed assessments of the significance of biophysical and social impacts, as well as the Environmental Management Programme (EMPr). The draft EIAR and EMPr are again provided to registered IAPs for comment. Comments are responded to in the Final EIAR and EMPr, which is submitted to the Competent Authority for decision-making.

Authority Review and Decision-making Phase: The Competent Authority reviews the information and recommendations provided in the Final EIAR and EMPr and is required to issue a decision to authorise (or refuse to authorise) the project within 107 days of submission of the documents.
The total timeframe for a “non-substantive” EIA process is legislated to take no more than 300 calendar days (excluding public holidays and the December break). This implies an EIA process where all issues could be satisfactorily resolved, and no substantive changes needed to be made or new and unexpected information needed to be added to the environmental reports.

5 EXPECTIVED BENEFITS AND IMPACTS

5.1 Benefits

The mine development will mine the first graphite deposit in South Africa. Benefits may include:

- Capital Investment and expected Revenue generation with a contribution to economic growth.
- Community ownership participation in Cuchron
- Employment and the generation of household income, including in supporting shops and suppliers.
- Secondary benefits in the creation of electricity to supply the domestic demand.
- Asset base: The capital expenditure outlaid into the land in the area will result in an asset base upon which future development can occur.
- Skills Development;
- Community development;
- Local procurement and SMME opportunities

5.2 Potential Impacts

The projects may also have environmental and social impacts, these will be further investigated during the Environmental Impact Assessment Phase and ways to mitigate and manage the impacts will be proposed. Preliminary impacts include:

- Geology:
    - *Disturbance of natural geology*
- Topography:
    - *Alteration of topography*
- Soils, Land use and Capability
    - *Loss of the original spatial distribution of natural soil forms and horizon sequences which cannot be reconstructed similarly during rehabilitation.*
    - *Loss of original soil depth and soil volume.*
    - *Loss of original fertility and organic carbon content.*
    - *Soil compaction from heavy machinery*
    - *Alteration of land use and capability of the project area (27ha)*
- Terrestrial Ecology
    - *Loss of habitat and biodiversity*
    - *Loss of animal, plant and medicinal species*
    - *Increased soil erosion*
    - *Alien plant invasion*
- Surface Water
    - *Reduction in storm water runoff*
    - *Decrease of surface water quality*
    - *Pollution as a result of leachate and runoff from the stockpile*
- Groundwater
    - *Lowering of groundwater levels*
    - *Effect on groundwater quality*
- Air Quality
    - *Increased of dust levels because of construction and hauling operations*
    - *Increased Particulate Matter, Sulphur Dioxide, Oxides or Nitrogen from the Syngas facility*
- Noise
    - *Increased total noise levels in the area, changing existing ambient sound levels at receptors*
- Archaeological and Cultural Interest
    - *Deterioration/damage of archaeological and cultural interest*
- Visual
    - *Visual intrusion of mining activities, impacting on the sense of place*
    - *Impact due to night-time lighting*
- Socio-economic Aspects
    - *Impact on land use and livelihoods from reduction in grazing area*
    - *Influx of Job seekers and Population growth pressures*
- Traffic
    - *Increased traffic on the Product Transport Route*
    - *Disruption of daily living and movement patterns and safety of road users*

6 SPECIALIST STUDIES

The impact assessment is divided into several fields of specialist study. The following specialist inputs to the EIA process include:

- Soil, Land Use, and Land Capability
- Terrestrial Ecological Impact Assessment (including Faunal and Floral);
- Surface Water Assessment;
- Groundwater Assessment;
- Heritage Assessment - Phase 1 Heritage Impact Assessment
- Palaeontology Impact Assessment – Desktop study as required by SAHRA
- Socio-economic Assessment:

7 PUBLIC PARTICIPATION PROCESS

The objectives of the Public Participation Process are to:

- Provide IAPs with an opportunity to voice their support, concerns and comments regarding the project, application, or decision.
- Provide an opportunity for IAPs, the EAP and the Competent Authority to obtain clear, accurate and understandable information about the environmental, social, and economic impacts of the proposed activity or implications of a decision.
- Provide IAPs with the opportunity of suggesting ways of reducing or mitigating negative impacts of an activity and for enhancing positive impacts.
- Enable the applicant to incorporate the needs, preferences, and values of affected parties into the application.

7.1 Getting Involved

You and/or your organisation are hereby invited to register as an IAP and provide input with regard the proposed project. You can become involved as follows:

- By registering as an IAP (see attached Registration Form).
- By reading this document and letting us know of any comments that you may have.
- By providing us with contact particulars of any other organisations or persons who may be affected by or interested in the proposed project.
- By attending Public Participation meetings to be scheduled during the EIA Phase.
- Review the draft Scoping Report and provide comments on or before **23 January 2021**.
- Contact the Public Participation Team regarding any query, comment, or request for further project information.

7.2 Who to contact?

The Public Participation Office can be contacted on 012 543 9093 (t); 086 602 5566 6243 (f) or email at steamboat@participation.co.za

8 STAKEHOLDER REGISTRATION AND COMMENT FORM

To register as an Interested and Affected Party, thereby ensuring that you are given an opportunity to comment on the documents and receive updated project information, please complete the form below and send your registration form with comments back to: **Lizinda Dickson / Lucky Ngale: Public Participation Office: Tel: 012 543 9093; Fax: 086 602 5566 or** steamboat@participation.co.za

Title		**Name**		**Surname**		
Farm Name (if applicable)					**Portion**	
Company						
Designation						
Address						
					Postal Code	
Tel. No.				**Fax No.**		
E-Mail				**Cell. No.**		
Preferred method of communication:						
Land Line	**Cellular phone**	**Fax**	**E-Mail**	**SMS**	**Post**	**Hand delivery**
Comments (feel free to attach additional pages):						
Indicate any direct business, financial, personal or other interest which you may have in the application:						
If you know of anyone who should be informed about the project, please provide their contact details:						
Name			**Tel. No.**			
Organisation / Farm						

PLEASE FEEL FREE TO CONTACT OUR PUBLIC PARTICIPATION OFFICE AT ANY TIME SHOULD YOU HAVE ANY QUESTION AND/OR SUGGESTIONS

Appendix B3: Adverts and On-site Notices

PUBLIC PARTICIPATION NOTIFICATION
PROPOSED CUCHRON MINING DEVELOPMENT AND STEAMBOAT BENEFICIATION PLANT
Ref No: LP 30/5/1/2/82/10193MR

Notice of the Mining Right Application in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) and two Environmental Authorisation Applications in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and the Environment Impact Assessment Regulations promulgated in Government Notice No. R. 982-986 of 4 December 2014, as amended in 2017 by Government Notice No. 324-327 of 7 April 2017 (EIA Regulations). The Two Environmental Authorisation Applications submitted include: a) Cuchron (Pty) Ltd has applied for Environmental Authorisation for the Mine Development and Associated Infrastructure; and b) Steamboat Graphite (Pty) Ltd has applied for the Environmental Authorisation for the Beneficiation Plant and associated infrastructure. Approval has been received from DMR to follow a joint and consolidated approach for the two Applications and there conduct a combined Environmental Impact Assessment Process in terms of Regulation 11(4) of the EIA regulations 2014 (as amended)

APPLICANTS: Cuchron (Pty) Ltd and Steamboat Graphite (Pty) Ltd

LOCATION AND NATURE: The projects are located on the farms Steamboat 306MR and Inkom 305MR, which is situated approximately 36km south-west of Alldays and 54km north-west of Vivo in the Blouberg Local Municipality, Capricorn District of Limpopo Province. The total extent of the properties is 1453.5761ha. The projects will require the following footprints: a) Mining Open Pit and Associated infrastructure: 14ha (1% of properties); and b) Beneficiation Plant and Associated infrastructure: 13ha (1% of properties). The combined size of the two projects are 27ha in total.

APPLICATION PROCESS: The application for a Mining Right and Environmental Authorisation triggers a Scoping and Environmental Impact Reporting (S&EIR) process as contemplated in regulation 21 to regulation 24 of the EIA Regulations.

ACCESS TO INFORMATION: Interested and Affected Parties (IAPs) are hereby notified of the applications, are requested to register as an Interested and Affected Party, and are notified of the availability of the Draft Scoping Report for comment. Access to the Scoping Report can be requested from the Public Participation Office, and comments should be submitted on or before **23 January 2021.**

For further information on the applications or to register as an IAP, please contact or send your information to the Public Participation Office: 012 543 9093 (t); 086 602 5566 6243 (f) or email at steamboat@participation.co.za

PUBLIC PARTICIPATION NOTIFICATION
PROPOSED CUCHRON MINING DEVELOPMENT AND STEAMBOAT BENEFICIATION PLANT
Ref No: LP 30/5/1/2/82/10193MR

Notice of the Mining Right Application in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) and two Environmental Authorisation Applications in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and the Environment Impact Assessment Regulations promulgated in Government Notice No. R. 982-986 of 4 December 2014, as amended in 2017 by Government Notice No. 324-327 of 7 April 2017 (EIA Regulations). The Two Environmental Authorisation Applications submitted include: a) Cuchron (Pty) Ltd has applied for Environmental Authorisation for the Mine Development and Associated Infrastructure; and b) Steamboat Graphite (Pty) Ltd has applied for the Environmental Authorisation for the Beneficiation Plant and associated infrastructure. Approval has been received from DMR to follow a joint and consolidated approach for the two Applications and there conduct a combined Environmental Impact Assessment Process in terms of Regulation 11(4) of the EIA regulations 2014 (as amended)

APPLICANTS: Cuchron (Pty) Ltd and Steamboat Graphite (Pty) Ltd

LOCATION AND NATURE: The projects are located on the farms Steamboat 306MR and Inkom 305MR, which is situated approximately 36km south-west of Alldays and 54km north-west of Vivo in the Blouberg Local Municipality, Capricorn District of Limpopo Province. The total extent of the properties is 1453.5761ha. The projects will require the following footprints: a) Mining Open Pit and Associated infrastructure: 14ha (1% of properties); and b) Beneficiation Plant and Associated infrastructure: 13ha (1% of properties). The combined size of the two projects are 27ha in total.

PROJECT DESCRIPTION:

Mine Development – Cuchron (Pty) Ltd: In support of its application to the Department of Mineral Resources for a mining right over Steamboat 306MR and Inkom 305MR. Cuchron submitted the application for an environmental authorisation for opencast mining and ancillary surface activities. The following components are included:

- Open pit;
- Internal Roads;
- Mining Office, Workshop and Storage Area
- Access Road;
- Storm water and pollution control infrastructure;
- Pipelines for transportation of clean water;
- Potable water storage facilities;

Beneficiation Plant – Steamboat Graphite (Pty) Ltd: In addition, and related to an application to the Department of Mineral Resources for a mining right by Cuchron (Pty) Ltd over Steamboat 306MR and Inkom 305MR, Steamboat Graphite will be the primary customer of Cuchron, and will establish the Graphite Beneficiation Plant on the Mining Right Area. Steamboat Graphite submitted the application for an environmental authorisation for the Graphite Beneficiation Plant and associated infrastructure. The following components are included:

• Graphite Beneficiation Plant	• Process Water Pipeline
• Electricity Generation Facility	• Pollution Control Dam
• Discard Dump	• Internal Service Roads
• Potable Water Pipelines	• New Access Road
• Stormwater channels	• Upgrade of existing Access Road

APPLICATION PROCESS: The application for a Mining Right and Environmental Authorisation triggers a Scoping and Environmental Impact Reporting (S&EIR) process as contemplated in regulation 21 to regulation 24 of the EIA Regulations.

ACCESS TO INFORMATION: Interested and Affected Parties (IAPs) are hereby notified of the applications, are requested to register as an Interested and Affected Party, and are notified of the availability of the Draft Scoping Report for comment. Access to the Scoping Report can be requested from the Public Participation Office, and comments should be submitted on or before **23 January 2021.**

For further information on the applications or to register as an IAP, please contact or send your information to the Public Participation Office: 012 543 9093 (t); 086 602 5566 6243 (f) or email at steamboat@participation.co.za

Appendix B4: Engagement Sessions

APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE CUCHRON MINE DEVELOPMENT AND THE STEAMBOAT BENEFICIATION PLANT

Date: 24 October 2020
Time: 11h00 – 16h00
Venue: Ga-Kibi Moshate & Traditional Authority
Meeting: Signing of the Cooperation Agreement between Cuchron, Steamboat Graphite and the Ga-Kibi Community

Meeting Note

The proceedings of the day were opened and chaired by Mr Molaobi Tlebjane.

The purpose of the meeting was to introduce the project to the community. Over the past 18 months Cuchron and Steamboat Graphite have been in discussions with the Representative Forum of the Ga-Kibi Traditional Authority and Community to reach agreement on how the parties will work together for this development.

The Cooperation Agreement was signed by all parties in front of witnesses from the Traditional Authority and the Community.

The meeting then presented the project to the broader community at the Traditional Authority office.

KIBI TRADITIONAL AUTHORITY

Roll Call

Venue : Moshate

Date: 24 October 2020

Name and Surname	Village	Cell no/ email	Signature
Sebaloishi Maputla	ARRIE	0804589782	Maputla
Calum Lekoloane	Radipotlane	—	[illegible]
Maputla Justice	Koysten	0736579194	[illegible]
Mashilo Martin	ARRIE	0736250426	[illegible]
Maicgaro Daniel	Simpson	0796839225	
Philemon Leboho	Donkerhoek	0782769728	Leboho
Alphous Rathipe	Donkerhoek	0738190551	AR
Leboho KC	Donkerhoek	0849777890	[illegible]
Johannes Matobo	"	0639341472	[illegible]
Ephraim Makotoba	Mogale	0736779415	[illegible]
Simon C Leboho	Donkerhoek	0737128697	[illegible]
Elias Leboho	Donkerhoek	074243237	[illegible]
Mahoreng Maputla	ARRIE	0662555597	[illegible]
Arnold Phetha	Rakwete	0719752709	[illegible]
Mapula TA.	Sias	0630892788	[illegible]
PHILLIP MAKHURA	Simson	0767746819	[illegible]
Jerry Mpashi	Devrade	0780650685	[illegible]
Jerry Tebjana	Langda	0719438684	[illegible]
Alphius Leboho	Donkerhoek	071748136	[illegible]
Tebita Leboho	Donkerhoek	0789301065	J.M. Leboho
Pedria Leboho	Donkerhoek	0712226377	M.L
Tselea Leboho	Donkerhoek	0781068951	L
Emily Leboho	Donkerhoek	0789383295	E Leboho
Josephina Leboho	Donkerhoek		M.J. Leboho
Mponeng Matema	Voorhoek	0738840651	M Matema

KIBI TRADITIONAL AUTHORITY

Roll Call

Venue : Moshate

Date: 24 October 2020

HEAD MEN

Name and Surname	Village	Cell no/ email	Signature
Jake Sekuba	Roydon	0787785245	M Sekuba
Meriam Sekuba	Voorhout	0788445895	MM Sekuba
Dicson Lebaho	Doekerhaug	0718490275	D Lebaho
Mt. Mabote	Edwinsdale	0725086391	M Mabote
Beteul Chepu	Morale	0827251316	[illegible]
Theophilos Ramana	Eswefele	0637320[illegible]	[illegible]
Pheeha SETATA	GROOTPAN	0790307724	PJ Setata
Simon Separa	Simson	0761822731	Sinan
Phineas Raphiri	Lias	0630892788	Raphiri P.
PETRICK NEKOTA	DOUBEDE	0792168522	Pheeta
Elias Kwata	Ralwele	0604650746	Em Kwata
Olifaan Rakgotopo	Longden	0630812771	Rakgotopo

KIBI TRADITIONAL AUTHORITY

Roll Call

Venue : Moshate

Date: 24 October 2020

Name and Surname	Village	Cell no/ email	Signature
Kyereshi P Mokwele	Ramotshi	07299334[illegible]	[illegible]
Thabo Ngobe	—	0836457434	[illegible]
Pastor Molapo			[illegible]
Mogemi MS	BLM	07136[illegible]	[illegible]
Phefadi Maseka	BLM MAYOR	0733391816	[illegible]
Lebotho Mathews	[illegible]		[illegible]
Mojodo Daniel	BLM	0835936[illegible]	[illegible]
Maphala Lazarus Moseo	Rakwele	0662734110	[illegible]
Morongoa Masha	Ga-Dauke	0726714000	Masha
Gloria Makhura	Radipatiana	0724468830	[illegible]
Mahlo M.B.	BLM	0734598014	[illegible]
[illegible]	Ga-Kibi	0842634178	
Thabo Mokwele	BLM [illegible]	0739774241	[illegible]
CARIEN JOUBERT	Diphororo	0833020353	[illegible]
Lizinda Dickson	"	0829222261	[illegible]
Setamorago Thobejane	Diphororo	0827820526	[illegible]

APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE CUCHRON MINE DEVELOPMENT AND THE STEAMBOAT BENEFICIATION PLANT

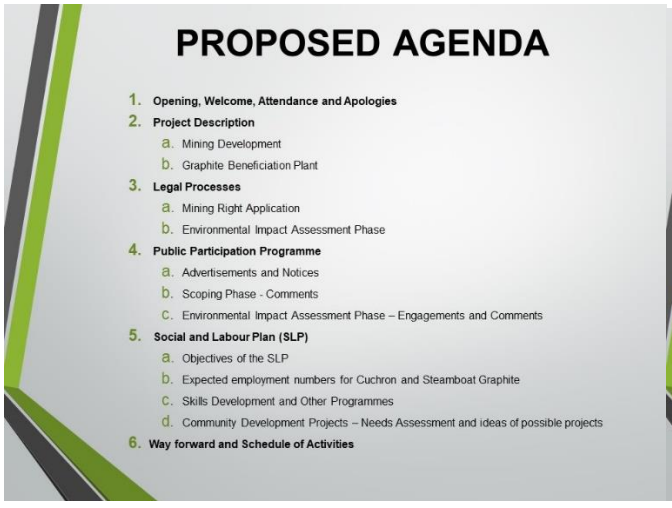
Date: 6 November 2020
Time: 9h00 – 16h00
Venue: Ambiance, Polokwane
Meeting: Workshop on the Social & Labour Plan, Mining Right and Environmental Authorisation Application Processes

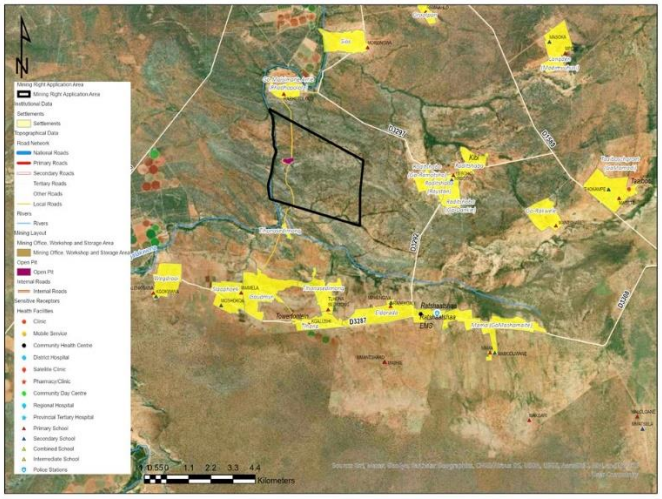
Meeting Note

The workshop was attended by the Community Committee, elected from the community and the Traditional Authority on 24 October 2020.

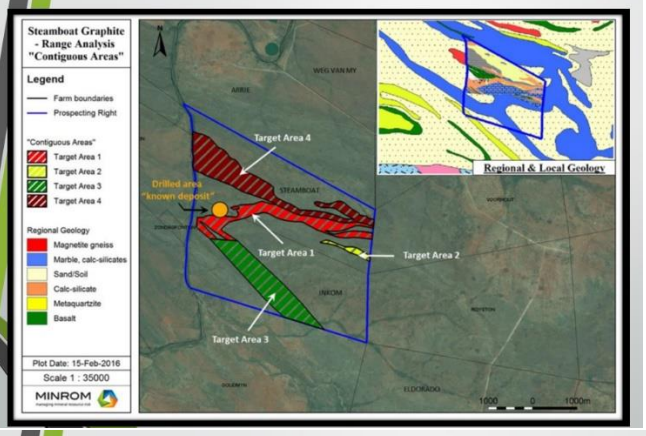
The purpose of the workshop was to explain the Environmental Impact Assessment process, steps to be taken, opportunities for participation, and finalising the Social and Labour Plan.

The following presentation was given:





Expansion Areas



2 a. Steamboat Graphite Mine

- Open Cast Mining of the resource Graphite
- Infrastructure will include:
  - Open pit (11ha);
  - Internal and Access Roads (0.5ha;
  - Mining Office, Workshop and Storage Area (1ha);
  - Storm water and pollution control infrastructure (1 ha);
  - Pipelines for transportation of clean water and Potable water storage facilities (1.5ha).
  - TOTAL 14ha (of the total size of Steamboat and Inkom which is 1453.58ha – 1%)
- The depth of mining in the open pit will vary from from 5m to 80m
- The life of the mine as part of this first phase is approximately 20 years, but there is an opportunity to expand. The mining right will cover the complete farms but the authorisation for activities only covers this first 14ha.
- Size of the deposit is 5.1Mt (Phase 1) with a further 253Mt for future expansion

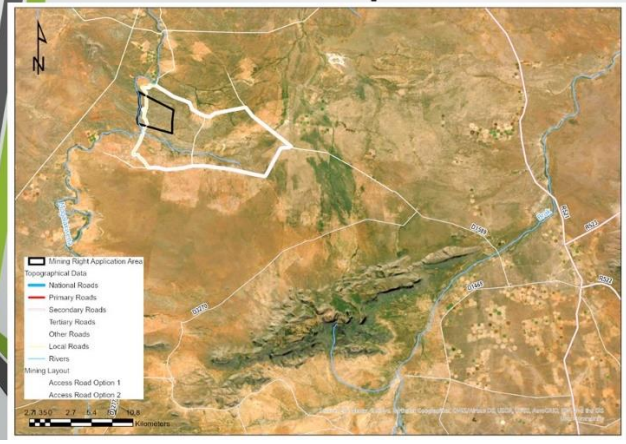
Mine Lay-out

2 b. Steamboat Graphite Beneficiation Plant

- Steamboat Graphite will be the primary customer of Cuchron, and will establish the Graphite Beneficiation Plant on the Mining Right Area
- Infrastructure will include:
  - Graphite Beneficiation Plant (2ha)
  - Electricity Generation Facility (3ha)
  - Discard Dump (3.2ha)
  - Potable Water Pipelines, Stormwater channels, Process Water Pipeline and Pollution Control Dam (1ha)
  - Internal Service Roads and Access Road (1ha)
  - Product Transport Route

Beneficiation Plant Layout

Product Transport Route



Water Resources

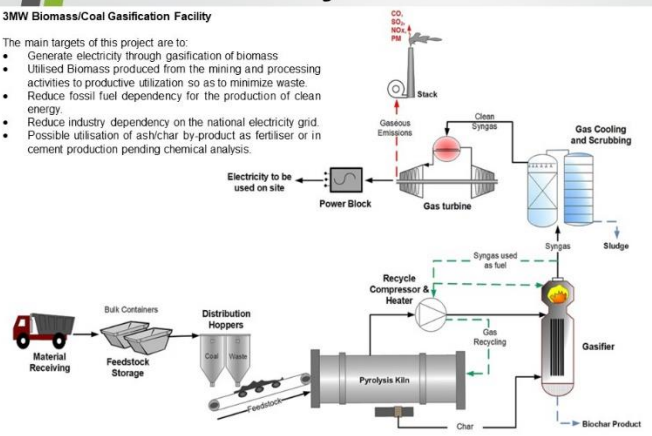
- Water Resources will be determined in parallel to the studies, possible sources will be identified in investigated:
  - Groundwater Sources
  - Water Allocation from the Mogalakwena River
  - Recycled Water

Electricity Generation

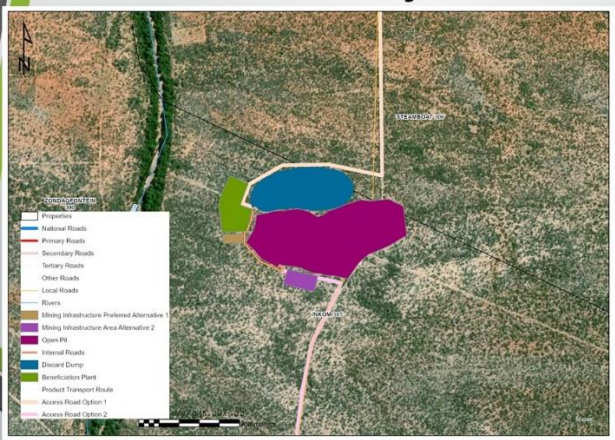
3MW Biomass/Coal Gasification Facility

The main targets of this project are to:

- Generate electricity through gasification of biomass
- Utilised Biomass produced from the mining and processing activities to productive utilization so as to minimize waste.
- Reduce fossil fuel dependency for the production of clean energy.
- Reduce industry dependency on the national electricity grid.
- Possible utilisation of ash/char by-product as fertiliser or in cement production pending chemical analysis.



Combined Layout



3. Legal Process

- When a company wants to mine, they need 4 primary licences:
  - Mining Right from the DMR
  - Environmental Authorisation (EA) from the DMR
  - Waste Management Licence (WML) from the DMR
  - Integrated Water Use Licence (IWUL) from the Department of Water and Sanitation (DWS)
- It is important to note that the approach for the Project is to first apply for the Mining Right and EA authorisations.
- Once this process is complete, the company will apply for its Waste Management and Water Use Licence.

3a. Mining Right Application

- The Mining Right Application provides DMR with the following information:
  - Technical & Geological Information
  - Mine Plan
  - Financial Information
  - Social and Labour Plan – DMR has provided that the SLP can be finalised in parallel with the EIA, and a final submitted then

3b. Environmental Impact Assessment

- The Environmental Impact Assessment will go through 2 phases that can take up to 12 months:

SCOPING & EIA PHASE

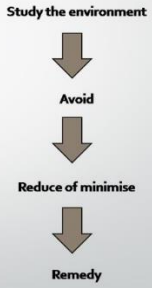
- During the Scoping Phase all available information is provided with a plan to gather further information
- During the EIA phase the results of the specialist st… Environmental & Social Impacts are determined :
  - Heritage Resources (Graves, etc)
  - Biodiversity (Animals, plants, etc)
  - Surface Water (rivers & streams)
  - Groundwater (testing all boreholes for yield and quality
  - Social Impact Assessment (land use, livestock, communities)

Typical Impacts

- Any development have impacts, typical for this type of development considering where it will b located are:
  - Impact on plant and animal species
  - Impact on traffic and movement
  - Impact on water sources
  - Impact on land use, decrease of grazing area
  - Dust generation on mine area, discard dump and product transport road
  - Waste products
- What is necessary is determining how these impacts can be reduced through mitigation measures

Mitigation Measures

- Methods or ways to address the risks (negative impacts)
- Hierarchy of mitigation
- Examples:
  - ***Avoid***: Re-align infrastructure to avoid impact, visual berms
  - ***Reduce or minimise***: Dust suppression, noise reducing devices
  - ***Remedy***: Rehabilitation after mining



EIA Actions to commence

ACTIONS

- Commence with specialist studies to gather existing information (timeframes dependent on specialist availability):
  - Heritage Resources – walk on the property to look for graves & other resources (3 – 5 days) – Nov - Dec 2020
  - Biodiversity (Animals, plants, etc) – walk on the property to identify plant and animal species (3 – 5 days) – Jan - Feb 2021
  - Surface Water (rivers & streams) – take samples from rivers and streams (2 days) – Jan - Feb 2021
  - Groundwater – take water samples from existing community boreholes within 2km radius (5 days) – Jan - Feb 2021
  - Social Impact Assessment – interviews with livestock owners and leadership within communities (2 – 5 days) – Jan - Feb 2021

4. Public Participation Process

1. Announcement – November 2020
   - Placement of On-site Notices
   - Placement of Advertisements
   - Sending out letters to all stakeholders
2. Scoping Report Availability: November 2020 – January 2021
   - Make available the Draft Scoping Report for comments
   - Incorporate the comments into the Final Scoping Report (FSR) to DMR
   - Await approval of the FSR from DMR
3. Scoping Report Decision: March 2021
   - Notify all stakeholders of DMR's decision

4. Public Participation Process

4. EIA Phase: March - April 2021
   - Placement of On-site Notices, availability of Summary of EIA
   - Meetings to present EIA findings
5. EIA Report Availability: April 2021 – May 2021
   - Make available the Draft EIA Report for comments
   - Incorporate the comments into the Final EIA to DMR
   - Await approval of the EIA from DMR
6. EIA Decision: Expected in October 2021
   - Notify all stakeholders of DMR's decision

4. Public Participation Process

- Extension of timeframes to allow more time for considering of reports – DMR allows additional 50 days

5. SOCIAL AND LABOUR PLAN

- Objectives of the SLP is:
  - Promoting employment and advancing the social and economic welfare of the people of the
  - Blouberg Municipality and South Africans in general.
  - Contribute to the transformation of the mining industry.
  - Promote economic growth and mineral and petroleum resources development in the Republic;
  - Ensure that the holder of a mining right contributes towards the socio-economic development of the areas in which they operate and the areas they source the majority of their workforce is sourced.
  - To utilise and expand the existing skills base for the empowerment of HDSA and to serve the community.

SLP Applicability

- The requirement for an SLP is only for the Cuchron Mining Application
- The SLP will refer only to the programmes to be followed for the expected employees for mining, but similar programmes will be followed for the beneficiation plant
- The Beneficiation Plant is not mining and therefore does not require a SLP
- The SLP is valid for 5 years, thereafter a new SLP must be drafted for approval by DMR.

The following aspect were raised during the Workshop:

- Timeframe of the process should be shortened where possible, people at Ga-Kibi wants the development to start as soon as possible
- The number of job opportunities should be optimized to increase employment in the communities, majority of the jobs should go to local people if the skills exist
- On-site notices must be accompanied by a register so that all can sign when they look at the register.
- All community members that attend meetings or submit comments must be registered. If a member raises a concern regarding the development, the concern will be shared with the Committee.
- A meeting will be arranged with the municipality to present the process and detail of the project.

The workshop ended at around 16h00.

STEAMBOAT GRAPHITE MINE PROJECT

Meeting: Ga-Kibi Stakeholders Workshop on the SLP and EIA process
Meeting Date: 6 November 2020 **Time:** 10h00 **Venue:** Ambiance, Polokwane

ATTENDANCE REGISTER

Title	First Name & Surname	Position / Designation	Organisation	Contact details	
Ms	Lizinda Dickson	Environmental Assessment Practisioner	Diphororo Development	Tel no:	012-543 9093
				Fax no:	
				Cell no:	0829222261
				Email:	lizinda@diphororo.com
				Signature:	Dickson.
Ms	Antoinette Pale	Commitie	Donkerhoek Kibi Tribal	Tel no:	
				Fax no:	
				Cell no:	0604424384
				Email:	
				Signature:	[illegible]
Mrs	[illegible]	[illegible]	[illegible]	Tel no:	
				Fax no:	
				Cell no:	0743175628
				Email:	
				Signature:	
Ms	Lebohang Mashiola	Committee	Moisimarie (Arrie)	Tel no:	0
				Fax no:	
				Cell no:	079 415 4393
				Email:	
				Signature:	Mashiola L.F

STEAMBOAT GRAPHITE MINE PROJECT

Meeting: Ga-Kibi Stakeholders Workshop on the SLP and EIA process

Meeting Date: 6 November 2020 **Time:** 10h00 **Venue:** Ambiance, Polokwane

ATTENDANCE REGISTER

Title	First Name & Surname	Position / Designation	Organisation	Contact details	
	Hosta Madraye	The Glade	The Glade	Tel no:	0761389018
				Fax no:	
				Cell no:	
				Email:	
				Signature:	
	K.P Molewena	Chairperson of the Mining negotiating committee	Ga-Kibi Traditional Authority	Tel no:	0729933434
				Fax no:	
				Cell no:	
				Email:	
				Signature:	
	M.L Mosena	Kibi Tribe Spokesperson	Ga Kibi Tribal Authority	Tel no:	
				Fax no:	
				Cell no:	0662734110
				Email:	
				Signature:	
	GLORIA MAKHURA	Kibi Tribal (Kgadi) Princess	Ga kibi Tribal Authority	Tel no:	
				Fax no:	0615014146
				Cell no:	0724468530
				Email:	
				Signature:	

ATTENDANCE REGISTER

Title	First Name & Surname	Position / Designation	Organisation	Contact details	
	Mocaoa Tebjane	Chairperson Committee	Longden	Tel no:	
				Fax no:	
				Cell no:	071 943 8684
				Email:	
				Signature:	
	Ismael Mabete	Committie	Edwinsdale	Tel no:	
				Fax no:	
				Cell no:	
				Email:	
				Signature:	
	Carlifonia Rapanyane	Committe	Edwinsdale	Tel no:	
				Fax no:	
				Cell no:	083 568 2296
				Email:	
				Signature:	
				Tel no:	
				Fax no:	
				Cell no:	0717729811
				Email:	
				Signature:	
	Mpashe Jerry	Committee	Devrede	Tel no:	
				Fax no:	
				Cell no:	078 068 4025
				Email:	mpashejerry@gmail.com
				Signature:	

ATTENDANCE REGISTER

Title	First Name & Surname	Position / Designation	Organisation	Contact details	
MS	MMOLOKI LEBOHO	COMMUNITTE MEM	KIBI TRADITIONAL AUTHORITY	Tel no:	
				Fax no:	
				Cell no:	078 5459958
				Email:	mmolokilebohot@gmail.com
				Signature:	
Mr	Malema Bennet	member committee	KIBI TRADITIONAL AUTHORITY	Tel no:	
				Fax no:	
				Cell no:	0738925517
				Email:	
				Signature:	Malema BB
Mr	Sekuba Sydney	Committeemember	Chairbi Ramotsho	Tel no:	
				Fax no:	
				Cell no:	0761833472 / 0710174990
				Email:	Sekuba.sns@gmail.com
				Signature:	
Mr	SEPAELA MOLATJITO NICOLAS	Mining Committee Member	Simpson Ramaswikana	Tel no:	
				Fax no:	0646011978
				Cell no:	0646011978
				Email:	Nicolas.sepaela@gmail.com
				Signature:	
				Tel no:	
				Fax no:	
				Cell no:	
				Email:	
				Signature:	

ATTENDANCE REGISTER

Title	First Name & Surname	Position / Designation	Organisation	Contact details	
Mr	Malema Bennet	Committee men	KIBI TRADITION	Tel no:	
				Fax no:	
				Cell no:	0738925517
				Email:	
				Signature:	
DR	Mukotshelwa Lebobo	Mmakgoshi	Kibi Traditional Authority	Tel no:	0835603824
				Fax no:	
				Cell no:	0829221861
				Email:	estherlebobo@gmail.com
				Signature:	
KGOSI MR	SETLAMORACO JHOBEJAME	Social PRACTITIONER	DIPHORORO DEVELOPMENT	Tel no:	
				Fax no:	
				Cell no:	082 782 0526
				Email:	stmafefe@gmail.com
				Signature:	
	MASHA MORONGOA DORIS	Committee member	KIBI TRIBAL AUTHORITY	Tel no:	—
				Fax no:	—
				Cell no:	0726714040
				Email:	morongoamasha@gmail.com
				Signature:	Mashall
				Tel no:	
				Fax no:	
				Cell no:	
				Email:	
				Signature:	

ATTENDANCE REGISTER

Title	First Name & Surname	Position / Designation	Organisation	Contact details	
Mr	Jacob Mosena	Committee		Tel no:	
				Fax no:	
				Cell no:	0717380412
				Email:	
				Signature:	
MR.	ISRAEL MABOTE	Committee	EDWINSDALE	Tel no:	
				Fax no:	
				Cell no:	0761668 252
				Email:	
				Signature:	
Mr	DOLADI TLEBJANE	Chairperson of committee	LONGDEN	Tel no:	
				Fax no:	
				Cell no:	~~0761668 252~~ 0719438684
				Email:	
				Signature:	
Miss	CARLIFONIA RAPANJANE	Committee	EDWINSDALE (MOKWENG)	Tel no:	
				Fax no:	
				Cell no:	0717729811
				Email:	
				Signature:	
MR	MPASHE JERRY	Committee	DEURESE	Tel no:	
				Fax no:	
				Cell no:	0788654035
				Email:	MPasheJerry@gmail.com
				Signature:	

ATTENDANCE REGISTER

Title	First Name & Surname	Position / Designation	Organisation	Contact details	
MS	MMOLOKI LEBOHO	Committee Member	KIBI TRADITIONAL	Tel no:	
				Fax no:	
				Cell no:	0785459958
				Email:	mr.sebitso@live.com
				Signature:	
Mr	Sydney Setuba	Committee Member	Co-tibi Ramotsho	Tel no:	
				Fax no:	
				Cell no:	0761853472/0710174990
				Email:	setubasns@gmail.com.
				Signature:	
Mr.	SEPAELA MOLATHO NICOLAS	COMMITTEE MEMBER	SIMPSON / RAMAGWAKANA	Tel no:	
				Fax no:	0646011978
				Cell no:	0646011978
				Email:	NicolasSepaela11@gmail.com
				Signature:	
Mrs	GLORIA MAKHURA	KIBI TRIBAL PROCESS	KIBI TRIBAL	Tel no:	
				Fax no:	
				Cell no:	0724468530/0615014146
				Email:	gloriamakhura@gmail.com
				Signature:	MGMakhura
Mr	Justice Mapuetla	Royston	Kibi Tribal	Tel no:	073 657 9194
				Fax no:	
				Cell no:	
				Email:	Justice.mapuetla48@gmail
				Signature:	

APPENDIX C: DEA SCREENING REPORT

SCREENING REPORT FOR AN ENVIRONMENTAL AUTHORIZATION OR FOR A PART TWO AMENDMENT OF AN ENVIRONMENTAL AUTHORISATION AS REQUIRED BY THE 2014 EIA REGULATIONS – PROPOSED DEVELOPMENT FOOTPRINT ENVIRONMENTAL SENSITIVITY

EIA Reference number: 001

Project name: Steamboat Graphite Mine & Beneficiation Plant

Project title: Environmental Impact Assessment for Mining Right and Environmental Authorisation

Date screening report generated: 08/01/2020 10:16:30

Applicant: Cuchron (Pty) Ltd and Steamboat Exploration (Pty) Ltd

Compiler: Lizinda Dickson (EAP) - Diphororo Development (Pty) Ltd

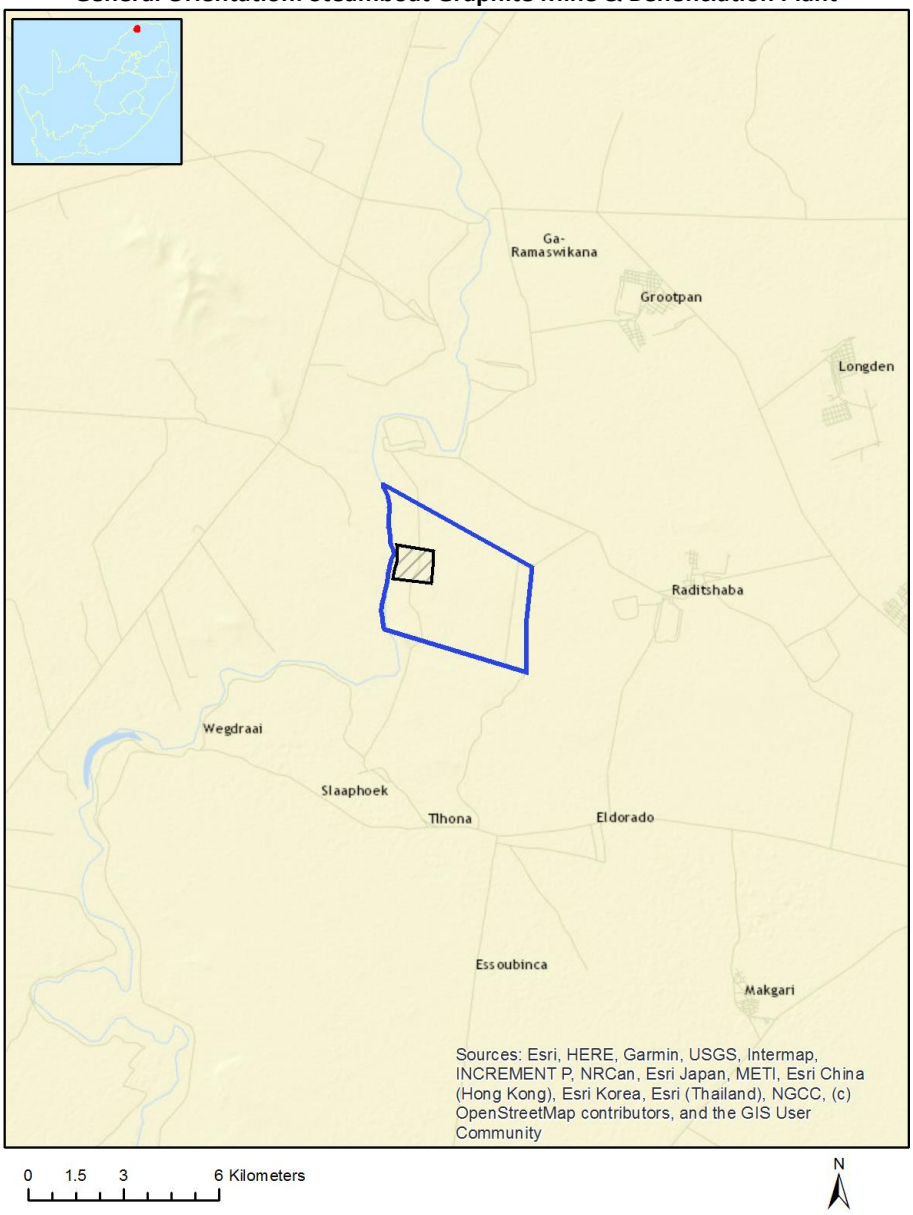
Compiler signature: .....

Table of Contents

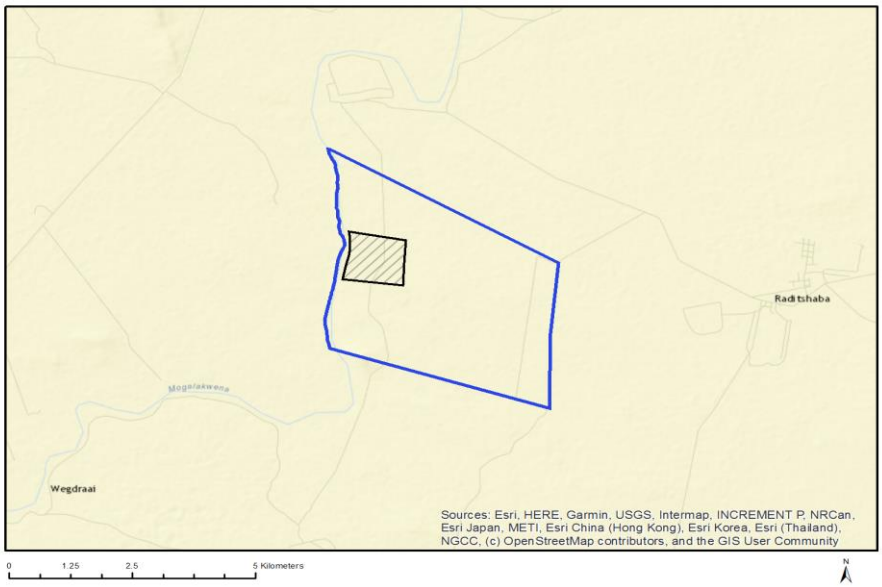
Proposed Project Location

Orientation map 1: General location

General Orientation: Steamboat Graphite Mine & Beneficiation Plant



Map of proposed site and relevant area(s)



Cadastral details of the proposed site

Property details:

No	Farm Name	Farm/ Erf No	Portion	Latitude	Longitude	Property Type
1	STEAMBOAT	306	0	22°49'51.11S	28°46'40.91E	Farm
2	INKOM	305	0	22°50'48.72S	28°46'34.42E	Farm
3	STEAMBOAT	306	0	22°49'51.11S	28°46'40.91E	Farm Portion
4	INKOM	305	0	22°50'48.72S	28°46'34.42E	Farm Portion

Development footprint[1] vertices:

Footprint	Latitude	Longitude
1	22°49'46.49S	28°45'39.52E
1	22°49'42.23S	28°45'38.67E
1	22°49'48.16S	28°46'16.02E
1	22°50'18.8S	28°46'14.23E
1	22°50'14.52S	28°45'34.52E
1	22°50'6.24S	28°45'36.53E
1	22°49'58S	28°45'38.62E
1	22°49'53.51S	28°45'39.52E
1	22°49'46.49S	28°45'39.52E

[1] "development footprint", means the area within the site on which the development will take place and incudes all ancillary developments for example roads, power lines, boundary walls, paving etc. which require vegetation clearance or which will be disturbed and for which the application has been submitted.

Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No nearby wind or solar developments found.

Environmental Management Frameworks relevant to the application

No intersections with EMF areas found.

Environmental screening results and assessment outcomes

The following sections contain a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development footprint as well as the most environmental sensitive features on the footprint based on the footprint sensitivity screening results for the application classification that was selected. The application classification selected for this report is:
Mining|Mining Right|Mining - Mining Right.

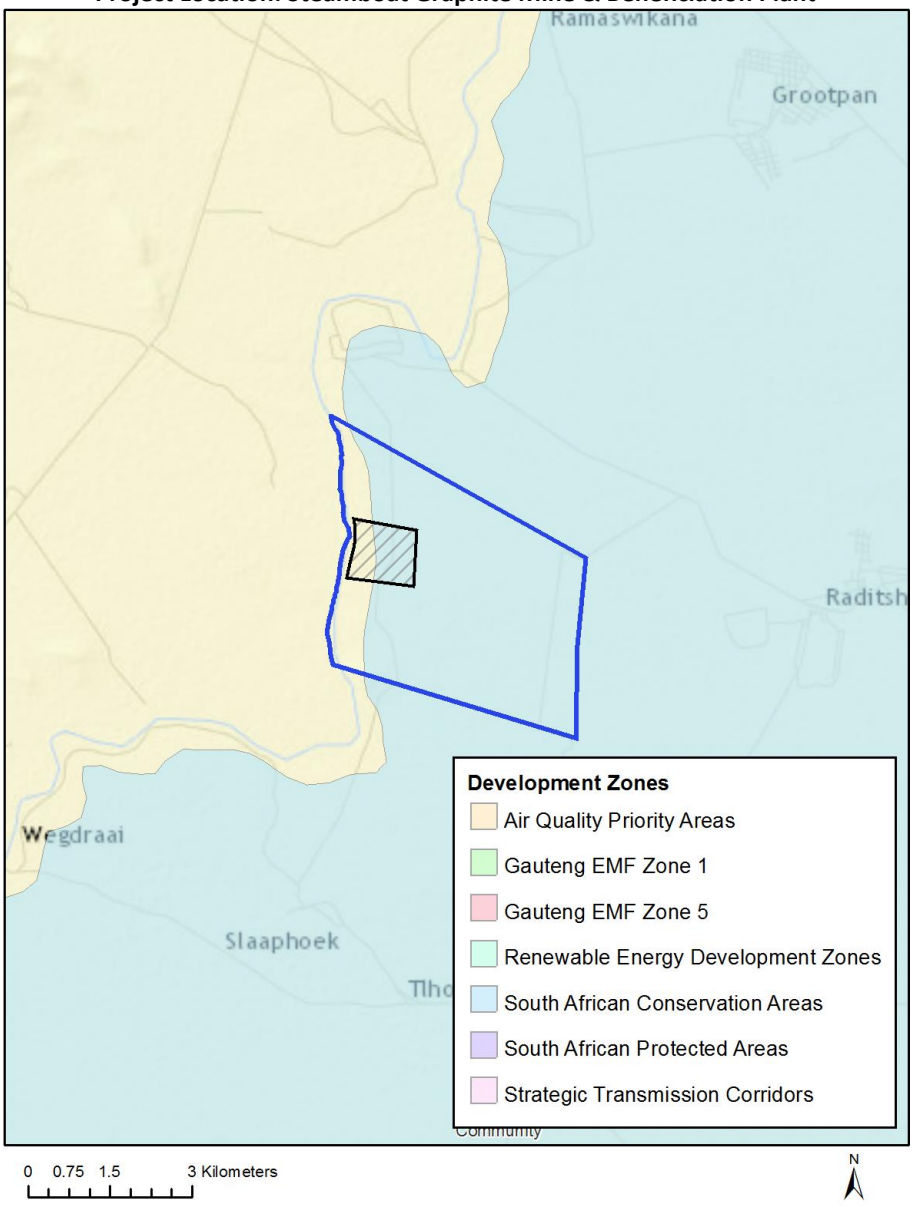
Relevant development incentives, restrictions, exclusions or prohibitions

The following development incentives, restrictions, exclusions or prohibitions and their implications that apply to this footprint are indicated below.

Incentive, restriction or prohibition	**Implication**
South African Conservation Areas	https://screening.environment.gov.za/ScreeningDownloads/DevelopmentZones/SACAD_OR_2019_Q1_Metadata.pdf

Map indicating proposed development footprint within applicable development incentive, restriction, exclusion or prohibition zones

Project Location: Steamboat Graphite Mine & Beneficiation Plant



Proposed Development Area Environmental Sensitivity

The following summary of the development footprint environmental sensitivities is identified. Only the highest environmental sensitivity is indicated. The footprint environmental sensitivities for the proposed development footprint as identified, are indicative only and must be verified on site by a suitably qualified person before the specialist assessments identified below can be confirmed.

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme			X	
Animal Species Theme			X	

Aquatic Biodiversity Theme				X
Archaeological and Cultural Heritage Theme		X		
Civil Aviation Theme				X
Plant Species Theme				X
Defence Theme				X
Terrestrial Biodiversity Theme	X			

Specialist assessments identified

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report. It is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the footprint situation.

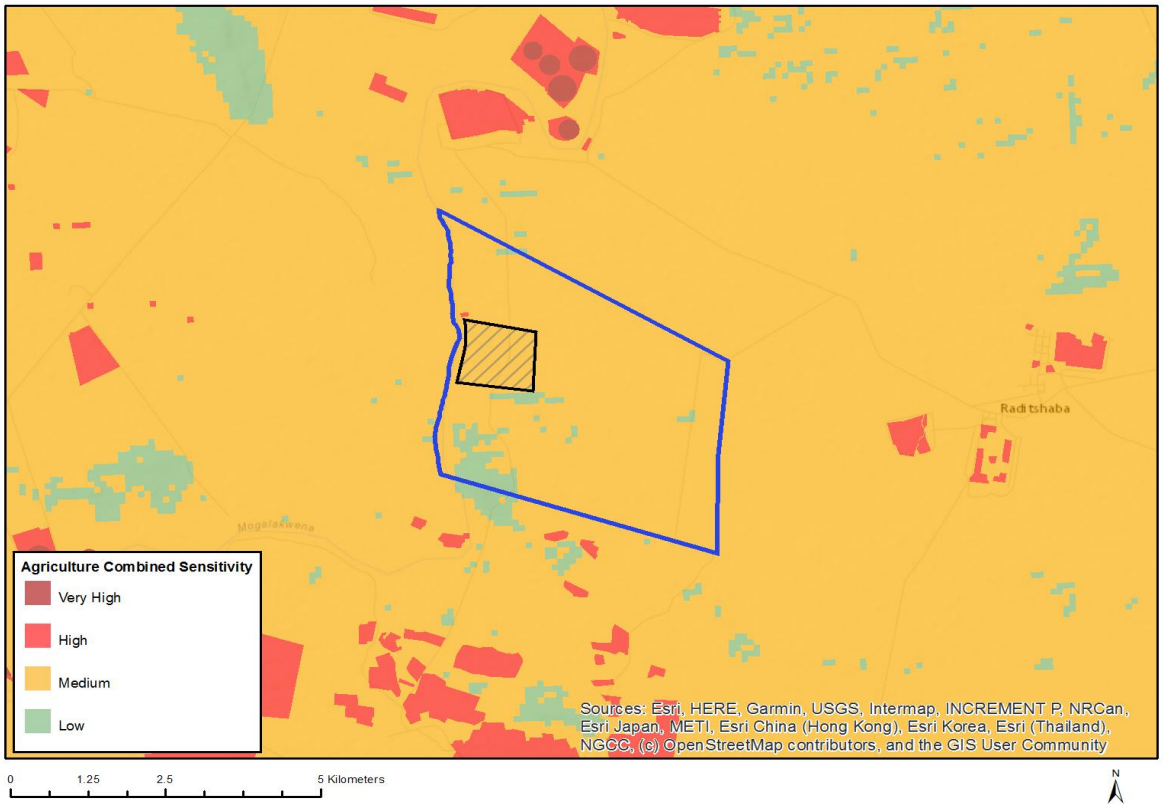
No	Specialist assessment	Assessment Protocol
1	Agricultural Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_Agriculture_Assessment_Protocols.pdf
2	Landscape/Visual Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
3	Archaeological and Cultural Heritage Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
4	Palaeontology Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
5	Terrestrial Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_Terrestrial_Biodiversity_Assessment_Protocols.pdf
6	Aquatic Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_Aquatic_Biodiversity_Assessment.pdf
7	Hydrology	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols

	Assessment	/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
8	Noise Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_Noise_Impacts_Assessment_Protocols.pdf
9	Radioactivity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
10	Traffic Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
11	Geotechnical Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
12	Climate Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
13	Health Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
14	Socio-Economic Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
15	Ambient Air Quality Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
16	Seismicity Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
17	Plant Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf
18	Animal Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/DraftGazetted_General_Requirement_Assessment_Protocols.pdf

Results of the environmental sensitivity of the proposed area.

The following section represents the results of the screening for environmental sensitivity of the proposed footprint for relevant environmental themes associated with the project classification. It is the duty of the EAP to ensure that the environmental themes provided by the screening tool are comprehensive and complete for the project. Refer to the disclaimer.

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY

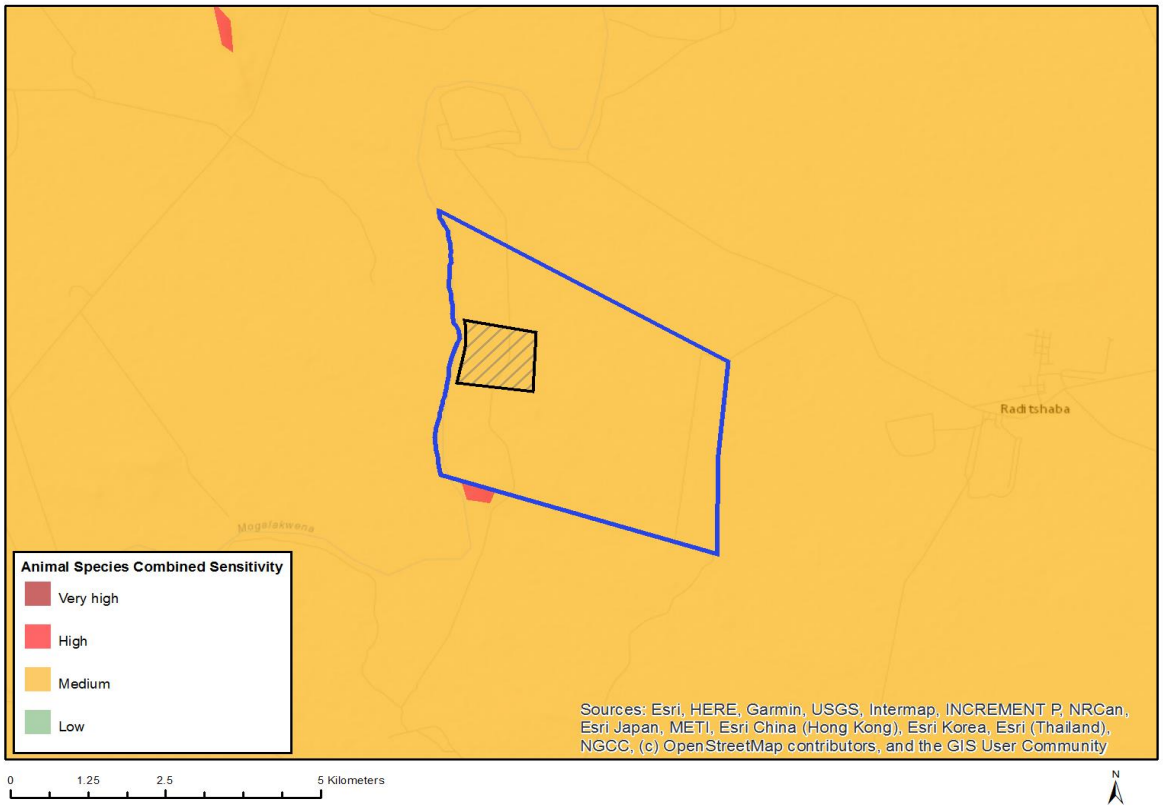


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY

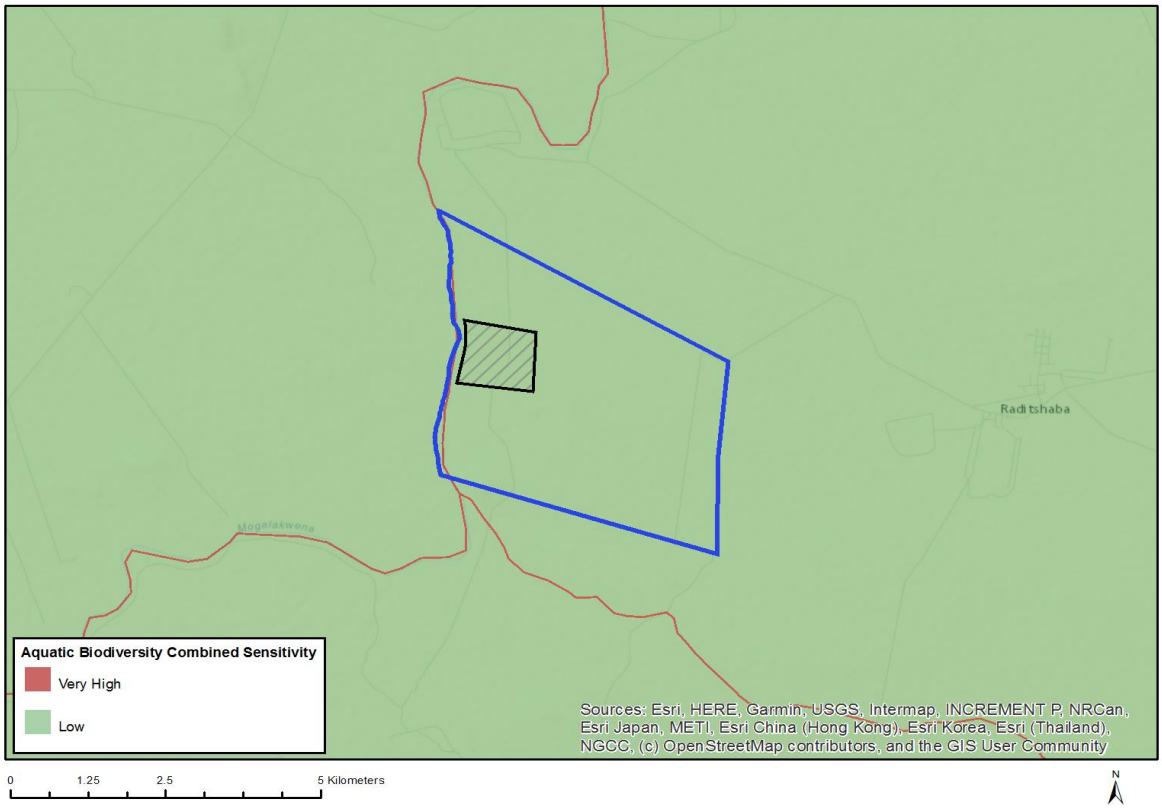


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Sensitive species 17

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY

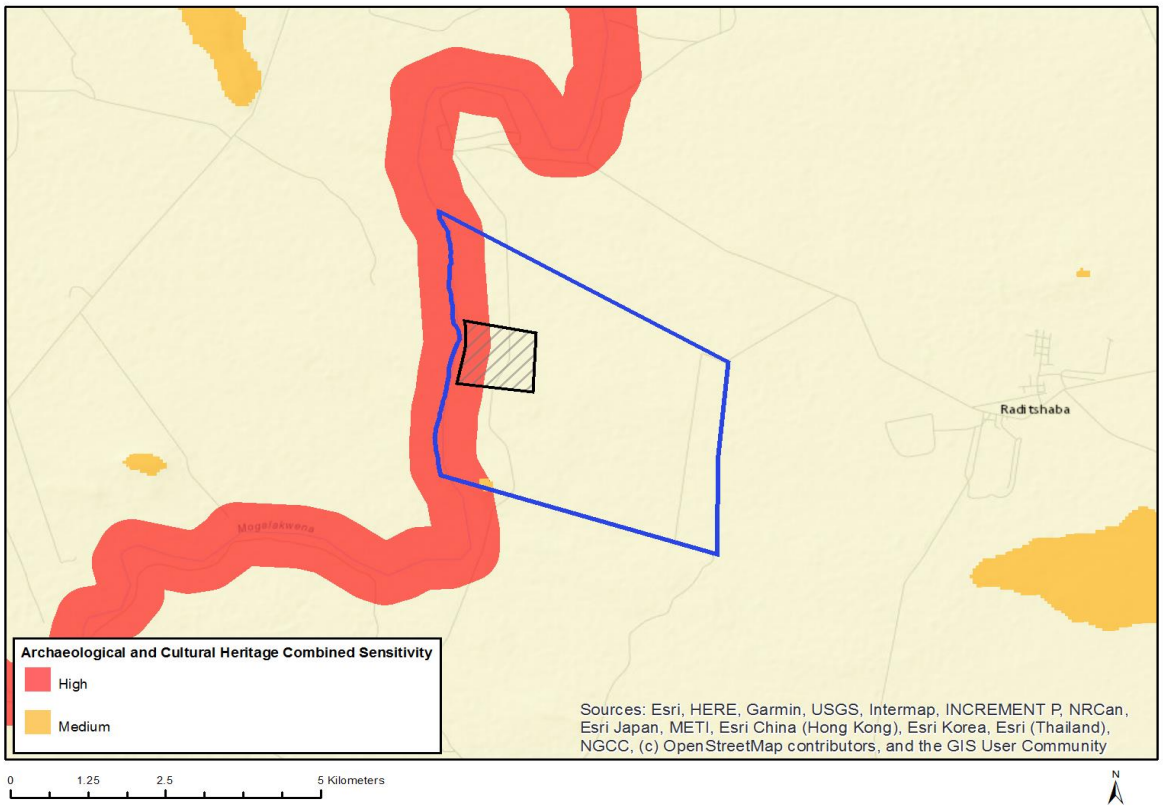


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity Areas

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY

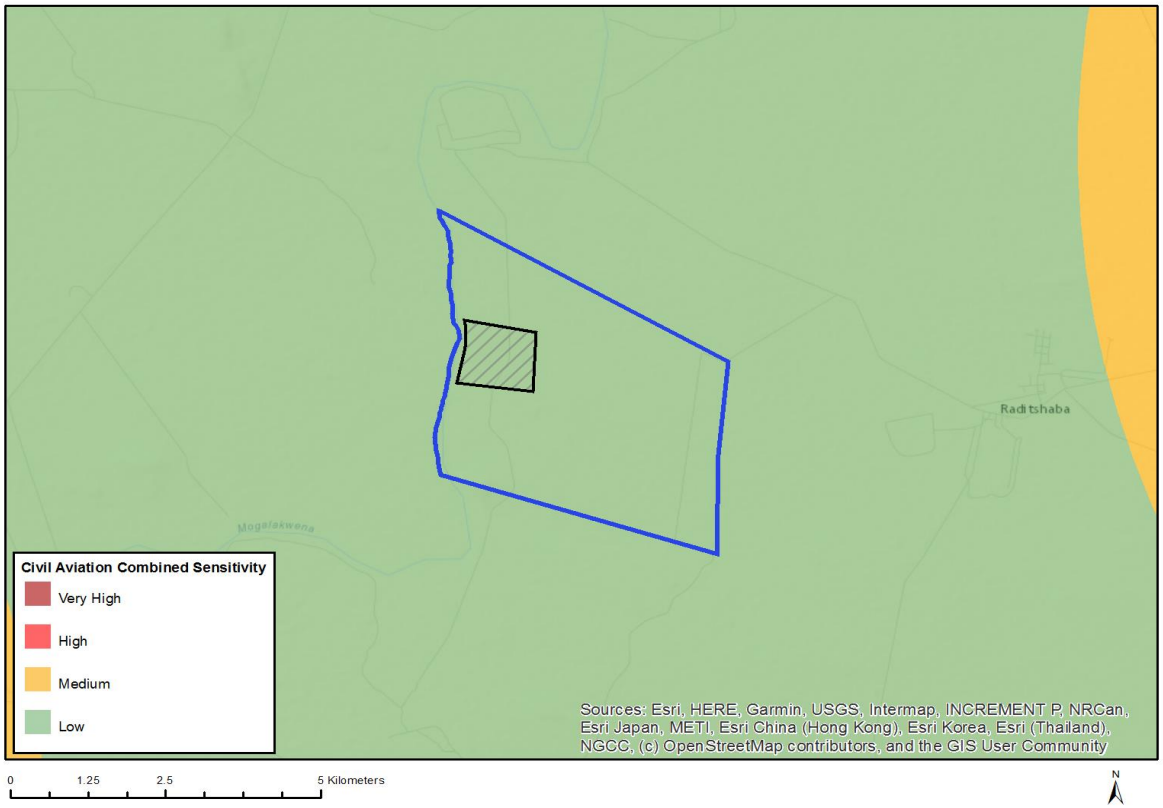


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Within 500 m of an important river

MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY

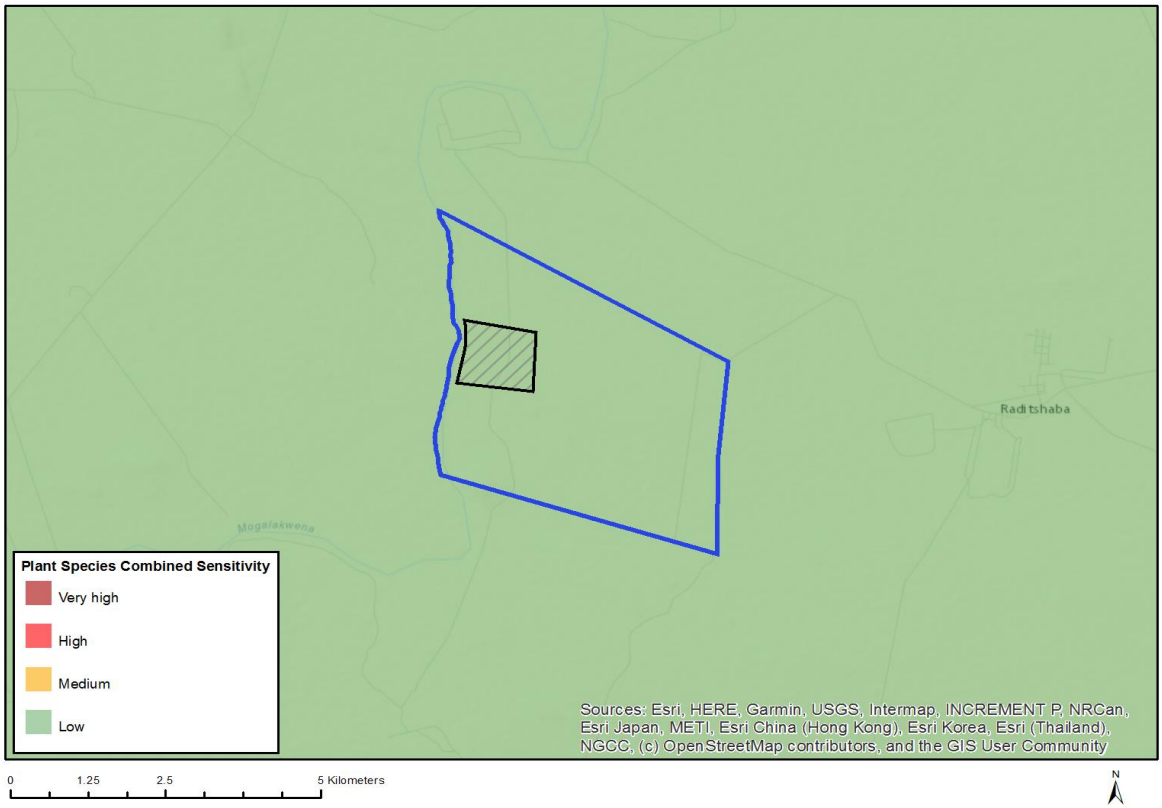


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY

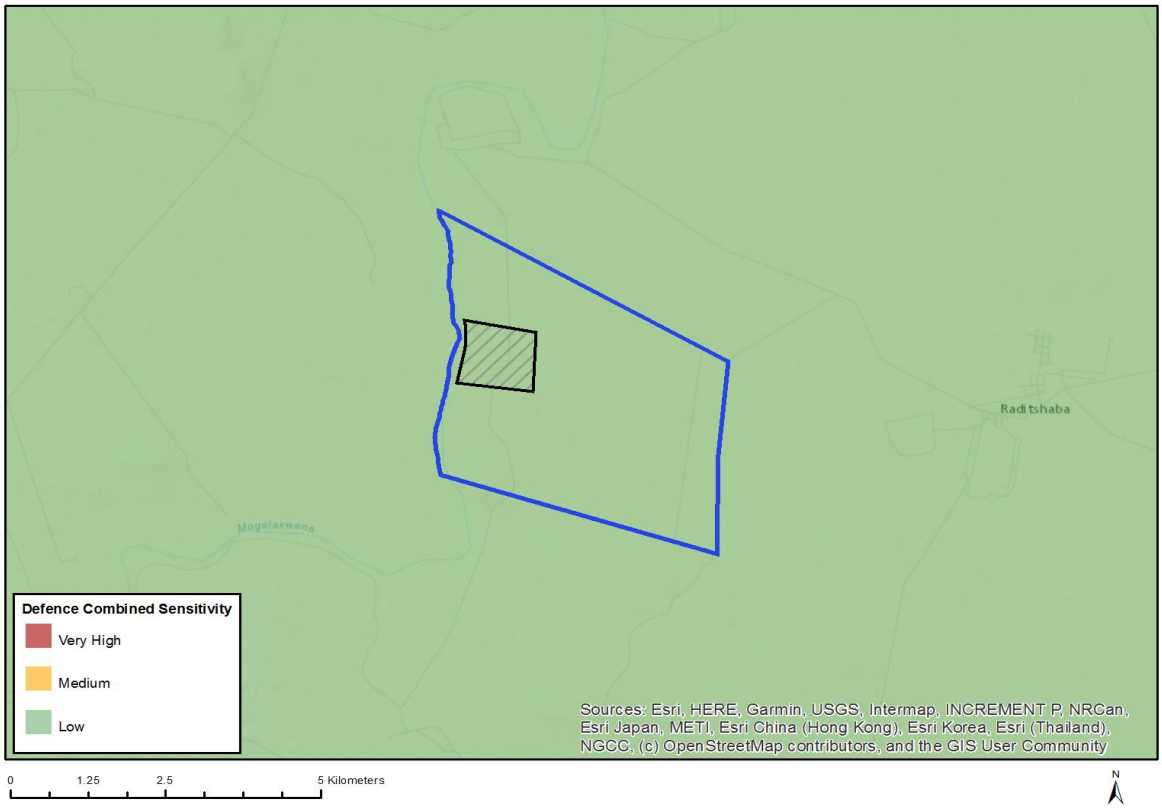


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE DEFENCE THEME SENSITIVITY

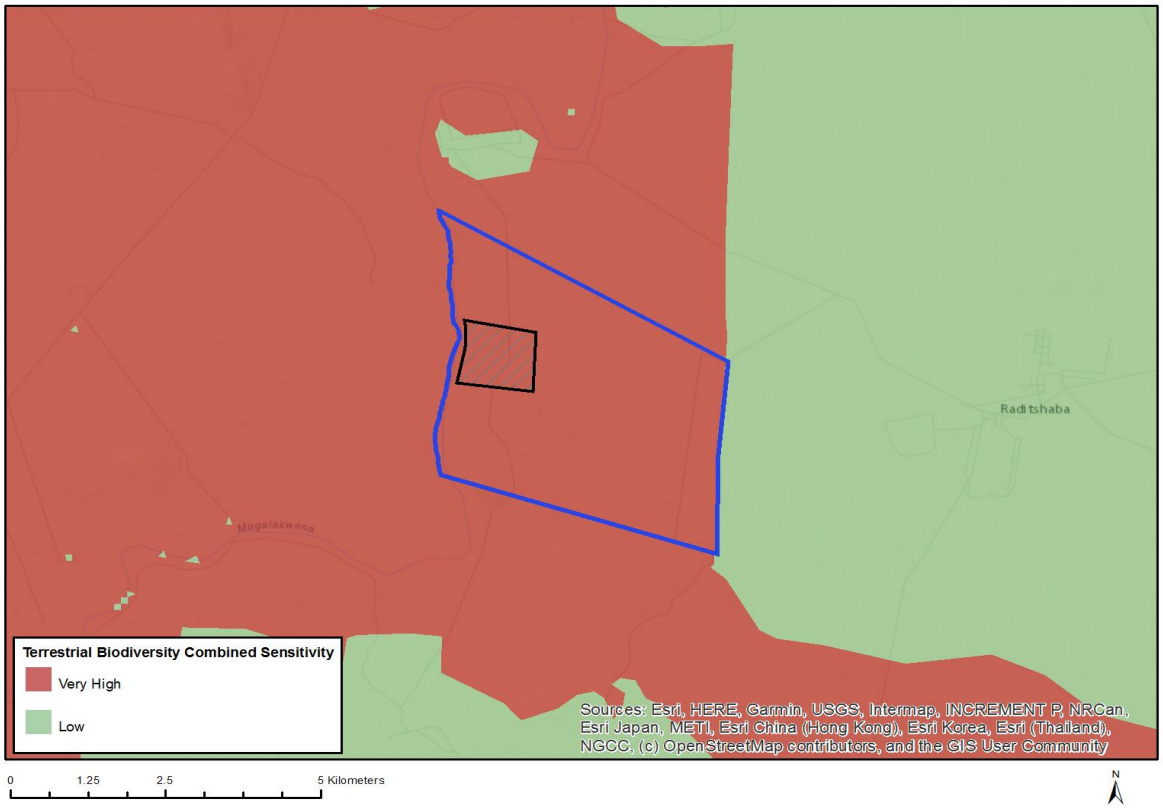


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	None
Very High	Critical Biodiversity Area 2