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BASIC IMPACT REPORT & ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

FOR THE PROPOSED MINING PERMIT FOR THE MINING OF SAND (QY) INCLUDING ASSOCIATED INFRASTRUCTURE, STRUCTURE AND EARTHWORKS ON A CERTAIN 5HA AREA ON A CERTAIN PORTION OF THE REMAINING EXTENT & PORTION 3 OF THE FARM BUFFELSHOEK 351, REGISTRATION DIVISION: KQ, LIMPOPO PROVINCE.

NAME OF APPLICANT	**Impulse Mining (Pty) Ltd**
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SAMRAD REF NUMBER:	**LP30/5/1/3/2/11880MP**

CONTENTS

PROJECT INFORMATION

Project Name:	Basic Assessment for the proposed Mining Permit for the mining of Sand (QY) including associated infrastructure, structure and earthworks on a certain 5ha area on a certain portion of the Remaining Extent & Portion 3 of the farm Buffelshoek 351, Registration Division: KQ, Limpopo Province.
Report Title:	BAR & EMPr
Prepared By:	Milnex CC
Date:	06/08/2022

QUALITY CONTROL:		
	Report Author:	**Report Reviewer:**
Name:	Lizanne Esterhuizen Honours Degree in Environmental Science	N/A
Signature:		

DISCLAIMER:

The DEA screening tool was used in compiling this document

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 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.

BASIC ASSESSMENT REPORT PROCESS

1) The environmental outcomes, impacts and residual risks of the proposed activity must be set out in the basic assessment report.

OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

2) The objective of the basic assessment process is to, through a consultative process—

a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
b) identify the alternatives considered, including the activity, location, and technology alternatives;
c) describe the need and desirability of the proposed alternatives**[,]**;
d) through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage**[ ]**, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on **[the]** these aspects to determine—
    i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
    ii) the degree to which these impacts—
        aa) can be reversed;
        bb) may cause irreplaceable loss of resources; and
        cc) can be avoided, managed or mitigated; and
e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
    i) identify and motivate a preferred site, activity and technology alternative;
    ii) identify suitable measures to avoid, manage or mitigate identified impacts; and
    iii) identify residual risks that need to be managed and monitored.

SCOPING OF ASSESSMENT AND CONTENT OF BASIC ASSESSMENT REPORT

1) Contact Person and correspondence address

A) DETAILS OF:

i) THE EAP WHO PREPARED THE REPORT

ii) EXPERTISE OF THE EAP

NAME OF PRACTITIONER	QUALIFICATIONS	CONTACT DETAILS
Lizanne Esterhuizen	Honours Degree in Environmental Science (refer to **Appendix 1**)	Tel No.: (018) 011 1925 Fax No.: (053) 963 2009 e-mail address: lizanne@milnex-sa.co.za

Summary of the EAP's past experience. (Attach the EAP's curriculum vitae as **Appendix 2**)

Milnex CC was contracted by **Impulse Mining (Pty) Ltd** as the independent environmental consultant to undertake the BAR and EMPr process for the proposed Mining Permit for the mining of Sand (QY) including associated infrastructure, structure and earthworks on a certain 5ha area on a certain portion of the Remaining Extent & Portion 3 of the farm Buffelshoek 351, Registration Division: KQ, Limpopo Province. The property is located approximately 10km South from town of Thabazimbi in the Limpopo province.

Milnex CC does not have any interest in secondary developments that may arise out of the authorisation of the proposed project.

Milnex CC is a specialist environmental consultancy with extensive experience in the mining industry which provides a holistic environmental management service, including environmental assessment and planning to ensure compliance with relevant environmental legislation. Milnex CC benefits from the pooled resources, diverse skills and experience in the environmental and mining field held by its team that has been actively involved in undertaking environmental studies for a wide variety of mining related projects throughout South Africa. The Milnex CC team has considerable experience in environmental impact assessment and environmental management, especially in the mining industry.

Milnex CC have experience consulting in the environmental field. Their key focus is on environmental assessment, advice and management and ensuring compliance to legislation and guidelines. They are currently involved in undertaking EIAs for several projects across the country (refer to **Appendix 2** for CV)

B) DESCRIPTION OF THE PROPERTY.

Farm Name:	A certain 5ha area on a certain portion of the Remaining Extent & Portion 3 of the farm Buffelshoek 351
Application area (Ha)	5 hectares
Magisterial district:	Thabazimbi Local Municipality Waterberg District Municipality
Registration Division	KQ
Distance and direction from nearest town	The property is located approximately 10km South from town of Thabazimbi in the Limpopo province
21 digit Surveyor General Code for each farm portion	1) T0KQ00000000035100000 2) T0KQ00000000035100003
Minerals applied for	Sand (QY)

III. FARM CO-ORDINATES

FARM	LONGITUDE	LATITUDE
A certain 5ha area on a certain portion of the Remaining Extent & Portion 3 of the farm Buffelshoek 351	27° 23' 3,752"" E	24° 39' 55,168"" S
	27° 23' 6,086"" E	24° 39' 54,894"" S
	27° 23' 7,688"" E	24° 39' 54,706"" S
	27° 23' 8,358"" E	24° 39' 54,581"" S
	27° 23' 9,028"" E	24° 39' 54,456"" S
	27° 23' 10,793"" E	24° 39' 54,125"" S
	27° 23' 15,397"" E	24° 39' 53,243"" S
	27° 23' 18,132"" E	24° 39' 52,723"" S
	27° 23' 20,520"" E	24° 39' 52,281"" S
	27° 23' 22,474"" E	24° 39' 51,920"" S
	27° 23' 22,976"" E	24° 39' 51,827"" S
	27° 23' 23,477"" E	24° 39' 51,734"" S
	27° 23' 25,564"" E	24° 39' 51,284"" S
	27° 23' 25,815"" E	24° 39' 51,229"" S
	27° 23' 26,067"" E	24° 39' 51,175"" S
	27° 23' 27,516"" E	24° 39' 50,874"" S
	27° 23' 28,256"" E	24° 39' 53,445"" S
	27° 23' 2,868"" E	24° 39' 57,558"" S

C) LOCALITY MAP (show nearest town, scale not smaller than 1:250000 attached as **Appendix 3**).

A Locality map is attached in **Appendix 3** and on figure 1 below.

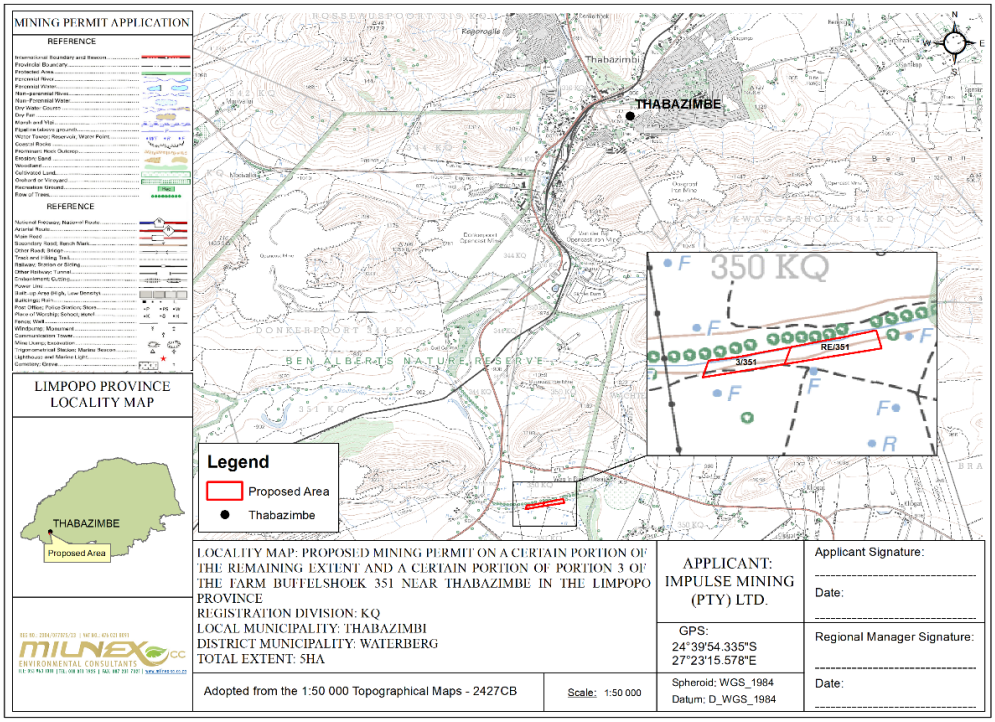


Figure 1: Locality Map

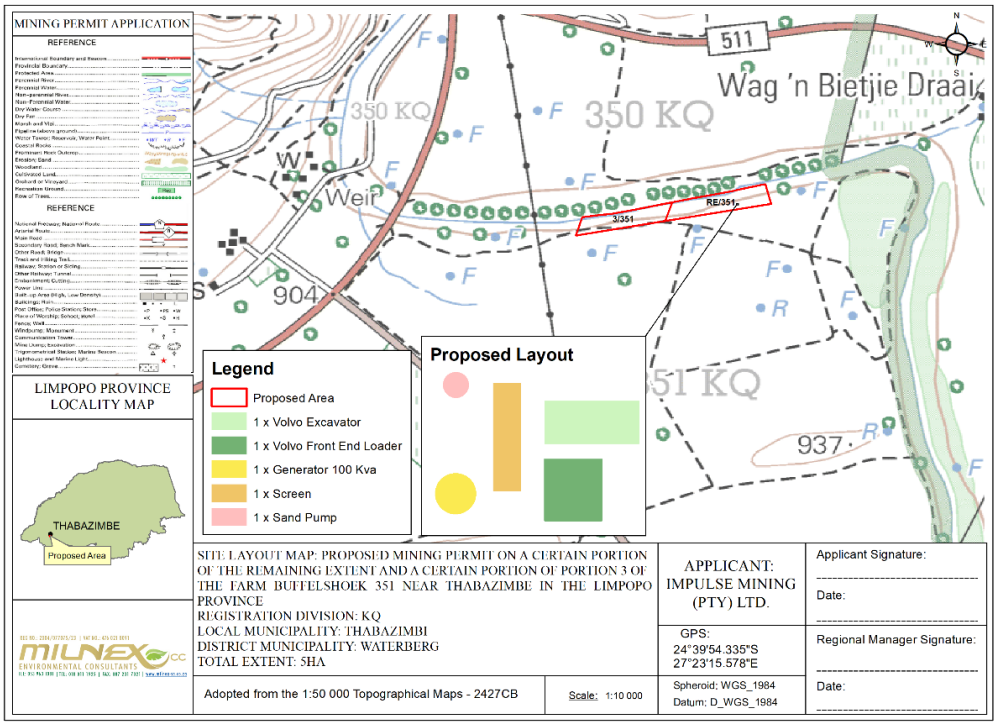


Figure 2: Site Plan Map

D) DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY.

i) LISTED AND SPECIFIED ACTIVITIES

Description of the overall activity. (Indicate Mining Right, Mining Permit, Prospecting right, Bulk Sampling, Production Right, Exploration Right, Reconnaissance permit, Technical co-operation permit, Additional listed activity)	1. ***Listing Notice 1, (GNR 327), Activity 19:*** *The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;* 2. **Listing Notice 1 (GNR 327) as amended (GNR 517), Activity 21:** *"Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice on in Listing Notice 3 of 2014, required to exercise the mining permit"* 3. **Listing Notice 1 (GNR 327), Activity 27***:* "*The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation."* 4. **Listing Notice 3 GNR 324, Activity 12:** *The clearance of an area of 300 square metres or more of indigenous vegetation;* ***(e) Limpopo (ii)*** *Within critical biodiversity areas identified in systematic biodiversity plans adopted by the competent authority* **5. Listing Notice 3 GNR 324, Activity 14:** The development of infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs (a) within a watercourse (c) if no development setback has been adopted, within 32metres of a watercourse **(e) Limpopo** (i) Outside urban areas: (ff) Critical Biodiversity areas (hh) Areas within 10 kilometres from a protected areas identified in terms of NEMPAA. Mining Permit for the mining of **Sand (QY)** including associated infrastructure, structure and earthworks.

NAME OF ACTIVITY **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. for mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	**Aerial extent of the Activity** **Ha or m²**	**LISTED ACTIVITY** (Mark with an **X** where applicable or affected).	**APPLICABLE LISTING NOTICE** **(*GNR 544, GNR 545 or GNR 546)***	**WASTE MANAGEMENT AUTHORISATION** (Indicate whether an authorisation is required in terms of the Waste Management Act). **(Mark with an X)**
Mining Permit: ***Listing Notice 1, (GNR 327), Activity 19:*** *The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;*	The application area is 5ha	X	***Listing Notice 1, (GNR 327), Activity 19:***	
Mining permit: **Listing Notice 1 (GNR 327) as amended (GNR 517), Activity 21:** *"Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice on in Listing Notice 3 of 2014, required to exercise the mining permit"*	The application area is 5ha	X	**Listing Notice 1 (GNR 327) as amended (GNR 517), Activity 21**	**-**
Clearance of indigenous vegetation: **Listing Notice 1 (GNR 327), Activity 27***:* "*The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation."*	The application area is 4. 8068ha	X	**Listing Notice 1 (GNR 327), Activity 27**	**-**
Clearance of indigenous vegetation: **Listing Notice 3 GNR 324, Activity 12:** *The clearance of an area of 300 square metres or more of indigenous vegetation;* ***(e) Limpopo (ii)*** *Within critical biodiversity areas identified in systematic biodiversity plans adopted by the competent authority*		X	**Listing Notice 3 GNR 324, Activity 12:**	

Mining permit: **Listing Notice 3 GNR 324, Activity 14:** *The development of infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs (a) within a watercourse (c) if no development setback has been adopted, within 32metres of a watercourse* ***(e) Limpopo*** *(i) Outside urban areas: (ff) Critical Biodiversity areas (hh) Areas within 10 kilometres from a protected areas identified in terms of NEMPAA.*		X	**Listing Notice 3 GNR 324, Activity 14:**	

ii) DESCRIPTION OF THE ASSOCIATED STRUCTURES AND INFRASTRUCTURE RELATED TO THE DEVELOPMENT
(Describe Methodology or technology to be employed, and for a linear activity, a description of the route of the activity

Impulse Mining (Pty) Ltd has embarked on a process for applying for proposed Mining Permit for the mining of Sand (QY) including associated infrastructure, structure and earthworks on a certain 5ha area on a certain portion of the Remaining Extent & Portion 3 of the farm Buffelshoek 351, Registration Division: KQ, Limpopo Province.

The area is preferred due to the sites expected mineral resources. **Impulse Mining (Pty) Ltd** requires a mining permit in terms of NEMA and the Mineral and Petroleum Resources Development Act to mine for minerals mentioned above within the Thabazimbi Local Municipality, Limpopo Province (refer to a locality map attached in **Appendix 3**).

Access roads
Access will be obtained from gravel and tar roads off the R510 and R511 roads.

Water Supply
Additional water requirements related to the portable water supply for employees and workers will be supplied.

Ablution
Chemical toilets shall be used, no french drains and pits shall be permitted.

Storage of dangerous goods
During mining activities, limited quantities of diesel and fuel, oil and lubricants if any will be stored on site. These goods should be placed in a bunded area one and a half times the volume of the total amount of goods to be stored.

Types of lubricants should be dependent on the machines used, this will include diesel, fuel and oil. It should be noted that no more than 30 000 cubes metres of diesel may be stored on site.

Dust suppression
Unacceptable levels of dust fallout can be determined by implementing dust management by monitoring compliance with the requirements of the National Dust Control Regulations for an activity, in terms of nuisance or disturbance.

The National Framework for Air Quality Management in the Republic of South Africa (the National Framework), as published under Government Notice No. 1144 of 26 October 2018, underpins NEM:AQA by providing national norms and standards for air quality management to ensure compliance with legislation. The National Framework serves as the country's AQMP.

Section 32 of the NEM:AQA makes provision for the Minister or the MEC to prescribe measures for the control of dust in specific places or areas, or by specified machinery or in specific instances. While dust generally does not pose a health risk, it may be regarded as a nuisance. It is the responsibility of the owner of the dust generating activity to take reasonable measures to limit the nuisance factor.

With respect to this, the Minister has published in the gazette the regulations for the control of dust in 2013 (Notice 827, Government Gazette No. 36974). These regulations provide requirements for measures for the control of dust, which includes the requirements for monitoring, dust management plan development and implementation and reporting.

According to dust levels set out by the National Dust Control Regulations 2013 (GNR. 827). The limits have the following threshold Section 3. Dustfall standard

Table 1. Acceptable dust fall rates

Restriction Areas	***Dustfall rate (D) (mg/m²/day, 30-day average)***	***Permitted frequency of exceeding dust fall rate***
Residential Area	*D < 600*	*Two within a year, not sequential months*
Non-residential Area	*600 < D < 1200*	*Two within a year, not sequential months*

(i) DESCRIPTION OF PLANNED INVASIVE ACTIVITIES: (These activities do not disturb the land where prospecting/mining will take place e.g. aerial photography, desktop studies, aeromagnetic surveys, etc.).

The sand mining methodology:

A floating barge, with a pump mounted on top, is used to pump the sand from the river bottom. Flexible floating pipes are connected to the pump, in order to transfer the sand from the river to the small "settling pond". The entrance to the pond is equipped with a sieve to ensure that only the fine sand enters the pond. The pond is also equipped with two water outflow pipes that ensures that the water flows back into the river, as soon as the sand has settled/deposited.

After the excess water has drained/flowed back into the river, the sand is removed from the settling pond and stockpiled at the demarcated stockpiling area. Here at the stockpiling area the sand will be left to dry. After the sand has dried, the sand is loaded and transported to the relevant client.

It should be kept in mind that the only disturbance to the riverbank is that disturbance caused by the small settling pond and the entry point to the river. There will only be two entry points and two settling ponds throughout the duration of the permit but, only one of each are in use while the other is being rehabilitated. Only one truck at a time is allowed to enter the area in order to minimize the possible generation of dust and to ensure that the trucks keep within the demarcated areas.

The above mentioned pump extracts approximately 700 cubic meters per hour. The 700 cubic meters consists of 210 cubic meters of sand per hour and 490 cubic meters of water per hour, but more than 466 (95%) cubic meters of water flows back into the river through the outflow pipes.

For backfilling and rehabilitation, the following procedures will be as follow:

- All infrastructures will be demolished and removed from the mining area.
- All stockpiled sand will be removed from the mining site.
- The access road will be used for farming purposes by the surface owner.
- The mined area within the riverbed will be levelled.
- The surface of the stockpile area will be ripped and seeded with a seed mix of the surrounding area.

(ii) DESCRIPTION OF PRE-FEASIBILITY STUDIES (Activities in this section includes but are not limited to: initial, geological modelling, resource determination, possible future funding models, etc.)

All data will be consolidated and processed to determine the diamond bearing resource on the property.

E) POLICY AND LEGISLATIVE CONTEXT

Title of legislation, policy or guideline:	Administering authority:	Promulgation Date:
National Environmental Management Act No. 107 of 1998 as amended.	Department of Environmental Affairs	27 November 1998
Constitution of South Africa Act 108 of 1996	National	18 December 1996
The National Heritage Resources Act (Act No. 25 of 1999)	SAHRA	1999

Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)	Department of Mineral Resources & Energy (DMRE)	2002
Mineral and Petroleum Resources Development Regulations, 2014.	Department of Mineral Resources & Energy (DMRE)	
National Infrastructure Plan	National	
National Environmental Management: Biodiversity Act No. 10 of 2004	Department of Environmental Affairs	7 June 2004
National Environmental Management Waste Act, 2008 (Act No. 59 of 2008)	National & Provincial	1 July 2009
National Environmental Management: Waste Act, 2008 (Act No. 59 Of 2008). Regulations regarding the Planning & Management of Residue Stockpiles & Residue Deposits from a Prospecting, Mining, Exploration or Production Operation		
EIA regulations under NEMA	Department of Environmental Affairs	14 December 2014
Conservation of Agricultural Resources Act,1983 (Act No. 43 of 1983)	Department of Agriculture Forestry and Fisheries	1 June 1984
National Environmental Management Air Quality Act, 2004 (Act No. 39 of 2004).	National and Provincial	11 September 2004
National Water Act, 1998 (Act No. 36 of 1998).	National	20 August 1998
National Forest Act (Act 84 of 1998) (NFA)	National	30 October 1998
National Veld & Forest Fires Act (Act 101 of 1998)	National	27 November 1998
National Environmental Management: Protected Areas Act 57 of 2003		
Hazardous Substances Act (No. 15 of 1979)		
Subdivision of Agricultural Land Act (No. 70 of 1970)		
Occupational Health and Safety Act (No. 85 of 1993)		
Mine Health and Safety Act (No. 29 of 1996)		
Government Notice Regulation 704 of 1999		
Waterberg District Municipality Integrated Development Plan (IDP)	Municipal	
Thabazimbi Local Municipality Integrated Development Plan (IDP)	Municipal	
Waterberg District Environmental Management Framework Report		

POLICY AND LEGISLATIVE CONTEXT

Title of legislation, policy or guideline:	Reference where applied	How does this development comply with and respond to the legislation and policy context.
Constitution of South Africa Act 108 of 1996	Section 24	The Constitution is the supreme law of the Republic and all law and conduct must be consistent with the Constitution. The Chapter on the Bill of Rights contains a number of provisions, which are relevant to securing the protection of the environment. Section 24 of the Constitution of the Republic of South Africa (Act 108 of 1996) states the following: *"Everyone has the right –* *(a) to an environment that is not harmful to their health or well-being; and* *(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –* *i) prevent pollution and ecological degradation;* *ii) promote conservation; and* iii) *secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."* The Constitution therefore, compels government to give effect to the people's environmental right and places government under a legal duty to act as a responsible custodian of the countries environment. It compels government to pass legislation and use other measures to protect the environment, to prevent pollution and ecological degradation, promote conservation and secure sustainable development.
National Environmental Management Act No. 107 of 1998 as amended.	S24(1) of NEMA S28(1) of NEMA	NEMA provides for co-operative governance by establishing principles and procedures for decision-makers on matters affecting the environment. An important function of the Act is to serve as an enabling Act for the promulgation of legislation to effectively address integrated environmental management. Some of the principles in the Act are accountability; affordability; cradle to grave management; equity; integration; open information; polluter pays; subsidiary; waste avoidance and minimisation; co-operative governance; sustainable development; and environmental protection and justice. The mandate for EIA lays with the National Environmental Management Act (107 of 1998) and the EIA Regulations No. 326, 327, 325, and 324 promulgated in terms of Section 24 of NEMA. The EIA Regulations determine that an Environmental Authorisation is required for certain listed activities, which might have a detrimental effect on the environment.
EIA regulations as amended under NEMA	Listing notice 1 Listing notice 2 Listing Notice 3	The National Environmental Management Act107 of 1998 (NEMA), as amended, makes provision for the identification and assessment of activities that are potentially detrimental to the environment. These activities are detailed in Listing Notice 1 (as amended by GNR 327 of 7 April 2017), Listing Notice 2 (as amended by GNR325 of 7 April 2017) and Listing Notice 3 (as amended by GNR324 of 7 April 2017). Undertaking activities specified in the Listing Notices are only allowed once Environmental Authorisation has been obtained from the competent authority. Such Environmental Authorisation will only be considered once there has been compliance with the EIA Regulations, 2014. The Environmental Authorisation which may be granted subject to conditions.
Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)	Section 10, 16, 22, 27 and 48	The Minerals and Petroleum Resources Development Act identifies the state as the official custodian of South Africa's Mineral and Petroleum Resources. Therefore, all activities relating to the reconnaissance, prospecting rights, mining rights, mining permits and retention permits are regulated by the State. One of the objectives of the Act is to give effect to section 24 of the Constitution by ensuring that the nation's mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development.

Mineral and Petroleum Resources Development Regulations, 2014.	Regulations 3, 5, 10 and 14	MPRDA Regulations prescribe how an application for a permit or right must be lodged.
The National Heritage Resources Act (Act No. 25 of 1999)	Section 35 Section 38	The National Heritage Resources Act (Act No 25 of 1999, Section 35) protects South Africa's unique and non-renewable archaeological and palaeontological heritage sites. These sites may not be disturbed without a permit from the relevant heritage resources authority. Section 38 of the NHRA provides guidelines for Cultural Resources Management and proposed developments:
National Environmental Management Waste Act, 2008 (Act No. 59 of 2008)	Category A Category B Category C	Section 24S of NEMA deals with the management of residue stockpiles and residue deposits and provides that Residue stockpiles and residue deposits must be deposited and managed in accordance with the provisions of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), on any site demarcated for that purpose in the environmental management plan or environmental management programme in question. The management of residue stockpiles and residue deposits must be done in accordance with any conditions set out and any identified measures in the environmental authorisation issued in terms of NEMA, an environmental management programme and a waste management licence issued in terms of NEMA (Regulation 3(2)). The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM:WA) regulates waste management in all aspects and created a list of waste management activities that have, or are likely to have, a detrimental effect on the environment, which requires an impact assessment and licensing process. Activities listed in Category A require a Basic Assessment process, activities listed in Category B require a Scoping and EIA process and activities under Category C must comply with the relevant requirements or standards, in order for competent authorities to consider an application in terms of NEM:WA.
National Environmental Management: Biodiversity Act No. 10 of 2004	Chapter 4 Chapter 5	The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) is part of a suite of legislation falling under NEMA. The Act provides for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant protection; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith (SANBI). Chapter 4 of NEMBA deals with threatened and protected ecosystems and species to ensure the maintenance of their ecological integrity, their survival in the wild, the utilisation of biodiversity is managed in an ecologically sustainable way and to regulate international trade in specimens of endangered species. Chapter 5 of NEMA deals with species and organisms posing potential threats to biodiversity. The purpose of this chapter is to prevent the introduction and spread of alien species and invasive species, also to manage, control and eradicate alien species and invasive species

National Environmental Management Air Quality Act, 2004 (Act No. 39 of 2004).	Section 21	The object of this Act is to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air in the Republic; the prevention of air pollution and ecological degradation; and securing ecologically sustainable development while promoting justifiable economic and social development. Regulations No. R248 (of 31 March 2010) promulgated in terms of Section 21(1) (a) of the National Environmental Management Act: Air Quality Act (39 of 2004) determine that an Atmospheric Emission License (AEL) is required for certain listed activities, which result in atmospheric emissions which have or may have a detrimental effect on the environment. The Regulation also sets out the minimum emission standards for the listed activities. It is not envisaged that an Atmospheric Emission License will be required for the proposed development.
National Water Act, 1998 (Act No. 36 of 1998).	Section 21	Sustainability and equity are identified as central guiding principles in the protection, use, development, conservation, management and control of water resources. The intention of the Act is to promote the equitable access to water and the sustainable use of water, redress past racial and gender discrimination, and facilitate economic and social development. The Act provides the rights of access to basic water supply and sanitation, and environmentally, it provides for the protection of aquatic and associated ecosystems, the reduction and prevention of pollution and degradation of water resources. As this Act is founded on the principle that National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, a person can only be entitled to use water if the use is permissible under the Act. Chapter 4 of the Act lays the basis for regulating water use.
National Forest Act (Act 84 of 1998) (NFA)	Regulation 7	The protection, sustainable management and use of forests and trees within South Africa are provided for under the National Forests Act (Act 84 of 1998). Regulation 7 from the Act states the following: **Prohibition on destruction of trees in natural forests.** (1) No person may - (a) cut, disturb, damage or destroy any indigenous tree in a natural forest; or (b) possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any tree, or any forest product derived from a tree contemplated in paragraph (a), except in terms of- (i) a licence issued under subsection (4) or section 23; or (ii) an exemption from the provisions of this subsection published by the Minister in the Gazette on the advice of the Council.
National Veld & Forest Fires Act (Act 101 of 1998)	Regulation 13 Chapter 5	The purpose of the Act is to prevent and combat veld, forest and mountain fires throughout the Republic and provides for a variety of institutions, methods and practices for achieving the purpose. Regulations 13 provides the requirement for firebreaks. Chapter 5 places a duty on all owners to acquire equipment and have available personnel to fight fires.

Conservation of Agricultural Resources Act (Act No. 85 of 1983)		The purpose of the Act is to provide for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith. The objects of this Act are to provide for the conservation of the natural agricultural resources of the Republic by the maintenance of the production potential of land, by the combating and prevention of erosion and weakening or destruction of the water sources, and by the protection of the vegetation and the combating of weeds and invader plants.
National Infrastructure Plan		The National Government adopted a National Infrastructure Plan in 2012. With the plan they aim to transform the South African economic landscape while simultaneously creating significant numbers of new jobs, and strengthening the delivery of basic services. Government will over the three years from 2013/14 invest R827 billion in building and upgrading existing infrastructure. These investments will improve access by South Africans to healthcare facilities, schools, water, sanitation, housing and electrification. On the other hand, investments in the construction of ports, roads, railway systems, electricity plants, hospitals, schools and dams will contribute to faster economic growth. This mining activity will indirectly contribute to the growing of the South African economy by supplying SANRAL with material to build and upgrade road infrastructure.
District Municipality Integrated Development Plan (IDP)		The IDP and SDFs of the relevant municipalities was examined and relevant information was included in the EIA report.
Local Municipality Integrated Development Plan (IDP)		The IDP and SDFs of the relevant municipalities was examined and relevant information was included in the EIA report.
National Environmental Management: Protected Areas Act 57 of 2003		This Act provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. It also seeks to provide for the sustainable utilization of protected areas and to promote participation of local communities in the management of protected areas.
National Environmental Management: Waste Act, 2008 (Act No. 59 Of 2008) Regulations regarding the Planning & Management of Residue Stockpiles & Residue Deposits from a Prospecting, Mining, Exploration or Production Operation		The purpose of these Regulations is to regulate the planning and management of residue stockpiles and residue deposits from a prospecting, mining, exploration or production operation.
Hazardous Substances Act (No. 15 of 1979)		The object of the Act is inter alia to 'provide for the control of substances which may cause injury or ill health to, or death of, human beings by reason of their toxic, corrosive, irritant, strongly sensitising or flammable nature or the generation of pressure thereby in certain circumstances; for the control of electronic products; for the division of such substances or products into groups in relation to the degree of danger; for the prohibition and control of such substances.'

		In terms of the Act, substances are divided into schedules, based on their relative degree of toxicity, and the Act provides for the control of importation, manufacture, sale, use, operation, application, modification, disposal and dumping of substances in each schedule.
Subdivision of Agricultural Land Act (No. 70 of 1970)		This Act regulates the subdivision of agricultural land and its use for purposes other than agriculture. The Directorate of Resource Conservation is responsible for the enforcement thereof. Investigations are done by the Provincial Department in support of the execution of the Act. The Act also deals with aspects associated with rezoning land.
Occupational Health and Safety Act (No. 85 of 1993)		The Occupational Health and Safety Act (No. 85 of 1993) (OHSA) provides a legislative framework for the provision of reasonably healthy and safe conditions in the workplace. It also places extensive legal duties on employees and users of machinery and makes major inroads on employers' and employees' common law rights. The OHSA is applicable and states that any person involved with construction, upgrades or developments for use at work or on any premises shall ensure as far as reasonably practicable that nothing about the manner in which it is installed, erected or constructed makes it unsafe or creates a risk to health when properly used
Mine Health and Safety Act (No. 29 of 1996)		The Mine Health and Safety Act (No. 29 of 1996) (MHSA) aims to protect and promote the health and safety of employees and persons that may be affected by the activities at a mine and outlines both the rights and responsibilities of an employer, as well as the obligations of employees working thereat. The following principles are considered applicable to the Proposed Project and are detailed below: • The primary responsibility for ensuring a health and safe working environment in the mining site is placed on the mine owner. The Act sets out in detail the steps that employers must take to identify, assess records and control health and safety hazards in the mine; • The right of workers to participate in health and safety decisions, the right to receive health and safety information, the right to training and the right to withdraw from the workplace in face of danger; • The Act requires the establishment of institutions to promote a culture of health and safety and develop policy, legislation and regulations; and • The responsibility for enforcing MHSA lies with the Mine Health and Safety Inspectorate. The Inspectorate's powers are recast and include the power to impose administrative fines upon employers who contravene the MHSA. The Act also contains innovative approaches to the investigation of accidents, diseases and other occurrences that threaten health and safety.
Government Notice Regulation 704 of 1999		GNR.704 of 1999 under the NWA provides regulations on the use of water for mining and related activities aimed at the protection of water resources (requirements for clean and dirty water separation). GNR.704 requires inter alia the following: • Separation of clean (unpolluted) water from dirty water; • Collection and confinement of the water arising within any dirty area into a dirty water system; • Design, construction, maintenance and operation of the clean water and dirty water management systems so that it is not likely for either system to spill into the other more than once in 50 years; • Design, construction, maintenance and operation of any dam that forms part of a dirty water system to have a minimum freeboard of 0.8m above full supply level, unless otherwise specified in terms of Chapter 12 of the Act; and • Design, construction, and maintenance of all water systems in such a manner as to guarantee the serviceability of such conveyances for flows up to and including those arising as a result of the maximum flood with an average period of recurrence of once in 50 years.

		<u>GNR.704 also stipulates that no person in control of a mine or activity may:</u> Locate or place any residue deposit, dam, reservoir, together with any associated structure or any other facility within the 1:100 year flood line or within a horizontal distance of 100 m from any watercourse or estuary, borehole or well, excluding boreholes or wells drilled specifically to monitor the pollution of groundwater, or on water-logged ground, or on ground likely to become water-logged, undermined, unstable or cracked; Place or dispose of any residue or substance which causes or is likely to cause pollution of a water resource, in the workings of any underground or opencast mine excavation, prospecting diggings, pit or any other excavation; or Use any area or locate any sanitary convenience, fuel depots, reservoir or depots for any substance which causes or is likely to cause pollution of a water resource within the 1:50 year flood line of any watercourse or estuary.

F) NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES.

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

Mining has played a vital role in the economy of South Africa for over 100 years. In 2015 the mining industry contributed R286 billion towards South African Gross Domestic Product (GDP) representing 7.1% of overall GDP. Mining is a significant contributor to employment in the nation, with 457 698 individuals directly employed by the sector in 2015. This represents just over 3% of all employed nationally. (Chamber of Mines, South Africa, 17:2016)

G) MOTIVATION FOR THE PREFERRED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE INCLUDING A FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE.

NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

Location of the site

The location of the site is preferred due to the presence of river sand. The site is located approximately 10 km south of Thabazimbi. Access will be obtained from gravel roads and tar roads off the R510 and R511 roads.

Preferred activity

The mining of Sand (QY) is one of the preferred activities for the site. The presence of high amounts of river sand makes the site ideal for sand mining. The mine will provide more job opportunities than what is providing currently.

H) A FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE, INCLUDING:

i) DETAILS OF THE DEVELOPMENT FOOTPRINT ALTERNATIVES CONSIDERED;

- **Consideration of alternatives**

  The DEAT 2006 guidelines on 'assessment of alternatives and impacts' proposes the consideration of four types of alternatives namely, the no-go, site, activity, and technology alternatives. It is however, important to note that the regulation and guidelines specifically state that only 'feasible' and 'reasonable' alternatives should be explored. It also recognizes that the consideration of alternatives is an iterative process of feedback between the developer, the EAP and Interested and affected parties, which in some instances culminates in a single preferred project proposal. The following sections explore each type of alternative in relation to the proposed activity.

- **Location alternatives**

  This alternative asks the question, if there is not, from an environmental perspective, a more suitable location for the proposed activity. Also, it is expected that the applied for minerals have been deposited on this farm and therefore the applicant would like to commence with their mining activities.

  According to **Figure 21** the proposed 5ha area falls within natural land cover. According to **Figure 22** the proposed 5ha area is covered by Thicket / Dense Bush, Woodland / Open bush, Wetland, Grassland and Bare non vegetation. The google earth map (**Figure 23)** shows the proposed area is partially within the Krokodile river. The maps below are available under **Appendix 5**.

Please see **figure 24** (photos) how the proposed area looks like and the plates under **Appendix 8** for the rest of the photos.

The applicant is in the process of applying for a Water Use License,

All infrastructure will be temporary and/or mobile.

Land capability

The proposed area falls within Land in **Class 4**. (refer to Land capability map on **figure 6** and attached as **Appendix 5**).

According to an article on the Grain SA website by Garry Paterson from ARC-Institute for Soil, Climate and Water on the Grain SA website, agriculture rests on three pillars where natural resources are concerned. These are the soil (comprising the growth medium for the plant), the climate conditions (which supply the plant with sufficient water and heat) and the terrain (enabling the crop to be physically planted, to grow and to be harvested sustainably).

The concept of land capability combines the three natural resource elements or factors listed above (soil, climate and terrain) and uses set parameters to determine a specific class for a given area. The basis of the land capability assessment in South Africa is the well-known Land Type Survey, which is a country-wide inventory of natural resources, i.e. soil pattern, macroclimate and terrain type, carried out between 1972 and 2002 by the ARC-Institute for Soil, Climate and Water.

Each unique land type is allocated to one of eight land capability classes. These classes are based on the original USDA land capability system, whereby Classes I and II comprise areas with little or no limitations to rainfed agriculture, Classes III and IV comprise those areas which are still considered arable, but with moderate to severe restrictions. Classes V to VIII comprise non-arable land with increasingly serious restrictions, either in terms of restricted soil, steep terrain, rockiness and/or an unfavourable climatic regime. (Garry Paterson, ARC-Institute for Soil, Climate and Water, November 2014.)

- **Activity alternatives**

The environmental impact assessment process also needs to consider if the development of Sand (QY), mining would be the most appropriate land use for the particular site.

Mining of other commodities – from the surface and desktop assessment there are no indications that there are other commodities to be mined on the site except Sand (QY).

If the proposed mining permit is not granted the proposed area will remain unchanged.

- **Design and layout alternatives**

Design alternatives were considered throughout the planning and design phase (i.e. where is the river sand is located?). The layout follows the limitations of the site and aspects such as, roads, infrastructure, equipment, as well as fencing– refer **Appendix 4**.

- **Operational alternatives**

The pump extracts 700 cubic meters per hour.	
210 cubic meters of sand per hour	490 cubic meters of water per hour
More than 466 (95%) cubic meters of water flows back into the river through the outflow pipes.	

Due to the nature of the mining activities, no permanent services in terms of water supply, electricity, or sewerage services are required.

The lifetime of the project is approximately 5 years. The facility will be operational from 6 A.M. to 6 P.M., Monday to Friday, but working hours may extend to 7 P.M. and Saturdays. It is however possible that the lifetime of the project can be prolonged by a year or two and that the facility can become operational for prolonged hours or over weekends, depending on the resource.

- **No-go alternative**

This alternative considers the option of 'do nothing' and maintaining the status quo. The description provided in section H of this report could be considered the baseline conditions (status quo) to persist should the no-go alternative be preferred. Should the proposed activity not proceed, the site will remain unchanged

- **Technology alternatives**

In terms of the technologies proposed, these have been chosen based on the long term success of their mining & prospecting history. The mining activities is dependent on the preceding phase as previously discussed; therefore no alternatives are indicated.

Mining process

A floating barge, with a pump mounted on top, is used to pump the sand from the river bottom. Flexible floating pipes are connected to the pump, in order to transfer the sand from the river to the small "settling pond". The entrance to the pond is equipped with a sieve to ensure that only the fine sand enters the pond. The pond is also equipped with two water outflow pipes that ensures that the water flows back into the river, as soon as the sand has settled/deposited.

After the excess water has drained/flowed back into the river, the sand is removed from the settling pond and stockpiled at the demarcated stockpiling area. Here at the stockpiling area the sand will be left to dry. After the sand has dried, the sand is loaded and transported to the relevant client

List of equipment

- Volvo excavator
- Volvo Front End Loader
- Generator 100kva
- Screen
- Sand pump

Dust suppression

When it comes to dust suppression two main methods were considered, namely molasses stillage and the wetting (water) of roads. The table below provides a short summary of the advantages and disadvantages of each.

WATER	MOLASSES STILLAGE
More cost effective	Much more expensive
Could lead to the depleting of water resources	Requires less water
No damage (only if used excessively)	The product may be toxic to aquatic organisms. (As this product could have physical effects on aquatic organisms for e.g. floating, osmotic damage)
No harm to humans or animals(Only a high quantity will have harm to humans or animals)	Not Hazardous or toxic. Could cause irritation to eyes, skin or when ingested and inhaled.
Non-flammable	Non-flammable
Eye-wash fountains not needed	Eye-wash fountains in the work place are strongly recommended
	Working procedures should be designed to minimize worker exposure to this product.
Basic storing methods	Storing methods are a bit more complicated. Should be stored in a plastic, plastic lined or stainless steel, tight closed containers between 5 and 40 degrees Centigrade.

Considering the above mentioned information, water will be used for dust suppression purposes.

ii) DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

NEWSPAPER ADVERTISEMENT

An advertisement was placed in English in the local newspaper (**Rustenburg Herald**) on **26 August 2022 (**see **Appendix 6**) notifying the public of the EIA process and requesting Interested and Affected Parties (I&APs) to register with, and submit their comments to Milnex CC. I&APs were given the opportunity to raise comments within 30 days of the advertisement.

PAGE 4 RUSTENBURG HERALD 26 AUGUST 2022

Wenners van die Vroeudag rolbalkompetisie – Midnight Rollers bestaande uit Sharky Herholdt, Jannie Herholdt, Jannie Harmse, Gideon Joubert en Dannie Rossouw van die Vryburgers wat die pryse oorhandig het.

RUSTENBURG HERALD - RUSTENBURG - Vryburger Omgeemense het die afgelope Vrouedag 'n suksesvolle rolbalkompetisie aangebied ten bate van die organisasie se "Kos vir kinders"projek.

Bykans 30 gemengde spanne bestaande uit mans, vroue, oud en jonk het gedeel in die pret en tegniek wat die formaat van sport bied. Daar is deurlopend heerlik gekuier en geskerts.

Baie geluk aan skipper Gideon Joubert en sy Midnight Rollers-span wat as wenners uit die stryd getree het en dankie vir die prysgeld wat weer teruggeskenk is aan die fonds. Dankie aan bestuur van Rustenburg Rolbalklub wat uit hul pad gegaan het om die Vryburgers se projek te akkommodeer asook aan elke deelnemer. Wees verseker dat die fondse vir die plaaslike gemeenskap aangewend sal word waar voedselnood bestaan.

Vryburgers sit bal aan die rol vir Vrouedag

Vryburger Omgeemense wat betrokke was by Vrouedag rolbalkompetisie; Walter, Kevin, Johan, Gert, Christo, Konraad, Abrie, De Wet, Reon, Danie, Jaco en Rossi.

Meat prices could rise even more

RUSTENBURG HERALD - RUSTENBURG - South Africa's growing foot and mouth disease (FMD) outbreak, and the government's subsequent ban on cattle movement, will likely not significantly impact red meat prices now.

Consumers will also not be paying up more to 'braai' during the next three months. But by the end of the year, if things go wrong, meat could be more costly.

Last week, South Africa's agriculture minister, Thoko Didiza, instated a countrywide ban on the movement of live cattle to curb the spread of FMD. During the ban, intended to last 21 days, live cattle may not be moved for any reason, excluding slaughtering.

According to the Department of Agriculture, Land Reform and Rural Development, South Africa currently has 116 outbreaks of FMD across KwaZulu-Natal, Limpopo, North West, Free State, Gauteng, and Mpumalanga.

The head of a major bank's division for agriculture information and marketing said the impact of the ban and the outbreak will not result in significant price increases for red meat.

"For consumers, it won't necessarily have a major impact at this stage because the ban is only on the movement of animals between premises, except if it's from a feedlot to an abattoir," he said.

"We might in the next month or two when the feedlots need to stock up again, then we may see an uptick, but I don't think it will be a needle mover, and I don't think it will have a substantial impact on the consumer," he said.

He added that consumer perceptions around FMD tend to drive prices down, despite the fact that meat remains safe for consumption.

"Although there's not a health risk linked to FMD (for consumers), the perceptions that there might be something, normally drives down prices a bit. There might actually be a bit of a pressure downwards," he said.

He added that it can be expected that meat prices, which are already at an elevated level, will pick up during the festive season, with demand for the protein also expected to increase.

"From September onwards, the demand for red meat picks up, up to December when we have braais, and then we normally see an uptick in prices due to the demand," he said.

"With the current levels, we won't see a substantial uptick in prices because it's already high," he said.

Experts have warned that much will depend on when, exactly, the movement ban is lifted. Prices should drop when cattle may be moved again, and will likely increase if the cattle lockdown is extended. But should it be lifted too soon and foot and mouth spreads further, price-spiking shortages of beef would be possible.

NWP/EIA/97/2021: GRANTING OF ENVIRONMENTAL AUTHORISATION FOR THE DEVELOPMENT AND OPERATION OF A FILLING STATION ON PORTION 135 OF THE FARM BOSCHHOEK 103JQ WITHIN RUSTENBURG LOCAL MUNICIPALITY, NORTH WEST PROVINCE

All stakeholders are hereby notified that the North West Department of Economic Development, Environment, Conservation and Tourism (NW DEDECT) has, on the 15th of August 2022 (received 16 August 2022), granted environmental authorization to JJJ Swarts. The environmental authorization was issued in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) as amended and the associated Environmental Impact Assessment (EIA) Regulations of 2014 as amended (Listing 1, activities 14, 27, 28(ii), and 67; Listing 3 Activities 4(h)(iv) & 12(h)(iv)) for development and operation of a filling station on Portion 135 of the farm Boschhoek 103JQ, Rustenburg Local Municipality, North West Province. A copy of the environmental authorization can be requested from HydroScience (see details below).

Formal appeals regarding this environmental authorisation can be directed to the Appeals Administrator for NW DEDECT in terms of the National Appeal Regulations (GNR 993, 8 December 2014) by no later than 15 September 2022 (20 days from newspaper notification on 26 August 2022).

Contact details for Appeals Administrator: Ms Carene Nieuwoudt
North West Department of Economic Development, Environment, Conservation and Tourism
Tel: 018 389 5986 / 083 385 9486 | Email: cnieuwoudt@nwpg.gov.za
Physical: Room E30, AgriCentre Building, Corner Dr James Moroka & Stadium Road, Mmabatho

Paulette Jacobs Pr.Sci.Nat
Cell: + (27) 082 850 5462 Fax: + (27) 086 692 8820
Email: paulette@hydroscience.co.za
Postal address: P.O. Box 1322, Ruimsig, 1732, South Africa
Web address: www.hydroscience.co.za

Hydro Science

Serial rapist convicted, again

RUSTENBURG HERALD - RUSTENBURG - On Thursday (18 August) the Bafokeng Regional Court sitting in Tlhabane sentenced Kleinboy Nakana Kwele (52) to 20 years direct imprisonment for raping a 45-year-old woman in 2018 at Lethabong - six months after been released on parole.

According to sgt Ofentse Mokgadi, Rustenburg Police spokesperson, the court was told that in December 2018, six months after his release on parole, Kwele met two women who were collecting firewood at the nearby bush and offered them money in exchange for sexual favours. Both women flatly refused.

He then threatened them with a knife and managed to drag one of the women far into the bushes and raped her. The matter was then reported to the Lethabong Police and Kwele was traced and arrested immediately.

After his arrest it was discovered that he was a parolee for rape that he

Child Protection and Sexual Offences Unit in Mogwase.

Sgt Mamonyana Gouwe was the investigating officer whose dedicated work ensured the latest conviction.

MMABANA ARTS, CULTURE & SPORT FOUNDATION

MMABANA Head Office: 103 Sekame Rd., Mmabatho, 273
North West, RSA.

Bids are hereby invited from suppliers for the following bid

Bid number	Description	Contact person	Compulsory briefing session	Closing d
MACSF 01-2022/23	EXPRESSION OF INTEREST AND APPOINTMENT OF A SERVICE PROVIDER AS EVENT MANAGEMENT FOR MMABANA ARTS, CULTURE AND SPORT FOUNDATION FOR THE TAUNG CULTURAL CABABASH EVENT FOR THE YEAR 2022/2023	• Technical enquiries: Mr Tshepiso Konopi (082 880 5128 or konopit@mmabana.org.za) • Supply chain enquiries: Mr Mandla Twala (066 189 9515 or mtwala@mmabana.org.za).	NO	DATE: TUES Y, 06 SEPTEM 2022

THE DOCUMENT IS DOWNLOADABLE ON THE MMABANA ARTS, CULTU E AND SPORT FOUNDATION WEBSITE (www.mmabana.org.za) and on e E-tender portal documents will be free.

Each tender shall be enclosed in a sealed envelope that bears the cor t identification details and shall be placed in the tender box located at:

101 Dr James Moroka Drive, Mmabatho, 2735.

Documents must be deposited in the bid box not later than **10:00AM n 06 September 2022. Bids will remain valid for a period of 90 days after e closing date.**

Bids received after the closing date and time will not be considered. The founda n does not bind itself to accept the lowest or any other bid in whole or in part.

NOTICE OF AN APPLICATION: MINING PERMIT AND SUBSEQUENT ENVIRONMENTAL IMPACT ASSESSMENT

Notice is given in terms of Section 27 (2) and 10 of the Mineral and Petroleum Resources Development Act (Act 28 of 2002) and Regulations 3, 14 and 51 of the Regulations published in Government Notice GN R527, & Notice is given in terms of the EIA regulations published in Government Notice No. R326 under Section 39-44 of the National Environmental Management Act (Act No. 107 of 1998) of the intent to carry out an Environmental Impact Assessment (i.t.o Listing Notice 1 of 2017, GNR 327 [Activity 19, 21, 27 (as amended, GNR517)] in Gazette no. 40772 & Listing Notice 3 of 2017, GNR 324 [Activity 12 & 14] in Gazette No. 40772 of the intent to carry out the activity mentioned above.

PROJECT TITLE

Proposed Environmental Authorisation application and subsequent Environmental Impact Assessment of **Impulse Mining (Pty) Ltd** for the proposed Mining Permit application for the mining of Sand (QY), including associated infrastructure, structure, and earthwork on a certain portion of the Remaining Extent and Portion 3 of the farm Buffelshoek 351, Registration Division: KQ, Limpopo Province.

PROJECT DESCRIPTION

Environmental Impact Assessment for the proposed Mining Permit application for the mining of Sand (QY), including associated infrastructure, structure, and earthwork on a certain portion of the Remaining Extent and Portion 3 of the farm Buffelshoek 351, Registration Division: KQ, Limpopo Province. The proposed area is approximately 8km South of the town of Thabazimbi.

APPLICATION AREA

A certain portion of the remaining extent and portion 3 of the farm Buffelshoek 351, Registration Division KQ, Limpopo Province.

PROPERTY'S LOCATION:	The property is located approximately 10km South from town of Thabazimbi in the Limpopo Province.
APPLICANT:	**Impulse Mining (Pty) Ltd**
SIZE OF SITE:	5 ha
DMRE REF:	-

CO-ORDINATES OF APPLICATION AREA

Latitude	Longitude
24°39'55.168"S	27°23' 3.752"E
24°39'50.874"S	27°23'27.516"E
24°39'53.445"S	27°23'26.256"E
24°39'57.558"S	27°23'2.868"E

Any inquiries/objections must be lodged in writing or verbally if unable to write to the below mentioned consultants:

CONSULTANTS	**Milnex CC Environmental Consultants**
	Ms. Percy Sehaole/ Ms. Lizanne Esterhuizen/ Mr. Christiaan Bonn/ Mr. Andile Grant Nxumalo
	Tel: (018) 011 1925
	Fax: 087 231 7021
	E-mail: percy@milnex-sa.co.za / lizanne@milnex-sa.co.za / christiaan@milnex-sa.co.za / andile.grant@milnex-sa.co.za
	Postal Address: P.O Box 1086, Schweizer-Reneke, 2780

Any meetings will be conducted virtually via **Zoom or Microsoft Teams** upon request by the I&APs.
The **Environmental Impact Assessment** application was submitted to the Department of Mineral Resources and Energy (DMRE). In order to ensure that you are identified as an interested and/or affected party please submit your name, contact information and interest in the matter, in writing or verbally to the contact persons given above **within 30 days of this advertisement.**

SITE NOTICES

Site notices was placed (as anticipated on the coordinates below) on site in English to inform surrounding communities and immediately adjacent landowners of the proposed development. I&APs will be given the opportunity to raise comments. Photographic evidence of the site notices will be included in **Appendix 6**. Below are the coordinates where the site notices were placed.

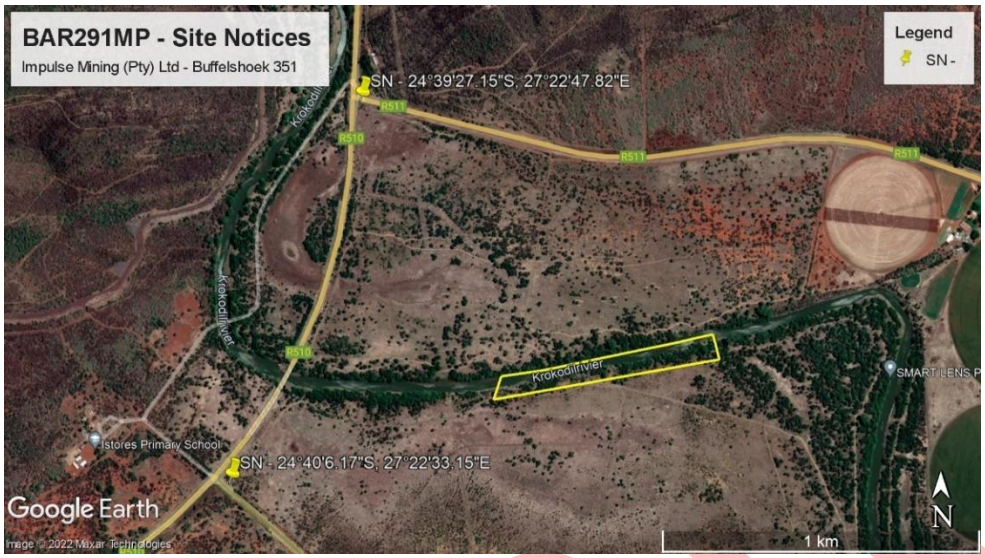


Figure 3: Site notice co-ordinates

One of the photos of the site notices placed. Please see **Appendix 6** for all the photos.

DIRECT NOTIFICATION AND CIRCULATION OF BASIC ASSESSMENT REPORT TO IDENTIFIED STALKHOLDERS, LANDOWNERS, SURROUNDING LANDOWNERS, OCCUPIERS & I&APS

Identified I&APs, including key stakeholders representing various sectors, are directly informed of the proposed development and the availability of the **Basic Assessment Report** via registered post on **06 October 2022** and were requested to submit comments by **05 November 2022**.

A copy of the report is also available at the Milnex offices in Schweizer-Reneke, 4 Botha Street, Schweizer-Reneke and Potchefstroom (Waterberry Street, Waterberry Square, 1st floor, Office 5B, Potchefstroom), between 7:30AM and 5PM, Monday to Friday. For a complete list of stakeholder details and for proof of registered post see **Appendix 6**.

It is expected from I&APs to provide their inputs and comments within 30 days after receipt of the notification or Basic Assessment Report. When the comment period ends, all comments received will be included in the final Basic Assessment Report & EMP Report.

Table 1: List of Stakeholders, Landowners, & surrounding landowners

Stakeholders
Department of Agriculture and Rural Development (DARD)
Department: Mineral Resources and Energy (DMRE)
Department of Transport and Community Safety (DTCS)
Department of Cooperative Governance, Human Settlement and Traditional Affairs (DCoGHSTA)
Limpopo Department of Economic Development, Environment and Tourism (LEDET)
Department of Public Works, Roads & Infrastructure (DPWI)
Limpopo Heritage Resources Authority (LIHRA)
Department of Water & Sanitation (DWS)
Office of the Regional Land Claims Commissioner: Limpopo
Waterberg District Municipality: Municipal manager
Thabazimbi Local Municipality: The municipal manager
Thabazimbi Local Municipality: Ward 6 Councillor
Thabazimbi Local Municipality: Ward 4 Councillor
WESSA
Interested and Affected Parties (I&APs)
Bossie
South African National Roads Agency SOC Ltd, (SANRAL)
Sishen Iron Ore (Pty) Ltd
Samrec (Pty) Ltd
Landowner
Thabazimbi Iron Ore Mine (Pty) Ltd
Sishen Iron Ore Company (Pty) Ltd
Surrounding landowners
Johannes Petrus Coetzee
Alfalfa Trust
Thabazimbi Iron Ore Mine (Pty) Ltd
Afrocol (Pty) Ltd

PUBLIC MEETING

Please note that the Stakeholders & Interested and Affected Parties (I&APs) were informed about the proposed project with the use of press advertisement, registered letters and site notices. It was mentioned that due to COVID-19, any meetings will be conducted virtually via Zoom or Microsoft Teams upon request by the I&APs.

No meeting was requested by I&APs.

ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

When the comment period ends, comments received was included in the comments and response table/form (See **Appendix 6** for comments and response form).

iii) SUMMARY OF ISSUES RAISED BY I&APS

(Complete the table summarising comments and issues raised, and reaction to those responses)

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issue and or response where incorporated
Organisation	**Contact person**			
Landowner				
Buffelshoek RE/351	Thabazimbi Iron Ore Mine (Pty) Ltd			
Buffelshoek 3/351	Sishen Iron Ore Company (Pty) Ltd			
Surrounding landowners				
Haakdoorndrift 1/373	Johannes Petrus Coetzee			
Haakdoorndrift 2/373	Alfalfa Trust: Maria Elizabeth Christina du Buys			
Wachteenbietjesdraai RE/2/350, Buffelshoek RE/1/351 & Grootfontein RE/1/352	Thabazimbi Iron Ore Mine (Pty) Ltd			
Roodedam RE/1/368	Afrocol (Pty) Ltd			
Langpan 371	Elsabe Hendrina Human			
Wachteenbietjesdraai 24/350	Hendrikus Broeze			

Wachteenbietjesdraai 15/350	Sandrivier Familietrust: A J Boshoff			
	Sandrivier Familietrust: M J Boshoff			
	Sandrivier Familietrust: L J Erasmus			
Wachteenbietjesdraai 48/350	No information available on SearchWorks			
Buffelshoek 7/351	No information available on SearchWorks			
Grootfontein 11/352	No information available on SearchWorks			
Municipality in which jurisdiction the development is located				
Thabazimbi Local Municipality	**Municipal Manager** To whom it may concern			
Municipal councilor of the ward in which the site is located				
Thabazimbi Local Municipality	Ward 6 councillor			
	Ward 4 councillor			
Organs of state having jurisdiction				
Department of Agriculture and Rural Development (DARD)	**Head of Department:** Ms Ramatsimele Jacqueline Maisel			
Department: Mineral Resources and Energy (DMRE)	Reginal Manager: Mr Azwihangwisi Mulaudzi Secretary Ms Tebogo Mangaba			
Department of Transport and Community Safety (DTCS)	**Head of Department** To whom it may concern			

Department of Cooperative Governance, Human Settlement and Traditional Affairs (DCoGHSTA)	**Head of Department** To whom it may concern			
Limpopo Department of Economic Development, Environment and Tourism (LEDET)	**Head of Department** To whom it may concern			
Department of Public Works, Roads & Infrastructure (DPWI)	**Head of Department:** Mr. Dikgole Timothy Seroka			
Limpopo Heritage Resources Authority (LIHRA)	Heritage Coordinator Mr Donald Lithole			
Department of Water & Sanitation (DWS)	Luyanda Babalwa Catsha			
	Mjona Thato Danny			
	Nemafhohoni Khangwelo Munaka			
Office of the Regional Land Claims Commissioner: Limpopo	Reratiloe Mothapo			
Others				
Waterberg District Municipality	**Municipal Manager** To whom it may concern			
WESSA	John Wesson			
Interested and Affected Party	Bossie			
South African National Roads Agency SOC Ltd, (SANRAL)	To whom it may concern			
Sishen Iron Ore (Pty) Ltd	Christo Reeders			
Samrec (Pty) Ltd	Brendan Botha			

iv) THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE SITES

Baseline Environment

The baseline environment is described with specific reference to geotechnical conditions, ecological habitat and landscape features, soil, land capability and agricultural potential, climate and the visual landscape.

DFFE Screening Report

According to the DFFE Screening Report (**Appendix 7**) the Environmental Sensitivity of the proposed area is as follows:

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

No	EIA Reference No	Classification	Status of application	Distance from proposed area (km)
1	14/12/16/3/3/1/969	Solar PV	Approved	29.7
2	14/12/16/3/1/969	Solar PV	Approved	29.7

Proposed Development Area Environmental Sensitivity

The following summary of the development site 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		
Defence Theme				X
Paleontology Theme		X		
Plant Species Theme				X
Terrestrial Biodiversity Theme	X			

Type of environment affected by the proposed activity.

(its current geographical, physical, biological, socio- economic, and cultural character).

ECOLOGICAL HABITAT AND LANDSCAPE FEATURES

The result obtained by plotting the coordinates are as follow:

Dwaalboom Thornveld

The proposed area falls within vegetation unit SVcb 3, which is known as the Dwaalboom Thornveld. The Dwaalboom Thornveld is part of the Central Bushveld Bioregion, which is a sub-bioregion for the Savanna Biome.

According to Mucina and Rutherford (2006:460), the Dwaalboom Thornveld covers the Limpopo and North-West Provinces: Flats north of the Dwarsberge and associated ridges mainly west of the Crocodile River in the Dwaalboom area but including a patch around Sentrum. South of the ridges it extends eastwards from the Nietverdiend area, north of the Pilanesberg to the Northam area. Altitude 900–1 200 m.

The vegetation & landscape features can be described as plains with layer of scattered, low to medium high, deciduous microphyllous trees and shrubs with a few broad-leaved tree species, and an almost continuous herbaceous layer dominated by

grass species. *Acacia tortilis* and *A. nilotica* dominate on the medium clays (at least 21% clay in the upper soil horizon but high in the lower horizons; Figure 9.10). On particularly heavy clays (>55% clay in all horizons) most other woody plants are excluded and the diminutive *A. tenuispina* dominates at a height of less than 1 m above ground. On the sandy clay loam soils (with not more than 35% clay in the upper horizon but high in the lower horizons) *A. erubescens* is the most prominent tree. The alternation of these substrate types creates a mozaic of patches typically 1–5 km across, for example in the unit west of Thabazimbi (Mucina and Rutherford, 2006:461).

Some other important Taxa found on in the area:

Tall Tree: *Acacia erioloba*.

Small Trees: *Acacia erubescens* (d), *A. nilotica* (d), *A. tortilis* subsp. *heteracantha* (d), *A. fleckii*, *A. mellifera* subsp. *detinens*, *Combretum imberbe*, *Rhus lancea*, *Ziziphus mucronata*.

Tall Shrubs: *Acacia hebeclada* subsp. *hebeclada*, *Combretum hereroense*, *Diospyros lycioides* subsp. *lycioides*, *Euclea undulata*, *Grewia flava*, *Tarchonanthus camphoratus*.

Low Shrubs: *Acacia tenuispina* (d), *Abutilon austro-africanum*, *Aptosimum elongatum*, *Hirpicium bechuanense*, *Pavonia burchellii*, *Solanum delagoense*.

Succulent Shrubs: *Kalanchoe rotundifolia*, *Talinum caffrum*.

Herbaceous Climber: *Rhynchosia minima*. Graminoids: *Aristida bipartita* (d), *Bothriochloa insculpta* (d), *Digitaria eriantha* subsp. *eriantha* (d), *Ischaemum afrum* (d), *Panicum maximum* (d), *Cymbopogon pospischilii*, *Eragrostis curvula*, *Sehima galpinii*, *Setaria incrassata*.

Herbs: *Heliotropium ciliatum*, *Kohautia caespitosa* subsp. *brachyloba*, *Nidorella hottentotica*.

Mucina and Rutherford (2006:460) also states that the conservation of this thornveld type is least threatened, with a target of 19%. Some 6% is statutorily conserved, mostly within the Madikwe Game Reserve in the west and about 14% transformed mainly by cultivation. Erosion is very low to low. This vegetation type is main use for extensive cattle grazing.

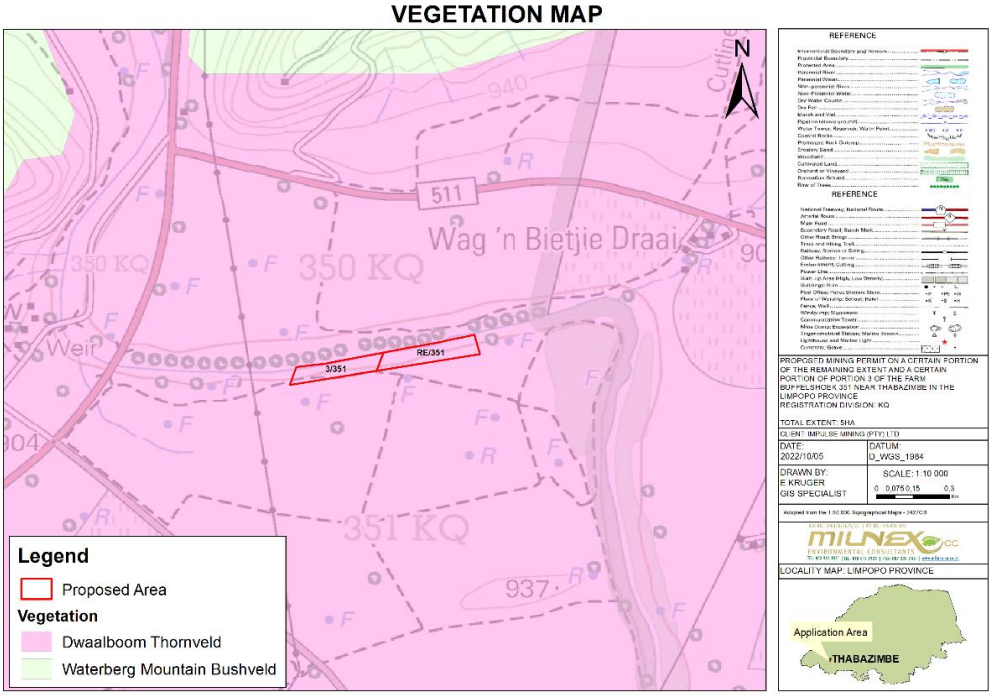


Figure 4: Vegetation Unit Map

According to the DFFE Screening Report the Plant Species theme sensitivity of the proposed area falls in Low sensitivity. Please see **Appendix 7** for the colour map.

Figure 5: Plant Species Combined Sensitivity

AGRICULTURAL / LAND CAPABILITY

According to an article on the Grain SA website by Garry Paterson from ARC-Institute for Soil, Climate and Water on the Grain SA website, agriculture rests on three pillars where natural resources are concerned. These are the soil (comprising the growth medium for the plant), the climate conditions (which supply the plant with sufficient water and heat) and the terrain (enabling the crop to be physically planted, to grow and to be harvested sustainably).

The concept of land capability combines the three natural resource elements or factors listed above (soil, climate and terrain) and uses set parameters to determine a specific class for a given area. The basis of the land capability assessment in South Africa is the well-known Land Type Survey, which is a country-wide inventory of natural resources, i.e. soil pattern, macroclimate and terrain type, carried out between 1972 and 2002 by the ARC-Institute for Soil, Climate and Water.

Each unique land type is allocated to one of eight land capability classes. These classes are based on the original USDA land capability system, whereby Classes I and II comprise areas with little or no limitations to rainfed agriculture, Classes III and IV comprise those areas which are still considered arable, but with moderate to severe restrictions. Classes V to VIII comprise non-arable land with increasingly serious restrictions, either in terms of restricted soil, steep terrain, rockiness and/or an unfavourable climatic regime. (Garry Paterson, ARC-Institute for Soil, Climate and Water, November 2014.)

The proposed area falls within Land in Class IV (4). (Refer to Land capability map on **figure 6** and attached as **Appendix 5**.

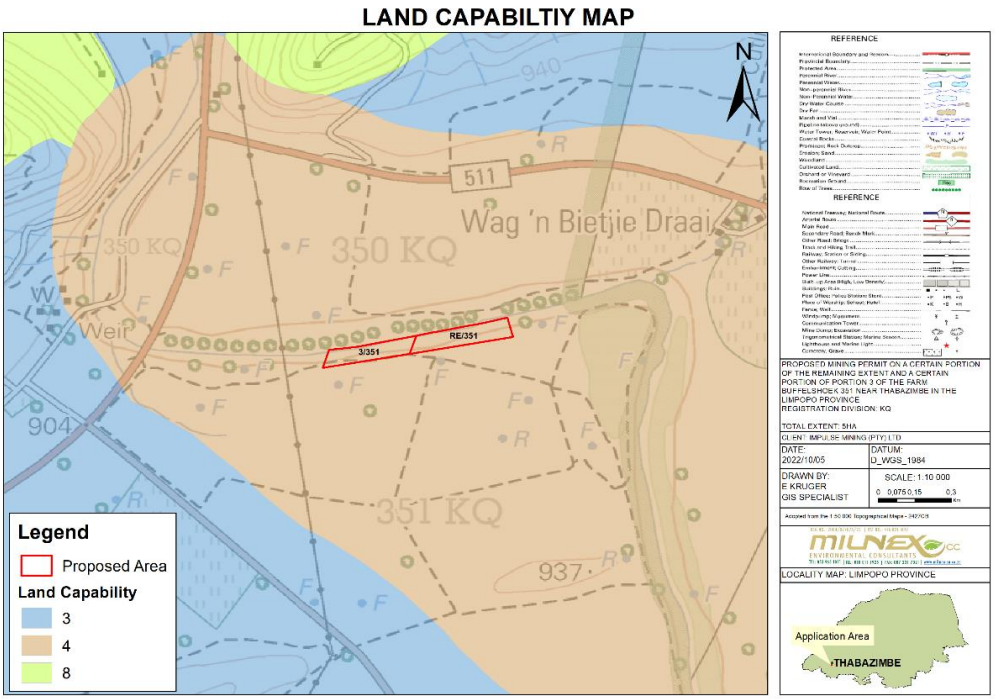


Figure 6: Land capability

According to the DFFE Screening Report the Agriculture theme sensitivity of the proposed area falls within Medium sensitivity.

Please see **Appendix 7** for the colour map.

Figure 6: Agriculture Combined Sensitivity

THREATENED ECOSYSTEMS

Ecosystem threat status outlines the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function and composition, on which their ability to provide ecosystem services ultimately depends (Driver et al. 2011). Datasets have been developed by SANBI (2016) in order to outline threatened ecosystems, with the primary objective of limiting the rate of ecosystem extinctions. Four established categories group these ecosystems namely: Critically Endangered (CR), Endangered (EN), Vulnerable (VU) and Protected.

According to **Figure 7**, the area does not fall within a threatened ecosystem

PROTECTED AREAS

Formally protected areas are protected either by national or provincial legislation. Based on the SANBI (2010) Protected Areas Map (**Figure 7**), the proposed area does not fall within a formally protected area. The Ben Alberts Nature Reserve is ± 3km from North West from the proposed area.

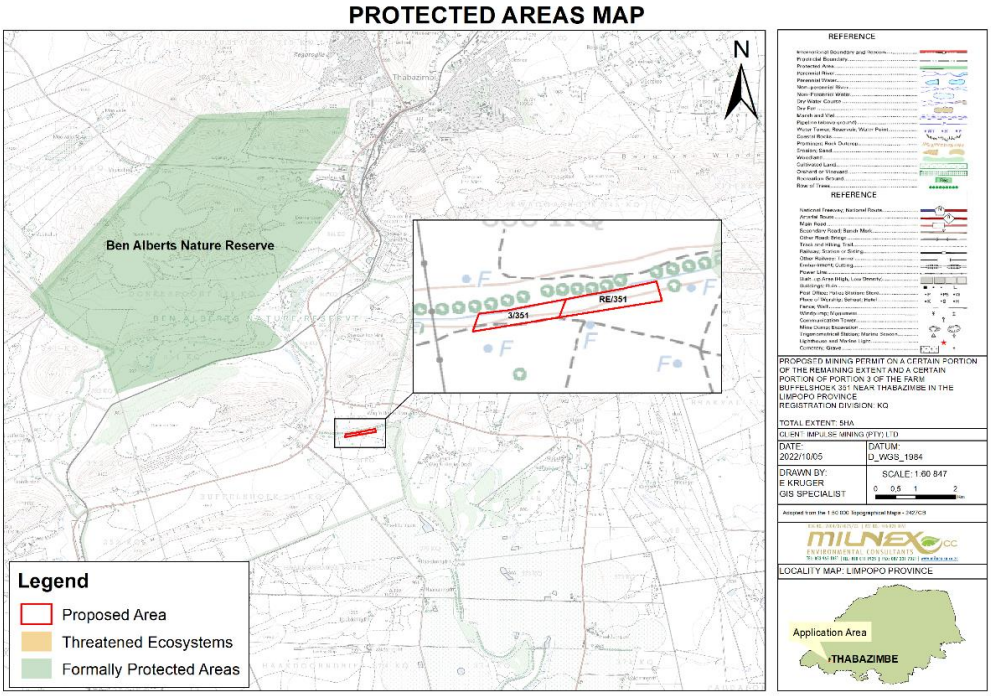


Figure 7: Threatened Ecosystems and Formally Protected Area.

NATIONAL PROTECTION AREA EXPANSION STRATEGY (NPAES)

According to the National Protected Area Expansion Strategy for South Africa 2016, the goal of the NPAES is to achieve cost effective protected area expansion for improved ecosystem representation, ecological sustainability and resilience to climate change. It sets protected area targets, maps priority areas for protected area expansion, and makes recommendations on mechanisms to achieve this.

Figure 8 below shows the proposed area does not fall within a NPAES.

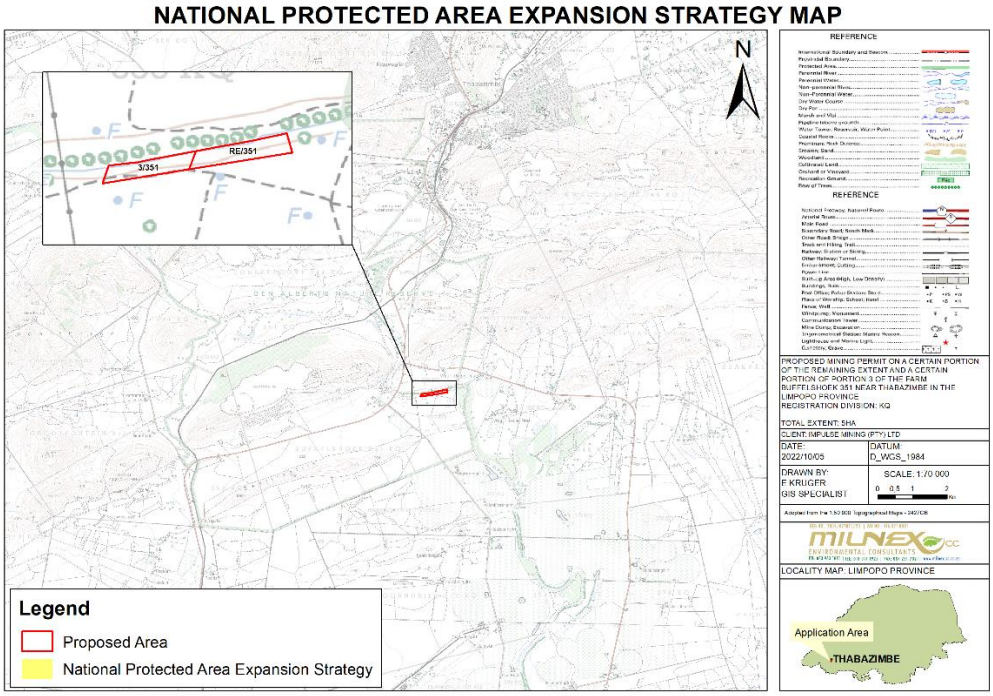


Figure 8: National Protection Area Expansion Strategy

STRATEGIC WATER SOURCE AREA MAP

Strategic Water Source areas are areas that supply areas of geographic interest with a varying amount of water

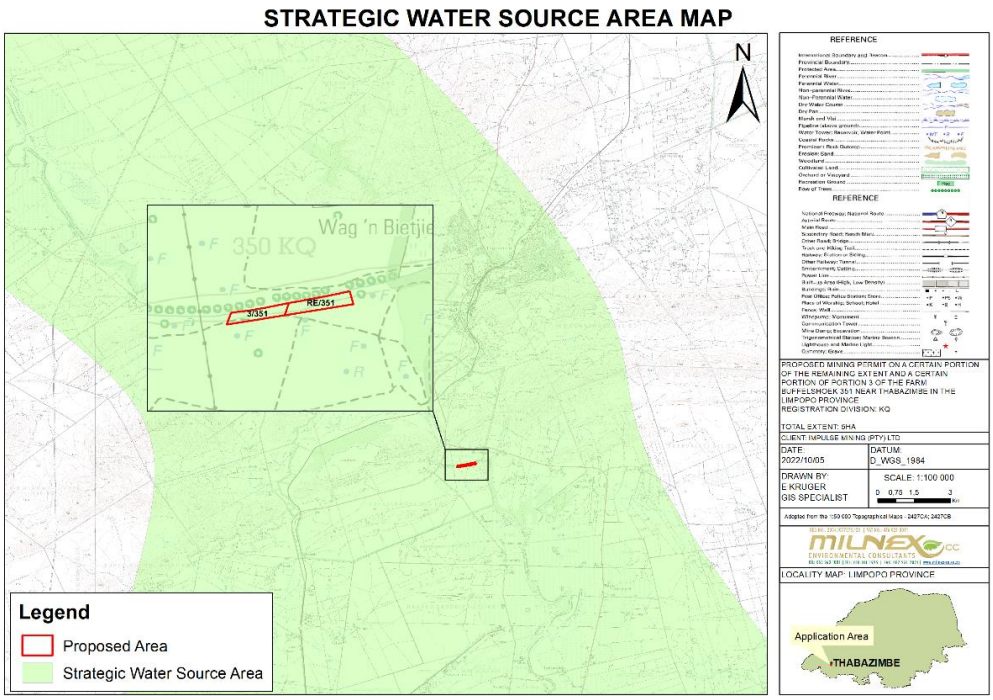


Figure 9: Strategic Water Source Area

CRITICAL BIODIVERSITY AREA

Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of high biodiversity value that need to be conserved and maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services (MTPA, 2014). According to the National Environmental Management Act (NEMA) (Act no. 107 of 1998) certain activities have strict guidelines or are prohibited within CBAs and ESAs. Refer to the listed activities under the NEMA: Environmental Impact Assessment Regulations of 2014 (GNR982) as promulgated in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) [as amended] for a comprehensive breakdown. The following terms are used to categorise the various land used types according to their biodiversity and environmental importance:

- Critical Biodiversity Area One (CBA1)
- Critical Biodiversity Area Two (CBA2)
- Ecological Support Area (ESA)
- Other Natural Areas (ONA) and
- Protected Area (PA).

The proposed area falls within CBA2, as illustrated on the map below (**Figure 10**).

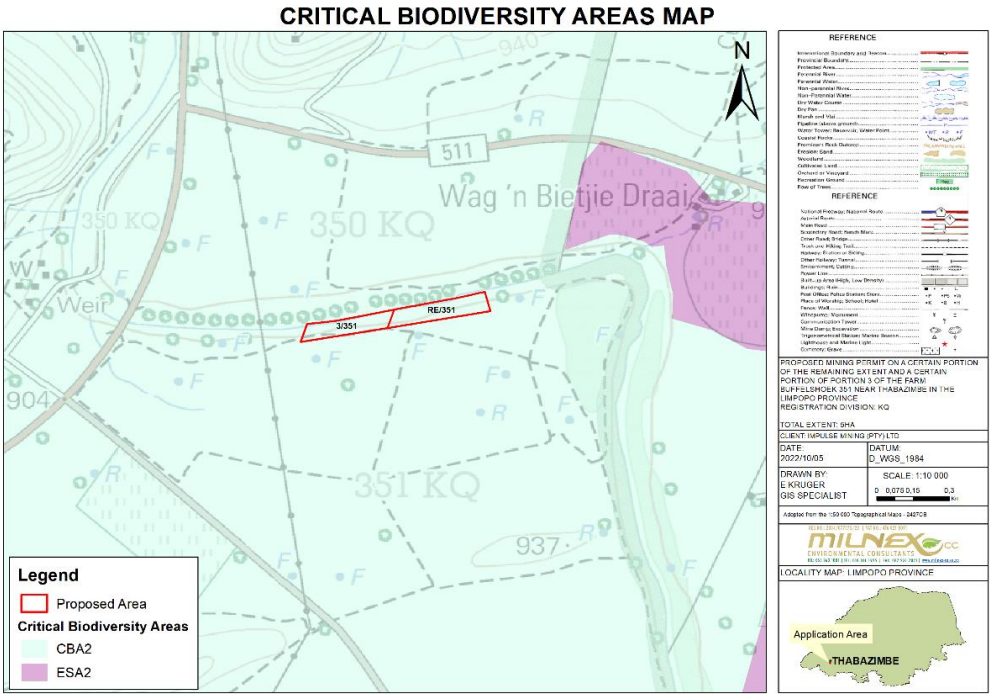


Figure 10: Critical Biodiversity Areas (CBAs) associated with the study site.

According to the DFFE Screening Report the proposed area falls within Very High Terrestrial Biodiversity sensitivity. Please see **Appendix 7** for the colour map.

Figure 11: Terrestrial Biodiversity Combined Sensitivity

According to the DFFE Screening Report the proposed area falls within High Aquatic Biodiversity theme sensitivity. Please see **Appendix 7** for the colour map.

Figure 12: Aquatic Biodiversity Combined Sensitivity

According to the DFFE Screening report the Animal Species theme sensitivity falls in High and Medium sensitivity. Please see **Appendix 7** for the colour map.

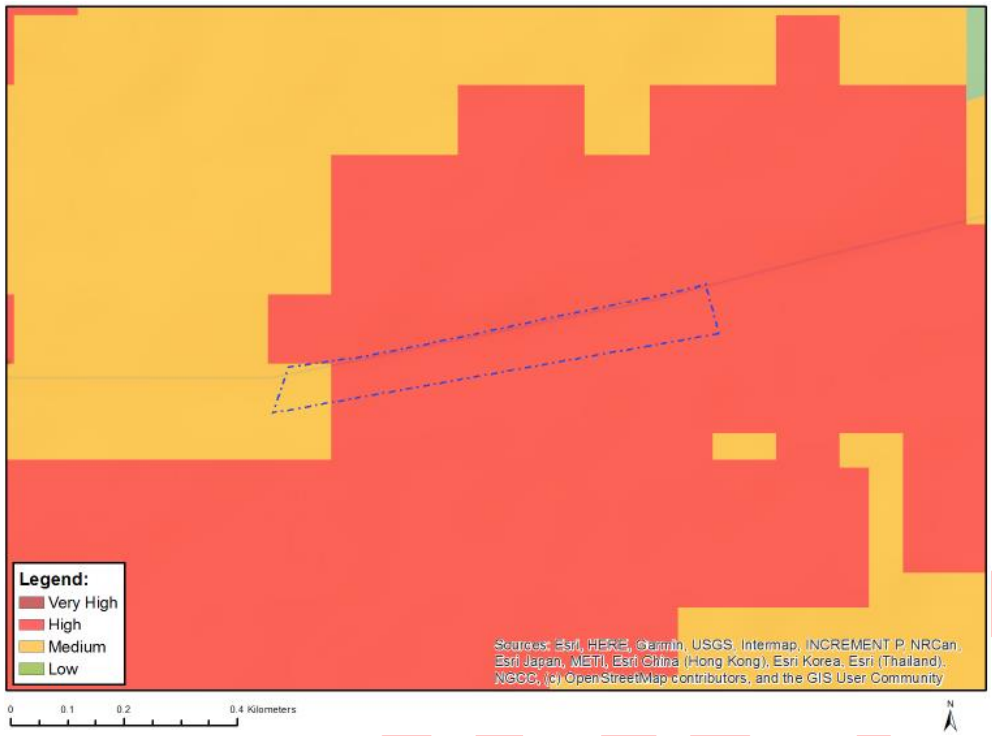


Figure 13: Animal Species theme sensitivity

BIODIVERSITY PRIORITY AREAS FOR MINING

The Mining and Biodiversity Guideline was developed in 2013 for the purpose of mainstreaming biodiversity management practices into the mining sector (DEA, DMRE, Chamber of Mines, SAMBF & SANBI 2013). This Guideline provides explicit direction in terms of where mining-related impacts are legally prohibited, where biodiversity priority areas may present high risks for mining projects, and where biodiversity may limit the potential for mining. The Guideline distinguishes between four categories of biodiversity priority areas in relation to their importance from a biodiversity and ecosystem service perspective as well as the implications for mining in these areas (**Table 2**).

Table: Four categories of biodiversity priority areas in relation to their biodiversity importance and implications for mining.

Category	Biodiversity Priority Areas	Risks for Mining	Implications for Mining
A. Legally Protected	• Protected areas (including National Parks, Nature Reserves, World Heritage Sites, Protected Environments, Nature Reserves) • Areas declared under Section 49 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002)	**Mining Prohibited**	Mining projects cannot commence as mining is legally prohibited. Although mining is prohibited in Protected Areas, it may be allowed in Protected Environments if both the Minister of Mineral Resources and Minister of Environmental Affairs approve it. In cases where mining activities were conducted lawfully in protected areas before Section 48 of the Protected Areas Act (No. 57 of 2003) came into effect, the Minister of Environmental Affairs may, after consulting with the Minister of Mineral Resources, allow such mining activities to continue, subject to

			prescribed conditions that reduce environmental impacts.
B. Highest Biodiversity Importance	• Critically endangered and endangered ecosystems • Critical Biodiversity Areas (or equivalent areas) from provincial spatial biodiversity plans • River and wetland Freshwater Ecosystem Priority Areas (FEPAs) and a 1km buffer around these FEPAs • Ramsar Sites	**Highest Risk for Mining**	Environmental screening, environmental impact assessment (EIA) and their associated biodiversity specialist studies should focus on confirming the presence and significance of these biodiversity features, and to provide site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision-making for mining, water use licences, and environmental authorisations. If they are confirmed, the likelihood of a fatal flaw for new mining projects is very high because of the significance of the biodiversity features in these areas and the associated ecosystem services. These areas are viewed as necessary to ensure protection of biodiversity, environmental sustainability, and human well-being. An EIA should include the strategic assessment of optimum, sustainable land use for an area and will determine the significance of the impact on biodiversity. This assessment should fully consider the environmental sensitivity of the area, the overall environmental and socio-economic costs and benefits of mining, as well as the potential strategic importance of the minerals to the country. Authorisations may well not be granted. If granted, the authorisation may set limits on allowed activities and impacts and may specify biodiversity offsets that would be written into licence agreements and/or authorisations.
C. High Biodiversity Importance	• Protected area buffers (including buffers around National Parks, World Heritage Sites* and Nature Reserves) • Transfrontier Conservation Areas (remaining areas outside of formally proclaimed protected areas) • Other identified priorities from provincial spatial biodiversity plans • High water yield areas • Coastal Protection Zone	**High Risk for Mining**	These areas are important for conserving biodiversity, for supporting or buffering other biodiversity priority areas, and for maintaining important ecosystem services for communities or the country. An EIA should include an assessment of optimum, sustainable land use for an area and will determine the significance of the impact on biodiversity. Mining options may be limited in these areas, and limitations for mining projects are possible. Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations.

	• Estuarine functional zone *Note that the status of buffer areas of World Heritage Sites is subject to a current intra-governmental process		
D. Moderate Biodiversity Importance	• Ecological support areas • Vulnerable ecosystems • Focus areas for protected area expansion (land-based and offshore protection)	**Moderate Risk for Mining**	These areas are of moderate biodiversity value. EIAs and their associated specialist studies should focus on confirming the presence and significance of these biodiversity features, identifying features (e.g. threatened (land-based and offshore protection) species) not included in the existing datasets, and on providing site-specific information to guide the application of the mitigation hierarchy. Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations.

Based on **Figure 12**, the proposed area falls within Category B: Highers Biodiversity Importance.

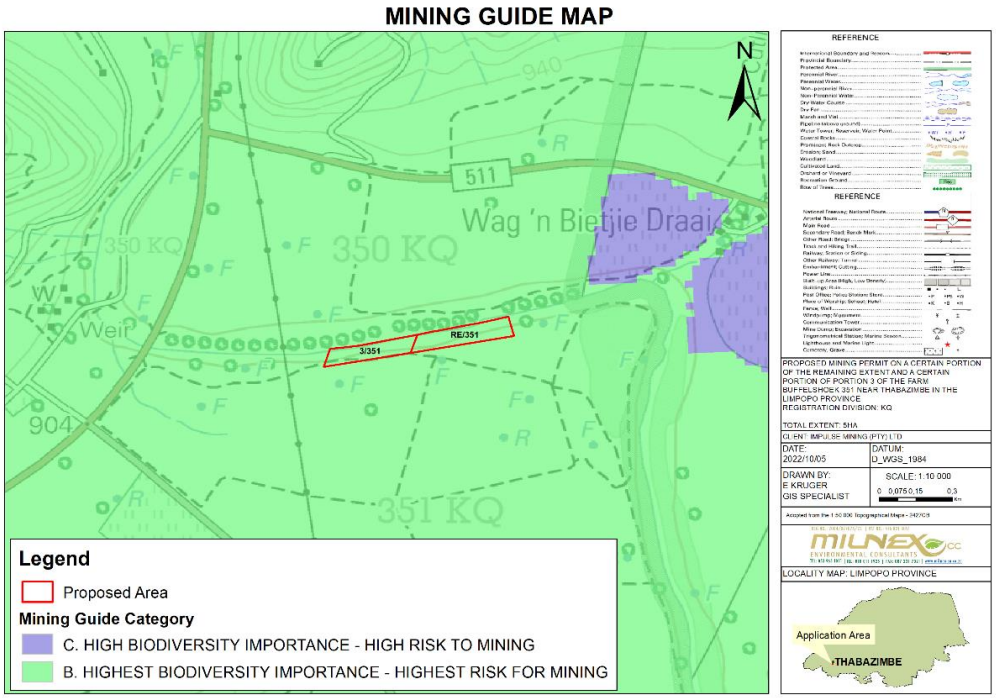


Figure 14: Biodiversity priority areas, in accordance with the Mining of Biodiversity Guidelines, associated with the study site.

WETLAND AREAS

In terms of Section 1 of the National Water Act (No. 36 of 1998) (NWA), wetlands are legally defined as: "*land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil*" (NWA 1998).

Wetlands are defined by the presence of unique soils and vegetation that do not occur in terrestrial and purely aquatic environments (Edwards *et al.* 2018). Wetland soils are referred to as hydric soils that develop under anaerobic conditions (condition where oxygen is virtually absent from the soil). Wetlands are also typically characterized by relatively large and dense stands of plants sticking out of shallow water or wet soil. Plants adapted to such waterlogged conditions are referred to as hydrophytes. Wetlands are distinct from true aquatic ecosystems like river ecosystems, which are characterized by fast flowing water within channels, and lake ecosystems, that are flooded to great depth; both of which are not primarily characterized by the occurrence of hydric soils and hydrophytes.

A wide variety of wetland types are present in South Africa, and can be classified into six broad types, namely floodplain wetlands, unchannelled valley bottom wetlands, channelled valley bottom wetlands, seeps, depressions and wetland flats. Owing to the large variations in climate and topography across South Africa, vegetation and habitat associated with these wetland types vary tremendously from subtropical reed beds and tall swamp forests to arid salt pans, which all support unique and varied animal life.

Figure 15 illustrates all wetland types associated with the study site. According to the map the proposed area falls withing a Floodplain wetland. The wetland vegetation on proposed site falls within Central Bushveld Group 2 (**Figure 16**).

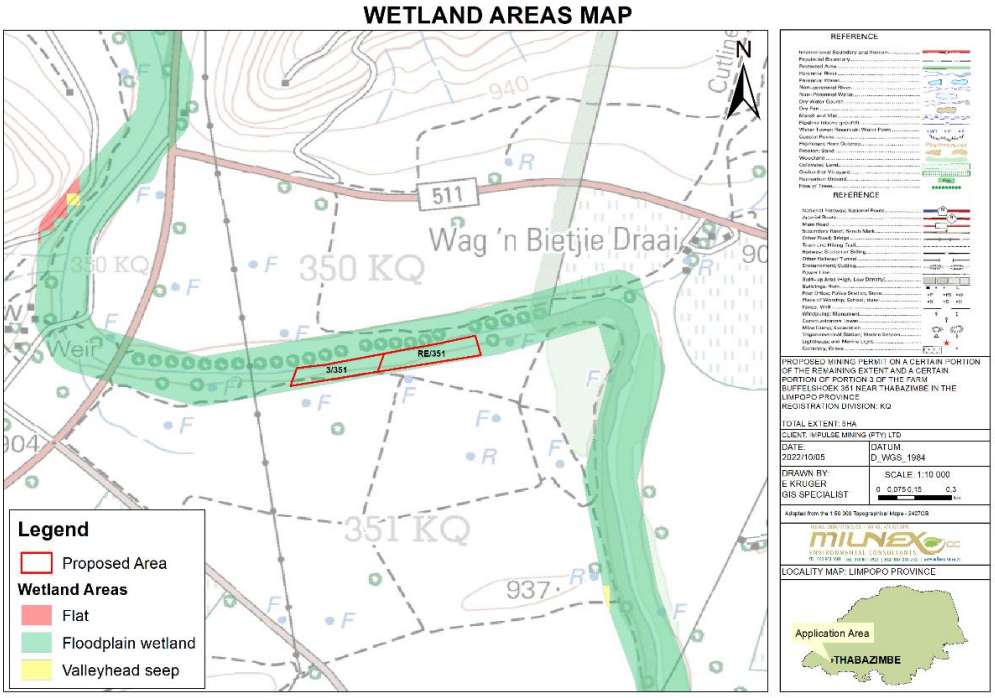


Figure 15: Wetland types located within or near the study site.

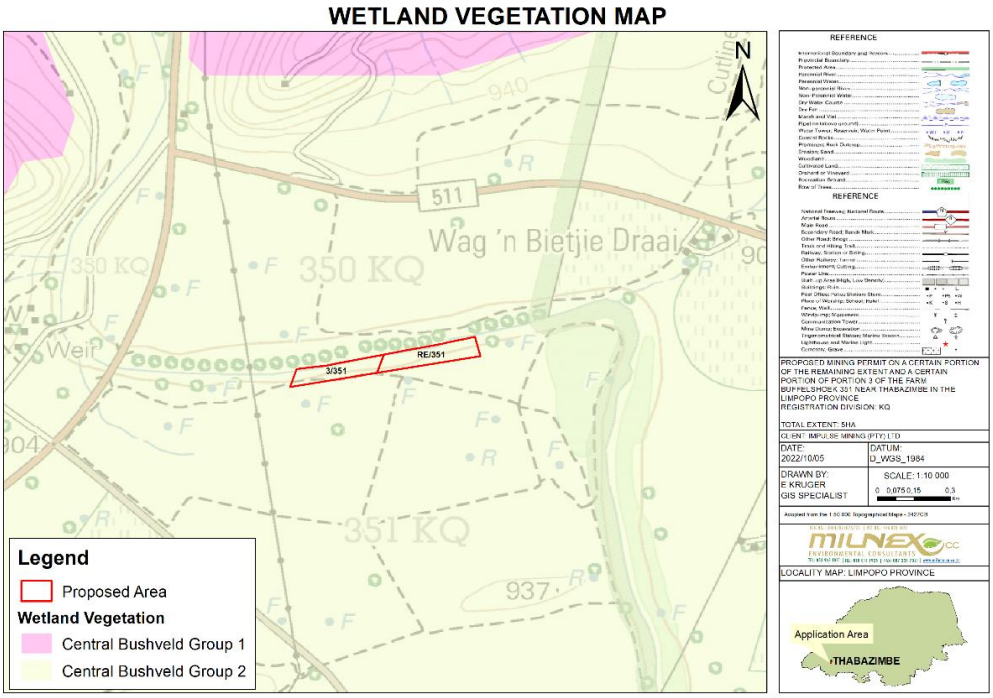


Figure 16: Wetland vegetation types associated with the study site.

RIVER ECOSYSTEM STATUS

The figure below depicts the river ecosystem status, the non-perennial river falls in Class D: Largely modified.

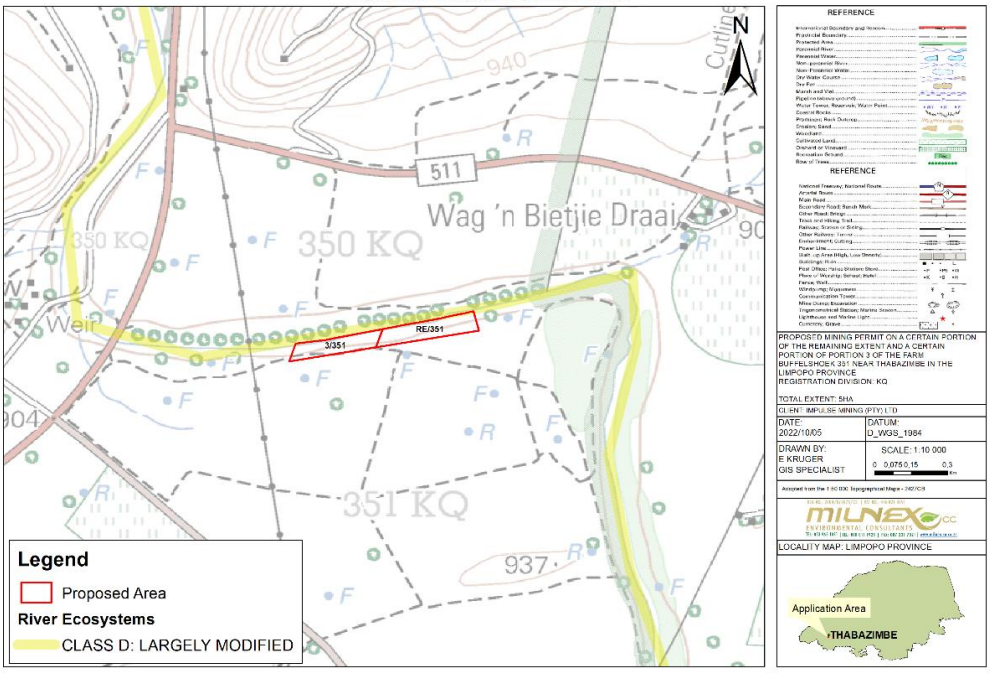


Figure 17: River Ecosystem Status

IMPORTANT BIRD AND BIODIVERSITY AREAS

Important Bird and Biodiversity Areas (IBAs) are a network of sites that are significant for the long-term viability of naturally occurring bird populations (Birdlife 2019). Many sites are also important for other forms of biodiversity; therefore, the conservation of Important Bird & Biodiversity Areas ensures the survival of a correspondingly large number of other animals and plants.

No IBAs were identified within the vicinity of the study site (**Figure 18**).

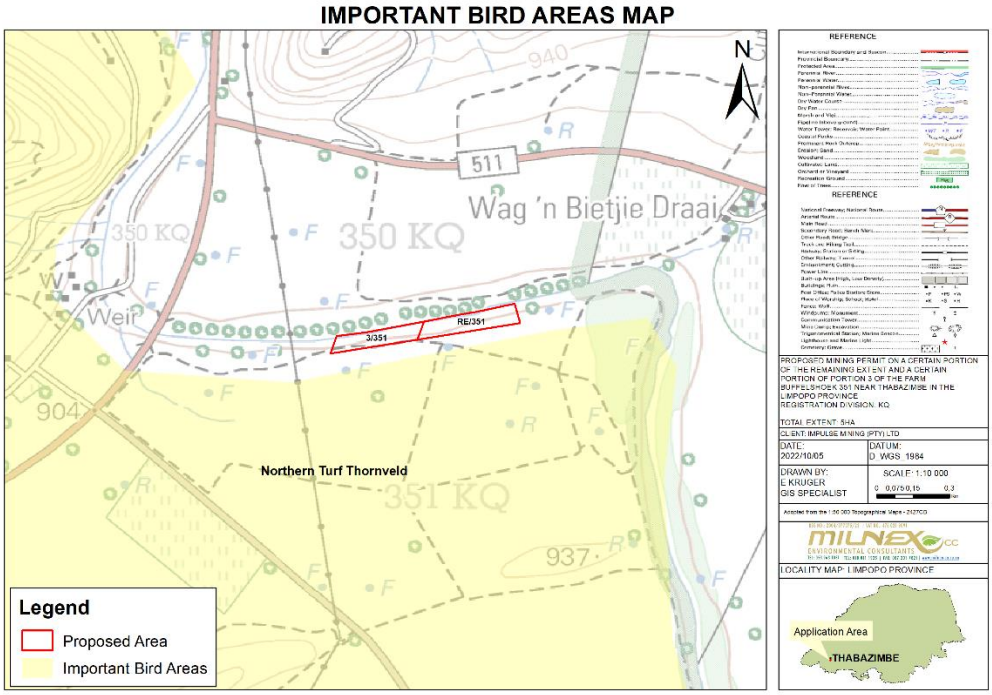


Figure 18: Important Bird and Biodiversity Areas associated with the study site.

DESCRIPTION OF THE SOCIO-ECONOMIC ENVIRONMENT

Thabazimbi Local Municipality

The Thabazimbi Local Municipality is a Category B municipality located within the Waterberg District in the south-western part of the Limpopo Province. It has Botswana as its international neighbour and is a mere two-hour drive from Pretoria. It is one of five municipalities in the district.

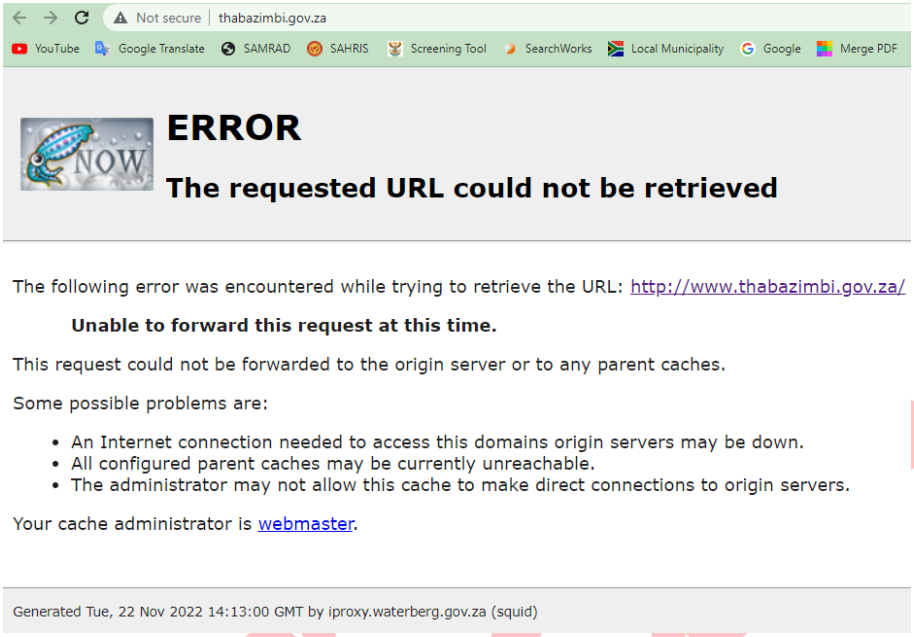
- Thabazimbi is known as 'mountain of iron', which is a Setswana name referring to the highly lucrative iron ore reef first discovered in the municipality in 1919. The municipality has Marakele National Park, which is a subsidiary of the National Parks Board, and in the same standard as the Kruger National Park and Mapungube. It has been mined since the 1930s, when iron and steel production started. Apart from iron ore, the Thabazimbi Municipality is surrounded by platinum-producing areas. Other minerals produced in the area include andalusite.
- Agriculture has also proven to be a strong economic sector in the municipality. Agricultural commodities produced are wheat, beans and maize. The municipality's goals are aligned with those of the Provincial Growth and Development Strategy in Limpopo. This will ensure that the growth trajectory also addresses the objective of poverty eradication through job creation and business opportunity stimulation.

Area: 11 190km²

Cities/Towns: Amandelbult Mine Town, Thabazimbi

Main Economic Sectors: Mining, agriculture, tourism

Please note the website of the Thabazimbi Local Municipality is not working to get mor information.



Waterberg District Environmental Management Framework Report

Economic Characteristics and Drivers

The sector that contributes most to the GDP of the Waterberg District is mining. However, the sector that employs the largest number of people is agriculture. With future developments set to take place in the Waterberg District, it is likely that current GDP and employment trends will change. In terms of the population, three local municipalities registered positive growth with Modimolle registering the biggest growth followed by Mogalakwena. Changes of municipal demarcations may have impacted on the growth trends observed.

Population Characteristics

The Waterberg District Municipality area has an estimated total population of 572 625. Most of the people in the District are distributed around Mogalakwena, Lephalale, as well as the Thabazimbi local municipality areas respectively. The education levels are relatively low within the Waterberg District. The working population tend to fall into two main brackets that earn between R1 to R400 and R6401 to R12 800 per month.

CULTURAL AND HERITAGE ASPECTS

According to the DFFE Screening Report the proposed area falls within low Archaeological and Cultural Heritage Theme Sensitivity. Please see map colour map under **Appendix 7.**

Figure 19: Archaeological and Cultural Heritage Combined Sensitivity

According to the DFFE Screening Report the proposed area falls within High Paleontology Theme Sensitivity. Please see map colour map under **Appendix 7**.

Figure 20: Relative Paleontology Theme Sensitivity

Cultural Heritage in South Africa (includes all heritage resources) is protected by the **National Heritage Resources Act (Act 25 of 1999) (NHRA).** According to Section 3 of the Act, all Heritage resources include **"all objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens**".

If such resources are found during the mining or development activities, they shall not be disturbed without a permit from the relevant heritage resource Authority, which means that before such sites are disturbed by development it is incumbent on the developer to ensure that a heritage impact assessment is done and the Provincial Heritage Resources Authority and SAHRA must be contacted immediately and work must stop.

If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies:

- NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;

If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the **Chance Find Protocol** must be implemented by the Environmental Control Officer (ECO) in charge of these developments. These discoveries ought to be protected and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation can be carry out by a paleontologist.

Chance Find Procedure

- If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find.
- The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates.
- A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates.
- Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.
- Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.

- The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sandbags. The Heritage agency will also be able to advise on the most suitable method of protection of the find.
- In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.
- Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.

DESCRIPTION OF THE CURRENT LAND USES.

According to **Figure 21** the proposed 5ha area falls within natural land cover. According to **Figure 22** the proposed 5ha area is covered by Thicket / Dense Bush, Woodland / Open bush, Wetland, Grassland and Bare non vegetation. The google earth map (**Figure 23)** shows the proposed area is partially within the Krokodileriver. The maps below are available under **Appendix 5**.

Please see **figure 24** (photos) below how the proposed area looks like and the plates under **Appendix 8** for the rest of the photos.

The applicant is in the process of applying for a Water Use License,

All infrastructure will be temporary and/or mobile.

LAND USE MAP

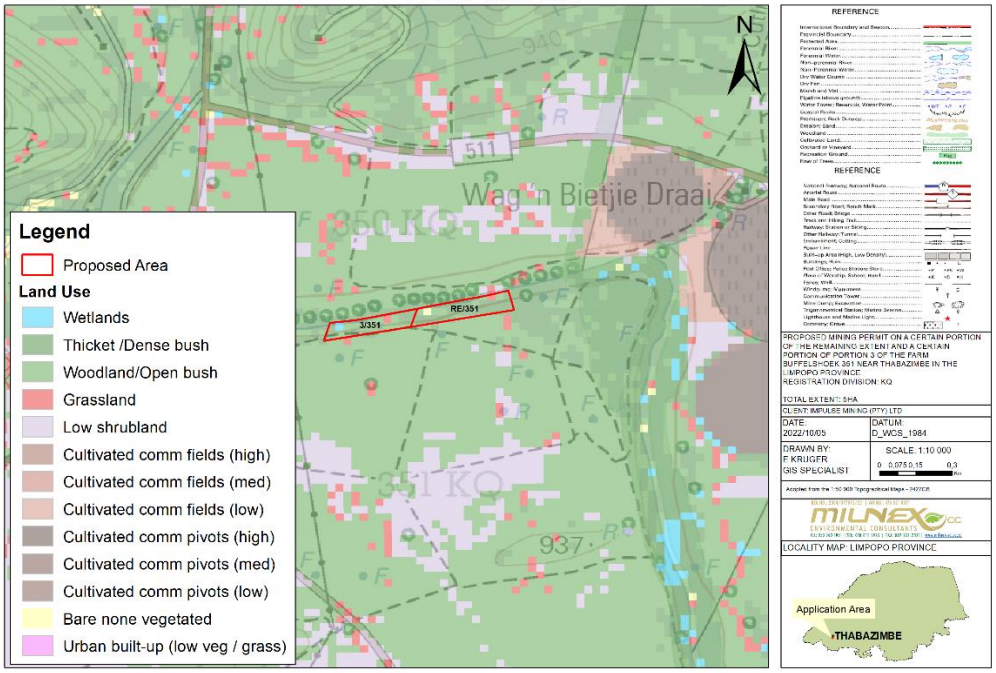


Figure 21: Land use map associated with study site and surrounding areas.

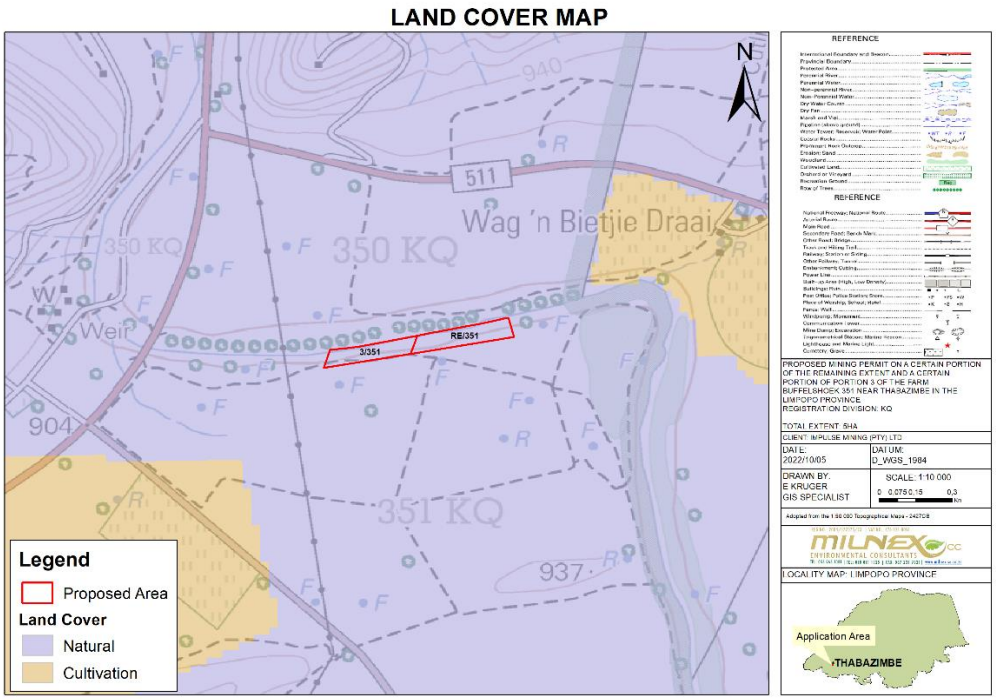


Figure 22: Landcover map associated with study site and surrounding areas.

Figure 23: Google earth map of the proposed area.

Figure 24: Photos of proposed area (**Appendix 8**)

v) IMPACTS AND RISKS IDENTIFIED INCLUDING THE NATURE, SIGNIFICANCE, CONSEQUENCE, EXTENT, DURATION AND PROBABILITY OF THE IMPACTS, INCLUDING THE DEGREE TO WHICH THESE IMPACTS -

(aa) can be reversed;
(bb) may cause irreplaceable loss of resources; and
(cc) can be avoided, managed or mitigated;

Significance of potential impacts

The following sections present the outcome of the significance rating exercise. The results suggest that the mining activities will have an impact on the natural vegetation and the agricultural activities, if not properly mitigated.

INITIAL CLEARANCE AND SITE PREPARATION PHASE

Direct impacts: During this phase minor negative impacts are foreseen over the short term. The latter refers to a period of weeks. The site preparation may result in the loss or fragmentation of indigenous natural fauna and flora, loss or fragmentation of habitats, soil erosion, hydrology, and temporary noise disturbance, generation of waste, visual intrusions, increase in heavy vehicle traffic, and risk to safety, livestock and farm infrastructure, and increased risk of veld fires. The abovementioned impacts are discussed in more detail below:

- Loss, destruction or fragmentation of indigenous natural fauna and flora:

The proposed area falls mostly within the Crocodile River.

The rest of the proposed area falls within the Dwaalboom Thornveld.

The Dwaalboom Thornveld is part of the Central Bushveld Bioregion, which is a sub-bioregion for the Savanna Biome.

According to Mucina and Rutherford (2006:460), the Dwaalboom Thornveld covers the Limpopo and North-West Provinces: Flats north of the Dwarsberge and associated ridges mainly west of the Crocodile River in the Dwaalboom area but including a patch around Sentrum. South of the ridges it extends eastwards from the Nietverdiend area, north of the Pilanesberg to the Northam area. Altitude 900–1 200 m.

The vegetation & landscape features can be described as plains with layer of scattered, low to medium high, deciduous microphyllous trees and shrubs with a few broad-leaved tree species, and an almost continuous herbaceous layer dominated by grass species. *Acacia tortilis* and *A. nilotica* dominate on the medium clays (at least 21% clay in the upper soil horizon but high in the lower horizons; Figure 9.10). On particularly heavy clays (>55% clay in all horizons) most other woody plants are excluded and the diminutive *A. tenuispina* dominates at a height of less than 1 m above ground. On the sandy clay loam soils (with not more than 35% clay in the upper horizon but high in the lower horizons) *A. erubescens* is the most prominent tree. The alternation of these substrate types creates a mozaic of patches typically 1–5 km across, for example in the unit west of Thabazimbi (Mucina and Rutherford, 2006:461).

Mucina and Rutherford (2006:460) also states that the conservation of this thornveld type is least threatened, with a target of 19%. Some 6% is statutorily conserved, mostly within the Madikwe Game Reserve in the west and about 14% transformed mainly by cultivation. Erosion is very low to low. This vegetation type is main use for extensive cattle grazing.

DEA Screening Report findings:

- *Plant Species theme sensitivity*: Low sensitivity
- *Aquatic Biodiversity sensitivity:* Very High sensitivity
- *Terrestrial Biodiversity sensitivity:* Very High sensitivity.
- *Animal Species sensitivity:* High and Medium sensitivity

Loss or fragmentation of indigenous natural fauna and flora	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (1)	Local (1)
Probability	Definite (4)	Definite (4)
Duration	Medium term (2)	Medium term (2)
Magnitude	High (3)	Medium (2)
Reversibility	Barely reversible (3)	Partly reversible (2)
Irreplaceable loss of resources	Significant loss of resources (3)	Marginal loss of resource (2)
Cumulative impact	Medium cumulative impacts (3)	
Significance	**Negative medium impact (48)**	**Negative low (28)**
Can impacts be mitigated?	If the development is approved, contractors must ensure that no mammalian species are disturbed, trapped, hunted or killed. If the development is approved, every effort should be made to confine the footprint to the blocks allocated for the development and have the least possible edge effects on the surrounding area. The EMPr also provides numerous mitigation measures – refer to section (f) of the EMPr. The potential impacts associated with damage to and loss of farmland should be effectively mitigated. The aspects that should be covered include: • The site should be fenced off prior to commencement of construction activities;	

	• The footprint associated with the construction related activities (access roads, construction platforms, workshop etc.) should be confined to the fenced off area and minimised where possible; • An Environmental Control Officer (ECO) should be appointed to monitor the establishment phase of the construction phase; • All areas disturbed by construction related activities, such as access roads on the site, construction platforms, workshop area etc., should be rehabilitated at the end of the construction phase; • The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. Specifications for the rehabilitation are provided throughout the EMPr – section (f) of the EMPr. • The implementation of the Rehabilitation Programme should be monitored by the ECO.

- Loss destruction or fragmentation of habitats –

According to **Figure 21** the proposed 5ha area falls within natural land cover. According to **Figure 22** the proposed 5ha area is covered by Thicket / Dense Bush, Woodland / Open bush, Wetland, Grassland and Bare non vegetation. The google earth map (**Figure 23)** shows the proposed area is partially within the Krokodile river. The maps below are available under **Appendix 5**.

Please see **figure 24** (photos) how the proposed area looks like and the plates under **Appendix 8** for the rest of the photos.

The applicant is in the process of applying for a Water Use License,

All infrastructure will be temporary and/or mobile.

DEA Screening Report findings:

- *Plant Species theme sensitivity*: Low sensitivity
- *Aquatic Biodiversity sensitivity:* Very High sensitivity
- *Terrestrial Biodiversity sensitivity:* Very High sensitivity.
- *Animal Species sensitivity:* High and Medium sensitivity

Loss or fragmentation of habitats	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (1)	Site (1)
Probability	Definite (4)	Definite (4)
Duration	Medium term (2)	Medium term (2)
Magnitude	High (3)	Medium (2)
Reversibility	Barely reversible (3)	Partly reversible (2)
Irreplaceable loss of resources	Significant loss of resources (3)	Marginal loss of resource (2)
Cumulative impact	Medium cumulative impacts (3)	
Significance	**Negative Medium impact (48)**	**Negative low (28)**
Can impacts be mitigated?	Exotic and invasive plant species should not be allowed to establish, if the development is approved. Where exotic and invasive plant species are found at the site continuous eradication should take place. If the development is approved, every effort should be made to confine the	

	footprint to the blocks allocated for development – section (f) of the EMPr also provides numerous mitigation measures related to fauna and flora.

- Loss of topsoil – Topsoil may be lost due to poor topsoil management (burial, erosion, etc.) during construction related soil profile disturbance (levelling, excavations, disposal of spoils from excavations etc.) The effect will be the loss of soil fertility on disturbed areas after rehabilitation.

Loss of topsoil	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Geographical extent	Site (1)	Site (1)
Probability	Possible (2)	Unlikely (1)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Low (1)
Reversibility	Barely reversible (3)	Partly reversible (2)
Irreplaceable loss of resources	Marginal loss of resource (2)	No loss of resource (1)
Cumulative impact	Low cumulative impacts (2)	
Significance	**Negative Low (24)**	**Negative Low (9)**
Can impacts be mitigated?	The following mitigation or management measures are provided: • If an activity will mechanically disturb below surface in any way, then any available topsoil should first be stripped from the entire surface and stockpiled for re-spreading during rehabilitation. • Topsoil stockpiles must be conserved against losses through erosion by establishing vegetation cover on them. • Dispose of all subsurface spoils from excavations where they will not impact on undisturbed land. • During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface. • Erosion must be controlled where necessary on top soiled areas. Establish an effective record keeping system for each area where soil is disturbed for constructional purposes. These records should be included in environmental performance reports, and should include all the records below. • Record the GPS coordinates of each area. • Record the date of topsoil stripping. • Record the GPS coordinates of where the topsoil is stockpiled. • Record the date of cessation of constructional (or operational) activities at the particular site. • Photograph the area on cessation of constructional activities. • Record date and depth of re-spreading of topsoil. • Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time. Section (f) of the EMPr also provide mitigation measures related to topsoil management.	

- Soil erosion – Soil erosion due to alteration of the land surface run-off characteristics. Alteration of run-off characteristics may be caused by construction related land surface disturbance, vegetation removal and the establishment of roads. Erosion will cause loss and deterioration of soil resources. This will result in grazing potential being lost, and also the increased turbidity and total suspended solids in the river.

Soil erosion	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Geographical extent	Local (2)	Site (1)
Probability	Definite (4)	Possible (2)
Duration	Permanent (4)	Medium term (2)
Magnitude	High (3)	Medium (2)
Reversibility	Barely reversible (3)	Party reversable (2)
Irreplaceable loss of resources	Significant (3)	Marginal (2)
Cumulative impact	Low cumulative impact (1) if rehabilitated.	
Significance	**Negative High (51)**	**Negative low (20)**
Can impacts be mitigated?	• The following mitigation or management measures are provided: Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. • Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and revegetation or soil erosion control efforts accordingly. Include periodical site inspection in environmental performance reporting that inspects the effectiveness of the run-off control system and specifically records the occurrence any erosion on site or downstream – refer to section (f) of the EMPr..	

- Temporary noise disturbance - Preparation activities will result in the generation of noise over a period of months. Sources of noise are likely to include vehicles, the use of machinery such as back actors and people working on the site. The noise impact is unlikely to be significant; since there is an existing mine adjacent the proposed area but activities should be limited to normal working days and hours (6:00 – 18:00).

Temporary noise disturbance	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Definite (4)	Possible (2)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Medium (2)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	Marginal loss (2)	Marginal loss (2)
Cumulative impact	Low cumulative impact (2).	
Significance	**Negative low (22)**	**Negative low (20)**

Can impacts be mitigated?	Yes, management actions related to noise pollution are included in section (f) of the EMPr.

- Generation of waste - general waste, construction waste, sewage and grey water - The workers on site are likely to generate general waste such as food wastes, packaging, bottles, etc. The applicant will need to ensure that general waste is appropriately disposed of i.e. taken to the nearest licensed landfill. Sufficient ablution facilities will have to be provided, in the form of portable/VIP toilets. No pit latrines, French drain systems or soak away systems shall be allowed.

Generation of waste	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Probable (3)	Possible (2)
Duration	Medium term (1)	Medium term (1)
Magnitude	Medium (2)	Low (1)
Reversibility	Irreversible (4)	Partly reversible (2)
Irreplaceable loss of resources	Marginal loss of resource (2)	No loss of resource (1)
Cumulative impact	Medium cumulative impact (3) - An additional demand for landfill space could result in significant cumulative impacts if services become unstable or unavailable, which in turn would negatively impact on the local community. If general waste is left on site livestock could mistakenly eat it, which might in turn harm or kill them.	
Significance	**Negative Medium (30)**	**Negative low (11)**
Can impacts be mitigated?	Yes, it is therefore important that all management actions and mitigation measures included in section (f) of the EMPr are implemented.	

Impacts on heritage objects –

DEA Screening Report findings:

- *Paleontology Theme Sensitivity:* High sensitivity
- *Archaeological and Cultural Heritage Theme Sensitivity:* Low Sensitivity

Cultural Heritage in South Africa (includes all heritage resources) is protected by the **National Heritage Resources Act (Act 25 of 1999) (NHRA).** According to Section 3 of the Act, all Heritage resources include **"all objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens**".

If such resources are found during the mining or development activities, they shall not be disturbed without a permit from the relevant heritage resource Authority, which means that before such sites are disturbed by development it is incumbent on the developer to ensure that a heritage impact assessment is done and the Provincial Heritage Resources Authority and SAHRA must be contacted immediately and work must stop.

If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies:

- NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must

be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;

- NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;

If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the **Chance Find Protocol** must be implemented by the Environmental Control Officer (ECO) in charge of these developments. These discoveries ought to be protected and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation can be carry out by a paleontologist.

Chance Find Procedure

- If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find.
- The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates.
- A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates.
- Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.
- Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.
- The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sandbags. The Heritage agency will also be able to advise on the most suitable method of protection of the find.
- In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.
- Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.

Impacts on heritage objects	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Possible (2)	Possible (2)
Duration	Medium term (1)	Medium term (1)
Magnitude	High (3)	Medium (2)
Reversibility	Irreversible (4)	Irreversible (4)
Irreplaceable loss of resources	Significant loss of resources (3)	Marginal loss of resource (2)

Cumulative impact	The impact would result in negligible to no cumulative effects (1).	
Significance	**Negative Medium (39)**	**Negative low (22)**
Can impacts be mitigated?	If archaeological sites or graves are exposed during construction work, it should immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. Also refer to section (f) of the EMPr.	

Indirect impacts: The nuisance aspects generally associated with the installation of infrastructure or ground preparation will also be applicable to this development, which relates primarily to the increase in vehicle traffic associated with prospecting / mining practices, the influx of job seekers to the area, risk to safety, livestock and farm infrastructure, and increased risk of veld fires.

- Increase in vehicle traffic – The movement of heavy vehicles have the potential to damage local farm roads and create dust and safety impacts for other road users in the area. Access will be obtained from gravel and tar roads off the R510 and R511 roads. The volume of traffic along this roads are **medium to high** and the movement of heavy vehicles along this road is likely to damage the road surface and impact on other road users. The contractor should be required to ensure that damage to the gravel road is repaired periodically if they use it. The movement of additional heavy vehicle traffic will add significantly to the current traffic load on the road. The impact on the gravel roads is therefore likely to be moderate.

Increase in vehicle traffic	**Pre-mitigation impact rating**	**Post mitigation impact rating**
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Site (1)
Probability	Possible (2)	Unlikely (1)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Low (1)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	Marginal loss of resource (2)	No loss of resource (1)
Cumulative impact	Low cumulative impact (2). If damage to roads is not repaired, then this will affect the farming activities in the area and result in higher maintenance costs for vehicles of local farmers and other road users. The costs will be borne by road users who were no responsible for the damage.	
Significance	**Negative low impacts (22)**	**Negative low (8)**
Can impacts be mitigated?	The potential impacts associated with heavy vehicles can be effectively mitigated. The mitigation measures include: • The contractor must ensure that damage caused by construction on the off-gravel roads. The costs associated with the repair must be borne by the contractor; • Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers; • All vehicles must be road-worthy and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits. Also refer section (f) of the EMPr. For mitigation measures related to traffic.	

- Risk to safety, livestock/game and farm infrastructure - The presence on and movement of workers on and off the site poses a potential safety threat to local famer's, farm workers and the communities in the vicinity of the site. In addition, farm infrastructure, such as fences and gates, may be damaged and stock losses may also result from gates being left open and/or fences being damaged, or stock theft linked either directly or indirectly to the presence of farm workers on the site.

  However, it should be noted that there is an existing mine adjacent the proposed area.

Risk to safety, livestock and farm infrastructure	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Possible (2)	Unlikely (1)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Low (1)
Reversibility	Partly reversible (2)	Completely reversible (1)
Irreplaceable loss of resources	Marginal resource (2)	Marginal resource (2)
Cumulative impact	Low cumulative effects (2), provided losses are compensated for.	
Significance	**Negative low (24)**	**Negative low (10)**
Can impacts be mitigated?	Key mitigation measures include: • **Impulse Mining (Pty) Ltd** should enter into an agreement with the local farmers in the area whereby damages to farm property etc. during the construction phase will be compensated for. The agreement should be signed before the construction phase commences; • The construction area should be fenced off prior to the commencement of the construction phase. The movement of construction workers on the site should be confined to the fenced off area; • Contractors appointed by **Impulse Mining (Pty) Ltd** should provide daily transport for low and semi-skilled workers to and from the site. This would reduce the potential risk of trespassing on the remainder of the farm and adjacent properties; • **Impulse Mining (Pty) Ltd** should hold contractors liable for compensating farmers in full for any stock losses and/or damage to farm infrastructure that can be linked to construction workers. This should be contained in the Code of Conduct to be signed between the proponent, the contractors and neighbouring landowners. The agreement should also cover loses and costs associated with fires caused by construction workers or construction related activities (see below); • The Environmental Management Programme (EMPr) should outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if ingested; • Contractors appointed **Impulse Mining (Pty) Ltd** must ensure that all workers are informed at the outset of the	

	construction phase of the conditions contained on the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms. • Contractors appointed by **Impulse Mining (Pty) Ltd** must ensure that construction workers who are found guilty of trespassing, stealing livestock and/or damaging farm infrastructure are dismissed and charged. This should be contained in the Code of Conduct. All dismissals must be in accordance with South African labour legislation; • The housing of construction workers on the site should be strictly limited to security personnel (if any).

- Increased risk of veld fires - The presence of construction workers and construction-related activities on the site poses an increased risk of grass fires that could in turn pose a threat to livestock/game, crops, wildlife, farmsteads and the communities in the area. In the process, infrastructure may also be damaged or destroyed and human lives threatened. The potential risk of grass fires was heightened by the windy conditions in the area, especially during the dry, windy winter months from May to October. Fire-fighting equipment should be provided on site during the construction phase.

Increased risk of veld fires	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Site (1)
Probability	Probable (3)	Unlikely (1)
Duration	Medium term (2)	Medium term (2)
Magnitude	High (3)	Medium (2)
Reversibility	Barely reversible (3)	Partly reversible (2)
Irreplaceable loss of resources	Significant loss (3)	Marginal loss (2)
Cumulative impact	High cumulative effects (4), provided losses are compensated for.	
Significance	**Negative high (51)**	**Negative low (24)**
Can impacts be mitigated?	The mitigation measures include: • A fire-break should be constructed around the perimeter of the site prior to the commencement of the construction phase; • Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas; • Contractor to ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high risk dry, windy winter months; • Contractor to provide adequate firefighting equipment on-site, including a fire fighting vehicle; • Contractor to provide fire-fighting training to selected construction staff; • No construction staff, with the exception of security staff, to be accommodated on site over night; • As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage	

	caused to their farms. The contractor should also compensate the firefighting costs borne by farmers and local authorities.

OPERATIONAL PHASE

Direct impacts: During the operational phase the study area will serve as a mining area and the impacts are generally associated with soil erosion, change in land use, impacts associated with the, increase in storm water runoff, increased consumption of water, visual intrusion, the generation of general waste, leakage of hazardous materials, and the change in the sense of place. The operational phase will also have a direct positive impact through the provision of permanent employment opportunities and facilitating a positive economic growth. The abovementioned impacts are discussed in more detail below:

- Soil erosion – The largest risk factor for soil erosion will be during the operational phase when the mining activity ensues, and soil is left bare until it is rehabilitated. Erosion will be localised within the site. This will ultimately lead to the irretrievable commitment of this resource. The measurable effect of reducing erosion by utilizing mitigation measures may reduce possible erosion significantly. The conditions of the EMP will be adhered to throughout the mining operation and commitment to rehabilitation is of paramount importance in order to obtain a closure certificate from DMRE.

Soil erosion	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Site (1)
Probability	Definite (4)	Unlikely (1)
Duration	Medium term (2)	Medium term (2)
Magnitude	High (3)	Medium (2)
Reversibility	Barely reversible (3)	Completely reversible (1)
Irreplaceable loss of resources	Significant loss of resource (3)	Marginal loss of resource (2)
Cumulative impact	Medium cumulative impact (3). Should these impacts occur, there will be a cumulative impact on the air and water resources in the study area in terms of pollution.	
Significance	**Negative High (51)**	**Negative Low (20)**
Can impacts be mitigated?	Yes, to avoid soil erosion it will be a good practice to not remove all the vegetation at once but to only clear the area as it becomes necessary and to implement concurrent rehabilitation. • The following mitigation or management measures are provided: Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. • Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and revegetation or soil erosion control efforts accordingly Also refer to section (f) of the EMPr.	

- Change in land-use - According to **Figure 21** the proposed 5ha area falls within natural land cover. According to **Figure 22** the proposed 5ha area is covered by Thicket / Dense Bush, Woodland / Open bush, Wetland, Grassland and Bare non vegetation. The google earth map (**Figure 23)** shows the proposed area is partially within the Krokodile river. The maps below are available under **Appendix 5**.

Please see **figure 24** (photos) how the proposed area looks like and the plates under **Appendix 8** for the rest of the photos.

The applicant is in the process of applying for a Water Use License,

All infrastructure will be temporary and/or mobile.

Change in land use	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Possible (3)	Possible (3)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Low (1)
Reversibility	Barely reversible (3)	Completely reversible (1)
Irreplaceable loss of resources	Marginal loss of resource (2)	No loss of resource (1)
Cumulative impact	Low cumulative effects (2) – the right holder should enter into a surface use agreement with the landowner to compensate for any financial losses.	
Significance	**Negative low (26)**	**Negative low (10)**
Can impacts be mitigated?	The proponent should establish a Rehabilitation Fund to be used to rehabilitate the area once the proposed facility has been decommissioned. The fund should be funded by revenue generated during the operational phase of the project. The motivation for the establishment of a Rehabilitation Fund is based on the experience in the mining sector where many mines on closure have not set aside sufficient funds for closure and decommissioning. Also refer to section (f) of the EMPr.	

- Generation of alternative land use income – Income generated through the potential mining of the minerals will provide the farming enterprise with increased cash flow and rural livelihood, and thereby improve the financial sustainability of farming on site.

Generation of alternative land use income	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Positive	Positive
Geographical extent	Local (2)	Local (2)
Probability	Definite (4)	Definite (4)
Duration	Medium term (2)	Medium term (2)
Magnitude	High (3)	High (3)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	No loss of resources (1)	No loss of resources (1)
Cumulative impact	Medium cumulative impact (3).	
Significance	**Positive medium (39)**	**Positive medium (39)**
Can impacts be mitigated?	No mitigation required.	

- Increase in storm water runoff – The development will potentially result in an increase in storm water run-off that needs to be managed to prevent soil erosion, especially where vegetation will be cleared. Not all the vegetation should be removed at once. Since the proposed area is to mine sand from the river, only the areas where the stockpiles, equipment, site area, etc must be cleared.

Increase in storm water runoff	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Site (1)
Probability	Probable (3)	Possible (2)
Duration	Long term (3)	Medium term (2)
Magnitude	High (3)	Medium (2)
Reversibility	Barely reversible (3)	Partly reversible (2)
Irreplaceable loss of resources	Significant loss of resource (3)	Marginal loss of resource (2)
Cumulative impact	Medium cumulative impact (3) - Should these impacts occur, there will be a cumulative impacts on the wider area.	
Significance	**Negative high (51)**	**Negative low (24)**
Can impacts be mitigated?	Yes. It is therefore important that all management actions and mitigation measures included in section (f) of the EMPr. are implemented to ensure that these impacts do not occur	

- Increased consumption of water – Additional water requirements related to the portable water supply for employees and workers. Water will also be used for dust suppression.

  According to the mine methodology water and sand will be pumped into the settling pond, please see below:

  A floating barge, with a pump mounted on top, is used to pump the sand from the river bottom. Flexible floating pipes are connected to the pump, in order to transfer the sand from the river to the small "settling pond". The entrance to the pond is equipped with a sieve to ensure that only the fine sand enters the pond. The pond is also equipped with two water outflow pipes that ensures that the water flows back into the river, as soon as the sand has settled/deposited.

  After the excess water has drained/flowed back into the river, the sand is removed from the settling pond and stockpiled at the demarcated stockpiling area. Here at the stockpiling area the sand will be left to dry. After the sand has dried, the sand is loaded and transported to the relevant client.

Increased consumption of water	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Definite (4)	Definite (4)
Duration	Medium term (2)	Medium term (2)
Magnitude	Low (1)	Low (1)
Reversibility	Irreversible (4)	Irreversible (4)
Irreplaceable loss of resources	Marginal loss of resources (2)	Marginal loss of resources (2)
Cumulative impact	Low cumulative impacts (2) - An additional demand on water sources could result in a significant cumulative impact with regards to the availability of water.	
Significance	**Negative Low (15)**	**Negative Low (15)**
Can impacts be mitigated?	Yes, management actions and mitigation measures related to the use of water are included in section (f) of the EMPr.	

- Generation of waste –Workers will be present on site from 6:00 – 18:00, Monday to Saturday. Sources of general waste will be waste food, packaging, paper, etc. General waste will be stored on the site and removed on a weekly basis.

Generation of waste	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Definite (4)	Definite (4)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Low (1)
Reversibility	Barely reversible (3)	Partly reversible (2)
Irreplaceable loss of resources	Marginal of resource (2)	No loss of resource (1)
Cumulative impact	Medium cumulative impact (3) - An additional demand for landfill space could result in significant cumulative impacts with regards to the availability of landfill space. If general waste is left on site livestock could mistakenly eat it, which might in turn harm or kill them.	
Significance	**Negative medium (32)**	**Negative low (14)**
Can impacts be mitigated?	Yes, management actions related to waste management are included in section (f) of the EMPr.	

- Leakage of hazardous materials - The proposed mining activity will make use of machinery that use fuel and oil. Leakage of these oils and fuel can contaminate water supplies and must be prevented by constructing oil and diesel permeable bunds to ensure that any spills are suitably attenuated and not released into the environment.

Leakage of hazardous materials	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Site (1)
Probability	Probable (3)	Possible (2)
Duration	Long term (3)	Short term (1)
Magnitude	Very high (3)	Medium (2)
Reversibility	Barely reversible (3)	Partly reversible (2)
Irreplaceable loss of resources	Significant loss of resources (3)	Marginal loss of resource (2)
Cumulative impact	High cumulative impacts (4) if impact occurs and not mitigated.	
Significance	**Negative high (72**	**Negative low (24)**
Can impacts be mitigated?	Yes. It is therefore important that all management actions and mitigation measures included in the section (f) of EMPr are implemented to ensure that these impacts do not occur.	

- Noise disturbance – Mining activities will result in the generation of noise over a period of 2-3 years. Sources of noise are likely to include vehicles, the use of machinery and people working on the site; but mining activities should be limited to normal working days and some Saturdays and hours (6:00 – 18:00).

Temporary noise disturbance	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Definite (4)	Possible (2)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Medium (2)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	Marginal loss (2)	Marginal loss (2)

Cumulative impact	Medium cumulative impact (3).	
Significance	**Negative low (26)**	**Negative low (22)**
Can impacts be mitigated?	Yes, management actions related to noise pollution are included in section (f) of the EMPr.	

Indirect impacts: The operational phase will have an indirect negative impact through the change in the sense of place and an indirect positive impact through the provision of additional electrical infrastructure.

- Potential impact on tourism – There are no tourist facilities in close proximity to the proposed area.

Potential impacts on tourism	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	N/A	N/A
Extent	N/A	N/A
Probability	N/A	N/A
Duration	N/A	N/A
Magnitude	N/A	N/A
Reversibility	N/A	N/A
Irreplaceable loss of resources	N/A	N/A
Cumulative impact	N/A	
Significance	**N/A**	**N/A**
Can impacts be mitigated?	No mitigation required	

DECOMMISIONING PHASE (MINE CLOSURE AND REHABILITATION)

Direct impacts: Typically, the major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income. This has implications for the households who are directly affected, the communities within which they live. If infrastructures are removed after a 3/5 year period, the site will be returned to its natural state. Therefore, the physical environment will benefit from the closure of the mining area.

- Rehabilitation of the physical environment – The physical environment will benefit from the closure of the mining area. There is a slight chance to restore the site to its natural state, however rehabilitation will be done concurrently with all activities

Rehabilitation of the physical environment	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Positive	Positive
Extent	Site (1)	Site (1)
Probability	Definite (4)	Definite (4)
Duration	Long term (3)	Long term (3)
Magnitude	High (3)	High (3)
Reversibility	N/A	N/A
Irreplaceable loss of resources	N/A	N/A
Cumulative impact	The impact would result in negligible to no cumulative effects (1)	
Significance	**Positive low (27)**	**Positive low (27)**
Can impacts be mitigated?	No mitigation measures required.	

- Loss of employment - The decommissioning of the facility has the potential to have a negative social impact on the local community.

Loss of employment	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Probable (3)	Probable (3)
Duration	Permanent (4)	Permanent (4)
Magnitude	Medium (2)	Medium (2)
Reversibility	Irreversible (4)	Irreversible (4)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Medium cumulative impacts (3)	
Significance	**Negative medium (34)**	**Negative medium (34)**
Can impacts be mitigated?	The following mitigation measures are recommended: • All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning; • **Impulse Mining (Pty) Ltd** should establish an Environmental Rehabilitation Trust Fund to cover the costs of decommissioning and rehabilitation of disturbed areas.	

Indirect impacts: No indirect impacts are anticipated from the decommissioning phase of the proposed development

vi) METHODOLOGY USED IN DETERMINING AND RANKING THE NATURE, SIGNIFICANCE, CONSEQUENCES, EXTENT, DURATION AND PROBABILITY OF POTENTIAL ENVIRONMENTAL IMPACTS AND RISKS

Method of environmental assessment

The environmental assessment aims to identify the various possible environmental impacts that could results from the proposed development. Different impacts need to be evaluated in terms of its significance and in doing so highlight the most critical issues to be addressed.

Significance is determined through a synthesis of impact characteristics which include context and intensity of an impact. Context refers to the geographical scale i.e. site, local, national or global whereas intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. Significance is calculated as shown in the Table below.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

Impact Rating System

Impact assessment must take account of the nature, scale and duration of impacts on the environment whether such impacts are positive or negative. Each impact is also assessed according to the following project phases:

- Construction

- Operation
- Decommissioning

Where necessary, the proposal for mitigation or optimisation of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance should also be included. The rating system is applied to the potential impacts on the receiving environment and includes an objective evaluation of the mitigation of the impact. In assessing the significance of each impact the following criteria is used:

Table: The rating system

NATURE		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be experienced.		
1	Site	The impact will only affect the site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.
4	International and National	Will affect the entire country.
PROBABILITY		
This describes the chance of occurrence of an impact.		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
DURATION		
This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase (0 – 1 years), or the impact will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite.
INTENSITY/ MAGNITUDE		
Describes the severity of an impact.		

1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/ component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired. Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
REVERSIBILITY		
This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible cumulative impact	The impact would result in negligible to no cumulative effects.
2	Low cumulative impact	The impact would result in insignificant cumulative effects.
3	Medium cumulative impact	The impact would result in minor cumulative effects.
4	High cumulative impact	The impact would result in significant cumulative effects
SIGNIFICANCE		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The calculation of the significance of an impact uses the following formula: (Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.		

The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.		
Points	Impact significance rating	Description
6 to 28	Negative low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative high impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive high impact	The anticipated impact will have significant positive effects.
74 to 96	Negative very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive very high impact	The anticipated impact will have highly significant positive effects.

vii) THE POSITIVE AND NEGATIVE IMPACTS THAT THE PROPOSED ACTIVITY (IN TERMS OF THE INITIAL SITE LAYOUT) AND ALTERNATIVES WILL HAVE ON THE ENVIRONMENT AND THE COMMUNITY THAT MAY BE AFFECTED.

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

ACTIVITY	PHASE	POTENTIAL NEGATIVE IMPACTS
Site preparation Site Clearance, establishing construction area	Construction Operation Decommissioning	Physical destruction and disturbance of: • Biodiversity (Fauna & Flora) • Air pollution • Disturbing noise • Visual impacts • Riverbanks • Habitat loss and fragmentation • Noise pollution
Earthworks / sand pumped from river	Construction Operation Decommissioning	Excavations & pumping sand from river • Disturbance of the riverbanks and riverbed • Riverbed deepening and widening • Riverbank, -bed and slope instability • Increased erosion • Habitat loss and fragmentation • Riverbed coarsening • Disturbance and killing of microorganism • Reduces respiration and photosynthesis • Reduced presence of benthic organisms • Increases concentration of heavy metals • Increases turbidity and total suspended solids • Loss of soil resources and land capability

		• Physical destruction and disturbance of biodiversity • Possible pollution of surface water resources • Possible alteration of natural drainage patterns • Possible contamination of groundwater • Air pollution • Disturbing noise • Visual impacts • Noise pollution
Civil works (if any) Erection of structures, concrete work, steel work, electrical installation, establishing pipelines, settling pond	Construction Operation Decommissioning	• Loss of mineral reserves • Hazardous structures/excavations/surface subsidence • Loss of soil resources and land capability • Possible pollution of surface water resources • Possible contamination of groundwater • Air pollution • Disturbing noise • Visual impacts
Sand mining Mining (Pumping), load, and hauling	Construction Operation	• Loss of mineral resources • Loss of soil resources and land capability
		Physical destruction and disturbance of: • Disturbance of the riverbanks and riverbed • Riverbed deepening and widening • Riverbank, -bed and slope instability • Increased erosion • Habitat loss and fragmentation • Riverbed coarsening • Disturbance and killing of microorganism • Reduces respiration and photosynthesis • Reduced presence of benthic organisms • Biodiversity within the river • Noise impact • Increases concentration of heavy metals • Increases turbidity and total suspended solids • Air pollution • Disturbing noise • Visual impacts • Possible pollution of surface water resources • Possible contamination of groundwater
Sand management Storage, stockpile or final disposal	Operation Decommissioning Closure (final landform)	• Loss of soil resources and land capability • Disturbance of biodiversity • Possible pollution of surface water resources • Possible contamination of groundwater • Air pollution • Disturbing noise • Negative landscape and visual impact
Dirty water management Collection, storage of dirty water for re-use,recycling	Construction Operation Decommissioning	• Possible pollution of surface water resources • Possible contamination of groundwater • Disturbing noise

Stormwater management Stormwater channels and berms, collection of dirty water, storage for re-use	Construction Operation Decommissioning	• Possible alteration of drainage patterns • Possible pollution of surface water resources • Possible contamination of groundwater
Transport systems Use of access points, road transport to and from site for employees and supplies, movement within site boundary (haul roads, conveyors, pipelines), taxi areas	Construction Operation Decommissioning	• Disturbance of biodiversity • Noise • Traffic impacts • Visual impacts
Storage and maintenance services/ facilities Washing vehicles and machinery, storage and handling non-process materials	Construction Operation Decommissioning	• Possible pollution of surface water resources • Possible contamination of groundwater resulting from hydrocarbon spills and soil erosion • Disturbing noise
Demolition Dismantling, demolition,removal of equipment	Operation (as partof maintenance) Decommissioning	• Hazardous structures (e.g., fuel tanks) • Loss of soil resources and land capability • Disturbance of biodiversity • Water pollution • Air pollution • Disturbing noise • Visual impacts
Non-mineralized waste management **Transportation of waste materials to waste facility**	Construction Operation Decommissioning Closure (limited)	• Pollution if not managed and stored properly
Rehabilitation Replacing soil, slope stabilization, landscaping, re-vegetation, restoration, riverbanks	Construction Operation Decommissioning Closure	• Disturbance of biodiversity • Alteration of natural drainage patterns • Contamination of groundwater • Air pollution • Visual impacts • Rehabilitate the banks
ACTIVITY	**PHASE**	**POTENTIAL POSITIVE IMPACTS**
Job creation	Construction, Operation	• Temporary employment and other economic benefits
Maintenance and aftercare Inspection and maintenance and machinery remaining facilities and rehabilitated areas	Closure	• Re-establishment of biodiversity

viii) THE POSSIBLE MITIGATION MEASURES THAT COULD BE APPLIED AND THE LEVEL OF RISK.

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

POTENTIAL IMPACT	POSSIBLE MITIGATION MEASURES
Influx of persons (job seekers)	• Establish and maintain site security measures • Control site and facility access
Hazardous waste pollution	• Implement hazardous waste, dirty water and mineralised and non-mineralised waste management procedures
Loss of soil resources and land capability through physical disturbance	• Implementation of a soil management plan • Limit disturbance of soil to what is necessary • Stripping, storing, maintenance and replacement of topsoil in accordancewith soil management procedures
Physical destruction or disturbance of biodiversity	• Implement a biodiversity management plan • Restrict project footprint • Provide alternative habitat (where appropriate and necessary) • Implement a monitoring programme • Rehabilitate disturbed areas • Prevention of the killing of animal species and harvesting of plant species • Implementation of dust control measures • Pollution prevention measures (water, soil etc.) • Prevention of the disturbance of ecosystems as far as possible. • Rehabilitated the riverbanks and slope. • Erosion control measure
Surface water pollution	• Appropriate design of polluting facilities and pollution prevention facilities • Implement and maintain stormwater controls that meet regulatory requirements • Implement a monitoring programme (water use, process water quality, rainfall-related discharge quality) • Implement emergency response • Authorise all water uses as defined in the NWA • Regularly service the sand pump
Groundwater contamination	• Appropriate design of polluting facilities (by qualified person) • Correct handling of hazardous wastes, mineralised and non-mineralised wastes • Compensation for loss • Implementation of a monitoring programme
Dewatering	• Authorise all water uses as defined in the NWA Compliance with relevant license requirements
Air pollution	• Implementation of air quality management plan • Implementation of an air quality monitoring plan • Control dust plumes • Implementation of an air complaints procedure • Maintenance of abatement equipmentImplement an emergency response
Noise pollution	• Maintenance of equipment and machinery in good working order • Equip machinery with silencers • Construction of noise attenuation measures • Implementation of noise monitoring programme
Visual impacts	• Limit the clearing of vegetation as far as possible • Limit the emissions of visual dust plumes

	• Use of screening berms Concurrent rehabilitation • Painting infrastructure to compliment the surrounding environmentImplementation of a closure plan • Management through care and aftercare
Traffic increases	• Implement speed allaying measures where appropriate, e.g. speed humps where necessary • Education and awareness training of workers • Enforce strict speed limits on mine access roads
Heritage andcultural	• Avoid heritage and cultural resources as far as practically possible • Apply for the relevant permits to remove or destroy heritage sites (ifapplicable) • Exhumation and relocation of graves according to legal requirements (ifapplicable) • Mark remaining heritage sites on plan
Economic impact	• Hire people from closest communities as far as practically possible • Local procurement of goods and services as far as practically possible • Compensation for loss of land use • Closure planning will consider skills, economic consideration and the needs of future farming
Land uses	• Implementation of EMPr commitments that focus on environmental and socialimpacts • Take necessary steps to prevent negative impact on surrounding land • Compensation for loss • Closure planning to incorporate measures to achieve future land use plans
River	• Rehabilitated the riverbanks and slope. • Erosion control measure • Stormwater management

ix) MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED.

As discussed in the previous section, the possibility to encounter further Sand (QY) on a certain 5ha area on a certain portion of the Remaining Extent & Portion 3 of the farm Buffelshoek 351, Registration Division: KQ, Limpopo Province, was identified.

x) STATEMENT MOTIVATING THE ALTERNATIVE DEVELOPMENT LOCATION WITHIN THE OVERALL SITE. (Provide a statement motivating the final site layout that is proposed)

The site is preferred due to its possibility of having Sand (QY) the property is also only suitable for potential grazing and cultivation, due to the climate conditions.

I) FULL DESCRIPTION OF THE PROCESS UNDERTAKEN TO IDENTIFY, ASSESS AND RANK THE IMPACTS AND RISKS THE ACTIVITY WILL IMPOSE ON THE PREFERRED SITE (IN RESPECT OF THE FINAL SITE LAYOUT PLAN) THROUGH THE LIFE OF THE ACTIVITY.

i. A description of all environmental issues and risks that are identified during the environmental impact assessment process

Process for the identification of key issues

The methodology for the identification of key issues aims, as far as possible, to provide a user-friendly analysis of information to allow for easy interpretation.

- Checklist: The checklist consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts.
- Matrix: The matrix analysis provides a holistic indication of the relationship and interaction between the various activities, development phases and the impact thereof on the environment. The method aims at providing a first order cause and effect relationship between the environment and the proposed activity. The matrix is designed to indicate the relationship between the different stressors and receptors which leads to specific impacts. The matrix also indicates the specialist studies, which will be submitted as part of the Environmental Impact Report in order to address the potentially most significant impacts.

Checklist analysis

The site visit was conducted to ensure a proper analysis of the site specific characteristics of the study area. The table below provides a checklist, which is designed to stimulate thought regarding possible consequences of specific actions and so assist scoping of key issues. It consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts. The table highlights certain issues, which are further analysed in matrix format.

Table: Environmental checklist

QUESTION	YES	NO	Un-sure	Description
1. Are any of the following located on the site earmarked for the development?				
I. A river, stream, dam or wetland	✕			The majority of the proposed 5ha area falls within the Crocodile River.
II. A conservation or open space area		✕		None.
III. An area that is of cultural importance			✕	According to the DFFE Screening Report the area falls within low Archaeological and Cultural Heritage Theme Sensitivity (**Appendix 7**).
IV. Site of geological significance			✕	According to the DFFE Screening Report the proposed area falls within High Paleontology Theme Sensitivity (**Appendix 7**).
V. Areas of outstanding natural beauty	✕			
VI. Highly productive agricultural land		✕		According to the Land Capability map the proposed area falls within Land in Class IV (4). The proposed area is natural and mostly within the Crocodile River.
VII. Floodplain		✕		According to the wetland areas map the proposed 5ha area falls within a Floodplain wetland.

VIII. Indigenous forest			×	According to the Land use map the proposed area is mostly covered in Woodland/Open bush.
IX. Grass land			×	According to **Figure 21** the proposed 5ha area falls within natural land cover. According to **Figure 22** the proposed 5ha area is covered by Thicket / Dense Bush, Woodland / Open bush, Wetland, Grassland and Bare non vegetation. The google earth map (**Figure 23)** shows the proposed area is partially within the Krokodile river. The maps below are available under **Appendix 5**. Please see **figure 24** (photos) how the proposed area looks like and the plates under **Appendix 8** for the rest of the photos.
X. Bird nesting sites		×		According to the Important Bird Areas map (**Appendix 7**) the proposed area does not fall within an Important Bird Area (IBAs). However, it is near the Northern Turf Thornveld which is an IBA area.
XI. Red data species			×	
XII. Tourist resort		×		None.
2. Will the project potentially result in potential?				
I. Removal of people		×		None.
II. Visual Impacts	×			The visual impact will be managed
III. Noise pollution	×			The noise impact will be limited to working hours.
IV. Construction of an access road		×		Access will be obtained from existing gravel roads
V. Risk to human or valuable ecosystems due to explosion/fire/ discharge of waste into water or air.		×		
VI. Accumulation of large workforce (>50 manual workers) into the site.		×		Employment opportunities will be created during the construction and operational phase of the project.
VII. Utilisation of significant volumes of local raw materials such as water, wood etc.		×		Sand will only be pumped from the river bottom to a small settling pond. The pond is also equipped with two water outflow pipes that ensures that the water flows back into the river.
VIII. Job creation	×			Employment opportunities will be created during the construction and operational phase of the project.
IX. Traffic generation			×	May be created when hauling the sand the various buyers.
X. Soil erosion	×			Erosion must be managed.
XI. Installation of additional bulk telecommunication transmission lines or facilities		×		None.
3. Is the proposed project located near the following?				

I. A river, stream, dam or wetland	✕			The Crocodile River passes through the proposed 5ha area.
II. A conservation or open space area		✕		None.
III. An area that is of cultural importance			✕	According to the DFFE Screening Report the surrounding area falls within low Archaeological and Cultural Heritage Theme Sensitivity (**Appendix 7**).
IV. A site of geological significance			✕	According to the DFFE Screening Report the surrounding area falls within High and mMedium Paleontology Theme Sensitivity (**Appendix 7**).
V. An area of outstanding natural beauty	✕			
VI. Highly productive agricultural land			✕	According to the Land Capability map the proposed area and surrounding area also falls within Land in Class IV (4), III (3) and VIII (8). In the surrounding area there are agricultural fields under central pivots irrigation.
VII. A tourist resort		✕		None.
VIII. A formal or informal settlement	✕			The town of Thabazimbi is approximately 8km North of the proposed area.

Matrix analysis

The matrix describes the relevant listed activities, the aspects of the development that will apply to the specific listed activity, a description of the environmental issues and potential impacts, the significance and magnitude of the potential impacts, and the mitigation of the potential impacts. The matrix also highlights areas of particular concern, which requires more in depth assessment. Each cell is evaluated individually in terms of the nature of the impact, duration and its significance – should no mitigation measures be applied. This is important since many impacts would not be considered insignificant if proper mitigation measures were implemented. The matrix also provides an indication if mitigation measures are available.

In order to conceptualise the different impacts the matrix specify the following:

- **Stressor**: Indicates the aspect of the proposed activity, which initiates and cause impacts on elements of the environment.
- **Receptor**: Highlights the recipient and most important components of the environment affected by the stressor.
- **Impacts**: Indicates the net result of the cause-effect between the stressor and receptor.
- **Mitigation**: Impacts need to be mitigated to minimise the effect on the environment.

J) AN ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK

LISTED ACTIVITY (The Stressor)	ASPECTS OF THE DEVELOPMENT /ACTIVITY	POTENTIAL IMPACTS			SIGNIFICANCE AND MAGNITUDE OF POTENTIAL IMPACTS			MITIGATION OF POTENTIAL IMPACTS	SPECIALIST STUDIES / INFORMATION
			Receptors	Impact description	Minor	Major	Duration	Possible Mitigation	
CONSTRUCTION PHASE									
Listing Notice 1, (GNR 327), Activity 19: *The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;* **Listing Notice 1 (GNR 327) as amended (GNR 517), Activity 21:** *"Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice on in Listing Notice 3 of 2014, required to exercise the mining permit"* **Listing Notice 1 (GNR 327), Activity 27***:* "*The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation."* **Listing Notice 3 GNR 324, Activity 12:** *The clearance of an area of 300 square metres or more of indigenous vegetation;* ***(e) Limpopo (ii)*** *Within critical biodiversity areas identified in systematic biodiversity plans adopted by the competent authority* **Listing Notice 3 GNR 324, Activity 14:** The development of infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs (a) within a watercourse (c) if no development setback has been adopted, within 32metres of a watercourse **(e) Limpopo** (i) Outside urban areas: (ff) Critical Biodiversity areas (hh) Areas within 10 kilometres from a protected areas identified in terms of NEMPAA.	<u>Site clearing and preparation</u> Areas earmarked for settling pond will need to be cleared, topsoil will be stockpiled separately.	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	• Loss or fragmentation of indigenous natural vegetation. • Loss of sensitive species. • Loss or fragmentation of habitats.	-		S	Yes	-
			Air	• Air pollution due to the increase of traffic. • Dust from mining/prospecting activities	-		M	Yes	-
			Soil	• Soil degradation, including erosion. • Loss of topsoil. • Disturbance of soils and existing land use (soil compaction).	-	-	S	Yes	-
			Geology	• It is not foreseen that the removal of indigenous vegetation will impact on the geology or vice versa.	-		S	Yes	-
			Existing services infrastructure	• Generation of waste that need to be accommodated at a licensed landfill site. • Generation of sewage that need to be accommodated by the local sewage plant.	-		S	Yes	-
			Ground water	• Pollution due to construction vehicles.	-		S	Yes	-
			Surface water	• Increase in storm water run-off. • Pollution of water sources due to soil erosion. • Destruction of watercourses (River/pans/dams/streams/wetlands).	-		S	Yes	-
		SOCIAL/ECONOMIC ENVIRONMENT	Local unemployment rate	• Job creation. • Business opportunities. • Skills development.	+		S	Yes	-
			Visual landscape	• Potential visual impact on residents of farmsteads and motorists in close proximity to proposed facility.	-		L	Yes	-
			Traffic volumes	• Increase in construction vehicles.	-		S	Yes	-
			Health & Safety	• Air/dust pollution. • Road safety. • Increased risk of veld fires.	-		S	Yes	-
			Noise levels	• The generation of noise as a result of construction vehicles, the use of machinery such as drills, excavators, dumper trucks, people working on the site, etc.	-		L	Yes	-
			Tourism industry	• Since there are no tourism facilities in close proximity to the site, the construction activities will not have an impact on tourism in the area.	N/A	N/A	N/A	N/A	-

			Heritage resources	• Removal or destruction of archaeological and/or paleontological sites. • Removal or destruction of buildings, structures, places and equipment of cultural significance. • Removal or destruction of graves, cemeteries and burial grounds.	-		L	Yes	-
	OPERATIONAL PHASE								
	The key components of the proposed project are described below: • <u>Supporting Infrastructure</u> - A control facility with basic services such as water and electricity will be constructed on the site and will have an approximate footprint 50m² or less. Other supporting infrastructure includes a site office and workshop area. • <u>Roads</u> – Access will be obtained from existing gravel and tar roads off the R510 and R511 roads. • <u>Fencing</u> - For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farm.	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	• Fragmentation and loss of habitats. • Smothered microorganisms • Reduced respiration and photosynthesis. • Reduced presence of benthic organisms • Establishment and spread of declared weeds and alien invader plants (operations).		-	L	Yes	-
			Air quality	• Air pollution due to the mining / prospecting activity and transport of the gravel to the designated areas.	-		S	Yes	-
			Soil	• Soil degradation, including erosion. • Disturbance of soils and existing land use (soil compaction). • Loss of agricultural potential (low significance relative to agricultural potential of the site).	-		L	Yes	-
			Geology	• Collapsible soil. • Seepage (shallow water table). • Active soil (high soil heave). • Erodible soil. • The presence of undermined ground. • Instability due to soluble rock. • Steep slopes or areas of unstable natural slopes. • Areas subject to flooding.	-		L	Yes	-
			Existing services infrastructure	• Generation of waste that need to be accommodated at a licensed landfill site. • Generation of sewage that need to be accommodated by the municipal sewerage system and the local sewage plant. • Increased consumption of water, dust suppression.	-		L	Yes	-
			Ground water	• Leakage of hazardous materials. The machinery on site requires oils and fuel to function. Leakage of these oils and fuels can contaminate water supplies.		-	L	Yes	-
			Surface water	• Increase in storm water runoff. The development will potentially result in an increase in storm water run-off that needs to be managed to prevent soil erosion. • Destruction of watercourses (River/pans/dams/streams/wetlands). • Leakage of hazardous materials. The machinery on site require oils and fuel to function. Leakage of these oils and fuels can contaminate water supplies. • Riverbed Coarsening • Riverbed widening and deepening • Riverbank, -bed, and slop instability • Altered hydrological table. • Increased turbidity and total suspended solids • Increased concentrations f heavy metals		-	L	Yes	-

		SOCIAL/ECONOMIC ENVIRONMENT	Local unemployment rate	• Job creation. Security guards will be required for 24 hours every day of the week. • Skills development.	+		L	Yes	-
			Visual landscape	• The proposed 5ha area is not used for any agriculture related activities.	-		L	Yes	-
			Traffic volumes	• Increase in vehicles collecting gravel for distribution.	-		S	Yes	-
			Health & Safety	• Air/dust pollution. • Road safety.	-		S	Yes	-
			Noise levels	• The proposed development will result in noise pollution during the operational phase.	-		M	Yes	-
			Tourism industry	• Since there are tourism facilities in close proximity to the site, the decommissioning activities may have an impact on tourism in the area.	N/A	N/A	N/A	N/A	-
			Heritage resources	• It is not foreseen that the proposed activity will impact on heritage resources or vice versa.	N/A	N/A	N/A	N/A	-
DECOMMISSIONING PHASE									
-	<u>Mine closure</u> During the mine closure the Mine and its associated infrastructure will be dismantled. <u>Rehabilitation of biophysical environment</u> The biophysical environment will be rehabilitated.	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	• Re-vegetation of exposed soil surfaces to ensure no erosion in these areas. • Stabilise riverbanks and slopes	+		L	Yes	-
			Air quality	• Air pollution due to the increase of traffic of construction vehicles.	-		S	Yes	-
			Soil	• Backfilling of all voids • Placing of topsoil on backfilled area • Sloping of the settling pond if necessary	+		L	Yes	-
			Geology	• It is not foreseen that the decommissioning phase will impact on the geology of the site or vice versa.	N/A	N/A	N/A	N/A	-
			Existing services infrastructure	• Generation of waste that need to be accommodated at the local landfill site. • Generation of sewage that need to be accommodated by the municipal sewerage system and the local sewage plant. • Increase in construction vehicles.	-		S	Yes	-
			Ground water	• Pollution due to construction vehicles.	-		S	Yes	-
			Surface water	• Increase in storm water run-off. • Pollution of water sources due to soil erosion. • Destruction of watercourses (River/pans/dams/streams/wetlands).	-		S	Yes	-
		SOCIAL/ECONOMIC ENVIRONMENT	Local unemployment rate	• Loss of employment.	-		L	Yes	-
			Visual landscape	• Potential visual impact on visual receptors in close proximity to proposed facility.	-		S	Yes	-
			Traffic volumes	• Increase in construction vehicles.	-		S	Yes	-
			Health & Safety	• Air/dust pollution. • Road safety. • Increased crime levels. The presence of mine workers on the site may increase security risks associated with an increase in crime levels as a result of influx of people in the rural area.	-		L	Yes	-

			Noise levels	• The generation of noise as a result of construction vehicles, the use of machinery and people working on the site.	-		S	Yes	-
			Tourism industry	• Since there are no tourism facilities in close proximity to the site, the decommissioning activities will not have an impact on tourism in the area.	N/A	N/A	N/A	N/A	-
			Heritage resources	• It is not foreseen that the decommissioning phase will impact on any heritage resources.	-		L	Yes	-

(N/A) No impact (+) Positive Impact (-) Negative Impact (S) Short Term (M) Medium Term (L) Long Term

K) WHERE APPLICABLE, A SUMMARY OF THE FINDINGS AND IMPACTS MANAGEMENT MEASURES IDENTIFIED IN AN SPECIALIST REPORT COMPLYING WITH APPENDIX 6 OF THESE REGULATIONS AND AN INDICATION AS TO HOW THESE FINDINGS AND RECOMMENDATIONS HAVE BEEN INCLUDED IN THE FINAL REPORT.

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIOS HAVE BEEN INCLUDED.
		X	

According to the **DFFE Screening Report** the Environmental Sensitivity of the proposed area is as follows:

The following summary of the development site 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		
Defence Theme				X
Paleontology Theme		X		
Plant Species Theme				X
Terrestrial Biodiversity Theme	X			

Specialist study according to DEA Screening tool		Response
Agriculture Impact Assessment		According to the DFFE Screening Report the Agriculture theme sensitivity of the proposed 5ha area fall within medium sensitivity. The land capability for the proposed area falls within Land in Class IV (4). Since the proposed 5ha area falls mostly within the Crocodile River we do not see a need for this study.
Biodiversity study	**Animal Species Assessment** **Aquatic Biodiversity Impact Assessment** **Plant Species Assessment** **Terrestrial Biodiversity Impact Assessment**	According to **Figure 21** the proposed 5ha area falls within natural land cover. According to **Figure 22** the proposed 5ha area is covered by Thicket / Dense Bush, Woodland / Open bush, Wetland, Grassland and Bare non vegetation. The google earth map (**Figure 23)** shows the proposed area is partially within the Krokodile river. The maps below are available under **Appendix 5**. Please see **figure 24** (photos) how the proposed area looks like and the plates under **Appendix 8** for the rest of the photos. The applicant is in the process of applying for a Water Use License, All infrastructure will be temporary and/or mobile. In the Environmental Management Programme there are mitigation measure provided.
Archaeological and Cultural Heritage Impact Assessment		**DEA Screening Report findings:** • *Paleontology Theme Sensitivity:* High sensitivity • *Archaeological and Cultural Heritage Theme Sensitivity:* Low Sensitivity If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies: • NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule; • NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule; • NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as
Palaeontology Impact Assessment		

	soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA; If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the **Chance Find Protocol** must be implemented by the Environmental Control Officer (ECO) in charge of these developments. These discoveries ought to be protected and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation can be carry out by a paleontologist. **Chance Find Procedure** • If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find. • The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates. • A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates. • Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found. • Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary. • The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find. • In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site. • Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.
Noise Impact Assessment	We do not see the need for this study as there is an existing mine adjacent the proposed area and the nearest homestead is approximately 900m East from the proposed area.
Radioactivity Impact Assessment	This study is not necessary since the process of mining Stone Aggregate does not have any radioactive effects.

L) ENVIRONMENTAL IMPACT STATEMENT

i) SUMMARY OF THE KEY FINDINGS

This section provides a summary of the assessment and conclusions drawn from the proposed mining area. In doing so, it draws on the information gathered as part of the environmental impact assessment process and the knowledge gained by the environmental consultant during the course of the process and presents an informed opinion on the environmental impacts associated with the proposed project. The following conclusions can be drawn for the proposed mining activity:

- Potential impacts on biodiversity: It is expected that some vegetation might be lost but through implementing mitigation measures, no adverse impacts are expected.

  According to **Figure 21** the proposed 5ha area falls within natural land cover. According to **Figure 22** the proposed 5ha area is covered by Thicket / Dense Bush, Woodland / Open bush, Wetland, Grassland and Bare non vegetation. The google earth map (**Figure 23)** shows the proposed area is partially within the Krokodile river. The maps below are available under **Appendix 5**.

  Please see **figure 24** (photos) how the proposed area looks like and the plates under **Appendix 8** for the rest of the photos.

  The applicant is in the process of applying for a Water Use License,

  All infrastructure will be temporary and/or mobile.

  DEA Screening Report findings:
  - *Plant Species theme sensitivity*: Low sensitivity
  - *Aquatic Biodiversity sensitivity:* Very High sensitivity
  - *Terrestrial Biodiversity sensitivity:* Very High sensitivity.
  - *Animal Species sensitivity:* High and Medium sensitivity

- Potential impact on Archaeological artifacts and Palaeontological resources: Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

  DEA Screening Report findings:
  - *Paleontology Theme Sensitivity:* High sensitivity
  - *Archaeological and Cultural Heritage Theme Sensitivity:* Low Sensitivity

  If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies:
  - NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
  - NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
  - NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly

discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;

If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the **Chance Find Protocol** must be implemented by the Environmental Control Officer (ECO) in charge of these developments. These discoveries ought to be protected and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation can be carry out by a paleontologist.

Chance Find Procedure

- If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find.
- The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates.
- A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates.
- Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.
- Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.
- The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find.
- In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.
- Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.

➢ Potential impacts on land use: A certain portion of the proposed area was previously used for cultivation, but not anymore.

According to **Figure 21** the proposed 5ha area falls within natural land cover. According to **Figure 22** the proposed 5ha area is covered by Thicket / Dense Bush, Woodland / Open bush, Wetland, Grassland and Bare non vegetation. The google earth map (**Figure 23)** shows the proposed area is partially within the Krokodile river. The maps below are available under **Appendix 5**.

Please see **figure 24** (photos) how the proposed area looks like and the plates under **Appendix 8** for the rest of the photos.

The applicant is in the process of applying for a Water Use License,

All infrastructure will be temporary and/or mobile.

➢ Potential social impacts: The presence of construction workers poses a potential risk to family structures and social networks. While the presence of construction workers does not in itself constitute a social impact, the manner in which construction workers conduct themselves can impact on local communities. The most significant negative impact is associated with the disruption of existing family structures and social networks.

- Potential negative impacts: (noise, dust, soil degradation, storm water, traffic, health and safety) associated with the operation of the facility are expected to be of low-high impact, of medium terms and site specific. These can be mitigated or negated through the implementation of practical and appropriate mitigation measures.

Positive impacts: The mining of Sand (QY) may result in socio-economic benefit to the area.

All possible negative impacts and risks that have been identified in this report can be effectively mitigated and managed by implementing the migratory measures as set out in the Environmental Management Programme (EMPr) attached in Part B.

ii) FINAL SITE MAP

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers.

Refer to Locality Map attached in **Appendix 4**.

iii) SUMMARY OF THE POSITIVE AND NEGATIVE IMPLICATIONS AND RISKS OF THE PROPOSED ACTIVITY AND IDENTIFIED ALTERNATIVES

- Increased noise levels
- Potential water and soil pollution impacts.
- Potential loss of fauna and flora.
- Fragmentation and loss of Habitat
- Smothering of Microorganisms in the river
- Reduced presence of benthic organisms
- Riverbed coarsening
- Altered hydrological table
- Instability of riverbed, bank and slope
- Deepening and widening of Riverbed
- Increased turbidity and total suspended solids in the river.
- Increased concentration of heavy metals in the river.
- Increased vehicle activity.
- Increased dust levels.
- Increase in water consumption
- Potential visual impacts.

All possible negative impacts and risks that have been identified in this report can be effectively mitigated and managed by implementing the mitigation measures as set out in the Environmental Management Programme (EMPr) attached in Part B.

M) PROPOSED IMPACT MANAGEMENT OBJECTIVES AND THE IMPACT MANAGEMENT OUTCOMES FOR INCLUSION IN THE EMPR (Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation)

Management objectives include:

- Ensure that the mining activity does not cause pollution to the environment or harm to persons.
- Minimise production of waste.
- All mining activities must be conducted in a manner that minimises noise impact, litter, environmental degradation and health hazards i.e. injuries.
- The mine must be kept neat and tidy during waste handling to prevent unsightliness and accidents.

Expected outcomes include:

- Minimum impacts on the environment as a result of mining.
- Compliance with legislative requirements.
- Mine is neat and tidy and well managed.

FINAL PROPOSED ALTERNATIVES

(Provide an explanation for the final layout of the infrastructure and activities on the overall site as shown on the final site map together with the reasons why they are the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment)

This alternative asks the question, if there is not, from an environmental perspective, a more suitable location for the proposed activity. Due to the expected mineral resources, **Impulse Mining (Pty) Ltd** would like to potentially mine for Sand (QY). including associated infrastructure, structure and earthworks on certain 5ha area on a certain portion of the Remaining Extent & Portion 3 of the farm Buffelshoek 351, Registration Division: KQ, Limpopo Province, therefore there will be no other alternative (i.e. to facilitate the movement of machinery, equipment, infrastructure).

N) ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION.

Any aspects which have not formed part of the EMPr that must be made conditions of the Environmental Authorisation

- The operational activities and relevant rehabilitation of disturbed areas should be monitored against the improved EMPr and all other relevant environmental legislation.
- A copy of the EMP should be made available onsite at all times.
- Implementation of the proposed mitigation measures set out in the EMPr.

O) DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE. (Which relate to the assessment and mitigation measures proposed)

The uncertainties in results are mostly related to the availability of information, time available to gather the relevant information as well as the sometimes-subjective nature of the assessment methodology. If the authority feels that more specialists' studies need to be conducted, such will be corresponded to the applicant.

P) REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORISED

Reasons why the activity should be authorized or not.

Based on the outcomes of the current Mining activities in the area the possibility to encounter high amounts of river sand, were identified.

The option of not approving the activities will result in a significant loss of possible valuable minerals being exploited. And all economic benefits will be lost.

Q) CONDITIONS THAT MUST BE INCLUDED IN THE AUTHORISATION

- The operational activities and relevant rehabilitation of disturbed areas should be monitored against the improved EMPr and all other relevant environmental legislation.
- A copy of the EMP should be made available onsite at all times.
- Implementation of the proposed mitigation measures set out in the EMPr.

The EMPr should be binding on all managers and contractors operating/utilizing the site.

Period for which the Environmental Authorisation is required.

For a minimum of 3 years.

R) UNDERTAKING

Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic assessment report and the Environmental Management Programme report.

The undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Environmental Impact Assessment report and the Environmental Management Programme report.

I, **Lizanne Esterhuizen** (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; ☒

Signature of the environmental assessment practitioner:

Milnex CC

Name of company:

06/08/2022

Date:

S) FINANCIAL PROVISION

State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.

XXXXX

i) Explain how the aforesaid amount was derived.

The closure cost estimate provided above aligned with the Financial Provisioning Regulations, 2015. The amount was calculated by Milnex CC. The amount was calculated by Milnex CC.

ii) Confirm that this amount can be provided for from operating expenditure. (Confirm that the amount, is anticipated to be an operating cost and is provided for as such in the Mining work programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be).

Financial Guarantee

The financial guarantee for the rehabilitation for land disturbed by **Impulse Mining (Pty) Ltd** submitted together with the application for a mining permit.

Rehabilitation Fund

Impulse Mining (Pty) Ltd will also make provision for rehabilitation during closure by establishing a rehabilitation trust.

iii) Motivation for the deviation.

Not applicable

T) OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

COMPLIANCE WITH THE PROVISIONS OF SECTIONS 24(4)(A) AND (B) READ WITH SECTION 24 (3) (A) AND (7) OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998). THE EIA REPORT MUST INCLUDE THE:

i. Impact on the socio-economic conditions of any directly affected person. (Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as Appendix 2.19.1 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12. herein).

The following impacts may be regarded as community impacts:

- Increased noise levels
- Potential water and soil pollution impacts.
- Potential loss of fauna and flora.
- Increased vehicle activity.
- Increased dust levels.
- Increase in water consumption
- Potential visual impacts.

Indirect socio-economic benefits are expected to be associated with the creation of employment.

ii. **Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act**. **(**Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(*i*)(vi) and (vii) of that Act, attach the investigation report as Appendix 2.19.2 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

DEA Screening Report findings:

- *Paleontology Theme Sensitivity:* High sensitivity
- *Archaeological and Cultural Heritage Theme Sensitivity:* Low Sensitivity

Cultural Heritage in South Africa (includes all heritage resources) is protected by the **National Heritage Resources Act (Act 25 of 1999) (NHRA).** According to Section 3 of the Act, all Heritage resources include **"all objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens**".

If such resources are found during the mining or development activities, they shall not be disturbed without a permit from the relevant heritage resource Authority, which means that before such sites are disturbed by development it is incumbent on the developer to ensure that a heritage impact assessment is done and the Provincial Heritage Resources Authority and SAHRA must be contacted immediately and work must stop.

If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies:

- NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;

If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the **Chance Find Protocol** must be implemented by the Environmental Control Officer (ECO) in charge of these developments. These discoveries ought to be protected and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation can be carry out by a paleontologist.

Chance Find Procedure

- If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find.
- The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21

462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates.

- A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates.
- Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.
- Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.
- The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find.
- In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.
- Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.

U) OTHER MATTERS REQUIRED IN TERMS OF SECTIONS 24(4)(A) AND (B) OF THE ACT.

(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as Appendix 4).

From a local perspective, the mining of Sand (QY) including associated infrastructure, structure and earthworks on a certain 5ha area on a certain portion of the Remaining Extent & Portion 3 of the farm Buffelshoek 351, Registration Division: KQ, Limpopo Province, is preferred because the geological formation supports the possibility that the minerals applied for could be found on the proposed area.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme.

A) DETAILS OF THE EAP

i) **The EAP who prepared the report**

ii) **Expertise of the EAP**

NAME OF PRACTITIONER	QUALIFICATIONS	CONTACT DETAILS
Lizanne Esterhuizen	Honours Degree in Environmental Science (refer to **Appendix 1**)	Tel No.: (018) 011 1925 Fax No.: (053) 963 2009 e-mail address: lizanne@milnex-sa.co.za

B) DESCRIPTION OF THE ASPECTS OF THE ACTIVITY (Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required).

It is hereby confirmed that the requirements to describe the aspects of the activity that are required by the EMP is already included in Part A, section 1(h).

C) COMPOSITE MAP

(Provide a map **(Attached as an Appendix**) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers)

Refer to Locality Map, attached as **Appendix 4**.

D) DESCRIPTION OF IMPACT MANAGEMENT OBJECTIVES INCLUDING MANAGEMENT STATEMENTS

i. **Determination of closure objectives.** (ensure that the closure objectives are informed by the type of environment described in 2.4 herein)

The overall goal for closure of the 5ha mining site is to do concurrent rehabilitation to avoid damming of water in the excavations/settling pond, ensuring that the land is stable and safe in the long-term. For post closure, the tranches will be shaped and rehabilitated and proposed future use after mining will be agricultural & Livestock/game grazing use. Closure objectives relate to the following:

PHYSICAL STABILITY: To level and shape excavations.

To this end the decommissioning and rehabilitation of all infrastructure areas will follow the following principles:

- All vehicles, plant (if any) and workshop equipment will be removed for salvage or resale.
- All fixed assets that can be profitably removed will be removed for salvage or resale
- All structures will be demolished, and foundations removed if they will not be used for any purpose
- The excavations/settling pond will be filled in with soil, the top 100 mm being topsoil (from stockpiles);
- Roads will be rehabilitated.
- All disturbed and exposed surfaces will be covered with at least 100 mm of topsoil and re-vegetation must be allowed to take place naturally.
- Water quality will be monitored until it reaches a steady state or for two years after closure.

- Dismantle and remove redundant fence for salvage.
- All services such as the water supply line and the power line will be demolishedonly for the section on the mine's property if there will be no use for them post mining.

SUBMISSION OF INFORMATION

- All facilities that become redundant during the life of the mine must be rehabilitated concurrently to lighten the rehabilitation process at the end of the mine's life;
- Attention must be paid to the latest developments in the mine rehabilitation
- The mine closure plan must always keep pace with the current best practices so it must bereviewed every three years; and
- All information as required by the various government departments should be captured and be readily available for submission when required.

MAINTENANCE

The necessary agreements and arrangement will be made by **Impulse Mining (Pty) Ltd** to ensure that all natural physical, chemical and biological processes for which a closure condition have been specified are monitored until they reach a steady state or for two years after closure or as long as deemed necessary at the time; and all rehabilitated areas will be monitored and maintained until such time as required to enable the mine to apply for closure of these different areas.

CLOSURE GOALS AND TARGETS

"That all residual environmental impacts associated with the mining method employed, including possible final voids, infrastructure, and stockpile will be neutralized or minimised suchthat the post-mining environment is able to function in a manner which conforms to the concept of sustainable development." Implement operational control measures as indicated and required by the EMP:

- Ensure post mining provision (financial) is documented and available;
- Initiate first stage rehabilitation with the aim of establishing low yield graze land, simultaneous acknowledgement of structural and service-related factors for the later residential development objective
- Address post mining objectives as stipulated in the section below

PERFORMANCE ASSESSMENTS

The proposed mining activities are only temporary on the land, so it is vital that rehabilitation of land takes place once mining operations have stopped. However, concurrent rehabilitation should take place where applicable. Mine reclamation activities are undertaken gradually; with the shaping and contouring of excavated areas,

- removal of infrastructure,
- replacement of topsoil,
- seeding with grasses and planting of trees taking place on the mined-out areas,

The above is largely achieved through bulldozers and scrapers which is used to reshape the disturbed area.

INFRASTRUCTURE AREA

The removal, decommissioning and disposal of all mining infrastructure, will comply with all conditions contained in the MPRDA, 2002 (Act No. 28 of 2002). To this end, decommissioning and rehabilitation of all infrastructure areas will follow the following principles:

- will be requested to remove all fuel storage and reticulation facilities.
- Rip and grade the above areas for placement of topsoil.
- Rip and grade mine roads for placement of topsoil.
- Maintenance of roads required for maintenance and monitoring.
- Load from stockpile, haul, place and spread a layer of topsoil on all areas on which vegetation will be established.

- Establish vegetation on topsoiled surfaces, including analysis of topsoil, application of fertilisers, application of seed and hand planting as necessary.
- Active maintenance of planted areas for a period of at least a year, including re- seeding and replanting, weed and alien vegetation control as required.
- Passive maintenance of planted areas, including re-seeding and re-planting, weed and alien vegetation control as required.
- Undertake complete groundwater quality and water level monitoring to establish long-term groundwater levels and quality trends.
- Haul roads will have consolidated basement materials lifted and disposed into pit.
- Piping and water treatment infrastructure will be maintained on site until water quality monitoring data proves that the water quality is acceptable for direct release to the receiving environment.
- The detailed closure plan that will be developed at end of mine life will address water monitoring and maintenance requirements.
- plan that will be developed at end of mine life will address water monitoring and maintenance requirements.

MINE RESIDUE

Topsoil deposit will be capped where necessary and vegetated with the seed mix. The following basic principles of rehabilitation form the basis of the mining method:

- Prepare a rehabilitation plan prior to the commencement of mining.
- Agree on the long-term post - mining land use objective for the area with the relevant government departments, local government councils and nearby community members.
- The land use must be compatible with the climate, soil, topography of the final landformand the degree of the management available after rehabilitation.
- Progressively rehabilitate the site, where possible, so that the rate of rehabilitation is similar to the rate of mining.
- Prevent the introduction of noxious weeds and pests.
- Minimise the area cleared for mining and associated facilities to that absolutely necessary for the safe operation of the mine.

LEADING CLOSURE OBJECTIVES

SOCIO ECONOMIC

Closure Management Objectives

The retrenchment processes will be followed as per requirements of the applicable legalprocess.

Specific Performance Criteria

- The rehabilitated mining environment shall be made safe and deemed safe;
- Where possible infrastructure will remain for social investment opportunities, this willbe decided in conjunction with the Integrated Development Plan (IDP) of the area and the local authorities (i.e. municipality). The soils and land capability will be rehabilitated.
- All fences erected around the mine will be dismantled and either disposed of at a permitted disposal site or sold as scrap (provided these structures will no longer be required by the post-mining landowner).
- Fences erected to cordon-off dangerous excavations will remain in place and will be maintained as required.

TRAFFIC AND SAFETY

Closure Management Objective

- Ensure that all roads rehabilitated and or left behind is safe in good working condition,ensuring public safety and access to site and monitoring points.

Monitoring and reporting

- The site manager will inspect the roads for degradation and spillages.
- Speed limits will be enforced on site where appropriate and feasible.
- All incidences and issues will be recorded, as will the actions taken to address issues andrecords of such actions kept on site.

Action required

- Any degradation to roads will be repaired with consultation of the roads department.

TOPOGRAPHY AND EROSION CONTROL

Closure Management Objectives

- The area will have contours constructed to prevent soil erosion.

Specific Performance Criteria

- Surface water bodies shall not be left in any mining voids unless the operations managerdemonstrates there will be no significant environmental impact (such as salinization, reduction in water availability, toxicity, algal problems, attraction to pest species or a local safety hazard).
- All slopes which may incur erosion will be profiled in such a way that a preferentialdown drain can be installed.
- Rehabilitated profiles must ensure free drainage of water and should be contoured to fitin with the catchment dynamics.
- Erosion control measures such as contour banks and cut off berms should be constructed and soil vegetated in rehabilitated areas.
- On gentle slopes, water will be encouraged to flow off the rehabilitated surface as surface flow, as quickly as possible without causing erosion.
- Where areas of potential ponding are noted, is to be re-profiled to be free draining thereby minimising the potential for ponding.

Monitoring and Proposed Actions

During decommissioning, the environmental site manager together with the site manager will monitor construction activities at least weekly to ensure the trenches and dams (sludge dam) are in accordance with the specification as per design.

- After rehabilitation the site will be monitored for any pooling or erosion on site, especially after rainfall. This will be the responsibility of the environmental site manager.
- The area needs to be surveyed every two months to monitor differential settlement.
- The environmental site manager will ensure annual soil assessments be conducted by specialist pedologists after rehabilitation of the site.
- Weekly inspections will be conducted by the environmental site manager for any erosion which must be addressed immediately if observed, and together with the site manager will inspect all pipelines and associated dirty water channels/compartments to ensure no leaks or damage to these.
- All dirty water separation and containment facilities will also be inspected at leastweekly (and after each rainfall event), to ensure adequate functioning of all systems to prevent leaks into the environment which will negatively impact on the soils.
- The environmental site manager will ensure monthly inspection of surrounding areas forsoil compaction.
- Ensure surface water monitoring and action plans are implemented.
- Rehabilitated sites will be inspected for soil erosion on a monthly basis, together with the visual inspection regards to the vegetation cover abundance.
- The rehabilitated areas must be monitored for the type and depth of soil cover used.

- Monitoring of any ecologically sensitive species should they be observed on site will bedone as and when required.
- The site will be monitored for alien invasive species at least every 6 months. This will,however, be dependent on the species of alien invasive species on site.
- Floral surveys will be conducted on rehabilitated areas on an annual basis, together withthe soil quality and depth monitoring.
- All reports will be kept at the mining offices. All incidences and issues will be recorded, as will the actions taken to address issues. The environmental site manager will be responsible for inspection of sites and keeping records of all monitoring activities.
- The site manager is responsible for ensuring that all vehicles, remaining on site during the decommission phase, are serviced on a regular basis in terms of the maintenance plans.

Action Required

- Any pooling will be addressed by filling depression and / or grading areas and re-vegetating such sites.
- Any erosion will also be addressed utilising contour berms, gabion structures if necessary or a specialist will be consulted if necessary. Any eroded soils will be liftedand returned to the affected area.
- Any deficiencies will be corrected by placing material in these areas as per the rehabilitation plan.
- Additional material or soil will be brought in if required.
- Where topographical areas are exceeded and create storm water drainage issues,excess material will be removed and area rehabilitated as per the rehabilitation plan.
- Any recommendations made by specialist pedologist after annual surveys ofrehabilitated areas will be considered for implementation as proposed.
- Any eroded soil will be lifted and replaced to the area which has been eroded.
- The area will be rehabilitated as per the rehabilitation plan.
- Erosion control measures, such as gabion structures, will be considered at areas whereerosion is persistent.
- Records of soil placement and package thickness will be kept on a monthly basis duringthe mining phase.
- Where the soil depth is compromised the areas will be filled with topsoil.
- Material will be brought in if necessary.
- Silt build-up in water management facilities will be cleared and deposited in residuedeposits if dirty.
- Any compacted soils will be ripped and re-vegetated with indigenous flora. Vegetationwill then be monitored in these areas.
- Should any erosion be observed on site, it will be reported to the site manager andenvironmental site manager. The issue will be addressed and consideration given to:
- Increasing vegetative cover in problem areas through manual seeding/planting.
- Implementing erosion control measures such as contour berms or gabion baskets.

CONSULTING SPECIALISTS

- Should soil depth be inadequate in the rehabilitated areas, then more soil will bebrought in and deposited on the site.
- The area will also be inspected for erosion to determine the reason for soil loss.This will be addressed immediately.
- All recommendations made by the specialists will be implemented wheredeemed appropriate.
- Manual seeding or planting should vegetative cover be inadequate.
- An alien invasive management program will be implemented for the control and eradication of alien invasive species on site. This plan will give preference to mechanical control methods.

SURFACE WATER CONTROL

Closure Management Objectives

- Surface water will be managed as per GN704 and all clean water will be diverted aroundthe rehabilitated area.
- All water that falls on the rehabilitated area will be managed in such a way that noerosion will occur through the use of contour drains.
- Potential dirty water will be directed to containment dams or silt dams.
- The filled and rehabilitated area will be shaped to facilitate run-off towards thecatchment area.
- There shall be no long term reduction in the availability of water to meet localenvironmental values.

Specific Performance Criteria

- Actions shall be taken during rehabilitation to ensure that surface and groundwater hydrological patterns/flows will not be adversely affected by the rehabilitation.
- Surface and groundwater levels and quality will reflect original levels and water chemistry;
- Clean water diversion drains are to be installed around the area. Once the final re- profiling has been completed and the clean water diversions are constructed on the rehabilitated ground.
- Run-off from un-rehabilitated areas will be directed away from any rehabilitated areas. Runoff from rehabilitated areas will be channelled to sedimentation structures so that eroded soil does not leave the property.
- Where seepage/decant may occur deep cut off trenches will be created to intercept the ground water where it daylights downstream and directed or pumped to the containment dam upslope of the void.
- Natural drainage lines will be followed to reduce loss of water in the natural catchments.

Monitoring and Proposed Actions

The environmental site manager will ensure that surface water quality is monitored during the closure phase:

- A water quality report will be compiled on a quarterly basis and will show all the high-risk areas and areas deviating from current background water quality.
- Specialists' recommendations with regard to water quality issues observed, will be implemented as appropriate.
- Water management features will be upgraded as necessary if water quality issues arise from these structures.
- The rehabilitated area will be monitored for ponding.
- Any areas where ponding occurs will be filled and reshaped as per the rehabilitation plan to ensure surface water runoff from the area and discourage ponding.

Water Quality Monitoring and Reporting

- This monitoring program will include various upstream and downstream monitoring points and various sources on site.
- Database of results will be maintained by the environmental site manager and quarterly and annual reports will be compiled and submitted to the mine management and will besubmitted to DWS.
- All samples will be submitted to an accredited laboratory for analysis.

ECOLOGY

Closure Management Objectives

- Areas will be fenced off once seeded to prevent surface disturbance to the site andallow for vegetation to establish and stabilise.

Specific Performance criteria

- Vegetation in rehabilitated areas will have equivalent values as surrounding naturalecosystems.
- The rehabilitated ecosystem will have equivalent functions and resilience as the targetecosystem.
- Soil properties will be appropriate to support the target ecosystem.

- The rehabilitated areas will provide appropriate habitat for fauna
- Fauna utilisation, abundance and diversity appropriate to specified post mining landuse.
- Berms will be maintained. This will be undertaken by vegetating all berms to ensure thatthey are stable. The berms will also be inspected to ensure that there are no cracks, which could cause leakage. The berms will only be demolished should the area prove to be free draining with no pollution potential after rehabilitation.

Monitoring and Proposed Actions

- Services of a qualified person will be used to monitor the re-vegetation of the rehabilitated areas.
- Records of the monitoring will be kept on site.
- The environmental site manager will ensure that an alien invasive monitoring, eradication and control programme is established during closure and the area will be inspected at least every 3 months and more frequently in areas where alien specieswere observed.
- The environmental site manager will be responsible for inspecting and managing any protected flora that may be identified by specialists. Specialists will be consulted regarding relocation of these species if necessary during rehabilitation or closure.
- All incidences and issues during closure will be recorded, as will the actions taken to address issues. These will be filed and kept at the mine offices.
- Rehabilitation will be visually inspected at least monthly with regards to vegetation cover abundance.
- The rehabilitated area will be inspected monthly for general erosion and vegetative cover.
- Rehabilitated areas will be monitored for soil quality and depth annually.

Action Required

- Should it be noted that designs are not being followed, rehabilitation activities will be amended to ensure corrective measures will be taken to ensure design specifications are achieved. Specialists will be consulted if necessary.
- The specialist's recommendations from bio-monitoring and from annual floral surveys ofrehabilitated areas will be implemented as soon as possible.
- Should any erosion be observed on site, it will be reported to the site manager and environmental site manager. The issue will be addressed and consideration given to:
  - ✓ Increasing vegetative cover in problem areas through manual seeding/planting.
  - ✓ Implementing erosion control measures such as contour berms or gabionbaskets.
  - ✓ Consulting specialists.
  - ✓ Should soil depth be inadequate in the rehabilitated areas, more soil will bebrought in and deposited on the site.
  - ✓ The area will also be inspected for erosion to determine the reason for soil loss.
  - ✓ All recommendations made by the specialists will be followed.
  - ✓ Manual seeding or planting should vegetative cover be inadequate.
  - ✓ An alien invasive management programme will be implemented for the control and eradication of alien invasive species on site. This plan will give preference to mechanical control methods. Any chemicals utilised must be used responsibly.

LAND USE

Closure Management objectives

- To ensure that rehabilitation (physical and chemical) is done to such an extent that land use potential is regained.

Specific Performance Criteria

- Soil samples will be taken from rehabilitated areas annually over the full period of closure to determine soil fertility, depth compaction, acidity and mine related pollution. This should be conducted by qualified specialist who will also recommend actions and remedial measures to correct any issues observed on site.

- Only after the levelled areas have been inspected and approved by the Mine Manager/Site Manager will topsoil be placed. The topsoil layer must be as even as possible, i.e. it must be smooth and the depth must remain consistent throughout.
- Once the topsoil has been replaced, vehicle movement will be restricted to prevent compaction of the topsoil. All runoff from freshly top soiled areas will be channelled to pollution control structures so that eroded soil does no leave the property.
- Rehabilitated areas will be vegetated within the same growing season (before or during the rainy season). A suitable seed bed will be prepared to enhance the penetration and absorption of water, thereby giving the seed the best possible chance to germinate. The seeding depth should be very shallow to provide better germination. For most grass species seeding depth is approximately 5- 15mm.
- Rehabilitated areas will be re-vegetated with local indigenous flora as far as possible.
- Once the seed mixture has been sown the land must be rolled using to ensure consolidation around the seeds and effective moisture retention. Access to seededareas will be restricted to protect the newly established pasture.

Monitoring and Measurement

- A detailed monitoring and reporting programme will be established and followed.
- Rehabilitated areas will be monitored for vegetation cover and alien invasiveencroachment at least monthly by visual means.
- Areas of failed growth will be fertilised if necessary and re-seeded or planted withseedling plugs. All exotic and invasive vegetation should be removed.

GROUND WATER

Closure Management Objective

- A cut-off intercept drain will be constructed to capture any seepage.
- Monitoring will continue to detect and report on changes in round water regime

Groundwater Quality and Quantity Monitoring and Reporting

- Up slope and down slope groundwater monitoring will be conducted on a quarterlybasis during the closure phase;
- Water management features will be upgraded as necessary if water quality issues arisefrom these structures.
- The environmental site manager will be responsible for the implementation andmaintenance of the groundwater monitoring and results obtained.
- The groundwater quality and levels will be monitored on a quarterly basis.
- All monitoring boreholes must be demarcated and protected to prevent damage ortampering.
- All samples will be submitted to an accredited laboratory for analysis.

General Monitoring and Reporting

- The environmental site manager and site manager will inspect all water management facilities and associated pipelines at least weekly to ensure there are no leaks which would result in loss of water and that they are functioning optimally.
- The environmental site manager will be responsible for inspection of sites and keeping records of all monitoring activities.
- All incidences and issues will be recorded, as will the actions taken to address issues. These will be kept at the mine offices.

Action Required

- Should significant changes in qualities or levels be observed then:

- All high risk facilities will be inspected to ensure no severe problems occur in these areas which have resulted in poor quality leachate.
- Any issues observed will be reported to the environmental site manager and respective site manager.
- A geo-hydrologist will be consulted with regards to any additional mitigation or management activities which can assist in resolving potential pollution, such as cut-off drains.
- Should substantial decreases in groundwater levels or quality be observed in boreholes utilised by surrounding community then the applicant will need to find solutions in conjunction with affected parties.
- Should spikes be observed in water consumption then these will be investigated immediately and sources identified.
- All leaks identified will be repaired.
- Silt build-up in water management facilities / dams will be cleared and deposited in soil stockpiles if clean or in residue deposits if dirty.

AIR QUALITY AND NOISE

Closure Management Objectives

- Dust suppression should be undertaken at site especially during the dry season and during windy conditions.

Monitoring and proposed actions

- Dust suppression techniques and/or frequency will be altered as necessary should dust levels become excessive and exceed target values during rehabilitation.
- Air quality monitoring and reporting will be conducted according to the GNR 827 – Dust control regulations;
- The environmental site manager will be responsible for managing the air quality database and implementing actions, should target levels and frequencies be exceeded. PM10 and PM2.5 monitoring will be conducted if required as per the air quality act and also fall within the responsibility of the environmental site manager.
- Ambient noise will be monitored bi-annually on the mine boundary in at least four compass directions.
- Occupational noise will be monitored on a monthly basis as part of Safety, Health and Environment.
- The environmental site manager will be responsible for managing noise level database and implement actions should acceptable noise levels be exceeded.
- The site manager will be responsible for ensuring that all vehicles, including those of contractors, are maintained as per their maintenance plan.
- All incidences and issues will be recorded, as will the actions taken to address issues.These will be kept at the mine offices.
- Specialists will be consulted where necessary.

Action required

- Should ambient dust levels exceed recommended standards and frequencies as per the Air Quality Act, then the management plan for dust will be re-evaluated and assessed to improve dust control on site. Actions could include:
- Use of dust binding agents in areas of high dust generation.
- Consideration of sprinkler systems in areas of high dust generation.
- More frequent spraying.
- Should ambient noise levels exceed target levels:
- Additional noise measurements will be taken at all sensitive receptors beyond the mine boundary in question, initially those nearest to the mine and working further away until levels are within acceptable levels.
- Should levels at sensitive receptors still exceed target levels, and it is due to mining activities, then the noise management plan will be re-evaluated to reduce noise at thesesensitive receptors to within acceptable limits.

Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

The Rehabilitation & Closure Plan is attached as **Appendix 9.**

Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

XXXXX

(a) Confirm that the financial provision will be provided as determined.

Financial Guarantee

The financial guarantee for the rehabilitation for land disturbed **Impulse Mining (Pty) Ltd** submitted together with the application for the mining permit.

Rehabilitation Fund

Impulse Mining (Pty) Ltd will also make provision for rehabilitation during closure by establishing a rehabilitation trust.

E) IMPACTS TO BE MITIGATED IN THEIR RESPECTIVE PHASES

Measures to rehabilitate the environment affected by the undertaking of any listed activity

paragraph ();

ACTIVITIES **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. For mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	**PHASE** (of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure).	**SIZE AND SCALE of disturbance** (volumes, tonnages and hectares or m²)	**MITIGATION MEASURES** (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity Or. Upon the cessation of mining, bulk sampling or prospecting as the case may be.
Clearance of vegetation	Pumping sand from the river and creating a settling pond- (construction and operation phase)	5ha	1. Site clearing must take place in a phased manner, as and when required. 2. Areas which are not to be mined within two months must not be cleared to reduce erosion risks. 3. The area to be cleared must be clearly demarcated and this footprint strictly maintained. 4. Spoil that is removed from the site must be removed to an approved spoil site or a licensed landfill site.	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the mining activities.

			5. The necessary silt fences and erosion control measures must be implemented in areas where these risks are more prevalent.		
Construction of roads	Pumping sand from the river - (construction and operation phase)		1. Planning of access routes to the site for construction/mining purposes shall be done in conjunction with the Contractor and the Landowner. All agreements reached should be documented and no verbal agreements should be made. The Contractor shall clearly mark all access roads. Roads not to be used shall be marked with a “NO ENTRY for mining vehicles" sign. 2. Construction routes and required access roads must be clearly defined. 3. Damping down of the un-surfaced roads must be implemented to reduce dust and nuisance. 4. Soils compacted by construction/mining activities shall be deep ripped to loosen compacted layers and re-graded to even running levels. 5. The contractor must ensure that damage caused by related traffic from a gravel road is repaired continuously. The costs associated with the repair must be borne by the contractor. 6. Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport the gravel are fitted with tarpaulins or covers. 7. All vehicles must be road-worthy, and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the mining activities.

Mining Sand (QY) – Soils and geology	Pumping sand from the river - (construction and operation phase)	5ha	1. The Contractor should, prior to the commencement of earthworks determine the average depth of topsoil (If topsoil exists), and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected by construction and related activities prior to the commencement of major earthworks. This should include the building footprints, working areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas. 2. Care must be taken not to mix topsoil and subsoil or any other material, during stripping. 3. The topsoil must be conserved on site in and around mining permit area. 4. Subsoil and overburden in the mining area should be stockpiled separately to be returned for backfilling in the correct soil horizon order. 5. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or geofabric, depending on the duration of the project. Stockpiles may further be protected by the construction of berms, trenches or low brick walls around their bases. 6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. 7. Where contamination of soil is expected, analysis must be done prior to disposal of soil to determine the appropriate disposal route. Proof from an approved waste disposal site where contaminated soils are dumped if and when a spillage/leakage occurs should be attained and given to the project manager.	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the mine

			8. The impact on the geology will be permanent. There is no mitigation measure.		
Mining Sand (QY) – Soils and geology	Pumping sand from the river - (construction and operation phase)	5ha	1. The mining activities must aim to adhere to the relevant noise regulations and limit noise to within standard working hours to reduce disturbance of dwellings in close proximity to the development. 2. Mine, workshops, and other noisy fixed facilities should be located well away from noise sensitive areas. Once the proposed final layouts are made available by the Contractor(s), the sites must be evaluated in detail and specific measures designed into the system. 3. Truck traffic should be routed away from noise sensitive areas, where possible. 4. Noise levels must be kept within acceptable limits. 5. Noisy operations should be combined so that they occur where possible at the same time. 6. Mine workers to wear necessary ear protection gear. 7. Noisy activities to take place during allocated hours. 8. Noise from labourers must be controlled. 9. Noise suppression measures must be applied to all equipment. Equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from the site. 10. The Contractor must take measures to discourage labourers from loitering in the area	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the mining area

			and causing noise disturbance. Where possible labour shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport. 11. Implementation of enclosure and cladding of processing plants. 12. Applying regular and thorough maintenance schedules to equipment and processes. An increase in noise emission levels very often is a sign of the imminent mechanical failure of a machine.		

F) IMPACT MANAGEMENT ACTIONS

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (c) and (d) will be achieved).

ACTIVITY (whether listed or not listed). **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)**.	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)**	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated **(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation..**	**STANDARD TO BE ACHIEVED** **(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.**
Clearance of vegetation	Loss or fragmentation of habitats	Fauna & flora	(construction and operation phase)	**Existing vegetation** 1. Vegetation removal must be limited to the mining area. 2. Vegetation to be removed as it becomes necessary rather than removal of all vegetation throughout the site in one step. 3. No vegetation to be used for firewood. 4. Exotic and invasive plant species should not be allowed to establish, if the development is approved. 5. There should be a preconstruction walk-through of the development footprint/project site in order to locate individuals of plant species of conservation concern. A search and rescue exercise must be done to locate and relocate any protected species to a suitable and similar	Minimisation of impacts to acceptable limits

				habitat where these plants can grow without any disturbance; 6. In case protected trees are found permits must be obtained from the relevant department/s to remove these individuals. The contractor must apply for these permits in a phased manner as mining proceeds. **Rehabilitation** 7. All damaged areas shall be rehabilitated upon completion of the contract. 8. Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction. 9. All natural areas impacted during construction/mining must be rehabilitated with locally indigenous grasses typical of the representative botanical unit. 10. Rehabilitation must take place in a phased approach as soon as possible. 11. Rehabilitation process must make use of species indigenous to the area. Seeds from surrounding seed banks can be used for re-seeding. 12. Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas. 13. Planting of indigenous tree species in areas not to be cultivated or built on must be encouraged. **Demarcation of mining area** 14. All plants not interfering with mining operations shall be left undisturbed clearly marked and indicated on the site plan. 15. The mining area must be well demarcated, and no construction/mining activities must be allowed outside of this demarcated footprint.	

				16. Vegetation removal must be phased in order to reduce impact of construction/mining. 17. Site office and laydown areas must be clearly demarcated and no encroachment must occur beyond demarcated areas. 18. Strict and regular auditing of the mining process to ensure containment of the mining and laydown areas. 19. Soils must be kept free of petrochemical solutions that may be kept on site during construction/mining. Spillage can result in a loss of soil functionality thus limiting the re-establishment of flora. **Utilisation of resources** 20. Gathering of firewood, fruit, muti plants, or any other natural material onsite or in areas adjacent to the site is prohibited unless with prior approval of the ECO. **Exotic vegetation** 21. Alien vegetation on the site will need to be controlled. 22. The Contractor should be responsible for implementing a programme of weed control (particularly in areas where soil has been disturbed); and grassing of any remaining stockpiles to prevent weed invasion. 23. The spread of exotic species occurring throughout the site should be controlled. 24. Weed control measures must be applied to eradicate any noxious weeds (category 1a &1b species) on disturbed areas. **Herbicides** 25. Herbicide use shall only be allowed according to contract specifications. The application shall be according to set specifications and under supervision of a qualified technician. The possibility of leaching into the	

				surrounding environment shall be properly investigated and only environmentally friendly herbicides shall be used. 26. The use of pesticides and herbicides on the site must be discouraged as these impact on important pollinator species of indigenous vegetation. **Fauna** 27. Rehabilitation to be undertaken as soon as possible after the mining activities have been completed. 28. No trapping or snaring to fauna on the construction/mining site should be allowed. 29. No faunal species must be disturbed, trapped, hunted, or killed by maintenance staff during any routine maintenance at the development. 30. Any fauna threatened by the construction and operation activities should be removed to safety by the ECO or appropriately qualified environmental officer. 31. All construction vehicles should adhere to a low-speed limit (<30km/h) to avoid collisions with susceptible species such as snakes and tortoises. 32. If trenches need to be dug for electrical cabling or other purposes, these should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench.	
Mining Sand (QY)	Loss of topsoil	Soil	(construction and operation phase)	1. The Contractor should, prior to the commencement of earthworks determine the average depth of topsoil, and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected by construction and related activities prior to the commencement of major earthworks. This should include the building footprints, working areas and storage areas. Topsoil	Minimisation of impacts to acceptable limits

				must be reused where possible to rehabilitate disturbed areas. 2. Care must be taken not to mix topsoil and subsoil or any other material, during stripping. 3. The topsoil must be conserved on site in and around mining permit area. 4. Subsoil and overburden in the mining area should be stockpiled separately to be returned for backfilling in the correct soil horizon order. 5. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or geofabric, depending on the duration of the project. Stockpiles may further be protected by the construction of berms or low brick walls around their bases. 6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. 7. Where contamination of soil is expected, analysis must be done prior to disposal of soil to determine the appropriate disposal route. Proof from an approved waste disposal site where contaminated soils are dumped if and when a spillage/leakage occurs should be attained and given to the project manager. Establish an effective record keeping system for each area where soil is disturbed for mining purposes. These records should be included in environmental performance reports, and should include all the records below. • Record the GPS coordinates of each area. • Record the date of topsoil stripping. • Record the GPS coordinates of where the topsoil is stockpiled.	

				• Record the date of cessation mining activities at the particular site. • Photograph the area on cessation of mining activities. • Record date and depth of re-spreading of topsoil. • Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time.	
	Erosion	Soil Air Water	(construction and operation phase)	1. An effective system of run-off control should be implemented, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. 2. Periodical site inspection should be included in environmental performance reporting that inspects the effectiveness of the run-off control system and specifically records the occurrence of any erosion on site or downstream. 3. Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. 4. Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and revegetation or soil erosion control efforts accordingly 5. Wind screening and stormwater control should be undertaken to prevent soil loss from the site. 6. The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion. 7. Other erosion control measures that can be implemented are as follows: ○ Brush packing with cleared vegetation ○ Mulch or chip packing	Minimisation of impacts to acceptable limits

				○ Planting of vegetation ○ Hydroseeding/hand sowing 8. Sensitive areas need to be identified prior to construction/ mining so that the necessary precautions can be implemented. 9. All erosion control mechanisms need to be regularly maintained. 10. Seeding of topsoil and subsoil stockpiles to prevent wind and water erosion of soil surfaces. 11. Retention of vegetation where possible to avoid soil erosion. 12. Vegetation clearance should be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time. 13. Re-vegetation of disturbed surfaces should occur immediately after construction/mining activities are completed. This should be done through seeding with indigenous grasses. 14. No impediment to the natural water flow other than approved erosion control works is permitted. 15. To prevent stormwater damage, the increase in stormwater run-off resulting from construction/mining activities must be estimated and the drainage system assessed accordingly. 16. Stockpiles not used in three (3) months after stripping must be seeded or backfilled to prevent dust and erosion.	
	Air Pollution	Air	(construction and operation phase)	**Dust control** 1. Wheel washing and damping down of un-surfaced and un-vegetated areas. 2. Retention of vegetation where possible will reduce dust travel.	Minimisation of impacts to acceptable limits

				3. Clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas. 4. Damping down of all exposed soil surfaces with a water bowser or sprinklers when necessary to reduce dust. 5. The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the neighbouring communities. 6. A speed limit of 30km/h must not be exceeded on site. 7. Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor. 8. Any dirt roads that are utilised by the workers must be regularly maintained to ensure that dust levels are controlled. **Odour control** 9. Regular servicing of vehicles in order to limit gaseous emissions. 10. Regular servicing of onsite toilets to avoid potential odours. **Rehabilitation** 11. The Contractor should commence rehabilitation of exposed soil surfaces as soon as practical after completion of earthworks. **Fire prevention** 12. No open fires shall be allowed on site under any circumstance. All cooking shall be done in demarcated areas that are safe and cannot cause runaway fires. 13. The Contractor shall have operational fire-fighting equipment available on site at all times. The level of	

				firefighting equipment must be assessed and evaluated through a typical risk assessment process.	
	Noise		(construction and operation phase)	1. The mining activities must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in close proximity to the development. 2. Mine, crushers, workshops and other noisy fixed facilities should be located well away from noise sensitive areas. Once the proposed final layouts are made available by the Contractor(s), the sites must be evaluated in detail and specific measures designed in to the system. 3. Truck traffic should be routed away from noise sensitive areas, where possible. 4. Noise levels must be kept within acceptable limits. 5. Noisy operations should be combined so that they occur where possible at the same time. 6. Mine workers to wear necessary ear protection gear. 7. Noisy activities to take place during allocated hours. 8. Noise from labourers must be controlled. 9. Noise suppression measures must be applied to all equipment. Equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from the site. 10. The Contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport. 11. Implementation of enclosure and cladding of processing plants.	Minimisation of impacts to acceptable limits

				12. Applying regular and thorough maintenance schedules to equipment and processes. An increase in noise emission levels very often is a sign of the imminent mechanical failure of a machine.	
	Impact on potential cultural, heritage artefacts and fossils.	Heritage and Palaeontology	(construction and operation phase)	1. Any finds must be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999) and to DEA. 2. Local museums as well as the South African Heritage Resource Agency (SAHRA) should be informed if any artefacts/ fossils are uncovered in the affected area. 3. The Contractor must ensure that his workforce is aware of the necessity of reporting any possible historical, archaeological or palaeontological finds to the ECO so that appropriate action can be taken. 4. Known sites should be clearly marked in order that they can be avoided. The work force should also be informed that fenced-off areas are no-go areas. 5. The ECO must also survey for heritage and palaeontological artefacts during ground breaking and digging or drilling. He/she should familiarise themselves with formations and its fossils or a palaeontologist should be appointed during the digging and excavation phase of the development. 6. All digging, excavating, drilling or blasting activities must be stopped if heritage and/or palaeontological artefacts are uncovered and a specialist should be called in to determine proper management, mitigation, excavation and/or collecting measures. 7. Any discovered artefacts or fossils shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from SAHRA should the proposed site affect any world heritage/palaeontology sites or if any	Minimisation of impacts to acceptable limits

				heritage/palaeontology sites are to be destroyed or altered. 8. Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1). 9. If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies: • NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule; • NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule; • NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or	

				palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA; If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the **Chance Find Protocol** must be implemented by the Environmental Control Officer (ECO) in charge of these developments. These discoveries ought to be protected and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation can be carry out by a paleontologist. **Chance Find Procedure** • If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find. • The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include	

				photographs of the find, from various angles, as well as the GPS co-ordinates. • A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates. • Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found. • Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary. • The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sandbags. The Heritage agency will also be able to advise on the most suitable method of protection of the find. • In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site. • Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.	
Waste management		Pollution	(construction and operation phase)	**Litter management** 1. Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction site.	Minimisation of impacts to acceptable limits

				2. The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at registered/licensed landfill. 3. Good housekeeping practices should be implemented to regularly maintain the litter and rubble situation on the construction site. 4. If possible and feasible, all waste generated on site must be separated into glass, plastic, paper, metal and wood and recycled. An independent contractor can be appointed to conduct this recycling. 5. Littering by the employees of the Contractor shall not be allowed under any circumstances. The ECO shall monitor the neatness of the work sites as well as the Contractor campsite. 6. Skip waste containers should be maintained on site. These should be kept covered and arrangements made for them to be collected regularly. 7. All waste must be removed from the site and transported to a landfill site promptly to ensure that it does not attract vermin or produce odours. 8. Where a registered waste site is not available close to the construction site, the Contractor shall provide a method statement with regard to waste management. 9. A certificate of disposal shall be obtained by the Contractor and kept on file, if relevant. 10. Under no circumstances may solid waste be burnt on site. 11. All waste must be removed promptly to ensure that it does not attract vermin or produce odours. **Hazardous waste** 12. All waste hazardous materials must be carefully stored as advised by the ECO, and then disposed of offsite at	

				a licensed landfill site, where practical. Incineration may be used where relevant. 13. Contaminants to be stored safely to avoid spillage. 14. Machinery must be properly maintained to keep oil leaks in check. 15. All necessary precaution measures shall be taken to prevent soil or surface water pollution from hazardous materials used during construction and any spills shall immediately be cleaned up and all affected areas rehabilitated. **Sanitation** 16. The Contractor shall install mobile chemical toilets on the site. 17. Staff shall be sensitised to the fact that they should use these facilities at all times. No indiscriminate sanitary activities on site shall be allowed. 18. Toilets shall be serviced regularly and the ECO shall inspect toilets regularly. 19. Toilets should be no closer than 50m or above the 1:100 year flood line from any natural or manmade water bodies or drainage lines or alternatively located in a place approved of by the Engineer. 20. Under no circumstances may open areas, neighbours fences or the surrounding bush be used as a toilet facility. 21. The construction of "Long Drop" toilets is forbidden, but rather toilets connected to the sewage treatment plant. 22. Potable water must be provided for all construction staff. **Remedial actions** 23. Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site.	

				24. Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or disposed of at a licensed hazardous landfill site. 25. The ECO must determine the precise method of treatment for polluted soil. This could involve the application of soil absorbent materials as well as oil-digestive powders to the contaminated soil. 26. If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material. 27. If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure. 28. Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use. 29. Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal.	
Water Use and Quality	Water pollution	Water	(construction and operation phase)	**Water Use** 1. Develop a sustainable water supply management plan to minimise the impact to natural systems by managing water use, avoiding depletion of aquifers and minimising impacts to water users. 2. Water must be reused, recycled or treated where possible. **Water Quality** 3. The quality and quantity of effluent streams discharged to the environment including stormwater should be managed and treated to meet applicable effluent discharge guidelines.	

				4. Discharge to surface water should not result in contaminant concentrations in excess of local ambient water quality criteria outside a scientifically established mixing zone. 5. Efficient oil and grease traps or sumps should be installed and maintained at refueling facilities, workshops, fuel storage depots, and containment areas and spill kits should be available with emergency response plans. **Stormwater** 6. The site must be managed in order to prevent pollution of drains, downstream watercourses or groundwater, due to suspended solids and silt or chemical pollutants. 7. Silt fences should be used to prevent any soil entering the stormwater drains. 8. Temporary cut off drains and berms may be required to capture stormwater and promote infiltration. 9. Promote a water saving mind set with construction/mining workers in order to Contractor ensure less water wastage. 10. Hazardous substances must be stored at least 40m from any water bodies on site to avoid pollution. 11. The installation of the stormwater system must take place as soon as possible to attenuate stormwater from the construction phase as well as the operation phase. 12. Earth, stone and rubble is to be properly disposed of, or utilized on site so as not to obstruct natural water path ways over the site. i.e. these materials must not be placed in stormwater channels, drainage lines or rivers. 13. There should be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed.	

				14. If a batching plant is necessary, run-off should be managed effectively to avoid contamination of other areas of the site. Untreated runoff from the batch plant must not be allowed to get into the storm water system or nearby streams, rivers or erosion channels or dongas. **Groundwater resource protection** 15. Process solution storage ponds and other impoundments designed to hold non fresh water or non-treated process effluents should be lined and be equipped with sufficient wells to enable monitoring of water levels and quality. **Sanitation** 16. Adequate sanitary facilities and ablutions must be provided for construction workers (1 toilet per every 15 workers). 17. The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution. **Concrete mixing** 18. Concrete contaminated water must not enter soil or any natural drainage system as this disturbs the natural acidity of the soil and affects plant growth. **Public areas** 19. Food preparation areas should be provided with adequate washing facilities and food refuse should be stored in sealed refuse bins which should be removed from site on a regular basis. 20. The Contractor should take steps to ensure that littering by construction/mining workers does not occur and persons should be employed on site to collect litter from	

				the site and immediate surroundings, including litter accumulating at fence lines. 21. No washing or servicing of vehicles on site.	

G) IMPACT MANAGEMENT ACTIONS

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (c) and (d) will be achieved).

ACTIVITY Whether listed or not listed. **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)**.	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** **Remedy through rehabilitation..**	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or prospecting as the case may be.	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
Clearance of vegetation	Loss or fragmentation of habitats	**Existing vegetation** 1. Vegetation removal must be limited to the mining site. 2. Vegetation to be removed as it becomes necessary rather than removal of all vegetation throughout the site in one step. 3. No vegetation to be used for firewood. 4. Exotic and invasive plant species should not be allowed to establish, if the development is approved. 5. There should be a preconstruction walk-through of the development footprint/project site in order to locate individuals of plant species of conservation concern. A search and rescue exercise must be done to locate and relocate any protected species to a suitable and similar habitat where these plants can grow without any disturbance;	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		6. In case protected trees are found permits must be obtained from the relevant department/s to remove these individuals. The contractor must apply for these permits in a phased manner as mining proceeds. **Rehabilitation** 1. All damaged areas shall be rehabilitated upon completion of the contract. 2. Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction. 3. All natural areas impacted during construction/mining must be rehabilitated with locally indigenous grasses typical of the representative botanical unit. 4. Rehabilitation must take place in a phased approach as soon as possible. 5. Rehabilitation process must make use of species indigenous to the area. Seeds from surrounding seed banks can be used for re-seeding. 6. Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas. 7. Planting of indigenous tree species in areas not to be cultivated or built on must be encouraged. **Demarcation of** mining **area** 8. All plants not interfering with mining operations shall be left undisturbed clearly marked and indicated on the site plan. 9. The mining area must be well demarcated and no construction activities must be allowed outside of this demarcated footprint. 10. Vegetation removal must be phased in order to reduce impact of construction mining. 11. Site office and laydown areas must be clearly demarcated and no encroachment must occur beyond demarcated areas.		

		12. Strict and regular auditing of the mining process to ensure containment of the mining and laydown areas. 13. Soils must be kept free of petrochemical solutions that may be kept on site during construction/ mining. Spillage can result in a loss of soil functionality thus limiting the re-establishment of flora. **Utilisation of resources** 14. Gathering of firewood, fruit, muti plants, or any other natural material onsite or in areas adjacent to the site is prohibited unless with prior approval of the ECO. **Exotic vegetation** 15. Alien vegetation on the site will need to be controlled. 16. The Contractor should be responsible for implementing a programme of weed control (particularly in areas where soil has been disturbed); and grassing of any remaining stockpiles to prevent weed invasion. 17. The spread of exotic species occurring throughout the site should be controlled. 18. Weed control measures must be applied to eradicate any noxious weeds (category 1a &1b species) on disturbed areas. **Herbicides** 19. Herbicide use shall only be allowed according to contract specifications. The application shall be according to set specifications and under supervision of a qualified technician. The possibility of leaching into the surrounding environment shall be properly investigated and only environmentally friendly herbicides shall be used. 20. The use of pesticides and herbicides on the site must be discouraged as these impact on important pollinator species of indigenous vegetation. **Fauna**		

		21. Rehabilitation to be undertaken as soon as possible after mining has been completed. 22. No trapping or snaring to fauna on the construction/mining site should be allowed. 23. No faunal species must be disturbed, trapped, hunted or killed by maintenance staff during any routine maintenance at the development. 24. Any fauna threatened by the construction and operation activities should be removed to safety by the ECO or appropriately qualified environmental officer. 25. All construction vehicles should adhere to a low speed limit (<30km/h) to avoid collisions with susceptible species such as snakes and tortoises. 26. If trenches need to be dug for electrical cabling or other purposes, these should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench.		
Mining Sand (QY) – excavations	Loss of topsoil	1. The Contractor should, prior to the commencement of earthworks determine the average depth of topsoil, and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected by construction/mining and related activities prior to the commencement of major earthworks. This should include the building footprints, working areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas. 2. Care must be taken not to mix topsoil and subsoil or any other material, during stripping. 3. The topsoil must be conserved on site in and around mining permit area. 4. Subsoil and overburden in the mining area should be stockpiled separately to be returned for backfilling in the correct soil horizon order. 5. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or geofabric, depending	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		on the duration of the project. Stockpiles may further be protected by the construction of berms or low brick walls around their bases. 6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. 7. Where contamination of soil is expected, analysis must be done prior to disposal of soil to determine the appropriate disposal route. Proof from an approved waste disposal site where contaminated soils are dumped if and when a spillage/leakage occurs should be attained and given to the project manager. Establish an effective record keeping system for each area where soil is disturbed for mining purposes. These records should be included in environmental performance reports, and should include all the records below. • Record the GPS coordinates of each area. • Record the date of topsoil stripping. • Record the GPS coordinates of where the topsoil is stockpiled. • Record the date of cessation mining activities at the particular site. • Photograph the area on cessation of mining activities. • Record date and depth of re-spreading of topsoil. • Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time.		
	Erosion	1. An effective system of run-off control should be implemented, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. 2. Periodical site inspection should be included in environmental performance reporting that inspects the effectiveness of the run-off control system and specifically records the occurrence of any erosion on site or downstream.	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		3. Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. 4. Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and revegetation or soil erosion control efforts accordingly 5. Wind screening and stormwater control should be undertaken to prevent soil loss from the site. 6. The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion. 7. Other erosion control measures that can be implemented are as follows: o Brush packing with cleared vegetation o Mulch or chip packing o Planting of vegetation o Hydroseeding/hand sowing 8. Sensitive areas need to be identified prior to construction/mining so that the necessary precautions can be implemented. 9. All erosion control mechanisms need to be regularly maintained. 10. Seeding of topsoil and subsoil stockpiles to prevent wind and water erosion of soil surfaces. 11. Retention of vegetation where possible to avoid soil erosion. 12. Vegetation clearance should be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time. 13. Re-vegetation of disturbed surfaces should occur immediately after construction/mining activities are completed. This should be done through seeding with indigenous grasses. 14. No impediment to the natural water flow other than approved erosion control works is permitted. 15. To prevent stormwater damage, the increase in stormwater run-off resulting from construction/mining activities must be estimated and the drainage system assessed accordingly. A drainage plan		

		must be submitted to the Engineer for approval and must include the location and design criteria of any temporary stream crossings. 16. Stockpiles not used in three (3) months after stripping must be seeded/backfilled to prevent dust and erosion.		
.	Air Pollution	**Dust control** 1. Wheel washing and damping down of un-surfaced and un-vegetated areas. 2. Retention of vegetation where possible will reduce dust travel. 3. Clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas. 4. Damping down of all exposed soil surfaces with a water bowser or sprinklers when necessary to reduce dust. 5. The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the neighbouring communities. 6. A speed limit of 30km/h must not be exceeded on site. 7. Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor. 8. Any dirt roads that are utilised by the workers must be regularly maintained to ensure that dust levels are controlled. **Odour control** 9. Regular servicing of vehicles in order to limit gaseous emissions. 10. Regular servicing of onsite toilets to avoid potential odours. **Rehabilitation** 11. The Contractor should commence rehabilitation of exposed soil surfaces as soon as practical after completion of earthworks. **Fire prevention** 12. No open fires shall be allowed on site under any circumstance. All cooking shall be done in demarcated areas that are safe and cannot cause runaway fires.	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		13. The Contractor shall have operational fire-fighting equipment available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process.		
	Noise	1. The mining activities must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in close proximity to the development. 2. Pans, power plants, crushers, workshops and other noisy fixed facilities should be located well away from noise sensitive areas. Once the proposed final layouts are made available by the Contractor(s), the sites must be evaluated in detail and specific measures designed in to the system. 3. Truck traffic should be routed away from noise sensitive areas, where possible. 4. Noise levels must be kept within acceptable limits. 5. Noisy operations should be combined so that they occur where possible at the same time. 6. Mine workers to wear necessary ear protection gear. 7. Noisy activities to take place during allocated hours. 8. Noise from labourers must be controlled. 9. Noise suppression measures must be applied to all equipment. Equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from the site. 10. The Contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport. 11. Implementation of enclosure and cladding of processing plants.	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		12. Applying regular and thorough maintenance schedules to equipment and processes. An increase in noise emission levels very often is a sign of the imminent mechanical failure of a machine.		
	Impact on potential cultural, heritage artefacts and fossils.	1. Any finds must be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999) and to DEA. 2. Local museums as well as the South African Heritage Resource Agency (SAHRA) should be informed if any artefacts/ fossils are uncovered in the affected area. 3. The Contractor must ensure that his workforce is aware of the necessity of reporting any possible historical, archaeological or palaeontological finds to the ECO so that appropriate action can be taken. 4. Known sites should be clearly marked in order that they can be avoided. The workeforce should also be informed that fenced-off areas are no-go areas. 5. The ECO must also survey for heritage and palaeontological artefacts during ground breaking and digging or drilling. He/she should familiarise themselves with formations and its fossils or a palaeontologist should be appointed during the digging and excavation phase of the development. 6. All digging, excavating, drilling or blasting activities must be stopped if heritage and/or palaeontological artefacts are uncovered and a specialist should be called in to determine proper management, mitigation, excavation and/or collecting measures. 7. Any discovered artefacts or fossils shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from SAHRA should the proposed site affect any world heritage/palaeontology sites or if any heritage/palaeontology sites are to be destroyed or altered. 8. Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and contractors	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1). 9. If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies: • NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule; • NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule; • NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA; If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the		

		Chance Find Protocol must be implemented by the Environmental Control Officer (ECO) in charge of these developments. These discoveries ought to be protected and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation can be carry out by a paleontologist. **Chance Find Procedure** • If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find. • The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates. • A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates. • Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.		

		• Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary. • The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sandbags. The Heritage agency will also be able to advise on the most suitable method of protection of the find. • In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site. • Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.		
Waste Management		**Litter management** 1. Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction/mining site. 2. The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at registered/licensed landfill. 3. Good housekeeping practices should be implemented to regularly maintain the litter and rubble situation on the construction/mining site. 4. If possible and feasible, all waste generated on site must be separated into glass, plastic, paper, metal and wood and recycled. An independent contractor can be appointed to conduct this recycling. 5. Littering by the employees of the Contractor shall not be allowed under any circumstances. The ECO shall monitor the neatness of the work sites as well as the Contractor campsite.	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		6. Skip waste containers should be maintained on site. These should be kept covered and arrangements made for them to be collected regularly. 7. All waste must be removed from the site and transported to a landfill site promptly to ensure that it does not attract vermin or produce odours. 8. Where a registered waste site is not available close to the construction/mining site, the Contractor shall provide a method statement with regard to waste management. 9. A certificate of disposal shall be obtained by the Contractor and kept on file, if relevant. 10. Under no circumstances may solid waste be burnt on site. 11. All waste must be removed promptly to ensure that it does not attract vermin or produce odours. **Hazardous waste** 12. All waste hazardous materials must be carefully stored as advised by the ECO, and then disposed of offsite at a licensed landfill site, where practical. Incineration may be used where relevant. 13. Contaminants to be stored safely to avoid spillage. 14. Machinery must be properly maintained to keep oil leaks in check. 15. All necessary precaution measures shall be taken to prevent soil or surface water pollution from hazardous materials used during construction/mining and any spills shall immediately be cleaned up and all affected areas rehabilitated. **Sanitation** 16. The Contractor shall install mobile chemical toilets on the site. 17. Staff shall be sensitised to the fact that they should use these facilities at all times. No indiscriminate sanitary activities on site shall be allowed. 18. Toilets shall be serviced regularly and the ECO shall inspect toilets regularly.		

		19. Toilets should be no closer than 50m or above the 1:100 year flood line from any natural or manmade water bodies or drainage lines or alternatively located in a place approved of by the Engineer. 20. Under no circumstances may open areas, neighbours fences or the surrounding bush be used as a toilet facility. 21. The construction of "Long Drop" toilets is forbidden, but rather toilets connected to the sewage treatment plant. 22. Potable water must be provided for all construction staff. **Remedial actions** 23. Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site. 24. Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or disposed of at a licensed hazardous landfill site. 25. The ECO must determine the precise method of treatment for polluted soil. This could involve the application of soil absorbent materials as well as oil-digestive powders to the contaminated soil. 26. If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material. 27. If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure. 28. Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use. 29. Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal.		
Water Use and Quality	Water pollution	**Water Use** 1. Develop a sustainable water supply management plan to minimise the impact to natural systems by managing water use,		

		avoiding depletion of aquifers and minimising impacts to water users. 2. Water must be reused, recycled or treated where possible. **Water Quality** 3. The quality and quantity of effluent streams discharged to the environment including stormwater should be managed and treated to meet applicable effluent discharge guidelines. 4. Discharge to surface water should not result in contaminant concentrations in excess of local ambient water quality criteria outside a scientifically established mixing zone. 5. Efficient oil and grease traps or sumps should be installed and maintained at refueling facilities, workshops, fuel storage depots, and containment areas and spill kits should be available with emergency response plans. **Stormwater** 6. The site must be managed in order to prevent pollution of drains, downstream watercourses or groundwater, due to suspended solids and silt or chemical pollutants. 7. Silt fences should be used to prevent any soil entering the stormwater drains. 8. Temporary cut off drains and berms may be required to capture stormwater and promote infiltration. 9. Promote a water saving mind set with construction/mining workers in order to Contractor ensure less water wastage. 10. New stormwater construction must be developed strictly according to specifications from engineers in order to ensure efficiency. 11. Hazardous substances must be stored at least 20m from any water bodies on site to avoid pollution. 12. The installation of the stormwater system must take place as soon as possible to attenuate stormwater from the construction phase as well as the operation phase.		

		13. Earth, stone and rubble is to be properly disposed of, or utilized on site so as not to obstruct natural water path ways over the site. i.e. these materials must not be placed in stormwater channels, drainage lines or rivers. 14. There should be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed. 15. If a batching plant is necessary, run-off should be managed effectively to avoid contamination of other areas of the site. Untreated runoff from the batch plant must not be allowed to get into the storm water system or nearby streams, rivers or erosion channels or dongas. **Groundwater resource protection** 16. Process solution storage ponds and other impoundments designed to hold non fresh water or un-treated process effluents should be lined and be equipped with sufficient wells to enable monitoring of water levels and quality. **Sanitation** 17. Adequate sanitary facilities and ablutions must be provided for construction workers (1 toilet per every 15 workers). 18. The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution. **Concrete mixing** 19. Concrete contaminated water must not enter soil or any natural drainage system as this disturbs the natural acidity of the soil and affects plant growth. **Public areas** 20. Food preparation areas should be provided with adequate washing facilities and food refuse should be stored in sealed refuse bins which should be removed from site on a regular basis.		

		21. The Contractor should take steps to ensure that littering by construction workers does not occur and persons should be employed on site to collect litter from the site and immediate surroundings, including litter accumulating at fence lines. 22. No washing or servicing of vehicles on site.		

Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

H) MONITORING OF IMPACT MANAGEMENT ACTIONS

I) MONITORING AND REPORTING FREQUENCY

J) RESPONSIBLE PERSONS

K) TIME PERIOD FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS

L) MECHANISM FOR MONITORING COMPLIANCE

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Clearance of vegetation	Loss or fragmentation of habitats	• Conduct regular internal audits • Conduct regular external audits	• Environmental Manager • Suitable qualified environmental auditor	Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required.
Mining of the applied for minerals	Loss of topsoil Erosion Air Pollution Noise Impact on potential cultural, heritage artefacts and fossils	• Conduct regular internal audits • Conduct regular external audits	• Environmental Manager • Suitable qualified environmental auditor	Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required.
Waste management	Pollution	• Conduct regular internal audits • Conduct regular external audits	• Environmental Manager • Suitable qualified environmental auditor	Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a

				suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required.
Water Use and Quality	Water pollution	• Conduct regular internal audits • Conduct regular external audits	• Environmental Manager • Suitable qualified environmental auditor	Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required.

M) THE FREQUENCY OF THE SUBMISSION OF THE PERFORMANCE ASSESSMENT REPORT.

External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the Competent Authority if required.

N) ENVIRONMENTAL AWARENESS PLAN

1. **Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work**.

Impulse Mining (Pty) Ltd will implement an Environmental Awareness Plan which will include various mechanisms for informing employees of environmental risks resulting from their work, including:

- Induction training for full –time staff and contractors;
- In-house training sessions to be held with relevant employees;
- On the job training regarding environmental issues
- Training and skills development

The above measures will be implemented through an Environmental Communication Strategy to be implemented.

See the attached **Appendix 10** for the Awareness plan

i. **Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.**

Impulse Mining (Pty) Ltd will implement an incident reporting and reporting procedure in order to identify risks timeously and implement actions to avoid or minimise environmental impacts.

O) SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

(Among others, Confirm that the financial provision will be reviewed annually).

No specific information requirements have been detailed by the Competent Authority.

-END OF THE REPORT-