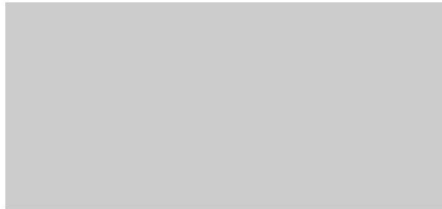


DRAFT BASIC ASSESSMENT REPORT

**MINING PERMIT APPLICATION FOR COAL, PSEUDOCOAL, TORBENITE/OIL
SHALE ON A PORTION OF PORTION 35 OF FARM RIETVLEI WITHIN THE
MAGISTERIAL DISTRICT OF VRYHEID, KWAZULU-NATAL (DMRE REFERENCE
NUMBER: KZN/30/5/1/1/2/10812MP)**



DECEMBER 2022



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT
And
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

PUBLIC REVIEW

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

NAME OF APPLICANT: IDLANGA MINING (PTY) LTD

TEL NO: 083 630 4150

FAX NO: 086 693 8318

POSTAL ADDRESS: Post Net Suite 8, Private Bag X7260, Emalahleni /Witbank

FILE REFERENCE NUMBER SAMRAD: KZN/30/5/1/1/2/10812MP

IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a mining 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 a 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.

OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

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 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;
 - (ba) may cause irreplaceable loss of resources; and
 - (ca) can be managed, avoided or mitigated;
- (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 manage, avoid or mitigate identified impacts; and
 - (iii) Identify residual risks that need to be managed and monitored.

TABLE OF CONTENTS

1.	INTRODUCTION	4
1.1	Location of the overall activity	4
1.2	Locality map	5
1.3	Details of the EAP	5
1.4	Expertise of the EAP	5
2.	DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY	6
2.1	Listed and specified activities.....	6
2.2	Description of the activities to be undertaken	7
6.	Mine Fleet and Hard Parking	10
3.	POLICY AND LEGISLATIVE CONTEXT	13
4.	NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES.....	14
5.	MOTIVATION FOR THE OVERALL PREFERRED SITE, ACTIVITIES AND TECHNOLOGY ALTERNATIVE. 14	
6.	FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ALTERNATIVES WITHIN THE SITE.....	15
6.1	Details of the development footprint alternatives considered.....	16
6.2	The property on which or location where it is proposed to undertake the activity.....	16
6.3	The type of activity to be undertaken	16
6.4	The option of not implementing the activity.....	16
7.	DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED	17
7.1	Public Participation Methodology	17
7.2	Identification of I&APs	17
7.3	List of Authorities Identified and Notified.....	18
7.4	List of Key Stakeholders Identified and Notified.....	18
7.5	Notification of I&APs	18
7.6	Description of the Information Provided to the Community, Landowners and I&APs	18
7.7	Summary of Issues Raised by I&APs	19
8.	ENVIRONMENTAL ATTRIBUTES AND ASSOCIATED ALTERNATIVES	20
8.1	Baseline Environment	20
8.1.1	Cadastral	20
8.1.2	Social and Economic	20
8.1.3	Geology	21
8.1.4	Agricultural capability.....	22
8.1.5	Biodiversity	22
8.1.6	Land Use	23
8.1.7	Noise	24
8.1.8	Air Quality	24
8.1.9	Topography	24
8.1.10	Climate	24
8.1.11	Hydrology	25
8.1.12	Heritage Resources.....	25
8.1.13	Vegetation	26
9.	METHODOLOGY OF IMPACT ASSESSMENT	27

10.	Impacts and risks identified	28
11.	Summary of specialist reports	36
12.	Environmental impact statement	37
12.1	Summary of the key findings of the environmental impact assessment.....	38
12.2	Final Site Map	38
12.3	Summary of the positive and negative implications and risks of the proposed activity and identified alternatives;	39
13.	Proposed impact management objectives and the impact management outcomes for inclusion in the EMPR;	39
14.	Aspects for inclusion as conditions of Authorization	40
15.	Description of any assumptions, uncertainties and gaps in knowledge	40
16.	Reasoned opinion as to whether the proposed activity should or should not be authorised	41
17.	Conditions that must be included in the authorisation.....	41
18.	Period for which the Environmental Authorisation is required.....	41
19.	Undertaking.....	42
20.	Financial Provision	42
20.1	Explain how the aforesaid amount was derived	42
20.2	Confirm that this amount can be provided for from operating expenditure.	42
21.	Specific Information required by the competent Authority.....	42
1.	INTRODUCTION	43
1.1	Details of the EAP	43
1.2	Description of the Aspects of the Activity	43
2.	ENVIRONMENTAL MANAGEMENT PRINCIPLES.....	43
2.1	Holistic principle	43
2.2	Best practicable environmental option	43
2.3	Sustainable development.....	43
2.4	Preventative principles	44
2.5	The precautionary principles	44
2.6	Duty of care and cradle to grave principle.....	44
2.7	Polluter pays principle	44
3.	FAILURE TO COMPLY WITH ENVIRONMENTAL CONSIDERATIONS	45
4.	Description of Impact management objectives including management statements	46

LIST OF TABLES

Table 1: Geographic Coordinates of the mining area	4
Table 2: Anticipated animal species	23

LIST OF FIGURES

Figure 1: Locality Map	5
Figure 2: Application Area	6
Figure 3: The Components Associated with a Gravel Road section	8
Figure 4: Coal Mining Stockpiling	9
Figure 5: Typical Coal ore Mining Quarry	9
Figure 6: Typical Mine Fence Signage	10
Figure 7: Typical Hardpan	10
Figure 8: Typical Channel Cross Section for Surface Water Diversion	11

Figure 9: Typical movable site office	12
Figure 10: Site layout plan	16
Figure 11: Wards Map (https://wazimap.co.za/profiles/ward-52603005-abaqulusi-ward-5-52603005/)	20
Figure 12: Gender, Population group statistics	21
Figure 13: Employment statistics	21
Figure 14: Geological map	22
Figure 15: Agricultural sensitivity map	22
Figure 16: Biodiversity Map	23
Figure 17: Elevation profile (North to South cross section)	24
Figure 18: The daily average high (red line) and low (blue line) temperature, with 25th to 75th and 10th to 90th percentile bands. The thin dotted lines are the corresponding average perceived temperatures (https://weatherspark.com/y/96306/Average-Weather-in-Vryheid-South-Africa-Year-Round)	25
Figure 19: Hydrological map	25
Figure 20: Vegetation Map	26
Figure 21: Cumulative sensitivity map	39
Figure 22: Final Layout Map	46

APPENDICES

- Appendix A-EAP CV and qualifications
- Appendix B-Maps and illustrations
- Appendix C-Public Participation
- Appendix D-Site photographs
- Appendix E-Mining Right Programme
- Appendix F-Ownership Information
- Appendix G-Specialist Assessments
- Appendix H-DFFE Screening Tool Report
- Appendix I-Other

ACRONYMS AND DESCRIPTIONS

ACRONYMS	DESCRIPTION
AIPs	Alien Invasive Plants
CBA	Critical Biodiversity Area
DBAR	Draft Basic Assessment Report
DWS	Department of Water and Sanitation
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ESA	Ecological Support Area
FBAR	Final Basic Assessment Report
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
NEMA	National Environmental Management Act
NFEPA	National Freshwater Ecosystem Priority Areas
NWA	National Water Act
PHRAG	The Provincial Heritage Resources Authority Gauteng
SAHRA	South African Heritage Resources Association
WULA	Water Use License Application
BAR	Basic Assessment Report

PART A: SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

1. INTRODUCTION

The Applicant, Idlanga Mining (Pty) Ltd, has appointed Thevha Sustainable Services (Pty) Ltd to apply for proposed mining permit application for coal on a portion of portion 35 of Farm Rietvlei within the magisterial district of Vryheid, KwaZulu-Natal. The proposed mining site is in Ward 5 of the Abaqulusi Local Municipality under the jurisdiction of the Zululand District Municipality (**Figure 1**).

The geographic coordinates of the mining area can be noted on **Table 1** below.

Table 1: Geographic Coordinates of the mining area

Mining Locations	Latitude	Longitude
A	-27.7635	31.0343
B	-27.7629	31.0358
C	-27.7659	31.0365
D	-27.7664	31.0352

1.1 Location of the overall activity

FARM NAME:	Rietvlei 150 HU Portion 35
APPLICATION AREA (HA)	The application area is approximately 5 (ha) in extent
MAGISTERIAL DISTRICT:	Abaqulusi
DISTANCE AND DIRECTION FROM NEAREST TOWN	Approximately 21 km east of Vryheid in KwaZulu-Natal
21 DIGIT SURVEYOR GENERAL CODE FOR EACH FARM PORTION	NOHU00000000015000035

1.2 Locality map

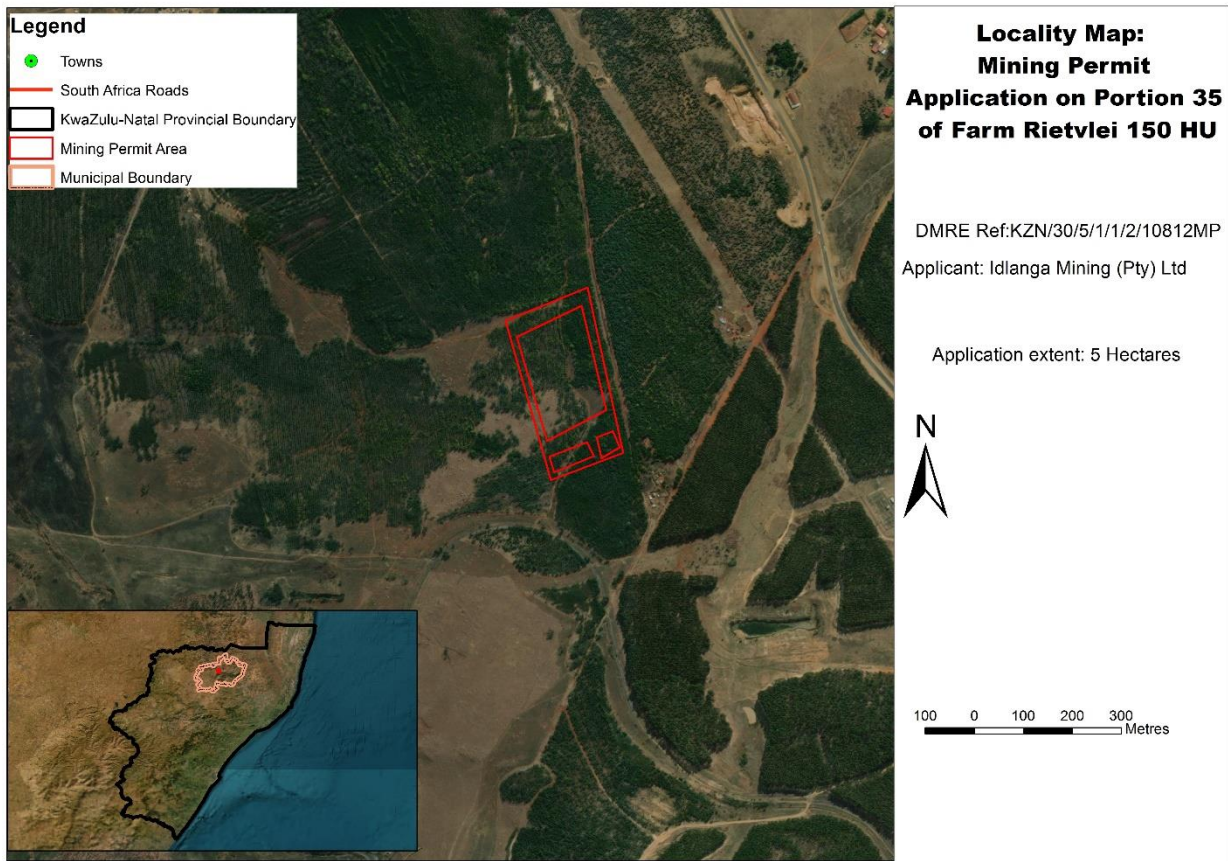



Figure 1: Locality Map

1.3 Details of the EAP

Name of The Practitioner:	 Thevha Sustainable Services (Pty) Ltd Vanessa Nkosi
Cell No:	076 376 2045
E-mail address:	info@thevhastainableservices.co.za

1.4 Expertise of the EAP

The qualifications of the EAP (with evidence).

BSc (Geology)	University of Pretoria
Post-graduate Diploma in Integrated Water Management	University of Free-State

The CV of the EAP has been included on Appendix A for further evaluation.

2. DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site.

The Applicant, Idlanga Mining (Pty) Ltd, has appointed Thevha Sustainable Services (Pty) Ltd to apply for proposed mining permit application for coal on a portion of portion 35 of Farm Rietvlei within the magisterial district of Vryheid, KwaZulu-Natal. The proposed mining site is in Ward 5 of the Abaqulusi Local Municipality under the jurisdiction of the Zululand District Municipality.

The proposed mine works program includes site preparation, access haul road construction, stockpiling of coal and topsoil, excavation or mining, fencing, mine office and hard pan, storm water trenching around the mining permit, waste management, and mine closer and rehabilitation.

The Mining Work Programme (PWP) has been attached as **Appendix E** of this report.

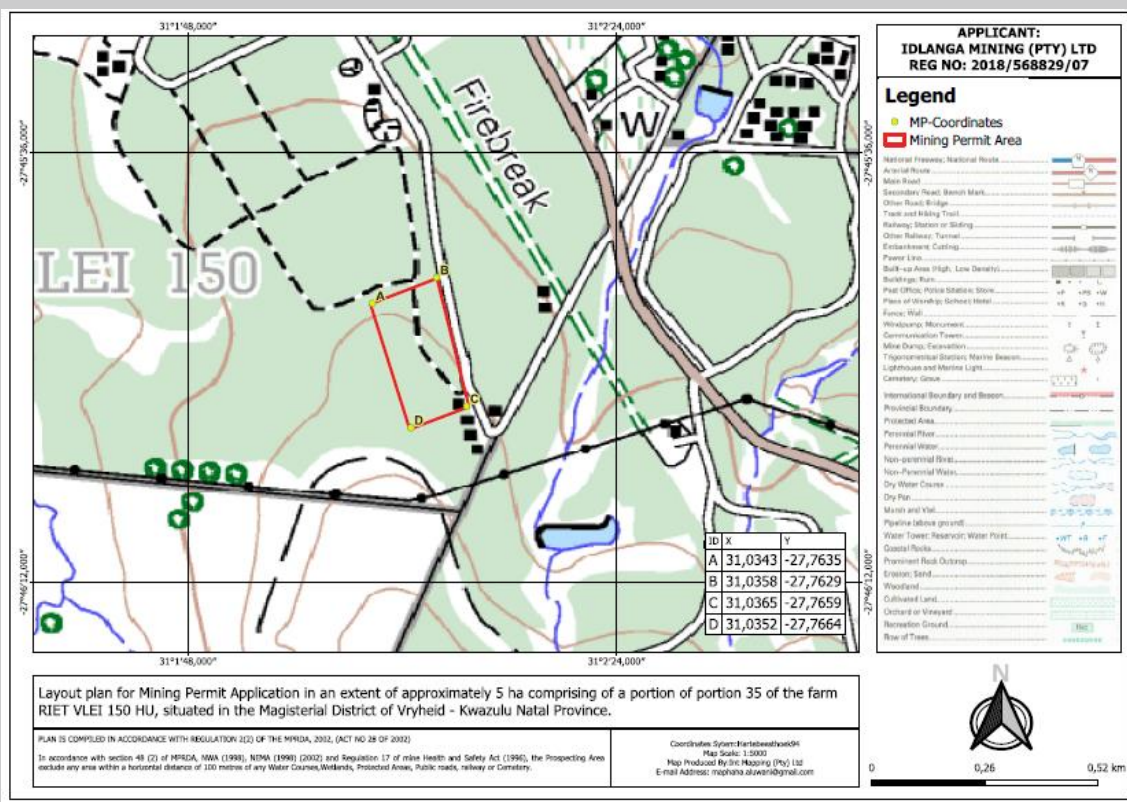


Figure 2: Application Area

2.1 Listed and specified activities

NAME OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY	APPLICABLE LISTING NOTICE	WASTE MANAGEMENT AUTHORISATION
Mining Permit Area	5 ha	Government Notice, No. R. Activity 21 327, April 2017 (LN1)	X
Site establishment	5 ha	Government Notice, No. R. Activity 21 327, April 2017 (LN1)	X
Stockpile topsoil	5 ha	Government Notice, No. R. Activity 21 327, April 2017 (LN1)	X
Open pit mining	5 ha	Government Notice, No. R. Activity 21 327, April 2017 (LN1)	X
Loading	5 ha	Government Notice, No. R. Activity 21 327, April 2017 (LN1)	X
Hauling and transport	5 ha	Government Notice, No. R. Activity 21 327, April 2017 (LN1)	X
Ablution facilities	5 ha	Government Notice, No. R. Activity 21 327, April 2017 (LN1)	X
Rehabilitation of site	5 ha	Government Notice, No. R. Activity 21 327, April 2017 (LN1)	X
Clearance of vegetation	5ha	Government Notice, No. R. Activity 12 324, April 2017 (LN3)	X
TOTAL APPROXIMATE AREA		5 HA	

2.2 Description of the activities to be undertaken

(Describe Methodology or technology to be employed, including the type of commodity to be prospected/ mined and for a linear activity, a description of the route of the activity).

The following site activities will be carried out and are associated with planned mining activity:

1. Site Preparation

Site preparation mainly deals with removing vegetation cover, stripping and stockpiling of topsoil prior to the mining activities. The proposed coal mining might not have topsoil at all due to weathering. However, should there be topsoil available, the site preparation may affect the quality and quantity of the available valuable topsoil. Therefore, soil management is essential. This is because soil management is for the following objectives:

- To provide sufficient stable topsoil material for rehabilitation;
- To optimise the preservation and recovery of topsoil for rehabilitation;
- To identify soil resources and stripping guidelines;
- To identify surface areas requiring stripping (to minimise over clearing);
- To manage topsoil reserves so as to not degrade the resource;
- To identify stockpile locations and dimensions; as well as
- To identify soil movements for rehabilitation use.

In accordance with the objective of providing sufficient stable soil material for rehabilitation and to optimise soil recovery, the following strategies have to be adopted:

- Construction of stockpiles by dozers rather than scrapers to minimise structural degradation.
- Construction of stockpiles with a "rough" surface condition to reduce erosion hazard, improve drainage and promote re-vegetation.
- Re-vegetation of stockpiles with appropriate fertiliser and seed in order to minimise weed infestation, maintain soil organic matter levels, soil structure and microbial activity and maximise the vegetative cover of the stockpile depending on the exposure timeframes.

In cognisance of the final void which has a considerable surface area relative to the total area mined as well as topsoil being recovered from all areas to be mined; it is anticipated that a topsoil surplus over the life of mine will not occur.

2. Access and Haul Road Construction

The dirt road measuring approximately 1.5km leading into the mine will be upgraded to meet the required standards which means improving it into a gravel road. This will be the main road used to access the mine, offices and hardpan. Coal transportation trucks will also use this road to enter and exit the mine premises. Several temporary haul roads inside the mine will also be constructed to access the mine area as well as the sand stockpile area. These haul roads will be used by mine personnel to access the mine areas for day-to-day duties and the dump trucks will use the road for haulage of sand to the sand stockpiles. The roads will be constructed to have a width of 8m. Dust suppression will be managed by way of using water carts with an added chemical dust suppressant which is an environmentally friendly product.

In order to maintain a gravel road properly operators must clearly understand the need for three basic items:

- A crowned driving surface;
- A shoulder area that slopes away from the edge of the driving surface; as well as
- Ditch.

The shoulder area and the ditch of many gravel roads are minimal. This is particularly true in regions with very narrow or confined right-of-ways. However, regardless of the location, the basic shape of the cross section must be correct, or a gravel road will not perform well, even under very low traffic. The figure below illustrates the components of a typical cross section of a gravel road that must be considered.

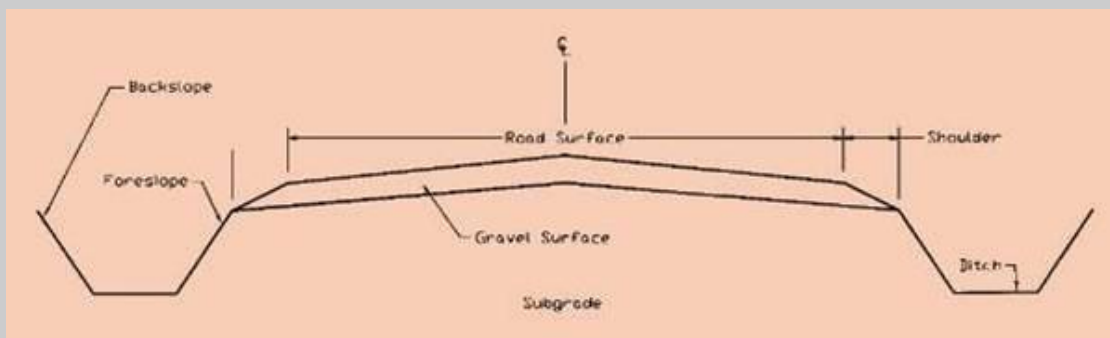


Figure 3: The Components Associated with a Gravel Road section

Gravel roads tend to rut more easily in wet weather. Traffic also tends to displace gravel from the surface to the shoulder area and even to the ditch during dry weather. Managers and equipment operators have the continual responsibility of keeping the roadway properly shaped. The shape of the road surface and the shoulder area is the equipment operator's responsibility and is classified as routine maintenance. Keeping the fore-slope and ditch established and shaped is often the maintenance operator's responsibility as well. The main aim of the design and associated maintenance is to keep water drained away from the roadway. Standing water at any place within the cross section (including the ditch) is one of the major reasons for distress and failure of a gravel road.

There is sometimes a need for specialized equipment to do major reshaping of the cross section, especially in very wet conditions. However, the operator of routine maintenance equipment must do everything possible to take care of the roadway. The recommended shape of each part of the cross section will be considered during road planning. When a gravel road is maintained properly, it will serve low volume traffic well. Unfortunately, most gravel roads will fail when exposed to heavy hauls even when shaped properly. This is due to weak subgrade strength and marginal gravel depths which are often problems with gravel roads. The low volume of normal traffic does not warrant reconstruction to a higher standard. However, improper maintenance can also lead to very quick deterioration of a gravel road, especially in wet weather. The maintenance equipment operators must always work at maintaining the proper crown and shape. During mining extra maintenance and wetting of the roads to ensure minimal dust generation will be required.

3. Stockpiles (Topsoil and Sand Stockpiles)

Positions of the topsoil have been indicated on the mine surface layout plan. All topsoil material will be removed during the mining operation and stockpiled separately for the purpose of backfill rehabilitation as discussed above. The stripping, handling and preservation of topsoil has also been reflected on earlier in this report due to the importance of topsoil for rehabilitation purposes. The topsoil stockpiles will not exceed a height of 6m which is high enough to reduce leaching impacts of stockpiled topsoil. The topsoil shall be adequately protected from being blown away by wind or eroded by the force of water. The topsoil stockpile areas will cover an area of approximately 0.04ha.

The coal stockpiling area will be constructed to cover an area of approximately 0.3ha and will not contain more than 2000 tons. The stockpile will also not exceed a height of 4m. The stockpile will be used to load sand from the mining area as well as to cater for any ceases in production resulting from breakdown or disruption of workings.



Figure 4: Coal Mining Stockpiling

4. Mining (Open Cast)

The most economical and safe method of coal mining is open pit. The impact of the coal mining processes is generally distinguished by whether they operate on. Summer seasons are very difficult for mining, so winter is preferred. Heavy rain and flooding are the biggest threat to coal mining during summer seasons. This often results in pit flooding and stockpile collapsing.

Assessment of technical and economic feasibility of a potential sand mine requires consideration of many factors including, regional geology, overburden if available, sand quality, climate, land ownership, surface drainage patterns, ground water, availability of labour and materials, sand purchaser and destination as well as capital investment requirements. Natural sand is usually mined with conventional earth-moving equipment. The quality and final use of the coal usually determines the amount of processing necessary. Washing and screening is used in some instances to produce better-quality coal.

The proposed coal mining project will use the open pit mining method and it will rehabilitate unmined areas. The open-cast reserves will be mined in conventional truck and shovel mining methods. This would mean mining from the one side of the development footprint in a linear fashion towards the opposite side while rehabilitating the area that has already been mined thus, creating the effect that the mining cuts are rolling over in a single direction. The process is driven primarily by legislation which ensures that the mine owner complies with the objective of achieving end conditions defined in broad terms by legislative guidelines. The primary procedures that will be implemented during the mining process include:

- Clearing and grubbing of the vegetative matter;
- Removing and stockpiling of topsoil;
- Trenching around the mining footprint to ensure storm water is controlled;
- Collection and stockpiling of overburden (if any);
- Excavation of the initial sand strip and load them to truck;
- Backfill rehabilitation concurrently as mine progress forward; and
- The use of a container storage; office and the provision of a portable chemical toilet.



Figure 5: Typical Coal ore Mining Quarry

5. Fencing

Fencing of the entire mining area will be required as a means of ensuring safety and that trespassers are kept at bay. The fencing however will be ecologically sensitive therefore it is important to ensure the effective migration of certain small species. These are to be identified by an ecological specialist who will conduct an investigative report. Fences will be appropriately fixed and appropriate signage will be displayed, similar to the signs in the images below. The necessary signage will also be erected at sites of archaeological and/or heritage importance to ensure visitors can easily and safely access the premises.



Figure 6: Typical Mine Fence Signage

6. Mine Fleet and Hard Parking

Designated parking areas will be constructed by compaction of the subsoil after removal, storage and preservation of the valuable layer of topsoil. Uncovered parking areas for mine fleet vehicles will be constructed in an area separate to the staff and visitors parking as a safety measure, one example being, mine fleet vehicles are very large and pose as safety hazard. The necessary waste receptacles as well as oil spill kits will be provided at these sites in case of accidental spillage or leakage of oil/greases from the vehicles.



Figure 7: Typical Hardpan

7. Storm Water Trenches

Images for clarification purposes have been provided below, indicating cross sections of water diversion trenches which will be constructed around the mining area.

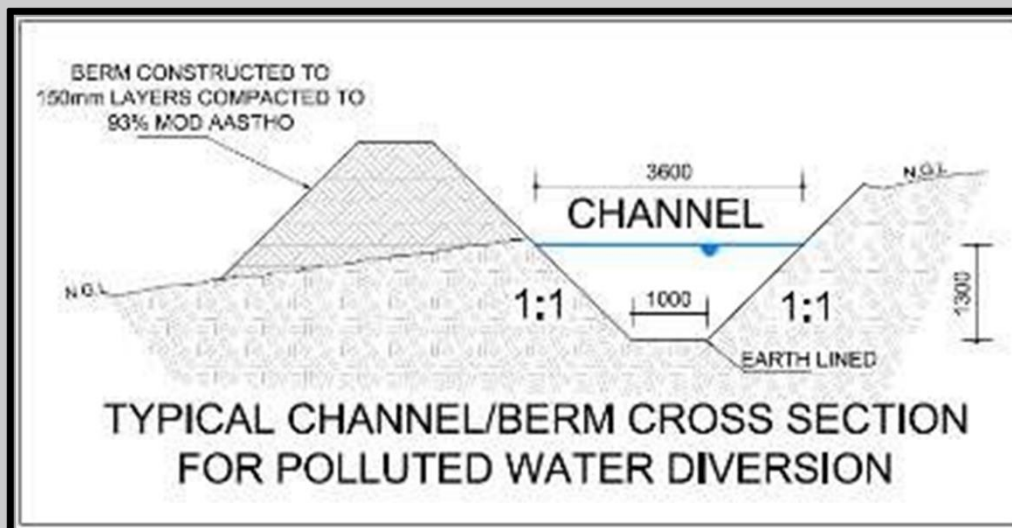


Figure 8: Typical Channel Cross Section for Surface Water Diversion

8. Waste Management

Waste will be generated from the start to the decommissioning of the project. It is proposed that the waste that will be generated on site be managed by reducing, reusing and recycling as far as possible. A certified and approved external contractor will be responsible for the removal and disposal of the waste to a registered landfill. The overall aim of the project is to keep the carbon footprint of the entire project as small as possible. This will include the use of “green” products as far as possible as well as the reclamation of all building rubble during the construction phase. Waste streams can be categorised into six different streams, based on similar health and environmental concerns namely:

- **Inorganic Wastes** – acids, alkalis, cyanide wastes, heavy metal sludges and solutions, asbestos wastes and other solid residues.
- **Oily Wastes** – primarily from the processing, storage and use of mineral oils.
- **Organic Wastes** – halogenated solvents residues, non-halogenated solvent residues, polycarbonic based (PCB) wastes, paint and resin wastes.
- **Putrescible Organic Waste** – wastes from production of edible oils, slaughter houses, tanneries and other animal based products.
- **High Volume/Low Hazard Wastes** – waste based on their intrinsic properties present relatively low hazards but may pose problems due to high volumes such as fly ash from power plants.
- **Miscellaneous Wastes** – the following basic principles of rehabilitation form the basis of the roll-over mining methodology that entails concurrent rehabilitation as mining progress:

9. Site Office (with Septic/Chemical Ablution Facilities)

The site offices for the project, including a small security hut at the entrance of the mining area next to the main entrance will consist of container-type offices that are commercially available as off the shelf products – as illustrated in the image below. This ensures minimal construction on site as well as minimal footprint. Keeping the disturbance minimal in the area and ensuring ease of mine closure and rehabilitation after the life of the mine makes the temporary offices ideal, especially considering the short duration of the proposed activities and requirement of these offices. The visual impact associated with the structures will also be considered and natural colour paint will be applied to the structures to blend in with the background features. Mobile chemical toilets will be used and supplied by an approved contractor who will be responsible for the management of these toilets. Water requirements relating to ablutions and drinking water are expected to be minimal; water to be sourced from the nearby town. The current expectation is that 15 employees will require 40 litres per person per day (litre pp/day) amounting to 600 litres per day.



Figure 9: Typical movable site office

10. Mine Closure and Rehabilitation

When planning for closure, there are four key objectives that will be considered:

- Protect public health and safety;
- Alleviate or eliminate environmental damage;
- Achieve a productive use of the land by all means possible or a return to its original condition or an acceptable alternative; and
- To the extent achievable, provide for sustainability of social and economic benefits resulting from mine development and operations.

Impacts that change conditions affecting these objectives are often broadly discussed as the 'impacts' or the environmental impacts of a site or a closure plan. It is convenient to consider potential impacts in four groupings:

- **Physical Stability** – include (but not limited to) buildings, structures, workings, pit slopes, underground openings, which must be stable so as to eliminate any hazards. These risks are considered taking into account aspects such as public health and safety or material erosion to the terrestrial or aquatic receiving environment at concentrations that are harmful. Therefore, engineered structures must not deteriorate and fail.
- **Geochemical Stability** – no geochemical instability is anticipated.
- **Land Use** - the closed mine site must be rehabilitated to pre-mining conditions or conditions that are compatible with the surrounding lands or achieves an agreed alternative productive land use. Generally, the former requires the land to be aesthetically similar to the surroundings and capable of supporting a self-sustaining ecosystem typical of the area.
- **Sustainable Development** - elements of mine development that contribute to (impact) the sustainability of social and economic benefit, post mining, should be maintained and transferred to succeeding custodians.

3. POLICY AND LEGISLATIVE CONTEXT

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT?
Constitution of the Republic of South Africa (Bill of Rights), 1996	Chapter 2 section 24	The mining activities shall be conducted in such a manner that significant environmental impacts are avoided, where significant impacts cannot all together be avoided, be minimised and mitigated in order to protect the environmental right of South Africans.
Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA)	Section 16, 17, and 39 of MPRDA This entire report is prepared as part of the Mining Right Application under the MPRDA	In terms of the Mineral and Petroleum Resources Development Act a Mining Right Application has been applied for.
National Environmental Management Act, 1998 (Act 107 of 1998)	Listed Activity 20 of Regulation R327 (December 2014) as amended in April 2017. This entire report is prepared as part of the Application for Environmental Authorizations under the NEMA.	In terms of the National Environmental Management Act an Application for Environmental Authorization subject to a Basic Assessment Process has been applied for.
National Water Act, 1998 (Act 36 of 1998) (NWA)	Not applicable Due to the nature of the proposed mining activities no Section 21 water uses will be triggered, therefore there is no requirement to apply for Water Use authorisation in terms of the NWA.	In terms of the National Water Act, no Water Use License has been applied for. It is anticipated that prior to the commencement of the mining activities, the applicant will formally engage the Department of Water and Sanitation accordingly.
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004): National Dust Control Regulations (GN 827)	Not applicable	Appropriate dust extractions/ suppression equipment will be a condition imposed on the drill contractor for their drill rigs.
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEMWA) as amended	Waste management on site	The generation of potential waste will be minimised through ensuring employees of the mining contractor are subjected to the appropriate environmental awareness campaign before commencement of mining. All waste generated during the mining activities will be disposed of in a responsible legal manner. Proof of legal disposal will be maintained on site.
National Heritage Resources Act, 1999 (Act 25 of 1999)	An official burial grounds was identified in close proximity to the mining right area at approximately 2km away.	A 50m buffer has been applied around the burial ground.

4. 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).

The mining industry is of great importance to the South African economy. It is common knowledge of how small-scale mining has dominated the local area and associated business and job opportunities.

The definition of mining in terms of the MPRDA states: "intentionally searching for any minerals by means of any method which disturbs the surface or sub-surface of the earth, including any portion of the earth that is under the sea or under other water..." Mining is the physical search for minerals, fossils, precious metals or mineral specimens, which allows a company to survey or investigate an area of land for the purpose of identifying an actual or probable mineral deposit, before investments are made into the mining activities.

In terms of the EIA Regulations the need and desirability of any development must be considered by the relevant competent authority when reviewing an application. The need and desirability must be included in the reports to be submitted during the environmental authorisation application processes.

With the rise in unemployment rate in youth within the country, on the February 2022, State of the Nation Address (SONA), President Cyril Ramaphosa encouraged the private to assist with the job provision. Therefore, the contribution of the mining sector within the municipal and even national economic industry has motivated the applicant to promote local development through the introduction of additional mines within the municipality.

5. MOTIVATION FOR THE OVERALL PREFERRED SITE, ACTIVITIES AND TECHNOLOGY ALTERNATIVE.

The identification of alternatives is a key aspect of the success of the Basic Assessment process. All reasonable and feasible alternatives must be identified and screened to determine the most suitable alternatives to consider in this application. There are, however, some constraints that have to be considered when identifying alternatives for a project depending on the scope. Such constraints include financial, social and environment related constraints. Alternatives can typically be identified according to:

- Activity Alternatives
- Location Alternatives
- Design or Layout Alternatives
- Technology Alternatives
- Operational Alternatives
- No-Action Alternative (No-Go)

For any alternative to be considered feasible, such an alternative must meet the need and purposes of the development proposal without presenting significantly high associated impacts. Alternatives are typically distinguished into discrete or incremental alternatives. Discrete alternatives are overall development options, which are typically identified during the pre-feasibility, feasibility and/or Basic Assessment process. Incremental alternatives typically arise during the Basic Assessment process and are usually suggested as a means of addressing/mitigating identified impacts (mining in low sensitivity areas). These alternatives are closely linked to the identification of mitigation measures and are therefore not specifically identified as distinct alternatives.

For the purpose of this project the need and justification for alternatives was specifically guided by the relatively low sensitivity of the receiving socio-economic and biophysical environment.

Motivation for the overall preferred site, activities, and technology alternative

The motivation towards the selection of the preferred was based on the coal ore location, residential areas, agricultural activities as well the environmental sensitivity of the original mining permit area.

**6. FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED
PREFERRED ALTERNATIVES WITHIN THE SITE**

6.1 Details of the development footprint alternatives considered

The table below indicates the location of the site camp inclusive of site camp infrastructure i.e., stockpile area, topsoil stockpile area, office and hardpan, access gate, access road, stormwater trenches and the mining area.

Area	Size	Latitude	Longitude
Stockpile Area	3000m ²	27°45'57.76"S	31° 2'8.02"E
Topsoil stockpile area	400m ²		
Office and hardpan	140m ²	27°45'57.02"S	31° 2'10.36"E
Access gate	8m	27°45'57.68"S	31° 2'10.42"E
Access road Start	755m	27°45'57.68"S	31° 2'10.42"E
Access road End		27°46'1.66"S	31° 2'13.36"E

6.2 The property on which or location where it is proposed to undertake the activity

The Figure below indicates the proposed site layout plan.

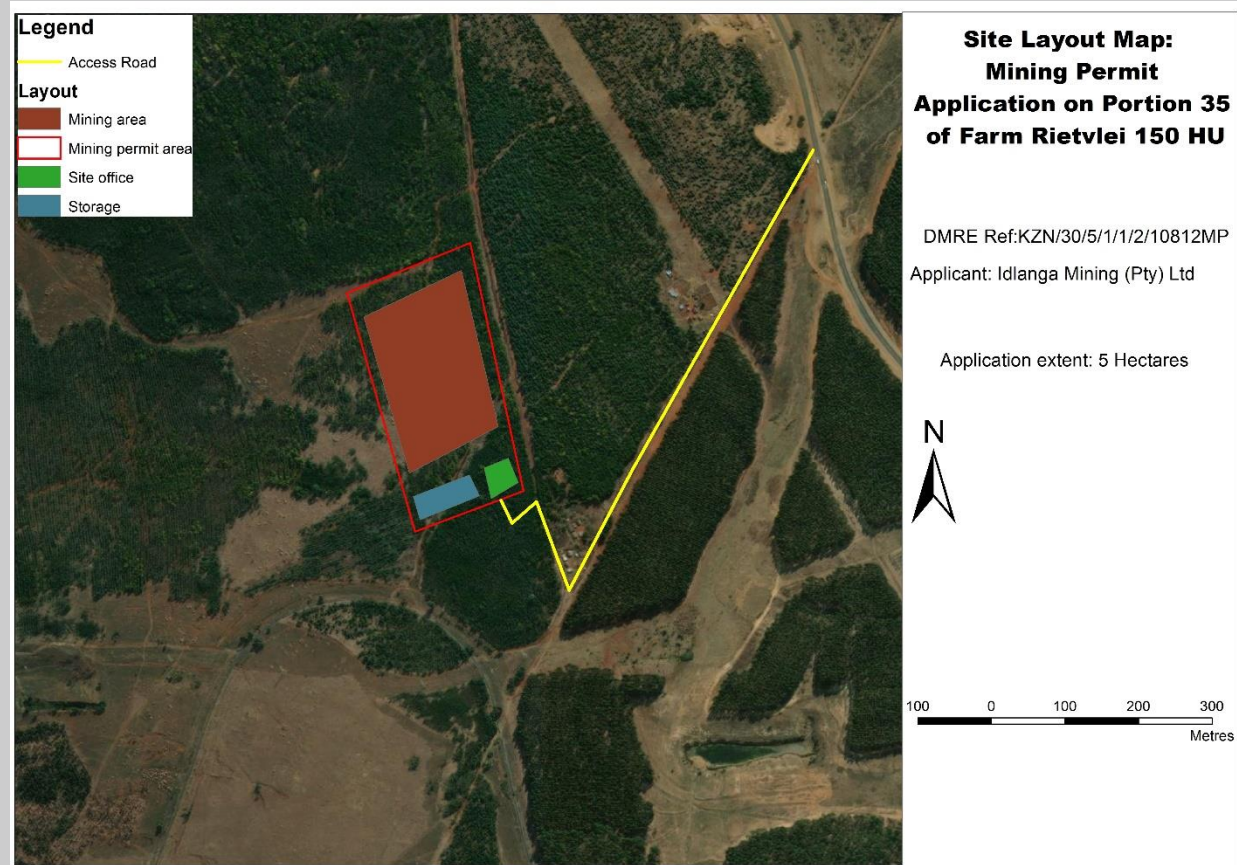


Figure 10: Site layout plan

6.3 The type of activity to be undertaken

In terms of the technologies proposed, these have been chosen based on the long-term success of the company in terms of their mining history. The mining activities proposed in the Mining Works Programme is dependent on the preceding phase as previously discussed, therefore, no alternatives are indicated, but rather a phased approach of trusted mining techniques.

6.4 The option of not implementing the activity

Mining activities are essential to investigate and confirm the existence/presence of coal ore and also required to generate a SAMREC compliant mineral resources statement or competent persons report (CPR). Furthermore, investment in the mining

industry will not transpire without mining activities and should the Mining Right application be denied, valuable economic and socio-economic opportunities may be lost.

7. DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

7.1 Public Participation Methodology

The Public Participation Process (PPP) is a requirement of several pieces of South African Legislation and aims to ensure that all relevant Interested and Affected Parties (I&APs) are consulted, involved and their opinions are taken into account and a record included in the reports submitted to Authorities. The process ensures that all stakeholders are provided this opportunity as part of a transparent process which allows for a robust and comprehensive environmental study. The public participation process undertaken was done in accordance to Regulation 39 – 44 of the EIA Regulations, 2014 (amended) summarised below;

- (a) fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of—
 - (i) the site where the activity to which the application or proposed application relates is or is to be undertaken; and
- (b) giving written notice, in any of the manners provided for in section 47D of the Act, to—
 - (i) the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;
 - (ii) owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;
 - (iii) the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;
 - (iv) the municipality which has jurisdiction in the area;
 - (v) any organ of state having jurisdiction in respect of any aspect of the activity; and
 - (vi) any other party as required by the competent authority;
- (c) placing an advertisement in—
 - (i) one local newspaper;
- (d) conduction of focus or public meetings

7.2 Identification of I&APs

A Draft IAP list has been included in this Report as **Appendix C6**. The IAP database was compiled containing the following categories of stakeholders.

- Provincial Authorities
- Local Authorities
- State-owned companies
- Other organisations, clubs, communities, and unions.
- Communal Property Association
- Community members

7.3 List of Authorities Identified and Notified

The following authorities have been identified and notified of the proposed Mining Permit:

- KZN Department of Mineral Resources and Energy
- KZN Department of Transport;
- KZN Department of Economic Development, Tourism and Environmental Affairs
- KZN Corporative Governance and Traditional Affairs
- KZN Department of Water and Sanitation
- KZN Department of Agriculture
- Abaqulusi Local Municipality
- Zululand District Municipality

7.4 List of Key Stakeholders Identified and Notified

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

- Ezemvelo KZN Wildlife
- South African Heritage Resources Agency/Amafa
- landowners

7.5 Notification of I&APs

Notification documents were prepared in English. All pre-identified I&APs, including those that requested to be registered as I&APs during the initial public consultation phase of the Basic Assessment process were notified of the proposed Prospecting Right Application via the following methods:

- Notification letters (Hand delivered and emailed) See **Appendix C4**
- Site notices at various locations on-site. See **Appendix C1**
- Placement of newspaper adverts in the *Vryheid Herald*.. See **Appendix C2**

7.6 Description of the Information Provided to the Community, Landowners and I&APs

Notification documents sent to all pre-identified I&APs included the following information:

- Locality map
- List of activities to be authorised.
- Scale and extent of activities to be authorised.
- The duration of the activity.
- The purpose of the proposed project.
- The mining methods to be used.
- Details of the affected property
- Details of the MPRDA and NEMA regulations that must be adhered to.
- The minerals being prospected for.
- Date by which comment, concerns and objections must be forwarded through to TSS.
- Contact details of the Environmental Assessment Practitioner (EAP).

7.7 Summary of Issues Raised by I&APs

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

Appendix C7 has been attached for the purpose of providing a detailed response of the comments received on the Draft BAR.

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	DATE COMMENTS RECEIVED	COMMENT RECEIVED	RESPONSE ISSUED
PROVINCIAL AUTHORITY				
KZN Department of Mineral Resources and Energy	X	N/A	No comments received to date	N/A
KZN Department of Economic Development, Tourism and Environmental Affairs	X	N/A	No comments received to date	N/A
KZN Department of Transport	X	N/A	No comments received to date	N/A
KZN Corporative Governance and Traditional Affairs	X	N/A	No comments received to date	N/A
KZN Department of Water and Sanitation	X	N/A	No comments received to date	N/A
KZN Department of Agriculture	X	N/A	No comments received to date	N/A
LOCAL AUTHORITIES				
Zululand District Municipality	X	N/A	No comments received to date	N/A
Abaqulusi Local Municipality	X	N/A		
STATE OWNED COMPANIES				
Ezemvelo KZN Wildlife	x	N/A	No comments received to date	N/A
Amafa	x	N/A	No comments received to date	N/A
OTHER PARTIES				
FARM OWNERS / LOCAL COMMUNITY MEMBERS				
See attached Appendix C5				

8. ENVIRONMENTAL ATTRIBUTES AND ASSOCIATED ALTERNATIVES

8.1 Baseline Environment

This section describes the baseline receiving environment of the mining area. Information in this section is based on desktop studies by the EAP, a site visits conducted during the period of October 2022, input from the public through the I&AP questionnaire. As such, the descriptions below of environmental features represent a consolidation of relevant information to the Application Area.

8.1.1 Cadastral

The application area is noted to be on a portion of portion 35 of Farm Rietvlei within the magisterial district of Vryheid, KwaZulu-Nata. The land is owned by Emhlangeni CPA as attached in **Appendix F**.

8.1.2 Social and Economic

Vryheid will be utilised to detail the demographics of the study area as the closest Central Business District (CBD) to the site.

According to Stats Sa 2011 Abaqulusi Municipality is located in the northern part of KwaZulu-Natal and is approximately 1943 km² in extent and has a population of about 211 060 people. It constitutes about 13.13% of the Zululand District Municipality and is one of the five local municipalities that make up the district. Vryheid is located in Abaqulusi local municipality, within the province of KwaZulu-Natal.

The proposed mining site is located in Ward 05 of the Abaqulusi Local Municipality under the jurisdiction of the Zululand District Municipality (**Figure 11**).

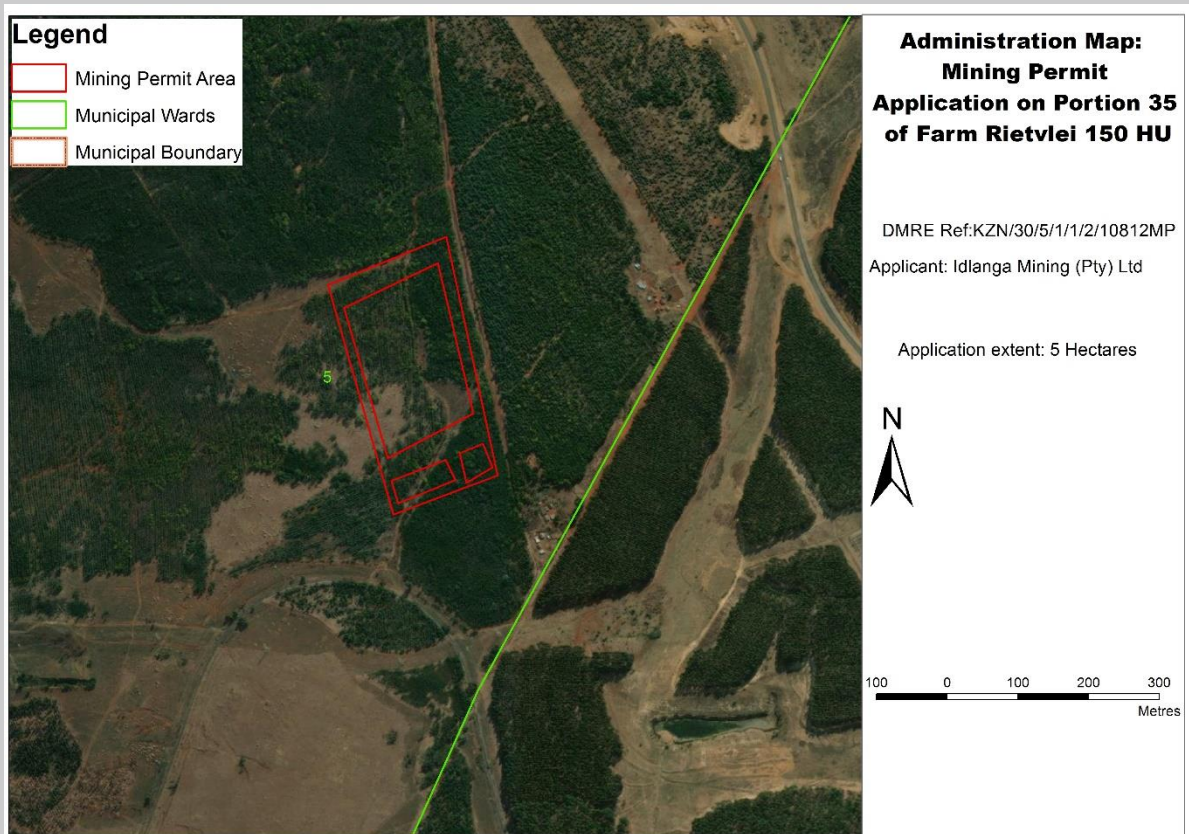


Figure 11: Wards Map (<https://wazimap.co.za/profiles/ward-52603005-abaqulusi-ward-5-52603005/>)

According to Census 2011, Ward 05 Abaqulusi Local Municipality has a total population of 7 863, of entirely 99% black Africans. Of those aged 20 years and older, 42.8% have completed grade 9 or higher, and 20.8% have completed matric.

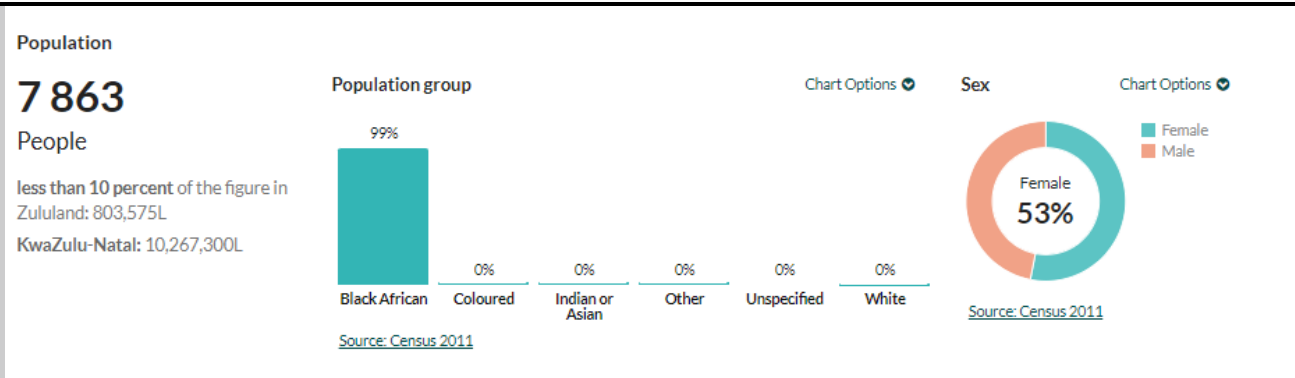


Figure 12: Gender, Population group statistics

Unemployment is rife in the ward with more than 9.4% of the population is employed whilst the municipality has 18.59 % employment rate.

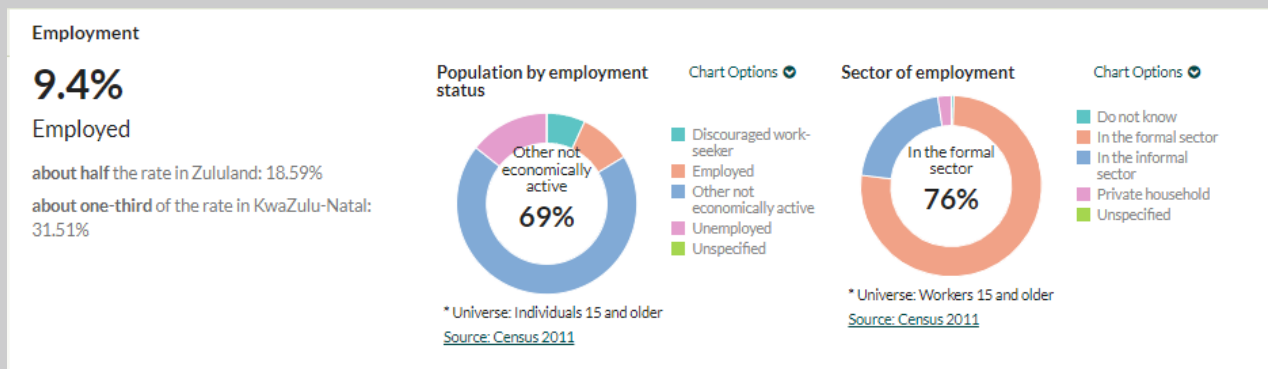


Figure 13: Employment statistics

8.1.3 Geology

The Lower Permian Pietermaritzburg Formation is a mudrock-dominated, upward-coarsening stratigraphic unit in the lower Ecca Group (Karoo Supergroup) in the northeastern part of the main Karoo Basin of South Africa. The formation extends over most of the province, and due to its lithology and the local climate, it is KwaZulu-Natal usually poorly exposed; hence the description is mainly based on borehole records. From a measured thickness of about 430 m south of the type area around Pietermaritzburg, the formation thins progressively northwards and pinches out against the Dwyka Group and pre-Karoo basement north of latitude 26° 30' S. This Lower Permian formation is considered a stratigraphic equivalent of the Prince Albert Formation in the southern part of the main Karoo Basin.

The Pietermaritzburg Formation only preserves scattered, fragmentary plant fossil and invertebrate trace fossils, which are diagnostic of marine conditions (e.g., Helminthopsis). Based on its sedimentary facies' characteristics and ichnofossil assemblages, the unit was probably deposited under low energy conditions on a northerly shallowing marine shelf that initially experienced deepening (during a major Artinskian transgression) and then shallowing in the early Kungurian.

The mudrock-dominated Lower Permian Pietermaritzburg Formation comprises fissile, medium- to dark grey, greyish olive, dark greenish grey, olive grey, greyish blue to medium bluishgrey, laminated, often carbonaceous shales with subordinate sandstone, and shows a general decrease in thickness from south to north. It weathers easily and can contribute to slope stability problems under the often hot, wet, high humidity conditions of the KwaZulu-Natal Province, which is the type area of the unit.



Figure 14: Geological map

8.1.4 Agricultural capability

According to the Department of Forestry, Fisheries and the Environment Screening Tool, a high sensitivity towards agriculture is noted within the larger extent of mining area. Large scale forestry plantations are noted within the study area.



Figure 15: Agricultural sensitivity map

8.1.5 Biodiversity

According to the KZN Conservation Plan, the study area is situated within Critical Biodiversity Areas Irreplaceable and Optimal. The study area is not situated within any CBA or ESA.

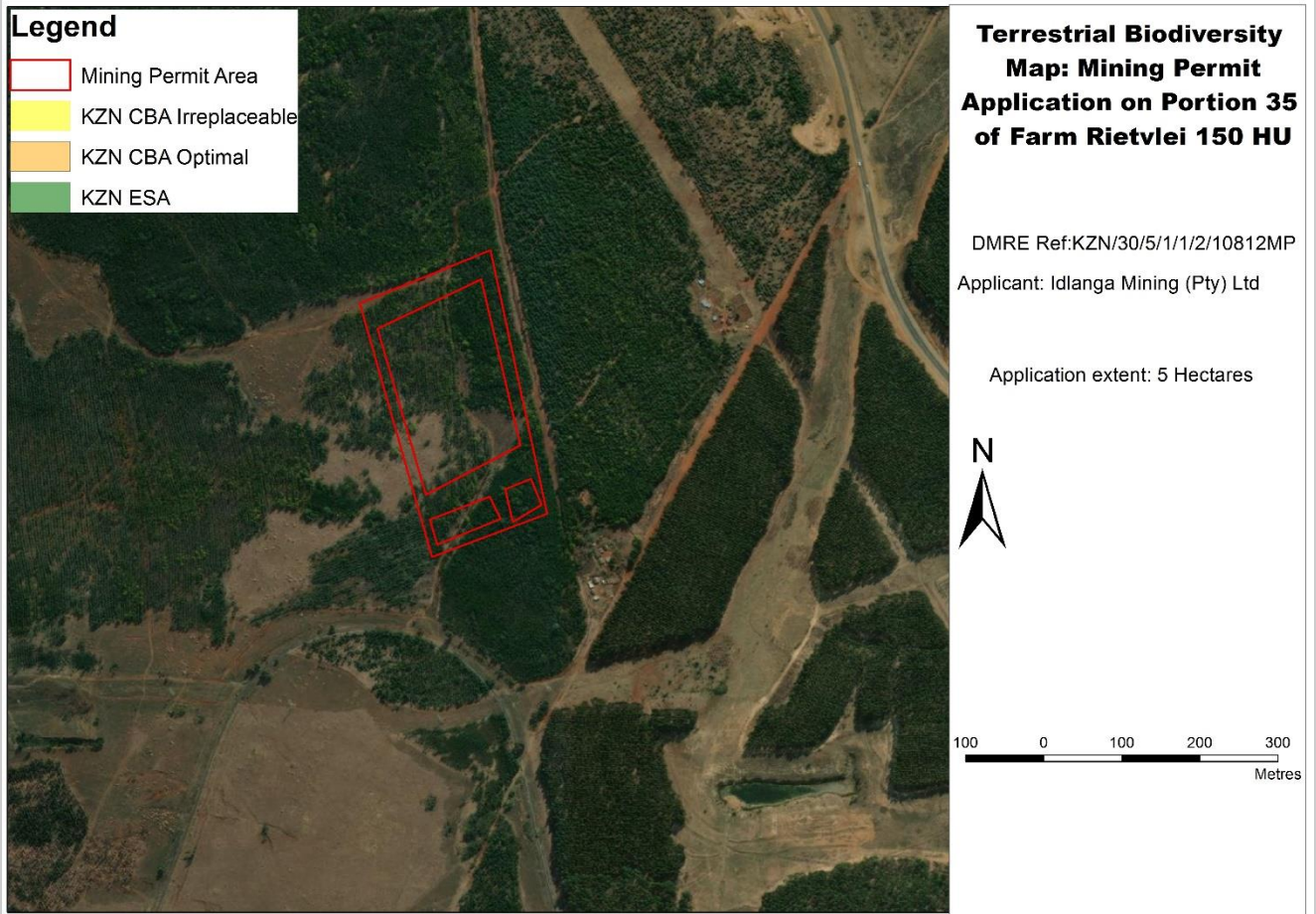
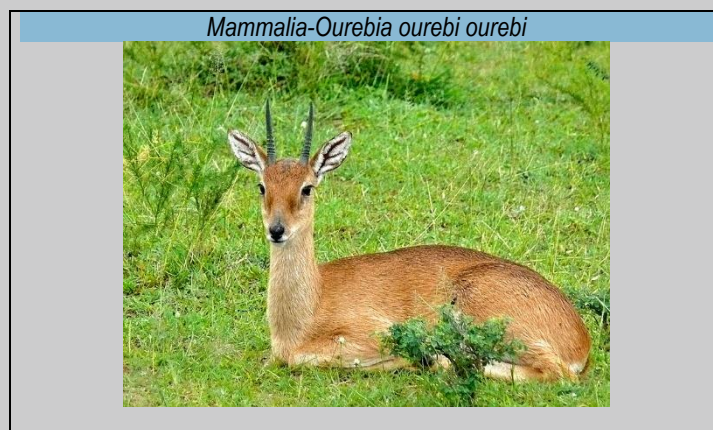


Figure 16: Biodiversity Map

Animal Species

A medium sensitivity is noted in terms of animal species. There is an anticipated presence of, *Mammalia-Hydrictis maculicollis* and *Mammalia-Ourebia ourebi ourebi* animal species as indicated below in Table 2. The EAP did not take note of any of the species tabulated below mainly due to the dominance of human inhabitat.

Table 2: Anticipated animal species



8.1.6 Land Use

The study area consists of a rural residential area around the mining area as well as multiple small-scale mines and large forestry plantations. A grave site is noted at least 2km away from the mining area.

8.1.7 Noise

Potential noise sources from the area may emanate from the following sources i.e. small scale mining.

8.1.8 Air Quality

The sources of air pollution from human activities comprise of three broad categories i.e. stationary sources (mining, quarrying,), community sources (homes or buildings, municipal waste, fireplaces, cooking facilities, laundry services and cleaning plants) and mobile sources combustion-engine vehicles and fugitive emissions from vehicle traffic). Air pollutants are generally classified into suspended particulate matter (dust, fumes, mists and smokes), gaseous pollutants (gases and vapours) and odours.

Assessment of the proposed mining right area has determined that all three categories of air pollution sources are expected to be of medium significance within the application area.

8.1.9 Topography

The mean elevation (m above sea level) ranges from 1308m above sea level, to 1341m above sea level. The study area is situated within a valley in relatively moderately steep profile as indicated by **Figure 17**.

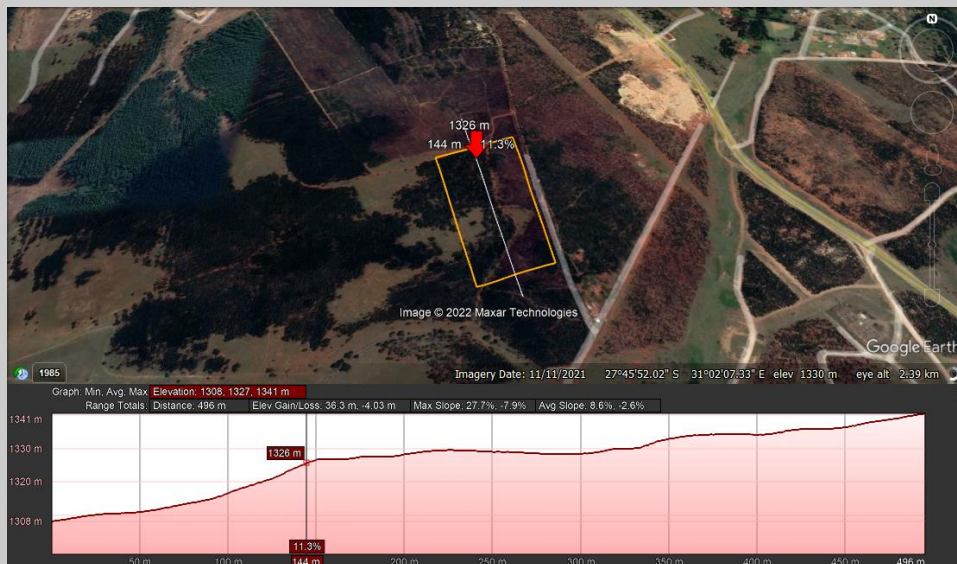


Figure 17: Elevation profile (North to South cross section)

8.1.10 Climate

In Vryheid, the wet season is warm and partly cloudy and the dry season is comfortable and mostly clear. Over the course of the year, the temperature typically varies from 41°F to 81°F and is rarely below 35°F or above 88°F. The warm season lasts for 3.1 months, from November 25 to February 28, with an average daily high temperature above 79°F. The hottest month of the year in Vryheid is January, with an average high of 80°F and low of 61°F

The cool season lasts for 2.0 months, from June 1 to August 3, with an average daily high temperature below 70°F. The coldest month of the year in Vryheid is July, with an average low of 41°F and high of 68°F. A wet day is one with at least 0.04 inches of liquid or liquid-equivalent precipitation. The chance of wet days in Vryheid varies very significantly throughout the year. The wetter season lasts 5.6 months, from October 8 to March 27, with a greater than 30% chance of a given day being a wet day. The month with the most wet days in Vryheid is December, with an average of 17.3 days with at least 0.04 inches of precipitation. The drier season lasts 6.4 months, from March 27 to October 8. The month with the fewest wet days in Vryheid is June, with an average of 1.3 days with at least 0.04 inches of precipitation.

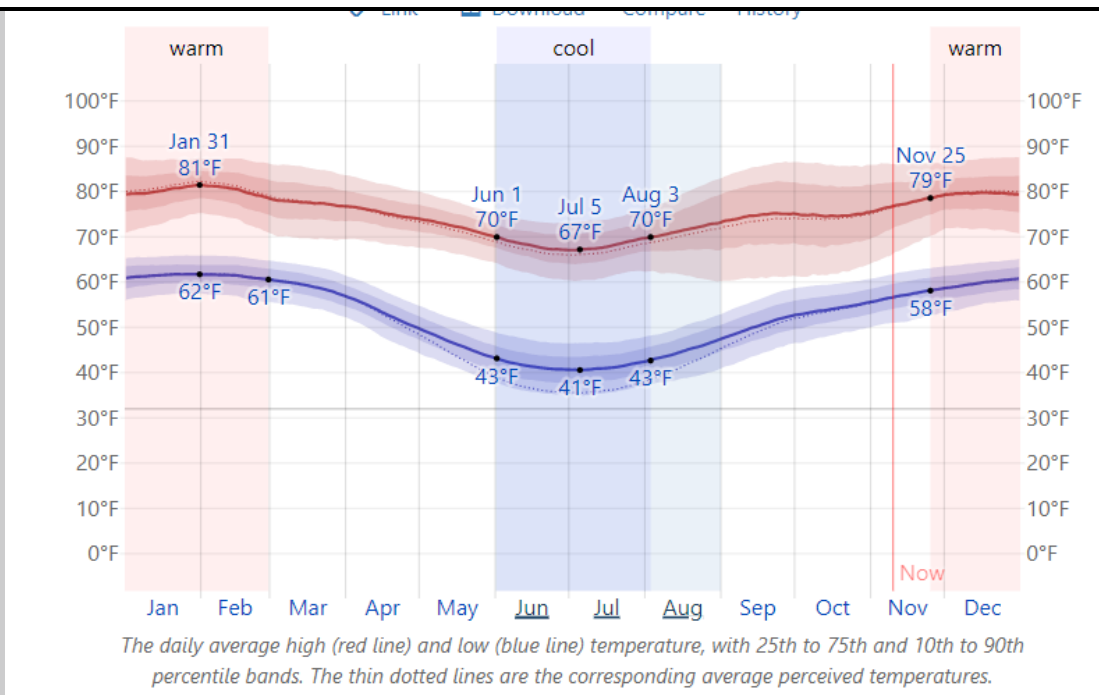


Figure 18: The daily average high (red line) and low (blue line) temperature, with 25th to 75th and 10th to 90th percentile bands. The thin dotted lines are the corresponding average perceived temperatures (<https://weatherspark.com/y/96306/Average-Weather-in-Vryheid-South-Africa-Year-Round>)

8.1.11 Hydrology

The mining area is located within 500m of a wetland as indicated by Figure 19 below.

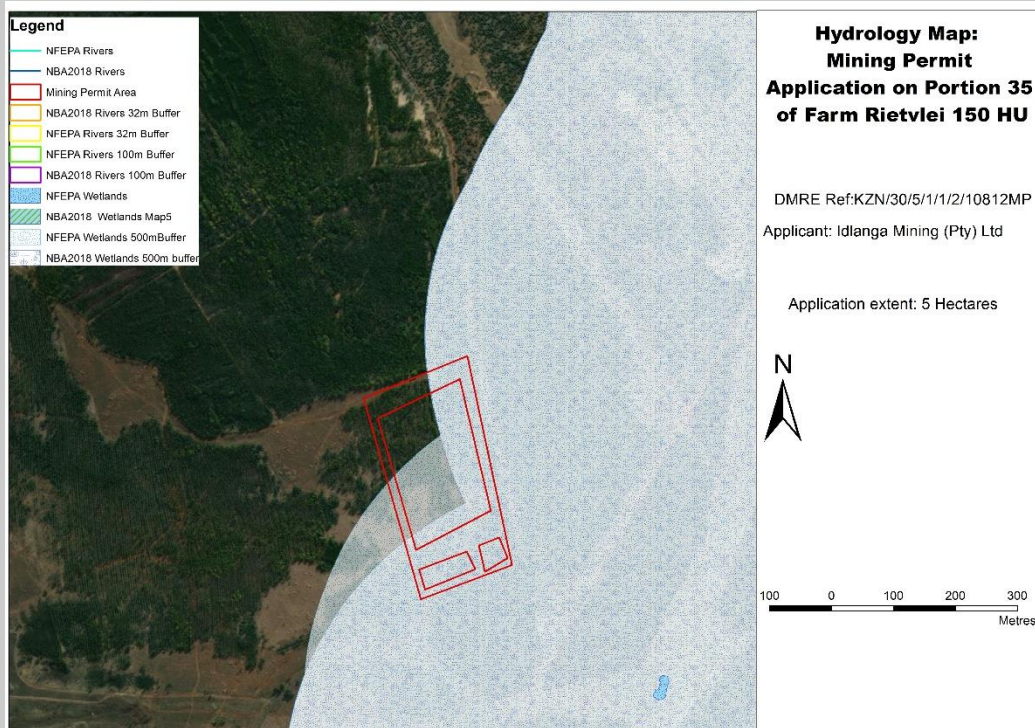


Figure 19: Hydrological map

8.1.12 Heritage Resources

At least one (1) burial ground is noted 2 kilometre away from the site.

8.1.13 Vegetation

The study area is situated within Northern KwaZulu-Natal Moist Grasslands, Paupietersberg Moist Grassland and income sandy grassland. The proposed drill holes are specifically within the Northern KwaZulu-Natal Moist Grasslands. The Northern KwaZulu-Natal Moist Grasslands vegetation type is largely dominated within the Newcastle area although it is distributed within the Northern parts of KZN from Ladysmith in the west to Vryheid. The vegetation is a mix of scrub and savanna. The most common tree species include Umbrella Thorn *Acacia tortilis*, Sweet Thorn *A. karroo*, Red Bushwillow *Combretum apiculatum*, *Boscia albitrunca*, *Euclea schimperi*, *Olea europaea* subsp. *africana*, *Schotia brachypetala*, *Euphorbia* spp. and *Spirostachys africana*. Consequently, the vegetation is classified as least threatened with a conservation target of 23%.

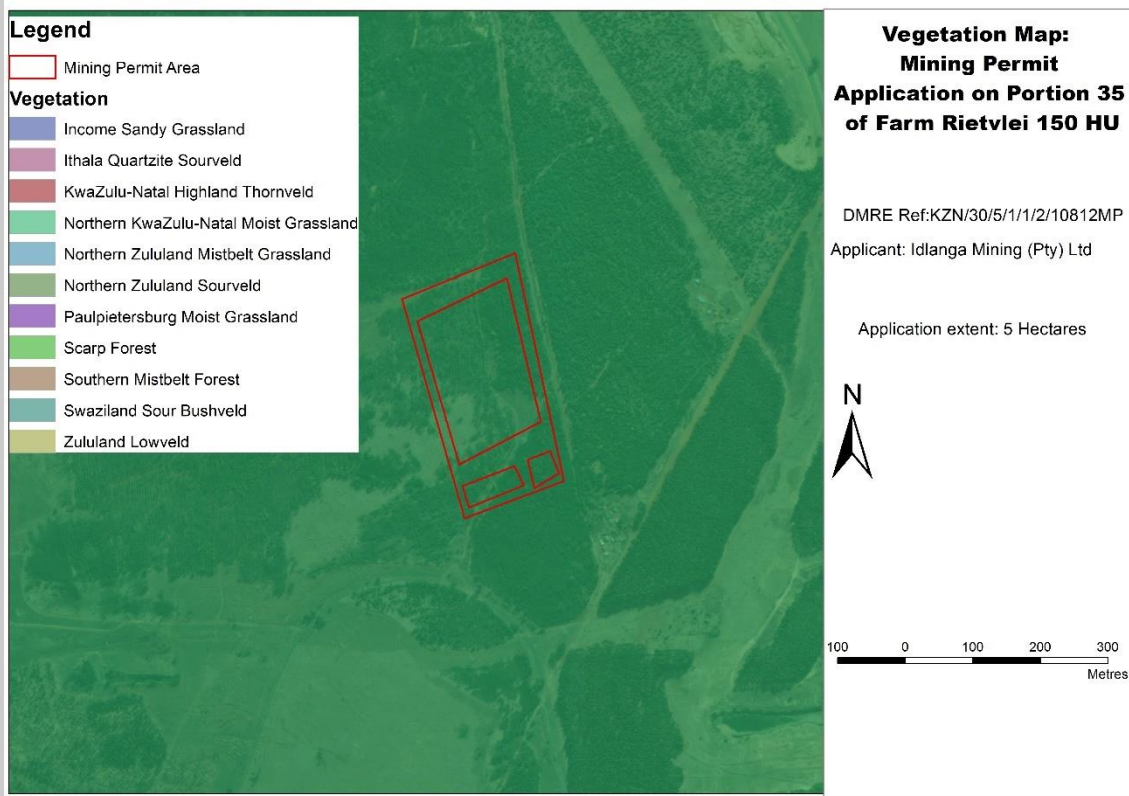


Figure 20: Vegetation Map

9. METHODOLOGY OF IMPACT ASSESSMENT

The following methodology has used to conduct the impact assessment for the proposed mining application.

ASPECT	SCORE	DEFINITION
Nature	- 1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e. limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property boundary),
	3	Local (i.e. the area within 5 km of the site),
	4	Regional (i.e. extends between 5 and 50 km from the site)
	5	Provincial / National (i.e. extends beyond 50 km from the site)
Duration	1	Immediate (<1 year)
	2	Short term (1-5 years)
	3	Medium term (6-15 years)
	4	Long term (the impact will cease after the operational life span of the project),
	5	Permanent (no mitigation measure of natural process will reduce the impact after
Magnitude/	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected)
	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected)
Intensity	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way)
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease) or
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease)
Reversibility	1	Impact is reversible without any time and cost
	2	Impact is reversible without incurring significant time and cost
	3	Impact is reversible only by incurring significant time and cost
	4	Impact is reversible only by incurring prohibitively high time and cost
	5	Irreversible Impact
Probabaility	1	Improbable (the possibility of the impact materialising is very low as a result of
	2	Low probability (there is a possibility that the impact will occur; >25% and <50%),
	3	Medium probability (the impact may occur; >50% and <75%),
	4	High probability (it is most likely that the impact will occur- > 75% probability), or
	5	Definite (the impact will occur),

SIGNIFICANCE AND RISK CATEGORY	DEFINITION
< -10	Low negative (i.e. where this impact would not have a direct influence on the decision to develop in the area).
>-10 <-20	Medium negative (i.e. where the impact could influence the decision to develop in the area).
>-20	High negative (i.e. where the impact must have an influence on the decision process to develop in the area).

10. Impacts and risks identified

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated).

CONSTRUCTION / OPERATION PHASE		
Impact	Safety and security risks to landowners and land occupiers	
Environmental Risk Scoring	Pre-Mitigation	Post-Mitigation
Nature of Impact	-1	-1
Extent of Impact	2	2
Duration of Impact	2	1
Magnitude of Impact	2	2
Reversibility of Impact	3	2
Probability	3	2
Environmental Risk Pre-Mitigation	11 (moderate)	8 (low)
Mitigation Measures:		
<ul style="list-style-type: none"> Prior to accessing any portion of land, the Applicant must enter into formal written agreements with the affected land occupants. This formal agreement should additionally stipulate landowner's special conditions which would form legally binding agreement. All homestead gates must be closed immediately upon entry/exit. Vehicles used must be in a roadworthy condition. Speed limits must be adhered to and all local, provincial and national regulations with regards to road safety and transport. 		
Impact	Disturbance of the natural characteristic of wetlands and rivers	
Environmental Risk Scoring	Pre-Mitigation	Post-Mitigation
Nature of Impact	-1	-1
Extent of Impact	4	2
Duration of Impact	4	2
Magnitude of Impact	4	2
Reversibility of Impact	3	3
Probability	3	3
Environmental Risk Pre-Mitigation	20 (high)	11 (moderate)
Mitigation Measures:		
<ul style="list-style-type: none"> Prior to mining, all topsoil must be stockpiled for use during the Closure and Rehabilitation Phase. Stockpiled topsoil should be used as the final cover for all disturbed areas where re-vegetation is required. Stockpiled soil should be protected by erosion-control berms if exposed for a period of greater than 14 days during the wet season. Soil stockpiles should be located away from drainage lines and areas of temporary inundation. If possible, seeding of the stockpiles with suitable local vegetation is recommended All watercourses including wetlands must be strictly avoided and an appropriate buffer and associated mitigation measures implemented. Measures must be implemented to avoid dewatering of surrounding wetland areas Prohibit the washing of vehicles or machinery on site Chemical toilets must be provided by the contractor in accordance with DWS requirements Measures must be put in place to ensure water saving techniques are implemented Ensure that erosion, stormwater and pollution mitigation measures as mentioned above and in Appendix 2 are implemented. 		

Impact	Clearance of vegetation	
Environmental Risk Scoring	Pre-Mitigation	Post-Mitigation
Nature of Impact	-1	-1
Extent of Impact	1	1
Duration of Impact	2	2
Magnitude of Impact	3	2
Reversibility of Impact	3	3
Probability	5	4
Environmental Risk Pre-Mitigation	13 (moderate)	11 (moderate)
Mitigation Measures		
<ul style="list-style-type: none"> Limit the removal of vegetation to the mining footprint. Prevent illegal removal of protected vegetation. Minimise scarring of the soil surface and land features. Minimise disturbance and loss of topsoil. Keep surrounding vegetation, especially larger trees and shrubs, to create a screen that reduces flooding impacts. 		
Impact	Soil Compaction, topography, soil erosion and contamination	
Environmental Risk Scoring	Pre-Mitigation	Post-Mitigation
Nature of Impact	-1	-1
Extent of Impact	2	2
Duration of Impact	2	2
Magnitude of Impact	3	2
Reversibility of Impact	3	2
Probability	4	2
Environmental Risk Pre-Mitigation	13 (moderate)	9 (low)
Mitigation Measures		
<p>Soil pollution and contamination</p> <ul style="list-style-type: none"> Should diesel be stored on site, it will need to be stored on a hard surface and 50m away from any drainage lines. Store fuel, chemicals and other hazardous substances in suitable secure weather-proof containers with impermeable and bunded floors to limit pilferage, spillage into the environment, flooding or storm damage Ensure that mining equipment are properly maintained. Equipment must be regularly serviced and inspected to make sure there are no leaks of oil, diesel, fuel, detergents, or hydraulic fluids. Repairs to vehicles and equipment on site should be avoided. If absolutely necessary repairs must be undertaken on hardened surfaces. <p>Soil compaction</p> <ul style="list-style-type: none"> Where roads have become compacted, they shall be ploughed, ripped and revegetated. <p>Soil erosion</p> <ul style="list-style-type: none"> Keep surrounding vegetation, especially larger trees and shrubs, to create a screen that reduces erosion impacts. During the mining activities, there shall be the protection of areas susceptible to erosion by installing necessary temporary and permanent works as soon as possible. Construct silt fences / traps in areas prone to erosion such as on the periphery of the mining footprint, to retain sediment-laden runoff. Remove sediment from silt fences/traps on a regular basis. Ensure silt fences / traps are adequately maintained. Monitor the mining footprint and general surroundings, weekly, for sedimentation and erosion and implement erosion and sediment control measures immediately where needed. Divert stormwater runoff and sheet runoff away from areas susceptible to erosion. Divert storm water runoff from the mining footprint into a sediment trapping device. Ensure it is not channelled directly into surrounding watercourses <p>Topography</p>		

<ul style="list-style-type: none"> Implementation of a Closure and Rehabilitation Plan Re-planting of indigenous vegetation 		
Impact	Disturbance/damage/destruction to Grave Site	
Environmental Risk Scoring	Pre-Mitigation	Post-Mitigation
Nature of Impact	-1	-1
Extent of Impact	2	2
Duration of Impact	2	2
Magnitude of Impact	2	2
Reversibility of Impact	3	3
Probability	2	1
Environmental Risk Pre-Mitigation	10 (low)	9 (low)
Mitigation Measures		
<ul style="list-style-type: none"> a 50 m buffer be maintained around cemeteries and that no construction material be placed near the cemeteries. The construction camp should also be constructed away from the cemeteries. 		
Impact	Noise	
Environmental Risk Scoring	Pre-Mitigation	Post-Mitigation
Nature of Impact	-1	-1
Extent of Impact	3	1
Duration of Impact	2	2
Magnitude of Impact	3	2
Reversibility of Impact	1	1
Probability	3	2
Environmental Risk Pre-Mitigation	11 (moderate)	7 (low)
Mitigation Measures		
<ul style="list-style-type: none"> All construction vehicles and machinery must be maintained in good working order. When working or travelling past noise sensitive receptors, no unnecessary hooting or noise should occur. Silencers on diesel-powered equipment must be properly designed and maintained. Construction activities should be limited to normal office hours. Adjacent landowners should be notified of extremely noisy activities at least 24 hours prior to such activities commencing. Mining should take place during work hours, Mondays to Saturdays. 		
Impact	Dust and air pollution	
Environmental Risk Scoring	Pre-Mitigation	Post-Mitigation
Nature of Impact	-1	-1
Extent of Impact	4	2
Duration of Impact	4	2
Magnitude of Impact	4	2
Reversibility of Impact	3	3
Probability	3	3
Environmental Risk Pre-Mitigation	20 (high)	11 (moderate)
Mitigation Measures		
<ul style="list-style-type: none"> Soil should be exposed for the minimum time possible once cleared of vegetation, i.e. the timing of clearing and grubbing should be coordinated as much as possible to avoid prolonged exposure of soils to wind and water erosion. The latter will facilitate the succession of indigenous vegetation. 		

- Handling must minimise the creation of dust and handling must be reduced during windy conditions
- Rehabilitation and re-vegetation will ensure good vegetative cover which will reduce dust creation
- All vehicles utilising gravel roads must adhere to speed limits.
- By minimising the removal of vegetation and topsoil in affected areas, this will minimise the potential for dusty conditions.
- Mining activities (including drill sites) must be located 100 m away from the residential area.
- Air filters on all mechanized equipment must be properly designed and maintained.
- Onsite burning of waste is not permitted.
- A dust suppression programme should be implemented on the gravel road surfaces of the existing access roads by means of periodic water sprinkling.

Impact	Visual impact	
Environmental Risk Scoring	Pre-Mitigation	Post-Mitigation
Nature of Impact	-1	-1
Extent of Impact	2	2
Duration of Impact	2	2
Magnitude of Impact	2	2
Reversibility of Impact	3	3
Probability	2	1
Environmental Risk Pre-Mitigation	10 (low)	9 (low)

Mitigation Measures

- Avoid shiny metals in structures. If possible shiny metal structures should be darkened or screened to prevent glare.
- Night-time light sources must be directed away from residential areas.
- Avoid activities outside of normal working hours.

Impact	Waste	
Environmental Risk Scoring	Pre-Mitigation	Post-Mitigation
Nature of Impact	-1	-1
Extent of Impact	2	2
Duration of Impact	2	2
Magnitude of Impact	3	3
Reversibility of Impact	4	3
Probability	4	3
Environmental Risk Pre-Mitigation	14 (moderate)	12 (moderate)

Mitigation Measures

- Waste generated on site must be disposed of in clearly marked bins. These must be emptied daily
- Domestic/general waste and hazardous waste must be separated, and bins clearly marked.

Impact	Heritage Resources	
Environmental Risk Scoring	Pre-Mitigation	Post-Mitigation
Nature of Impact	-1	-1
Extent of Impact	2	2
Duration of Impact	2	2
Magnitude of Impact	3	3
Reversibility of Impact	4	3
Probability	4	3
Environmental Risk Pre-Mitigation	14 (moderate)	12 (moderate)

Mitigation Measures

- a 50-metre buffer is observed to ensure the graves are not destroyed by the development.
- In the event that any human remains are discovered. It should also be pointed out that the NHR-Act requires that operations exposing archaeological and historical residues, including modern graves, should cease immediately pending an evaluation by the heritage authorities.
- It is very likely that sub-surface remains of archaeological artefacts and sites could still be encountered during the construction activities associated with the project.
- Such sites would offer no surface indication of their presence due to heavy plant cover in other areas. In the event of discovery such archaeological artefacts or sites during site preparation and mining phase, the North West Provincial Heritage Resources Authority or SAHRA will be informed immediately and a Phase 2(two) Heritage Impact assessment should be initiated.

Impact	Introduction of alien invasive species	
Environmental Risk Scoring	Pre-Mitigation	Post-Mitigation
Nature of Impact	-1	-1
Extent of Impact	2	2
Duration of Impact	2	1
Magnitude of Impact	4	2
Reversibility of Impact	4	2
Probability	3	2
Environmental Risk Pre-Mitigation	14 (moderate)	8 (low)

Mitigation Measures

- Undertake activities in previously disturbed areas.
- Locate activities on the boundaries of existing disturbance.
- Use existing access roads as much as possible.
- Rehabilitate disturbed areas as soon as possible.
- In the event that alien invasives are noted within the area, these must be managed within mining activities.

Impact	Social-Economic	
Environmental Risk Scoring	Pre-Mitigation	Post-Mitigation
Nature of Impact	1	1
Extent of Impact	4	4
Duration of Impact	4	4
Magnitude of Impact	4	4
Reversibility of Impact	3	3
Probability	3	3
Environmental Risk Pre-Mitigation	21 (high)	21 (high)

Mitigation Measures

- Direct employment and job creation of locals

DECOMMISSIONING PHASE

Impact	Spillage of oils, fuels, and chemicals	
Environmental Risk Scoring	Pre-Mitigation	Post-Mitigation
Nature of Impact	-1	-1
Extent of Impact	3	3
Duration of Impact	2	2
Magnitude of Impact	3	2
Reversibility of Impact	4	3

Probability	4	2
Environmental Risk Pre-Mitigation	15 (moderate)	11 (moderate)
Mitigation Measures		
<ul style="list-style-type: none"> Drip trays must be placed under vehicles. Any spills or leaks must immediately be cleaned up and the contaminated soil suitably disposed of. During refuelling of vehicles or equipment, drip trays must be utilised to prevent spills or leaks. Spill clean-up equipment must be available on site at all times. In the event of large spills, this must be reported to the authorities and a specialist spill contractor immediately sought to assist with the clean-up. 		
Impact	Noise	
Environmental Risk Scoring	Pre-Mitigation	Post-Mitigation
Nature of Impact	-1	-1
Extent of Impact	2	1
Duration of Impact	2	2
Magnitude of Impact	3	2
Reversibility of Impact	3	1
Probability	3	2
Environmental Risk Pre-Mitigation	12 (moderate)	7 (low)
Mitigation Measures		
<ul style="list-style-type: none"> All construction vehicles and machinery must be maintained in good working order. When working or travelling past noise sensitive receptors, no unnecessary hooting or noise should occur. 		
Impact	Dust	
Environmental Risk Scoring	Pre-Mitigation	Post-Mitigation
Nature of Impact	-1	-1
Extent of Impact	1	1
Duration of Impact	1	2
Magnitude of Impact	3	2
Reversibility of Impact	3	2
Probability	3	2
Environmental Risk Pre-Mitigation	10 (low)	8 (low)
Mitigation Measures		
<ul style="list-style-type: none"> All vehicles utilising gravel roads must adhere to speed limits. By minimising the removal of vegetation and topsoil in affected areas, this will minimise the potential for dusty conditions. 		

(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

See table above.

(viii) The possible mitigation measures that could be applied and the level of risk.

The following potential mitigation measures and residual risks have been provided for each environmental aspect assessed. It should be noted that this report will be made available to I&APs for review and comment, and their comments and concerns will be addressed in the final report to be submitted to the DMRE for adjudication.

Furthermore, it should be noted that the results of the public consultation will be used to update the proposed potential mitigation measures prior to the submission of the finalised BAR and EMPr to the DMRE for adjudication.

Safety and security risks to landowners and lawful occupiers:

- Ensure construction is consistent with occupational health and safety requirements.
- Prior to accessing any portion of land, the Applicant must enter into formal written agreements with the affected land occupants. This formal agreement should additionally stipulate landowner's special conditions which would form a legally binding agreement.
- All homestead gates must be closed immediately upon entry/exit.
- All construction and vehicles using public roads must be in a roadworthy condition and their loads secured. Speed limits must be adhered to and all local, provincial and national regulations with regards to road safety and transport.

Clearance of vegetation:

- Limit the removal of vegetation to the mining footprint.
- Prevent illegal removal of protected vegetation.
- Minimise scarring of the soil surface and land features.
- Minimise disturbance and loss of topsoil.
- Keep surrounding vegetation, especially larger trees and shrubs, to create a screen that reduces flooding impacts.

Disturbance of the natural characteristic of wetlands and rivers

- Prior to mining, all topsoil must be stockpiled for use during the Closure and Rehabilitation Phase.
- Stockpiled topsoil should be used as the final cover for all disturbed areas where re-vegetation is required.
- Stockpiled soil should be protected by erosion-control berms if exposed for a period of greater than 14 days during the wet season.
- Soil stockpiles should be located away from drainage lines and areas of temporary inundation.
- If possible, seeding of the stockpiles with suitable local vegetation is recommended
- All watercourses including wetlands must be strictly avoided and an appropriate buffer and associated mitigation measures implemented.
- Measures must be implemented to avoid dewatering of surrounding wetland areas
- Prohibit the washing of vehicles or machinery on site
- Chemical toilets must be provided by the contractor in accordance with DWS requirements
- Measures must be put in place to ensure water saving techniques are implemented
- Ensure that erosion, stormwater and pollution mitigation measures as mentioned above and in Appendix 2 are implemented.

Soil pollution and contamination

- Should diesel be stored on site, it will need to be stored on a hard surface and 50m away from any drainage lines.
- Store fuel, chemicals and other hazardous substances in suitable secure weather-proof containers with impermeable and bunded floors to limit pilferage, spillage into the environment, flooding or storm damage
- Ensure that mining equipment are properly maintained. Equipment must be regularly serviced and inspected to make sure there are no leaks of oil, diesel, fuel, detergents, or hydraulic fluids.
- Repairs to vehicles and equipment on site should be avoided. If absolutely necessary repairs must be undertaken on hardened surfaces.

Soil compaction

- Where roads have become compacted, they shall be ploughed, ripped and revegetated.

Soil erosion

- Keep surrounding vegetation, especially larger trees and shrubs, to create a screen that reduces erosion impacts.
- During the mining activities, there shall be the protection of areas susceptible to erosion by installing necessary temporary and permanent works as soon as possible.
- Construct silt fences / traps in areas prone to erosion such as on the periphery of the mining footprint, to retain sediment-laden runoff.
- Remove sediment from silt fences/traps on a regular basis.
- Ensure silt fences / traps are adequately maintained.
- Monitor the mining footprint and general surroundings, weekly, for sedimentation and erosion and implement erosion and sediment control measures immediately where needed.
- Divert stormwater runoff and sheet runoff away from areas susceptible to erosion.
- Divert storm water runoff from the mining footprint into a sediment trapping device. Ensure it is not channelled directly into surrounding watercourses

Topography

- Implementation of a Closure and Rehabilitation Plan
- Re-planting of indigenous vegetation

Soil contamination/pollution:

- Drip trays must be placed under vehicles.
- Machinery to be used for the operation will be of good working conditions.
- Any hydrocarbon spill from the site establishment will be remediated as soon as possible.

Heritage Resources

- a 50-metre buffer is observed to insure the graves are not destroyed by the development.
- In the event that any human remains are discovered. It should also be pointed out that the NHR-Act requires that operations exposing archaeological and historical residues, including modern graves, should cease immediately pending an evaluation by the heritage authorities.
- It is very likely that sub-surface remains of archaeological artefacts and sites could still be encountered during the construction activities associated with the project.
- Such sites would offer no surface indication of their presence due to heavy plant cover in other areas. In the event of discovery such archaeological artefacts or sites during site preparation and mining phase, the NW Provincial Heritage Resources Authority or SAHRA will be informed immediately and a Phase 2(two) Heritage Impact assessment should be initiated.

Dust

- Soil should be exposed for the minimum time possible once cleared of vegetation, i.e. the timing of clearing and grubbing should be coordinated as much as possible to avoid prolonged exposure of soils to wind and water erosion. The latter will facilitate the succession of indigenous vegetation.
- Handling must minimise the creation of dust and handling must be reduced during windy conditions
- Rehabilitation and re-vegetation will ensure good vegetative cover which will reduce dust creation
- All vehicles utilising gravel roads must adhere to speed limits.
- By minimising the removal of vegetation and topsoil in affected areas, this will minimise the potential for dusty conditions.
- Mining activities (including drill sites) must be located 100 m away from the residential area.
- Air filters on all mechanized equipment must be properly designed and maintained.
- Onsite burning of waste is not permitted.
- A dust suppression programme should be implemented on the gravel road surfaces of the existing access roads by means of periodic water sprinkling

Noise:

- All construction vehicles and machinery must be maintained in good working order.
- When working or travelling past noise sensitive receptors, no unnecessary hooting or noise should occur.
- Silencers on diesel-powered equipment must be properly designed and maintained.
- Construction activities should be limited to normal office hours.
- Adjacent landowners should be notified of extremely noisy activities at least 24 hours prior to such activities commencing.

- Mining should take place during work hours, Mondays to Saturdays.

Visual

- Avoid shiny metals in structures. If possible shiny metal structures should be darkened or screened to prevent glare.
- Night-time light sources must be directed away from residential areas.
- Avoid activities outside of normal working hours.

Introduction of alien species:

- Undertake activities in previously disturbed areas.
- Locate activities on the boundaries of existing disturbance.
- Use existing access roads as much as possible.
- Rehabilitate disturbed areas as soon as possible.
- In the event that alien invasives are noted within the area, these must be managed within mining activities.

Generation and disposal of waste

- Any excess or waste material or chemicals, must be removed from the site and must preferably be recycled (e.g. oil and other hydrocarbon waste products)
- Any waste materials or chemicals that cannot be recycled must be disposed of at a suitably licensed waste facility
- All permanent facilities must be removed from site upon closure. This will include the associated equipment, material and waste on site
- Under no circumstances is any form of waste to be disposed of on site

Socio-economic

- Direct employment and job creation of locals

(ix) Motivation where no alternatives sites were considered.

The application area has been selected as the preferred site based on the historical data and available, which indicates the potential for economically viable minerals to occur. In addition, the presence of operational mines within the local area motivates the possibility of the desired mineral to occur.

(x) Statement motivating the alternative development location within the overall site (Provide a statement motivating the final site layout that is proposed)

The location considered for the proposed project includes the mining sites and associated campsite location and access routes. The location was selected based on a number of criteria, which include the environmental considerations (how sensitive is the area in terms of soils, wetlands, groundwater etc.) and the dependency of the project to the required infrastructure.

- 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.

(Including (i) a description of all environmental issues and risks that are identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.)

The impact assessment process may be summarised as follows:

- Identification of proposed mining activities including their nature and duration.
- Screening of activities likely to result in impacts or risks.
- Utilisation of the above-mentioned methodology to assess and score preliminary impacts and risks identified.
- Inclusion of I&AP comment regarding impact identification and assessment.
- Finalisation of impact identification and scoring.

11. Summary of specialist reports

No specialist reports were conducted and motivation has been provided.

12. Environmental impact statement.

12.1 Summary of the key findings of the environmental impact assessment

During the proposed mining operation impacts may only occur on soils, natural vegetation, surface water, sensitive landscapes, air quality, noise, visual aspects, and sites of archaeological and cultural importance should the mining method statement not be adhered to.

Alternatives considered for the location campsite has shown that the selected locations would be the most favourable. Idlanga Mining will undertake measures to ensure that the identified impacts are minimised. Assessment of the impacts with the proposed mitigation measures has shown the significance of the impacts on all affected environmental aspects to be reduced from to low and negligible significance.

Land Use

The study area consists of a rural residential area around the mining area as well as multiple small-scale mines and large forestry plantations. A grave site is noted at least 2km away from the mining area.

Measures such as safety along the roads and dust suppression will be undertaken to ensure that the impacts on the landowners and land occupiers are minimised.

Vegetation

The study area is situated within Northern KwaZulu-Natal Moist Grasslands, Paupietersberg Moist Grassland and income sandy grassland. The proposed drill holes are specifically within the Northern KwaZulu-Natal Moist Grasslands. The Northern KwaZulu-Natal Moist Grasslands vegetation type is largely dominated within the Newcastle area although it is distributed within the Northern parts of KZN from Ladysmith in the west to Vryheid. The vegetation is a mix of scrub and savanna. The most common tree species include Umbrella Thorn *Acacia tortilis*, Sweet Thorn *A. karroo*, Red Bushwillow *Combretum apiculatum*, *Boscia albitrunca*, *Euclea schimperii*, *Olea europaea* subsp. *africana*, *Schotia brachypetala*, *Euphorbia* spp. and *Spirostachys africana*. Consequently, the vegetation is classified as least threatened with a conservation target of 23%..

Assessment of the vegetation within the footprint of the development area has shown presence of natural vegetation. The nature of the proposed activity indicates medium impacts on the vegetation as boreholes drilled will be immediately rehabilitated upon completion through soil filling and plantation of removed indigenous vegetation. This action will be supervised by an Environmental Control Officer. Existing roads must be used as far as possible. If the proposed activity requires new access routes, these routes should avoid all sensitive areas and their ecological buffers. The applicant must further minimise clearing to areas that are required for invasive works. Where possible, cut vegetation instead of clearing to minimise soil disturbance. Consequently, rehabilitate all disturbed areas following invasive mining activities to the conditions that existed prior to mining.

Wetlands and Rivers

The mining area is located within 500m of a wetland as indicated by Figure 19 below. A water use licence application must be lodged by the applicant.

Socio-economic

According to Census 2011, Ward 05 Abaqulusi Local Municipality has a total population of 7 863, of entirely 99% black Africans. Of those aged 20 years and older, 42.8% have completed grade 9 or higher, and 20.8% have completed matric.

All workers must be recruited locally and temporary housed in the campsite to be established on site. The employees will be given strict instruction not to undertake activities that will affect the environment and that may have an impact on the landowner. Waste generated from the site will be collected in proper receptacle and disposed off in registered waste disposal sites.

12.2 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. Attach as **Appendix B**

The final map is depicted by **Figure 21** below depicting the randomly selected drill hole locations as well as all the identified sensitive features.

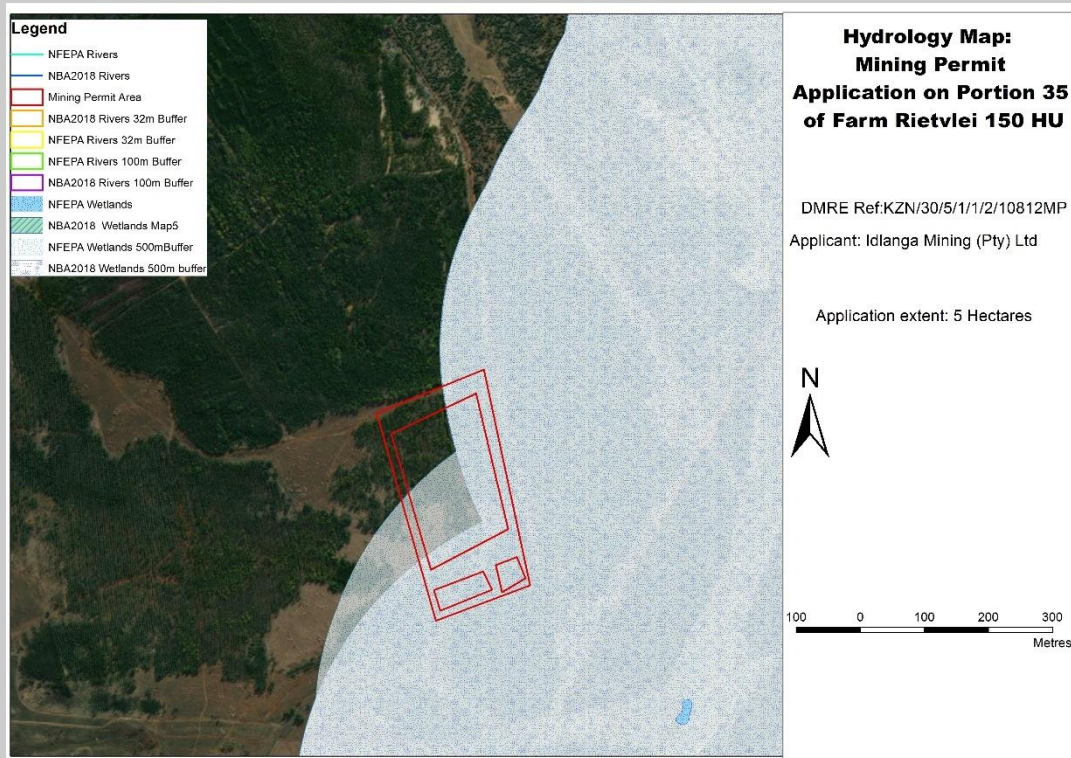


Figure 21: Cumulative sensitivity map

12.3 Summary of the positive and negative implications and risks of the proposed activity and identified alternatives;

A summary of the positive and negative potential impacts associated with the project has been outlined in Section I(i) above.

13. 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.

The EMPr addresses the environmental impacts associated with the project during Construction, Operation, Decommissioning and Rehabilitation of the proposed project. The objectives of the EMPr will be to provide detailed information that will advise the planning design of mining activities in order to avoid and/or reduce impacts that may be detrimental to the environment. The following environmental management objectives are recommended for the proposed mining development and associated infrastructure:

- Alien plant monitoring should take place after construction, throughout the lifecycle of the borrow pit, as well as rehabilitation phase of the borrow pit.

- Development planning must restrict the area of impact to a minimum and designated area only. Monitor and prevent contamination and undertake appropriate remedial actions.
- Limit the visual and noise impact on receptors.
- Avoid impact on possible heritage finds.
- Promote health and safety of workers.
- Limit dust and other emissions to within allowable limits.
- Manage soils to prevent erosion.
- Ensure strict erosion control measures are implemented;
- Avoid/Limit the removal of indigenous vegetation;
- Removal alien vegetation that may appear;
- Limit the use of water as far as possible;
- Maintain and service mining equipment to prevent contamination of the land;
- Enforce no-go areas and buffer zones;
- Limit access to site and place signage;
- Ensure proper waste disposal is implemented;
- Limit the noise created during mining process;
- Implement proper dust control measures;
- Employ local labour from the area; and
- Rehabilitation should be treated as an on-going process

14. Aspects for inclusion as conditions of Authorization

Any aspects which must be made conditions of the Environmental Authorization

In authorising the proposed Mining project, the following conditions must form part of the environmental authorisation:

- Idlanga Mining may not alter the location of any of the project activities included in this environmental impact assessment without obtaining the required environmental authorisation to do so under NEMA.
- Idlanga Mining will not undertake any new activity that was not part of this environmental impact assessment and that will trigger a need for an environmental authorisation without proper authorisation.
- Idlanga Mining must, where necessary, undertake specialists' studies, management procedures and method statement should the need arise.
- The EMPr must be implemented fully at all stages of the proposed project.
- Should archaeological sites or graves be exposed in other areas during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.
- The Fossil Chance Find Protocol must be complied with during the construction/operational phase of the mining activity.

15. Description of any assumptions, uncertainties and gaps in knowledge.

(Which relate to the assessment and mitigation measures proposed)

- The project scope and descriptions are based on project information provided by the client;
- The information presented in this report is based on the information available at the time of compilation of the report
- It is assumed that all data and information supplied by the departments, Applicant or any of their staff or consultants is complete, valid and true.
- The description of the baseline environment has been obtained from desktop studies and site visit. No specialist assessments were conducted for the preparation of this assessment report.

The EIA Regulations, 2014 outline specific requirements that a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures must be provided in the EIR. The assessments undertaken are based on conservative methodologies and these methods attempts to determine potential negative impacts that could occur on the affected environmental aspects.

These impacts may however be of smaller magnitude than predicted, while benefits could be of a larger extent than predicted. This section outlines various limitations to the specialist studies that have been undertaken and indicates, where appropriate, the adequacy of predictive methods used for the assessment. This has been done to provide the authorities and interested and affected parties with an understanding of how much confidence can be placed in this impact assessment.

The EIA has investigated the potential impact on key environmental media relating to the specific environmental setting for the site. A number of desktop assessments were undertaken and results thereof are presented in this report. The information provided in this BAR and EMPr is therefore considered sufficient for decision-making purposes.

16. Reasoned opinion as to whether the proposed activity should or should not be authorised

i) Reasons why the activity should be authorized or not.

According to the impact assessment undertaken for the proposed project, the key impacts of the project are on soils, wetlands, natural vegetation, and landowners/occupiers. The project will also have positive impacts due to the employment to be created although for a short term. The public will also be requested for their comments. All comments to be received during Public Participation Process will be included in this BAR and EMPr.

These comments will be addressed as far as possible to the satisfaction of the interested and affected parties. The management of the impacts identified in the impact assessment for all phases of the proposed project will be undertaken through a range of programmes and plans contained in the EMPr. Inconsideration of the programmes and plans contained within the EMPr, layouts and method statements compiled for the project, which is assumed will be effectively implemented, there will be significant reduction in the significance of potential impacts.

Based on the above, it is therefore the opinion of the EAP that the activity should be authorised.

17. Conditions that must be included in the authorisation

In authorising the proposed Mining project, the following conditions must form part of the environmental authorisation:

- A detailed site layout plan should be submitted to the DMR and interested and affected parties once finalised
- An Environmental Control Officer should be appointed for the proposed mining project
- Idlanga Mining may not alter the location of any of the project activities included in this environmental impact assessment without obtaining the required environmental authorisation to do so under NEMA.
- Idlanga Mining will not undertake any new activity that was not part of this environmental impact assessment and that will trigger a need for an environmental authorisation without proper authorisation.
- Idlanga Mining must, where necessary, undertake specialists' studies, management procedures and method statement should the need arise.
- The EMPr must be implemented fully at all stages of the proposed project.
- Should archaeological sites or graves be exposed in other areas during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.
- The Fossil Chance Find Protocol must be complied with during the construction/operational phase of the mining activity.

18. Period for which the Environmental Authorisation is required.

The Applicant requires the mining right to be valid for a period of five years.

19. Undertaking

The undertaking is provided at the end of the EMPr and is applicable to both the BAR and EMPr.

20. Financial Provision

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

R 658 707.99 including VAT.

20.1 Explain how the aforesaid amount was derived.

See Appendix E3

20.2 Confirm that this amount can be provided from operating expenditure.

Idlanga Mining has committed to finance the mining costs and the rehabilitation of the site once mining has been concluded.

21. Specific Information required by the competent Authority

No other information was requested or required from the Competent Authority.

- i) 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: -

(1) 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 alluvial diamond mining 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 an Appendix.

The consultation process allowed directly affected parties to raise their concerns. Further to this, it must be noted that I&AP's, including directly affected parties such as landowners, had the opportunity to review and comment on this report. The result of the public consultation is included in the final report submitted to the department for adjudication.

(2) 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 alluvial diamond mining 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).

N/A

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 D).

N/A

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1. INTRODUCTION

1.1 Details of the EAP

The requirements for the provision of the details and expertise of the EAP are included in Part A, Section a) and as Appendix A.

1.2 Description of the Aspects of the Activity

The requirement to describe the aspects of the activity that are covered by the draft environmental management programme is included in PART A, Section d).

2. ENVIRONMENTAL MANAGEMENT PRINCIPLES

It is extremely important for effective environmental management that the Applicant be aware of the general principles upon which sound environmental management is based and that these principles are considered in all aspects of the mining operation. NEMA has established a general framework for environmental law, in part by prescribing national environmental management principles that must be applied when making decisions that may have a significant impact on the environment. These principles are briefly summarised in the sections that follow.

2.1 Holistic principle

The Holistic principle, as defined by NEMA (Section 2(4)(b) requires that environmental management must be integrated, acknowledging that all elements of the environment are linked and inter-related and it must take into account the effect of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option (defined below).

Holistic evaluation does not mean that a project must be looked at as a whole. It rather means that it must be accepted that there is a whole into which a project introduced. If the indications are that the project could have major adverse effects, the project must be reconsidered and where appropriate re-planned or relocated to avoid an adverse impact or to ensure a beneficial impact.

2.2 Best practicable environmental option

When it is necessary to undertake any action with environmental impacts, the different options that could be considered for the purpose must be identified and defined. The Best Practicable Environmental Option (BPEO) is defined in NEMA as "the option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term." Other guidelines typically used for environmental management in terms of other legislation include: BPM which is the Best Practicable Means and BAT which is the Best Available Technology.

2.3 Sustainable development

The concept of sustainable development was introduced in the 1980's with the aim to ensure that the use of natural resources is such that our present needs are provided without compromising the ability of future generations to meet their own needs. The constitution of South Africa is built around the fact that everyone has the right to have the environment protected through reasonable legislative and other measures that secure ecologically sustainable development. The National Environmental Principles included in the NEMA require development to be socially, environmentally and economically sustainable.

2.4 Preventative principles

The preventative principle is fundamental to sustainable development and requires that the disturbance to ecosystems and the pollution, degradation of the environment and negative impacts on the environment be avoided, or, where they cannot be altogether avoided, are minimised and remedied.

2.5 The precautionary principles

The precautionary principle requires that where there is uncertainty, based on available information, that an impact will be harmful to the environment, it is assumed, as a matter of precaution, that said impact will be harmful to the environment until such time that it can be proven otherwise. The precautionary principle requires that decisions by the private sector, governments, institutions and individuals need to allow for and recognise conditions of uncertainty, particularly with respect to the possible environmental consequences of those decisions. In South Africa, the DWA (then DWAF, now DWS) adopted a BPEO guideline in 1991 for water quality management and in 1994 in the Minimum Requirements document for waste management.

In terms of DWAF Minimum Requirements for the Handling and Disposal of Hazardous Waste, 1994, the precautionary principle is defined as, "Where a risk is unknown; the assumption of the worst-case situation and the making of provision for such a situation." Here the precautionary principle assumes that a waste or an identified contaminant of a waste is "both highly hazardous and toxic until proven otherwise."

In the context of the EIA process in South Africa, the precautionary principle also translates to a requirement to provide sound, scientifically based, information that is sufficient to provide the decision-making authority with reasonable grounds to understand the potential impacts on the environment, the extent thereof and how impacts could be mitigated. If such information is not adequate for this purpose, the relevant authority cannot be satisfied as is required and then the authority should require that further information be collected and provided.

2.6 Duty of care and cradle to grave principle

In terms of the NEMA Section 28, "Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment."

By way of example, the principle of "duty of care" in terms of waste management emphasises the responsibility to make sure that waste is correctly stored and correctly transported, as it passes through the chain of custody to final point of disposal. This means that waste must always be stored safely and securely. The company removing and disposing of waste also holds the responsibility to hold the relevant licenses, and that waste is transported alongside the necessary paperwork. "Cradle to Grave" refers to the responsibility a company takes for the entire life cycle of a product, service or program, from design to disposal or termination. In terms of the DWAF Minimum Requirements for the Handling and Disposal of Hazardous Waste, 1994, "any person who generates, transports, treats or disposes of waste must ensure that there is no unauthorised transfer or escape of waste from his control. Such a person must retain documentation describing both the waste and any related transactions. In this way, he retains responsibility for the waste generated or handled."

This places responsibility for a waste on the Generator, by the "Cradle to Grave" principle, according to which a "manifest" accompanies each load of Hazardous Waste until it is responsibly and legally disposed. This manifest is transferred from one transporter to the next along with the load, should more than one transporter be involved. Once the waste is properly disposed of at a suitable, permitted facility, a copy of the manifest must be returned to the point of origin." Duty of Care offers one strategy to implement sustainable development.

2.7 Polluter pays principle

The "polluter pays principle" holds that the person or organisation causing pollution is liable for any costs involved in cleaning it up or rehabilitating its effects. It is noted that the polluter will not always necessarily be the generator, as it is possible for responsibility for the safe handling, treatment or disposal of waste to pass from one competent contracting party to another. The polluter may therefore not be the generator but could be a disposal site operator or a transporter.

Through the 'duty of care' principle, however, the generator will always be one of the parties held accountable for the pollution caused by the waste. Accordingly, the generator must be able to prove that the transferral of management of the waste was a responsible action. The polluter pays principle acceding to NEMA dictates that "the cost of remedying pollution, environmental degradation and consequent adverse effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment."

3. FAILURE TO COMPLY WITH ENVIRONMENTAL CONSIDERATIONS

There are a number of penalties for non-compliance or offences. Below are a few extracts of national legislation with regards to non-compliance:

- NEMA Section 24F(2): It is an offence for any person to fail to comply with or to contravene the conditions applicable to any environmental authorization granted for that listed activity. 24F(4) A person convicted for an offence under subsection 2 is liable to a fine not exceeding 5 million rand or to imprisonment not exceeding 10 years or to both such a fine and imprisonment
- NEMA Section 34(6): Whenever any manager, agent or employee does or omits to do an act which it had been his or her task to do, or to refrain from doing on behalf of the employer and which would be an offence under any provision listed in Schedule 3 (relates to all environmental related acts) for the employer to do or omit to do, he or she shall be liable to be convicted and sentenced in respect thereof as if he or she were the employer
- NWA Section 151 (1): "No person may fail to comply with any condition attached to a permitted water use (Water Use License)"
- NWA Section 151 (2): "Any person who contravenes any provision of subsection 1 is guilty of an offence and liable, on the first conviction, to a fine or imprisonment for a period not exceeding 5 years or to both a fine and such imprisonment (10 years for second conviction)"
- In addition, if anyone is convicted of an offence under the act which has resulted in harm, loss or damage to any other person, the court may award damages to be paid by the accused or convicted
- NWA Section 154: Makes provision that it's not only the applicant that may be liable but also an employee or agent acting on their behalf
- In terms of the MPRDA, Section 98, any person is guilty of an offence if he or she fails to comply with the requirements of the issued mining permit
- MPRDA Section 99 (1a): any person convicted of an offence in terms of the MPRDA is liable to a fine not exceeding R100, 000 or to imprisonment to a period not exceeding 2 years or to both such fine and imprisonment.

It is recommended that a procedure for non-compliances (i.e., incentives or disincentives for conformance and non-conformance with the EMPr requirements) must be employed to ensure that the EMPr is adequately implemented. The system to be used must be determined before mining commences, included in the tender documents and contracts, and made clear to all project workers. The system may include that the independent ECO can be authorised to impose spot fines on the Contractor and/or his subcontractors for any of the transgressions detailed below:

- Littering on site
- Lighting of illegal fires on site
- Persistent or un-repaired oil leaks
- Any persons, vehicles or equipment related to the Contractor's operations found within the designated "No – go" areas
- Any vehicles being driven in excess of designated speed limits
- Removal and/or damage to fauna, flora or heritage objects on site
- Legal contraventions

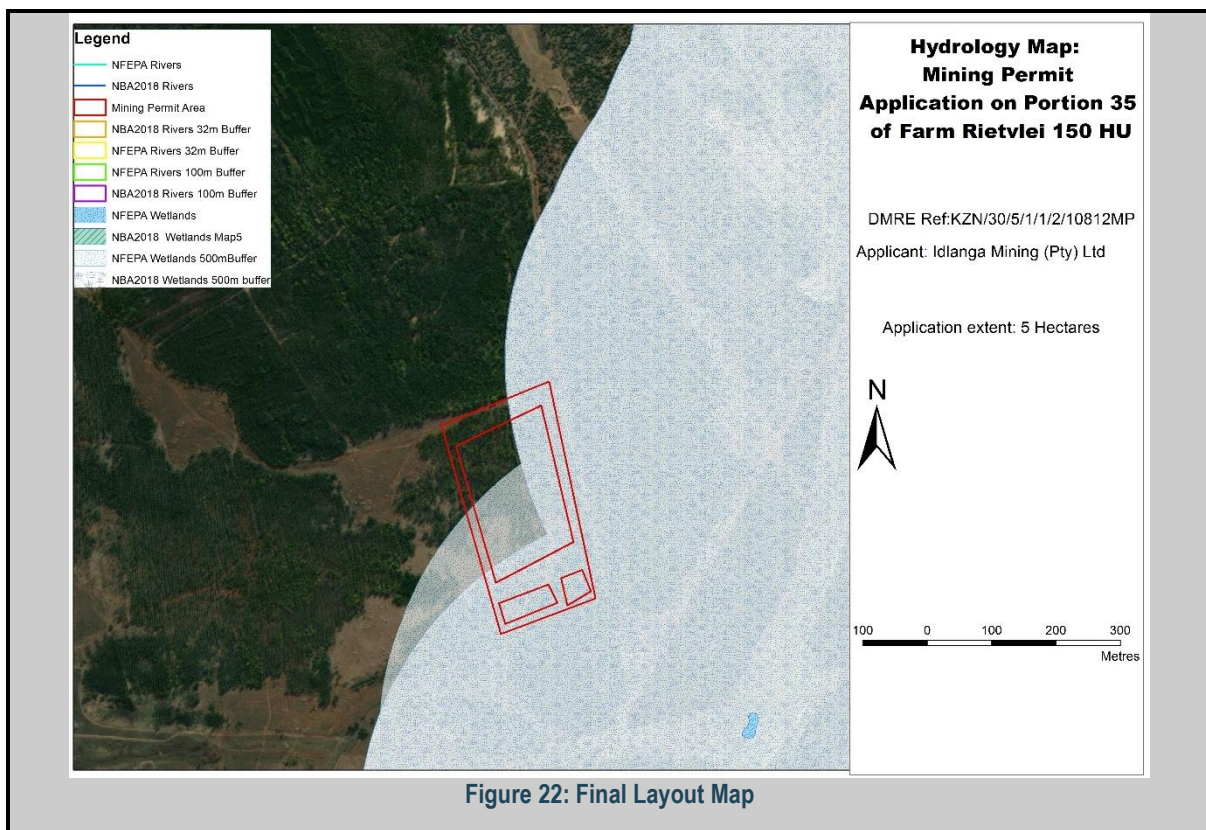
Such fines should be issued in addition to any remedial costs incurred as a result of non-compliance with the Environmental Specifications and or legal obligations.

(a) 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)

The maps below have been presented utilizing existing GIS information and databases from the Department of Water and Sanitation, and SANBI BGIS. The Department of Water and Sanitation has made provision of the rivers and NFEPA wetland databases. This data has been superimposed to the mining area to identify the wetlands and rivers present on site. A 32 m buffer has been created for the rivers and a 500m regulated buffer has been created for the wetlands.

Based on this information, the drill holes have been strategically placed out of the buffer zones with the aim of reducing the impacts of the mining activity within the watercourses.



4. Description of Impact management objectives including management statements

The following are the closure objectives, general principles and objectives guiding closure of the mining area:

- Rehabilitation of areas disturbed as a consequence of mining to a land capability that will support and sustain a predetermined post-closure land use;
- Removal of all infrastructure/equipment that cannot be beneficially re-used, as per agreements established, and returning the associated disturbed land to the planned final land use;
- Removal of existing contaminated material from affected areas;
- Establishment of final landforms that are stable and safe in the long run;
- Establishment and implementation of measures that meet specific closure related performance objectives;
- Treatment of mine-affected water to ensure compliance with all relevant standards and supply
- Monitoring and maintenance of rehabilitated areas forming part of site closure to ensure the long-term effectiveness and sustainability of measures implemented.

- (i) **Determination of closure objectives.** (Ensure that the closure objectives are informed by the type of environment described)

The vision, and consequent objective and targets for rehabilitation, decommissioning and closure, aim to reflect the local environmental and socio-economic context of the project, and to represent both the corporate requirements and the stakeholder expectations.

The receiving environment within which the mining activities will be undertaken includes the following key land uses:

Concerns raised by the stakeholders consulted during the public participation process for the basic assessment have been taken into consideration and included in the final BAR and EMP.

In practice the post closure land-use will depend on the pre-mining land-use applicable to the specific location of the invasive mining activities. Considering that the exact locations of the planned mining have been identified and assessed, it can be said that the closure plan will sufficiently address the objectives for the preferred alternative. This EMP does, however, aim to address the key closure objectives which are likely to remain consistent for the majority of the mining activities.

The EMPr includes a monitoring and a rehabilitation plan. The plan shall outline the closure objectives which are aimed at reinstating the landform, land use and vegetation units to the same as before mining operations take place unless a specific, reasonable alternate land use is requested by the landowner. As such, the intended end use for the disturbed mining areas and the closure objectives will be defined in consultation with the relevant landowner. Proof of such consultation will be submitted together with the Application for Closure Certificate.

The overall aim of the rehabilitation plan is to rehabilitate the environment to a condition as close as possible to that which existed prior to mining. This shall be achieved with a number of specific objectives.

- Making the area safe. I.e., decommission mining activities so as to ensure that the environment is safe for people and animals. This entails refilling excavations, sealing boreholes, etc.
- Recreating a free draining landform. This entails earthworks infilling, reshaping, levelling, etc. to recreate as close as possible the original topography and to ensure a free draining landscape.
- Re-vegetation. This involves either reseeding or allowing natural succession depending on the area, climate etc.
- Storm water management and erosion control. Management of storm water and prevention of erosion during rehabilitation. E.g., cut off drains, berms etc. and erosion control where required.
- Verification of rehabilitation success. Entails monitoring of rehabilitation.
- Successful closure. Obtain closure certificate.

(ii) Volumes and rate of water use required for the operation.

The volumes of water anticipated for dust suppression and the mining activities are not known at this stage. In addition, the Applicant is still investigating the source of the water. Should water need to be abstracted from the watercourse on site, a water use licence application must be submitted under Section 21 a: abstraction of water from a watercourse to the Mpumalanga Regional offices.

(iii) Has a water use licence has been applied for?

No water use licence has been applied for as part of this Mining Right application; however, it is anticipated that Section 21c and i water use may be applicable. It is recommended that this be confirmed with the Department of Water and Sanitation (DWS) prior to commencement of the invasive mining activities that require water and should any of the National Water Act (NWA) Section 21 water uses become applicable, then the Applicant will need to apply for the relevant water uses from the DWS prior to undertaking such activities.

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	Phase	Size and Scale	Potential impact	Aspects affected	Mitigation type and actions	Compliance Standards	Time period for implementation
Site clearance, excavations, loading and hauling	<ul style="list-style-type: none"> Inception Operation Rehabilitation 	<ul style="list-style-type: none"> 4.5ha 	<ul style="list-style-type: none"> Interference with existing land uses Disturbance/damage/destruction of the Grave Sites Sense of place Fugitive dust emissions Noise Loss and fragmentation of the vegetation Community Disturbance/damage/destruction of heritage sensitive areas Increased runoff and sedimentation Degradation and/or destruction of wetland habitats Contamination of surface and ground water Displacement of landowners and livestock 	<ul style="list-style-type: none"> Topography Soil Air quality Groundwater Social Ecology Watercourse Noise Heritage 	<p>Dust</p> <p>Reduce drop height of material to a minimum. Area will be mined in phases to reduce the barren areas. Temporarily halt material handling in windy conditions. A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers entering the site will be informed of the speed limit. The speed limit will be applicable when delivery trucks drive through areas where housing is next to the road.</p>	<p>The dust generated and fallout will be monitored against the requirements described below and the activity will cease, and mitigation measures implemented to ensure that the dust generated as a result of the activity meets the regulatory requirements.</p> <p>The National Dust Control Regulations regulates the following: No person may conduct any activity in such a way as to give rise to dust in such quantities and concentrations that the dust or dust fallout has a detrimental effect on the environment, including health, social, economic, ecological or cultural heritage conditions or has contributed to the degradation of the ambient air quality beyond the premises where it originates from; or that the dust remains visible in the ambient air beyond the premises where it originates from; or if the dust fall at the boundary or beyond the boundary of the premises where it originates exceeds: ≤ 1200 mg/m²/day averaged over 30 days, measured in accordance with reference method ASTM D1739 (Standard Test Method for Collection and Measurement of Dust fall (Settleable Particulate Matter)). It is important to note that people experience dust deposition as a nuisance effect, and that there are no direct human health implications because the dust does not reach the lungs. Indirect effects on human and animal health may result from the deposition of dust containing toxicants onto edible plants. Heavy dust deposition can have detrimental effects on plants if the leaves are smothered to the extent where transpiration and photosynthesis are affected. Particulate Matter).</p> <p>Two dust fallout incidents that exceed the limit may occur within a year (not sequential months). The control of incidents and emergency situations identified in terms of section 30 and section 30A of the NEMA, respectively. Any incident must be reported within the relevant timeframes to all relevant authorities. Containment, clean-up, and remediation of the affected area must commence immediately, and all necessary documentation must be completed and submitted to the relevant authorities within the prescribed timeframes.</p>	<p>Upon cessation of the individual activity (phase)</p>

Activity	Phase	Size and Scale	Potential impact	Aspects affected	Mitigation type and actions	Compliance Standards	Time period for implementation
		•	•		<p>Access Road and Safety</p> <p>The vehicles must stick to a speed limit of 30km/h on the narrow road section and when farm yard. The access road must be maintained and graded once monthly during operations.</p>	To maintain the current standard before mining operations, commence. The control of incidents and emergency situations identified in terms of section 30 and section 30A of the NEMA, respectively. Any incident must be reported within the relevant timeframes to all relevant authorities. Containment, clean-up, and remediation of the affected area must commence immediately, and all necessary documentation must be completed and submitted to the relevant authorities within the prescribed timeframes.	Upon cessation of the individual activity (phase)
		•	•		<p>Noise</p> <p>No activities that generate noise levels above the legal limit in terms of the Environmental Conservation Act, Western Cape Noise regulations will be conducted. Machinery and vehicles should be regularly maintained to prevent excessive noise. All machinery and work activities must adhere to the requirements of the noise regulations.</p>	The standard below will be used to measure noise levels and impacts. Table 2 of SANS 10103:2004 The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication where the daytime, equivalent continuous rating level is given as 70 dBA for Rural Districts.	Upon cessation of the individual activity (phase)
		•	•		<p>Emissions</p> <p>Vehicles and machinery on the site will be monitored for excessive emissions. Vehicles and machinery will be maintained to minimize emissions. A log book will be filled in to keep a record of all maintenance problems encountered and mitigation measures implemented to resolve the problem. Vehicles and machinery emitting excessive emissions will be stopped immediately and not allowed to operate until the necessary repairs have been done.</p>	Carbon monoxide (CO) is an odorless, colorless, and poisonous gas. Most CO is formed as a result of incomplete combustion of organic materials used as fuel. CO emissions are highest during incomplete combustion e.g., during idling and low speed mobile source operations, such as vehicle idle. CO enters the bloodstream and reduces oxygen delivery to the body's organs and tissues. Its most serious effects occur at high concentrations, and therefore it tends to be a localized problem. CO may produce adverse health effects such as headaches, work capacity impairment, learning ability impairment, dizziness, weakness, nausea, vomiting, loss of muscular control, increasing and decreasing respiratory rates, collapse, unconsciousness, or death. The health threat from CO is most serious for those who suffer from cardiovascular disease. Healthy individuals also can be affected, but only at higher concentrations. It is not anticipated that the CO emissions levels that is generated will cause the above effects. The occupational exposure limit of CO is 50 parts per million for a 40-hour work week. It is highly unlikely whether this level will be reached in the general environment. The control of incidents and emergency situations identified in terms of section 30 and section 30A of the NEMA, respectively. Any incident must be reported within the relevant timeframes to all relevant authorities.	Upon cessation of the individual activity (phase)

Activity	Phase	Size and Scale	Potential impact	Aspects affected	Mitigation type and actions	Compliance Standards	Time period for implementation
						Containment, clean-up, and remediation of the affected area must commence immediately, and all necessary documentation must be completed and submitted to the relevant authorities within the prescribed timeframes.	
Stormwater management and soil erosion	Inception Operation Rehabilitation	<ul style="list-style-type: none"> 5ha 	<ul style="list-style-type: none"> Flooding 	Surface water Neighboring houses Livestock	<p>Minimize sediment load in the water by stripping a maximum of 10 meters ahead of the mining face and only moving the material once it needs to be processed or into the intended topsoil beams on the edge of all current and future mining areas. Monitor for erosion. Should erosion be present, undertake maintenance activities such as planting of vegetation.</p> <p>All roads need to be maintained and monitored. Visible signs of possible erosion must be immediately rehabilitated.</p> <p>All storm water falling outside the mine property must be diverted around the mine. This forms part of the Storm Water Management Plan.</p> <p>Visually inspect exposed surfaces and top soil beams for signs of erosion. If erosion channels are discovered the mine will compile and implement a plan to determine the cause of erosion, reducing erosion in the identified areas and preventing future erosion. Fix the erosion. Reinstate engineered constructed contours as soon as a phase is completed, and topsoil placed on mine surface area</p>	Conservation of Agricultural Resources Act, 43 of 1983 and regulations. The control of incidents and emergency situations identified in terms of section 30 and section 30A of the NEMA, respectively. Any incident must be reported within the relevant timeframes to all relevant authorities. Containment, clean-up, and remediation of the affected area must commence immediately, and all necessary documentation must be completed and submitted to the relevant authorities within the prescribed timeframes.	Upon cessation of the individual activity (phase)
Fire	Inception Operation Rehabilitation	<ul style="list-style-type: none"> 5ha 	<ul style="list-style-type: none"> Uncontrolled fires 	Neighboring houses Livestock	<p>All employees will be trained on fire safety and on how to reduce the probability of a fire spreading out of control.</p> <p>Anyone who observes a fire must report it immediately to the fire protection agency/ fire brigade and their supervisor/ mine manager.</p> <p>Fire breaks will be maintained on the boundary of the mine site.</p> <p>Vehicles must be parked in an area with no vegetation if a fire occurs</p>	Conservation of Agricultural Resources Act, 43 of 1983 and National Veld and Forest Fire Act, 101 of 1998; and regulations	Upon cessation of the individual activity (phase)
Storage of hazardous substances	Construction Operation	<ul style="list-style-type: none"> 5ha 	<ul style="list-style-type: none"> Spillage of oils, fuels, and chemicals 	Surface water Groundwater Soil Pollution	<p>Any mine vehicle which is leaking hydrocarbons (e.g., petrol, diesel, or oil) will be serviced in a concreted workshop to repair the leak. If it is not possible to repair the leak immediately, a drip tray will be placed under the leak to trap any spillages. The content of the drip trays will be decanted into an old oil drum for removal from the site.</p> <p>An area for machinery refueling must be demarcated. These areas must be bunded and contain spill kits.</p>	Hazardous Substances Act, 15 of 1973 and National Environmental Management: Waste Act (Act No 59 of 2008); and regulations. The control of incidents and emergency situations identified in terms of section 30 and section 30A of the NEMA, respectively. Any incident must be reported within the relevant timeframes to all relevant authorities. Containment, clean-up, and remediation of the affected area must commence immediately, and all necessary documentation must be completed and	Upon cessation of the individual activity (phase)

Activity	Phase	Size and Scale	Potential impact	Aspects affected	Mitigation type and actions	Compliance Standards	Time period for implementation
					Contaminated spill kit cleaning materials must be disposed of at a hazardous landfill facility. Hydrocarbon spillages are to be cleaned up immediately. The mine will also maintain a store of suitable absorbent material, suitable bioremediation substance and a spill kit. All incidences/ spillages are to be recorded in an incident log book. Contaminated soil must go to a licenced Landfill site.	submitted to the relevant authorities within the prescribed timeframes.	
Waste management	Construction • Operation	• 5ha	• Generation and disposal of waste	Pollution	The toilet is serviced when needed and emptied when almost full. If a leak occurs the correct emergency procedure is to be followed (see above). Litter will be removed from site by the operator daily.	National Environmental Management: Waste Act (Act No 59 of 2008) and regulations. The control of incidents and emergency situations identified in terms of section 30 and section 30A of the NEMA, respectively. Any incident must be reported within the relevant timeframes to all relevant authorities. Containment, clean-up, and remediation of the affected area must commence immediately, and all necessary documentation must be completed and submitted to the relevant authorities within the prescribed timeframes. The control of incidents and emergency situations identified in terms of section 30 and section 30A of the NEMA, respectively. Any incident must be reported within the relevant timeframes to all relevant authorities. Containment, clean-up, and remediation of the affected area must commence immediately, and all necessary documentation must be completed and submitted to the relevant authorities within the prescribed timeframes.	Upon cessation of the individual activity (phase)
Rehabilitation	Rehabilitation	• 5ha	<ul style="list-style-type: none"> • Encroachment and displacement of an indigenous and vulnerable vegetation community by alien invasive species, potential re-establishment of natural species that were removed, the nature of the erosion will depend on the amount of successful vegetation establishment • Soil instability • Increased runoff and sedimentation • Soil pollution/contamination • Disturbance/damage/destruction of heritage sensitive areas • Disturbance/damage/destruction of the Grave 	Topography Land use Soil Ecology Heritage	<p>The main aim in developing this rehabilitation plan is to mitigate the impacts caused by the mining activities and to restore land back to a satisfactory standard. It is best practice to develop the rehabilitation plan as early as possible so as to ensure the optimal management of rehabilitation issues that may arise</p> <p>The following measures and objectives must be implemented;</p> <ul style="list-style-type: none"> ▪ Maintain and minimise impacts to the ecosystem within the study area. ▪ Re-establishment of the pre-developed land capability to allow for suitable post-mining land use. ▪ Prevent soil, surface water and groundwater contamination. 	Listing Notice 1 Activity 22: The decommissioning of any activity requiring – I. a closure certificate in terms of Section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002). II. A mining right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years excluding where the competent authority has in writing agreed that such reduction in throughput does not constitute closure.	Rehabilitation

Activity	Phase	Size and Scale	Potential impact	Aspects affected	Mitigation type and actions	Compliance Standards	Time period for implementation
					<ul style="list-style-type: none"> Comply with the relevant local and national regulatory requirements. Maintain and monitor the rehabilitated areas. <p>Successful rehabilitation must be sustainable, requires an understanding of the basic baseline environment and project management to ensure that the rehabilitation program is a success</p>		
Impact on the naturally occurring fauna present in the area	<ul style="list-style-type: none"> Inception Operation Rehabilitation 	<ul style="list-style-type: none"> 5ha 	<ul style="list-style-type: none"> Fauna and Flora destruction and interception of breeding patterns and habitat 	Fauna and Flora	<ul style="list-style-type: none"> Rehabilitate the area after the mining process is complete and vegetation will return. Use of topsoil with seeds and roots to rehabilitate the site. 	National Biodiversity Management Act	Upon cessation of the individual activity (phase)
Socio-economic	<ul style="list-style-type: none"> Inception Operation Rehabilitation 	<ul style="list-style-type: none"> 5ha 	<ul style="list-style-type: none"> Job employment Local Business Empowerment 	Employment	<ul style="list-style-type: none"> Jobs will be created. Local residents will be employed Local contractors, employing or seeking to employ local (historically disadvantaged individuals (HDIs) from the region who are suitably qualified, should get preference. The municipality, local community and local community organizations should be informed of the project and potential job opportunities by the developer. 	Employment and Labour Act BBBEE Principle	Upon cessation of the individual activity (phase)
Fossil Chance Find Protocol	<ul style="list-style-type: none"> Construction/operational 	<ul style="list-style-type: none"> 5ha 	<ul style="list-style-type: none"> Destruction to heritage resources 	Heritage resources	<ul style="list-style-type: none"> The following procedure is only required if fossils are seen on the surface or below the surface when excavations/mining commence. When excavations begin the rocks must be given a cursory inspection by the geologist on site, environmental officer, or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the mining activities will not be interrupted. Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures. Photographs of the putative fossils can be sent to the paleontologist for a preliminary assessment. If there is any possible fossil material found by the developer/environmental officer/miners then the qualified paleontologist sub-contracted for this project, should visit the site to inspect the 	National Heritage Act	Upon cessation of the individual activity (phase)

Activity	Phase	Size and Scale	Potential impact	Aspects affected	Mitigation type and actions	Compliance Standards	Time period for implementation
					<p>selected material and check the dumps where feasible.</p> <ul style="list-style-type: none"> ▪ Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the paleontologist must be removed, catalogued, and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a ▪ SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits. ▪ If no good fossil material is recovered, then the site inspections by the paleontologist will not be necessary. If no fossils are found and the excavations have finished, then no further monitoring is required. 		

Impact Management Outcomes

(g) description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph ();

Activity	Potential Impact	Aspects affected	Phase	Mitigation Type	Standard to be achieved
See f) Impact Management Actions above					

Impact Management Actions

Activity	Potential Impact	Aspects affected	Phase	Mitigation Type	Standard to be achieved
See f) Impact Management Actions above					

i) Financial Provision

- 1) Determination of the amount of Financial Provision.

Section 24 P of NEMA requires an applicant applying for an environmental authorisation related to mining to comply with the prescribed financial provision for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts before the Minister responsible for mineral resources issues the environmental authorisation. The above-mentioned financial provision may be in the form of an insurance, bank guarantee, trust fund or cash.

Regulations pertaining to the pertaining to the financial provision for mining, exploration, mining or production operations (GNR 1147) were promulgated on the 20th of November 2015.

Idlanga Mining has undertaken the financial provision determination in line with the requirements of section 11 of the Regulations pertaining to the Financial Provision for Mining, Exploration, Mining or Production Operations (GNR 1147). The financial provision determination for the proposed project is submitted to the Department of Mineral Resources for their consideration.

- (a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.

Considering the relatively limited impact of the proposed mining activities, the closure objectives are aimed at re-instating the landform, land use and vegetation units to the same as before mining operations take place unless a specific, reasonable alternate land use is requested by the landowner. As such, the intended end use for the disturbed mining areas and the closure objectives will be defined in consultation with the relevant landowner. Proof of such consultation will be submitted together with the Application for Closure Certificate. The overall aim of the rehabilitation plan is to rehabilitate the environment to a condition as close as possible to that which existed prior to mining. This shall be achieved with a number of specific objectives

1. Making the area safe. I.e., Decommission mining activities so as to ensure that the environment is safe for people and animals. This entails refilling excavations, sealing boreholes, etc.
2. Recreating a free draining landform. This entails earthworks infilling, reshaping, levelling, etc. to re-create as close as possible the original topography and to ensure a free draining landscape.
3. Re-vegetation. This involves either reseeding or allowing natural succession depending on the area, climate, etc.
4. Storm water management and erosion control. Management of storm water and prevention of erosion during rehabilitation. E.g., cut off drains, berms etc. and erosion control where required.
5. Verification of rehabilitation success. Entails monitoring of rehabilitation.

6. Successful closure. Obtain closure certificate.

- (b) Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

The Public Participation Process (PPP) is a requirement of several pieces of the South African legislation and aims to ensure that all relevant Interested and Affected Parties (I&APs) are consulted, involved and their opinions are taken into account and a record included in the reports submitted to Authorities. The process ensures that all stakeholders are provided this opportunity as part of a transparent process which allows for a robust and comprehensive environmental study.

The PPP which forms part of the Mining Right application needs to be managed sensitively and according to best practises in order to ensure and promote:

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

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

- Introduce the proposed project.
- Explain the environmental authorisations required.
- Explain the environmental studies already completed and yet to be undertaken (where applicable).
- Determine and record issues, concerns, suggestions and objections to the project.
- Provide opportunity for input and gathering of local knowledge.
- Establish and formalise lines of communication between the I&APs and the project team.
- Identify all significant issues for the project.
- Identify possible mitigation measures or environmental management plans to minimise and/or prevent negative environmental impacts and maximise and/or promote positive environmental impacts associated with the project.

- (c) 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 main aim in developing this rehabilitation plan is to mitigate the impacts caused by the mining activities and to restore land back to a satisfactory standard. It is best practice to develop the rehabilitation plan as early as possible so as to ensure the optimal management of rehabilitation issues that may arise. It is important that the project's closure plan is defined and understood before starting the process and is complementary to the rehabilitation goals. Rehabilitation and closure objectives need to be tailored to the project and be aligned with the EMPr. The overall rehabilitation objectives for this project are as follows:

- Maintain and minimise impacts to the ecosystem within the study area.
- Re-establishment of the pre-developed land capability to allow for a suitable post-mining land use.
- Prevent soil, surface water and groundwater contamination.
- Comply with the relevant local and national regulatory requirements.
- Maintain and monitor the rehabilitated areas.

Successful rehabilitation must be sustainable, requires an understanding of the basic baseline environment and project management to ensure that the rehabilitation program is a success. It is noted that an application for environmental authorisation must be submitted for closure in accordance with

Listing Notice 1 Activity 22:

The decommissioning of any activity requiring –

I. a closure certificate in terms of Section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002).

II. A mining right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years excluding where the competent authority has in writing agreed that such reduction in throughput does not constitute closure.

LANDFORM DESIGN, EROSION CONTROL AND REVEGETATION

Landform, erosion control and re-vegetation is an important part of the rehabilitation process. Landform and land use are closely interrelated, and the landform should be returned as closely as possible to the original landform.

Community expectations, compatibility with local land use practices and regional infrastructure, or the need to replace natural ecosystems and faunal habitats all support returning the land as closely as possible to its original appearance and productive capacity. This requires the following:

- Shape, level and de-compact the final landscape after removing all the project infrastructure, dress with topsoil and, where necessary, vegetate with indigenous species. Commission specialists to assist in planning re-vegetation and the management of environmental impact, as required.
- Remove access roads with no beneficial re-use potential by deep ripping, shaping and levelling after the removal and disposal of any culverts, drains, ditches and/or other infrastructure. Natural drainage patterns are to be reinstated as closely as possible.
- Shape all channels and drains to smooth slopes and integrate into the natural drainage pattern.
- Construct contour banks and energy dissipating structures as necessary to protect disturbed areas from erosion prior to stabilisation.
- Promote re-vegetation through the encouragement of the natural process of secondary succession.
- Natural re-vegetation is dependent on de-compactation of subsoils and adequate replacement of the accumulated reserves of topsoil (for example, over the borehole sites), so as to encourage the establishment of pioneer vegetation.
- Remove alien and/or exotic vegetation.
- Undertake a seeding programme only where necessary, and as agreed with the re-vegetation specialist.

POST-CLOSURE MONITORING AND MAINTENANCE

Prior to decommissioning and rehabilitation activities, a monitoring programme shall be developed and submitted to the relevant authority for approval, as a part of the Final Rehabilitation Plan. The programme is to include proposed monitoring during and after the closure of the mining borehole sites and related activities. It is recommended that the post-closure monitoring include the following;

- Confirmation that any waste, wastewater or other pollutants that is generated as a result of decommissioning will be managed appropriately, as per the detailed requirements set out in the Final Rehabilitation Plan.
- Confirmation that all de-contaminated sites are free of residual pollution after decommissioning.
- Confirmation that acceptable cover has been achieved in areas where natural vegetation is being re-established. 'Acceptable cover' means re-establishment of pioneer grass communities over the disturbed areas at a density similar to surrounding undisturbed areas, non-eroding and free of invasive alien plants.
- Confirmation that the mining borehole sites are safe and are not resulting in a pollution hazard.

Annual environmental reports will be submitted to the Designated Authority and other relevant Departments for at least one-year post-decommissioning. The frequency and duration of this reporting period may be increased to include longer term monitoring, at intervals to be agreed with the Designated Authority.

The monitoring reports shall include a list of any remedial action necessary to ensure that infrastructure that has not been removed remains safe and pollution free and that rehabilitation of project sites are in a stable, weed and free condition.

(d) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

The closure plan will assist the proposed mining operation to achieve the following objectives:

- Comply with relevant legislation and policy requirements with regards to mine rehabilitation.
- Avoid or mitigate impacts associated with the project which may be detrimental to the environment.
- Land rehabilitation to a predetermined and agreed upon state that allows sustainable land use and capability of the site, that is to return the site to the condition that existed prior to mining or an agreed upon state.
- Cost effective and efficient closure of mining operations.

- Management and monitoring of the area post-closure.

The rehabilitation plan will thus be aligned to the closure objectives and tailored to the project to achieve these objectives. It will include information about the site prior to the mining operation and provide information on the maintenance of resources required for the rehabilitation process, as well detail how rehabilitation will be undertaken. It will also provide information on the management and monitoring of disturbance to avoid or minimise detrimental impacts, as well as an estimate of the financial closure provision. It will also include information associated with post-closure environmental monitoring of the site to ensure that the rehabilitation plan is followed, and its objectives are achieved.

Activity	Closure Objective	Rehabilitation measures required	Extent to be rehabilitated	Monitoring required	Suggested order and time period for rehabilitation
Mining area, Loading and truck turning area	Mining, loading/ turning area to be rehabilitated to sustain vegetation; soil must be free of erosion and contamination, and not compacted.	Any rill or gully erosion must be rehabilitated using rock and/or brush packing. Excessive erosion (gullies deeper than 50cm) must be rehabilitated with larger structures such as gabions or rock mattresses. Soil surface is to be ripped to reduce compaction and allow for infiltration of water and establishment of vegetation. Area must then be overlaid with topsoil and seeded using locally occurring pioneer grass species (seeds can be collected from surrounding veld or grass seeds/plugs/mats can be purchased). Watering must take place every second day for at least one month to encourage establishment of vegetation. Overwatering of steep slopes being rehabilitated must be avoided as top soil and seeds may be washed away. Rather aim to dampen the surface frequently. This will also help reduce dust dispersion. No vehicles may be permitted to drive on area being rehabilitated. Silt fences must be erected across all areas of the site disturbed during mining (see detailed explanation of this measure in the last row of this table "excavation area"). This applies to all activities/area effected except the access road.	5ha	Weekly inspection by mine manager to ensure - vehicle access is being prevented, - there are no signs of erosion - There are signs of plant establishment - Invasive plants are removed Inspected monthly during/following rehabilitation by ECO audit	Mining area rehabilitated must only take place once all other infrastructure is removed and as soon as vehicle access is no longer required
Access Road	An access road free of erosion is to remain following mining	Gravel will be added to the road during site establishment. It is recommended that gravel be added to the road during operational phase and during rehabilitation. A gravel surface will aid infiltration and reduce erosion risks (as well as reducing dust emissions during operation). Rock packing or gabions must be used to stabilise the sides of the road if signs of erosion are present.	200m ²	Regular monitoring of the stability of the road and roadside is essential. Any early signs of erosion must be reported to the ECO immediately. ECO must instruct further erosion control measures. Options include silt fences, rock packing, gabions, rock mattresses and use of geotextiles. Movement of all vehicles on site must be monitored to ensure no vehicles are operating outside of the designated access, loading, turning, and parking areas. Any erosion control measures that are put in place must be monitored to ensure whether they are functional and/or effective enough. Inspected monthly during/following rehabilitation by ECO audit	Rehabilitation of the access road to be done last as the road needs to be used to access the site during rehabilitation.
Stockpiles	Ensure no stockpiled material is left on site and area used for stockpiling is vegetated	Only river sand (silica sand) will be stockpiled on site. Only a thin layer of river sand must remain on the soil once the stockpiles have been removed. This will in fact aid in promoting infiltration and is a medium on which vegetation will easily establish. All stockpiled material must be removed in a manner that does not lead to erosion of stockpiles or sedimentation of the river. Compaction of soil under stockpiles is likely lower than the road and truck turning areas, but ECO should assess and advise whether ripping before seeding is necessary. Area must then be overlaid with topsoil and seeded using locally occurring pioneer grass species (seeds can be collected from surrounding veld or grass seeds/plugs/mats can be purchased) or with sugar cane if this area falls within the area to be farmed. Watering must take place every second day for at least one month to encourage establishment of vegetation. Overwatering of steep slopes being rehabilitated must be avoided as top soil and seeds may be washed away. Rather aim to dampen the surface frequently. This will also help reduce dust dispersion. No vehicles may be permitted to drive on area being rehabilitated. Silt fences must be erected across all areas of the site disturbed during mining (see detailed explanation of this measure in the last row of this table "excavation area"). This applies to all activities/area effected except the access road.	100m ²	Weekly inspection by mine manager to ensure - vehicle access is being prevented, - there are no signs of erosion - There are signs of plant establishment - Invasive plants are being removed Inspected monthly during/following rehabilitation by ECO audit	Sand stockpiles levels are expected to be low prior to rehabilitation as this is the mines commodity. As such it doesn't rank high on the priority list. Mine manager must ensure the stockpiles are cleared and rehabilitated before the loading/turning area and access road are rehabilitated, as vehicle access will be required to removed raw materials.
Office	Office and all equipment stored on site to be removed. Area is to be rehabilitated to pre-mining state; soil must be free of	Storage containers and all equipment must be removed in such a way as to cause minimal damage to the surrounding environment. The ground under the storage container will likely be compacted and not suitable for plants to establish on. Soil is to be ripped to reduce compaction and allow for establishment of vegetation.	40m ²	Weekly inspection by mine manager to ensure - vehicle access is being prevented, - there are no signs of erosion	Storage container must be removed following slipway and stockpile rehabilitation, and prior to access road and turning area rehabilitation as

	<p>erosion, stable, vegetated and not compacted</p>	<p>Area must then be prepared as per the rest of the site; following profiling, area must then be overlaid with topsoil, fertilised and seeded using locally occurring pioneer grass species (seeds can be collected from surrounding veld or grass seeds/plugs/mats can be purchased) or with sugar cane if this area falls within the area to be farmed. Watering must take place every second day for at least one month to encourage establishment of vegetation. Overwatering of steep slopes being rehabilitated must be avoided as top soil and seeds may be washed away. Rather aim to dampen the surface frequently. This will also help reduce dust dispersion. No vehicles may be permitted to drive on area being rehabilitated. Silt fences must be erected across all areas of the site disturbed during mining (see detailed explanation of this measure in the last row of this table "excavation area"). This applies to all activities/area effected except the access road.</p>		<ul style="list-style-type: none"> - There are signs of plant establishment - Invasive plants are being removed <p>Inspected monthly during/following rehabilitation by ECO audit</p>	<p>vehicles access will be required for removal of the container,</p>
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- (e) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

Refer to Appendix E3 of the BAR for a detailed breakdown.

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

Idlanga Mining has committed to finance the mining costs and the rehabilitation of the site once mining has been concluded.

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

f) Monitoring of Impact Management Actions

g) Monitoring and reporting frequency

h) Responsible persons

i) Time period for implementing impact management actions

j) Mechanism for monitoring compliance

Source Activity	Impacts requiring monitoring programs	Functional requirements for monitoring	Roles and responsibilities	Monitoring and reporting
Mining Operation phase	Impacts on soil, air, and water	Conduct regular internal audits and inspections of the mining operation and assess against mine permit, Environmental Authorization and EMPr conditions. Yearly audits and mine performance assessment reports	Applicant and Environmental Control Officer	Monitoring should be undertaken for duration of operations and after completion of each phase. Internal audits and inspections should be undertaken at least monthly. External audits and annual performance report should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the Competent Authority if required.
Mining: Closure and rehabilitation phase	Impacts on soil, air, and water	Conduct regular internal audits and inspections of the mining operation and assess against mine permit, Environmental Authorization and EMPr conditions. Yearly audits and mine performance assessment reports	Applicant and Environmental Control Officer	Monitoring should be undertaken for duration of operations and after completion of each phase. Internal audits and inspections should be undertaken at least monthly. External audits and annual performance report should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the Competent Authority if required.

Indicate the frequency of the submission of the performance assessment/ environmental audit report.

The result of environmental monitoring and compliance to the approved EMPR will be undertaken annually and submitted to the DMRE in the form of an environmental performance assessment. Included in the report will be the following relevant information:

- The period when the performance assessment was conducted.
- The scope of the assessment.
- The procedures used for conducting the assessment.
- Interpreted information gained from monitoring the EMPR.
- Evaluation criteria used during the assessment.
- Results of the assessment are to be discussed and mention must be made of any gaps in the EMPR and how it can be rectified.
- Yearly updated layout plans.

Any emergency or unforeseen impacts will be reported immediately to the DMR and other relevant government departments.

m) 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.

The Applicant and Contractor must ensure that all relevant employees are trained and capable of carrying out their duties in an environmentally responsible and compliant manner and are capable of complying with the relevant environmental requirements. To obtain buy-in from staff, individual employees need to be involved in:

- Identifying the relevant risks.
- Understanding the nature of risks
- Devising risk controls.
- Given incentive to implement the controls in terms of legal obligations.

Training and/or awareness should be raised and effectively communicated prior to the commencement of the mining activity. Training sessions should incorporate the management plans addressed in the EMPR as well as any new information and documentation.

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

Environmental awareness could be fostered by induction course for all personnel on site, before commencing site visits. Personnel should also be alerted to particular environmental concerns associated with their tasks for the area in which they are working. Courses must be given by suitably qualified personnel and in a language and medium understood by personnel. The environmental awareness training programme will include the following:

1. Occupational Health and Safety Training (OHS).
2. Environmental Awareness Training EMPR management actions.

Environmental awareness training will focus on the following specific aspects and be undertaken in "Toolbox talk" topics prior to site access:

1. Waste collection and disposal.
2. EMPR management options and application.

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

The following measures are provided to control any causes of pollution or degradation during the mining activities.

- Contain potential pollutants and contaminants (where possible) at source.

- Handling of potential pollutants and contaminants (where possible) must be conducted in bunded areas and on impermeable substrates.
- Ensure the timeous clean-up of any spills.
- Implement a waste management system for all waste stream present on site.
- Investigate any I&AP claims of pollution or contamination as a result of mining activities.

n) Specific information required by the Competent Authority
(Among others, confirm that the financial provision will be reviewed annually).

No specific information requirements have been made by the Competent Authority at this stage.

2) UNDERTAKING

The EAP herewith confirms

- (a) The correctness of the information provided in the reports
- (b) The inclusion of comments and inputs from stakeholders and I&APs ;
- (c) The inclusion of inputs and recommendations from the specialist reports where relevant; and
- (d) That the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein.



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Signature of the environmental assessment practitioner:

THEVHA SUSTAINABLE SERVICES (PTY) LTD
Name of company:

2nd December 2022
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Date: