
Basic Assessment Report and Environmental Management Programme for Coal Mining Permit Application on Portion of the Farm Lot 15049, Amajuba district in Kwazulu Natal Province.

Prepared for: Breakthrough Power Solar (Pty) Ltd

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mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT

AND

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

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FILE REFERENCE NUMBER SAMRAD: KZN 30/5/1/3/2/10893 MP

1. IMPORTANT NOTICE

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

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

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

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or 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.

2. 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;
 - (bb) may cause irreplaceable loss of resources; and
 - (cc) 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.

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PART A

SCOPE OF ASSESSMENT AND REPORT

1. Contact Person and correspondence address

1.1 Details of the EAP

Names of Practitioners:	Phathutshedzo Mugagadeli
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1.2 Expertise of the EAP.

The EAP has a Bachelor of Environmental Sciences from University of Venda and Bachelor of Science Honours in Geography (UNISA).

Summary of the EAP's past experience

Mr Mugagadeli Phathutshedzo has a solid 05 years' experience in Conducting EIAs. He has conducted EIAs for various projects including but not limited to Construction, Agricultural, Prospecting and Mining as well as Waste Management. His exposure to different working environment has greatly advanced his technical ability in identifying and assessing impacts as well as providing mitigation thereof, from this role he has learnt the best practical strategies to manage and mitigate impacts.

The EAP's CVs is attached as Appendix 02.

2.0. Project Locality

2.1 Location of the overall activity

Farm Name:	Portion of the farm A Lot 15049
Application area (Ha)	05 Hectares
Magisterial district:	Amajuba
Distance and direction from nearest town	Approximately 05 Kilometres west of Newcastle
21 digit Surveyor General Code for each farm portion	N0HS02210001504900000

2.2 Locality map

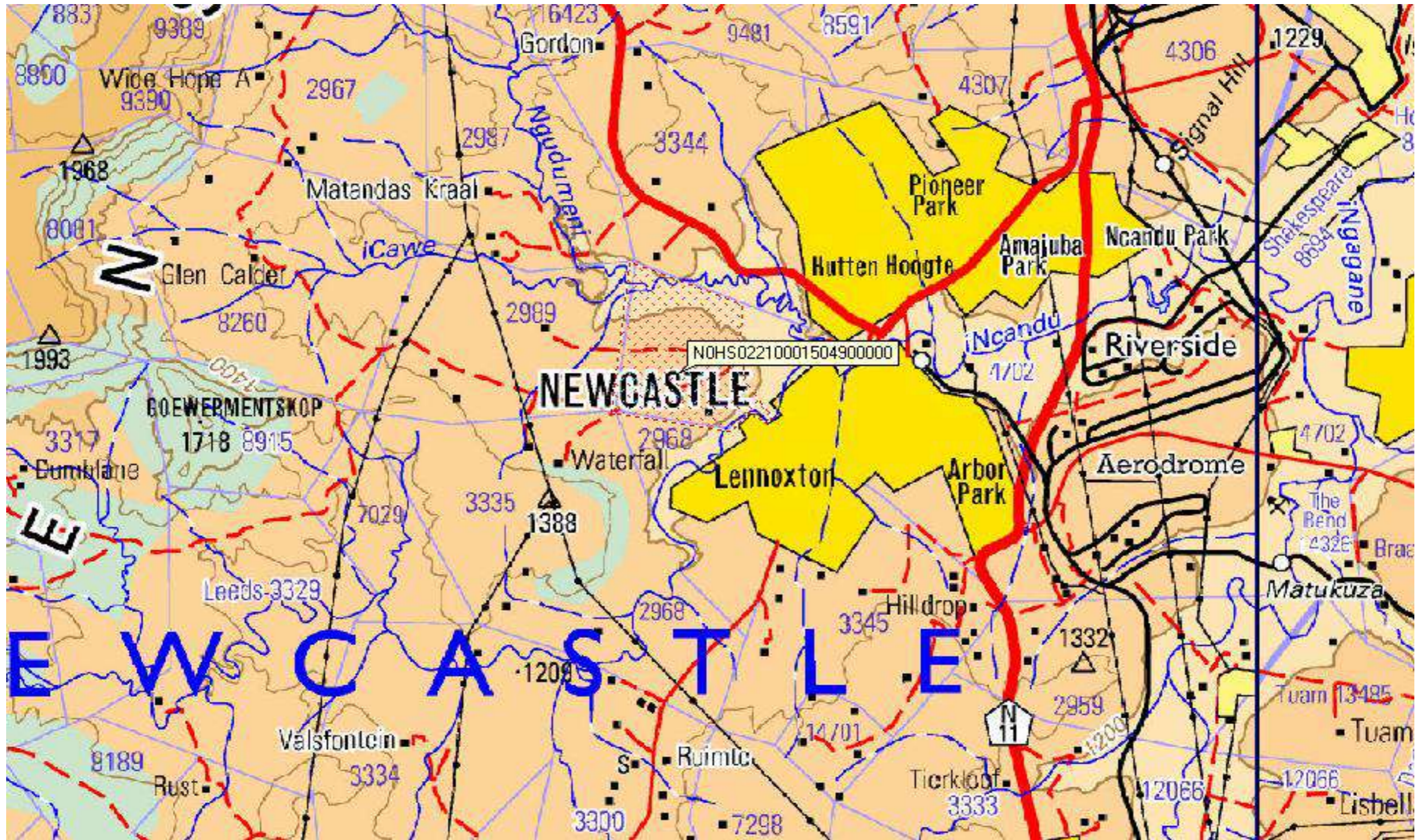


Figure 2-1: Locality map

3.0. DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY

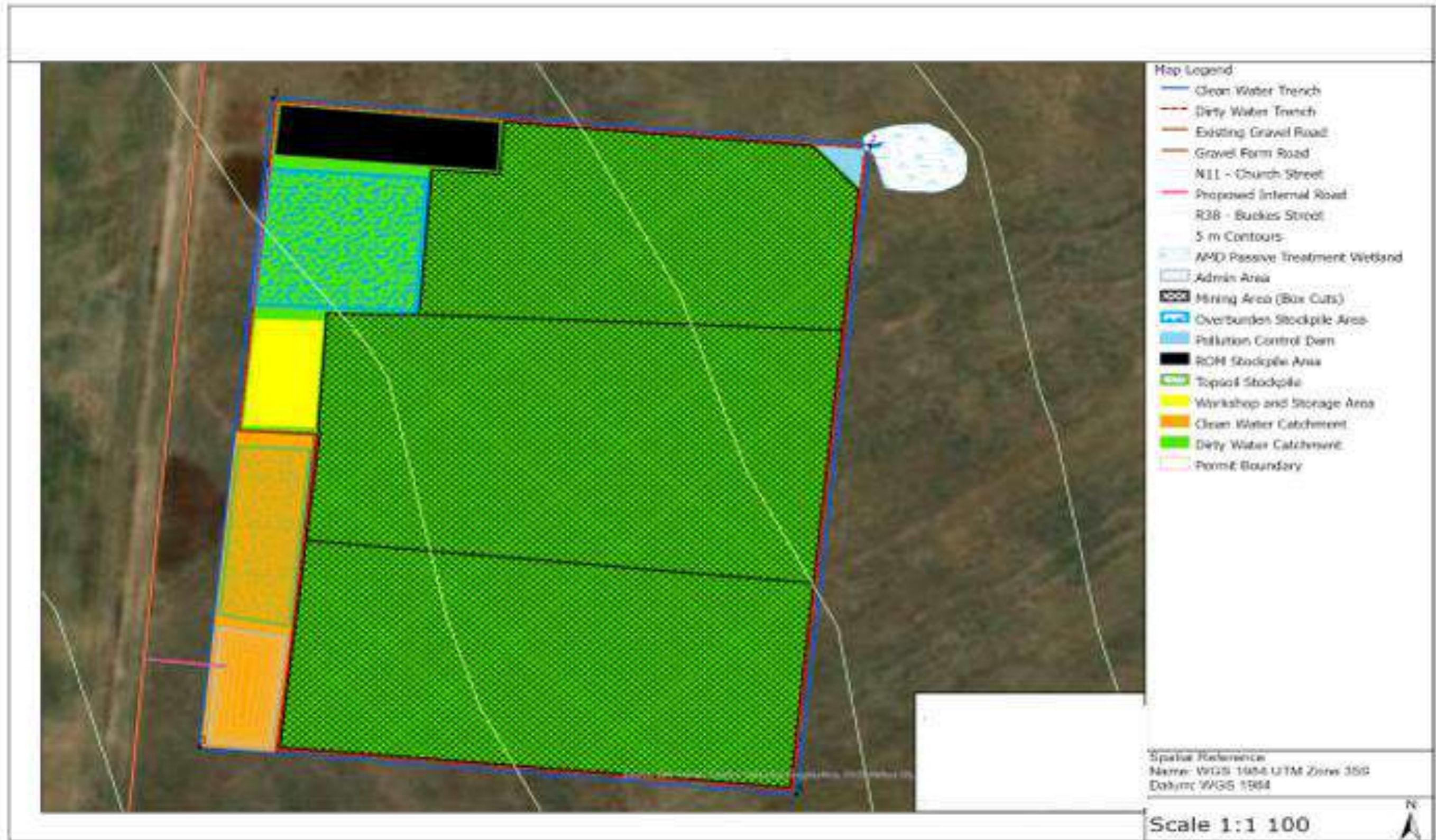


Figure 3-1:: Site proposed mine layout

3.1 Listed and specified activities

Name of Activity	Aerial Extent of the Activity Ha Or M ²	Listed Activity	Applicable Listing Notice	Waste Management Authorisation
Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002),	5 ha	X	GNR 327 – Listing 1: Activity No. 21	N/A
Clearance of vegetation to establish mining area and placement of mining infrastructure.	5 ha	X	GNR 327 – Listing 1: Activity No. 27	N/A
Site Establishment: <ul style="list-style-type: none"> • Demarcation and Fencing • Installing Access Gates • Creation of Access Roads 	1.2 ha		Not Listed	N/A
Camp establishment: <ul style="list-style-type: none"> • Ablution Facilities • Mobile site office • Hydrocarbon Storage Tanks • Water Storage Drums/Tanks 	0.07 ha		Not listed	N/A
Storage Area Establishment: <ul style="list-style-type: none"> • Topsoil Stockpiling Area • Overburden Stockpiling Area • ROM Stockpiling Area 	0.8 Ha		Not listed	N/A
General Waste Storage & Disposal	25 m ²		Not listed	N/A
Mining Preparation Activities: <ul style="list-style-type: none"> • Topsoil Stripping and Haulage • Overburden Removal and Haulage • Coal extraction and haulage 	5 Ha		Not listed	N/A
Water Management: <ul style="list-style-type: none"> • Construction of Pollution Water Dam • Construction of Storm water diversion/control Trenches • Construction of clean water Trenches 	0.6 Ha		Not listed	N/A

Name of Activity	Aerial Extent of the Activity Ha Or M ²	Listed Activity	Applicable Listing Notice	Waste Management Authorisation
Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002),	5 ha	X	GNR 327 - Listing 1: Activity No. 21	N/A
Clearance of vegetation to establish mining area and placement of mining infrastructure.	5 ha	X	GNR 327 - Listing 1: Activity No. 27	N/A
<ul style="list-style-type: none"> Construction of Dirty Water Trenches 				
Rehabilitation	5 Ha		Not listed	N/A

3.2 Description of the activities to be undertaken

Breakthrough Power Solar Pty Ltd with the service of an independent Environmental Assessment Practitioner from Mielelani Consultancy is applying for a Mining Permit on a 5 Hectares piece of land on Portion of the farm A Lot 15049. The Farm is located within the jurisdiction of Newcastle Local Municipality, Amajuba District in Mpumalanga Province. The application area lies approximately 05 Kilometres west of Newcastle town.

3.2.1 What is surface mining?

Open-pit mining, also known as opencast mining, is a surface mining technique that extracts coal ore from an open pit in the ground. Open-pit mining is the most common method used throughout the world for mining and does not require extractive methods or tunnels. This surface mining technique is used when ore deposits are found relatively close to the surface of the earth.



Figure 3-2: Typical surface mine



Figure 3-3: Coal open pit mining

Open-pit mines are dug on benches that are between four and sixty-meters in size, depending on the size of machinery used to excavate. The walls of most open-pit mines are dug at an angle and include steps to prevent avalanches from occurring inside the build site. The incline section of the wall is called the 'batter,' and the flat part of the step is called the 'bench' or 'berm.'

In some cases, de-watering bores are drilled horizontally into the walls to relieve water pressure, which can destroy the walls if not properly addressed. A haul road is dug at the side of the pit to form a ramp for ore-carrying trucks to haul material to and from the mining site. After the physical mine infrastructure has been built, production activities include drilling, blasting, excavation, loading and transporting broken ore.

Waste rock is piled up near the edge of the pit and spreads both horizontally and vertically. This is known as the 'waste dump'. The waste dump is also tiered and stepped, to keep rocks from falling into other parts of the site.

Processed ore, known as 'tailings,' is pumped into a settling pond until the water evaporates. These tailings ponds are often toxic due to the presence of un-extracted sulfide minerals.

Typical mine infrastructure includes: haul roads, spoil dumps, surface facilities (e.g. Toilets, stockpiles and storage yard) waste rock disposal areas, transport and service corridors (e.g. roads), product stockpiles, chemicals and fuel storage, storm water management infrastructure and site offices.

SUMMARY OF ACTIVITIES

- Site preparation;
- Box cut open cast mining with roll over rehabilitation sequence;
- Clean and dirty water separation system;
- Trenching 1.8 meters deep and 2 meters wide and placement of a berm 2 meters wide and 1.5 meters high around the perimeter;
- Fencing;
- Building a confinement dam;
- Drilling and blasting and explosive handling;
- Topsoil, subsoil, overburden, discard and ROM stockpiles;
- Waste management; &
- Mine closer and rehabilitation.

3.3 Activities associated with the proposed mining

3.3.1 Site Access and routes

The undertaking of mining activities will require access from the local road into the mining property. The local access roads to be used from site will be the existing gravel road into the property from the R34.

Access into the mining property must be through access agreements contracts signed between property owner and the Applicant. The access agreements will be a legal document effective from the date of signing until the exit contract is signed off. The gravel roads will be maintained to the applicable standards which includes a gravel road leading to the mine. Several temporary roads will be constructed to access the ROM stockpile area. The water carts with an added dust suppressant will be used to suppress the dust on the roads inside and outside the 5-ha mining permit area.

The impact assessment and management details how the roads must be created and managed.

3.3.2 Fencing and installation of access gates

The mining site will be completely fenced off from the surrounding and Access Gates will be installed. Fencing of the entire mining area ensures safety and also keeping trespassers and unauthorised persons at bay. The site perimeter is approximately 1200 metres.

3.3.3 Site Preparation

Site preparation mainly deals with mining area demarcation, clearing of vegetation, the stripping and stockpiling of topsoil prior to mining activities commencing as this might affect the quality and quantity of available valuable topsoil resources required for rehabilitation.

3.3.4 Site stockpiles

Position of the topsoil, subsoil and overburden stockpiles have been indicated on the mine plan. All topsoil, subsoil and overburden material removed during the mining operation will be stockpiled separately for the purpose of backfill and rehabilitation.

The topsoil stockpiles will not exceed a height of two (2) meters which is high enough to reduce leaching impacts of stockpiled topsoil. The subsoil and overburden stockpiles will however exceed this height.

Topsoil will be kept separate from other stockpiles and shall not be used for construction purposes or for maintenance of the access roads. The topsoil shall be adequately protected from being blown away by wind or eroded by the force of water. The subsoil and overburden stockpile areas will cover an area of approximately 0.8 ha inside the Mining Permit area, of which the topsoil will be stripped and stockpiled separately.

Stockpiles may be used in some instance to provide visual and noise barriers between mining operations and neighbouring land users. These stockpiles will be constructed from either overburden or from soil (not topsoil) and will be in place for the life of mine and will be top-soiled and grasses immediately after their construction. Topsoil removal will take place by means of excavator and hauled with Articulate Dump Trucks.

The Coal Stockpiling/ Run of Mine Material (ROM) area will be established to cover an area approximately 0.6 ha inside the proposed mining area and will not contain more than 10 000 tons of coal at one period. The stockpile will also

not exceed a height of 6m. Dirty water emanating from this area will be diverted to the pollution control dam.

3.3.5 Mobile offices, toilets and sanitation

The chemical toilet (conservancy) system will ensure a type of sewage removal vehicle can remove and dispose of sewage at an appropriate treatment facility. Mobile toilets will also be used where necessary. Water for drinking will be brought on site by tanks. Mobile offices will also be brought on to the site inside the 5-ha mining application area.

3.3.6 Water Management

3.3.6.1 Clean and dirty water separation

The site clean and dirty water will be separated on site. The dirty water catchment will be demarcated and the dirty water will be directed to the pollution control dam (PCD). No dirty/ contaminated water will be released off site without treatment. Lined trenches will be created around the dirty water catchment into the PCD.

Unlined trenches will be created to prevent clean water from flowing into the dirty water catchment. The clean water trenches will divert clean water away from active and contaminated mining area.

3.3.6.2 Dirty water management

This is the management of water that has been contaminated by coming into contact with the dirty materials on site, this includes flows from the mine pit, flows from ROM as well as flows from hazardous wastes. Dirty water must not be mixed with clean water at all times. The mine designs will ensure that dirty water is minimized and also directed away from clean water trenches. The primary objective of dirty water management is to balance the average inflows with expected usage. If a positive water balance exists even for average rainfall conditions, the achievement of 2% of lower risk of spilling is regarded as problematic.

Dirty water will be contained within the site in the Pollution Control Dam. The dirty water may be reused within the mining area for dust control and cleaning of plants.

3.3.7 Waste Management

Waste will be generated from the start to the decommissioning of the project. It is proposed that the waste that would be generated on site would be managed by reducing, reusing and recycling/rehabilitating as far as possible. A certified and approved external contractor will be responsible for the removal and disposal of the waste at 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 the reclamation of all building rubble during the construction phase.

3.3.8 Mine Closure and Rehabilitation

During decommissioning, the working areas will be rehabilitated and re-vegetated, as per the approach outlined in the closure/rehabilitated plan. It is important that the applicant and the landowner's liability for the site persist until such time as a closure certificate has been issued by the DMRE, accordingly, once the vegetation has been established, a closure report will be submitted to the DMRE.

3.4 Project scheduling

The department of Mineral Resources and Energy allows for a maximum of two (2) years to conduct mining activities.

3.5 Equipment and/or Technology to be used

- ✓ Articulated haulage truck;
- ✓ Bull dozer;
- ✓ Front End Loader;
- ✓ Detonators; and
- ✓ Water Tanker.

4.0. 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 South Africa, specifically section 24(a), (b)(i) – (iii).	Impact assessment and management; and Public Participation Process;	<p>[1] The Rights of the affected parties will be considered and they will be informed of the proposed mining activities;</p> <p>[2] The prospecting activities will only proceed after effective consultation.</p>
Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) section 16(1)(a)-(c)	The Mining Permit application was lodged in terms of the MPRDA and requirements were satisfied.	The application for mining permit was lodged and all required documents submitted.
National Environmental Management Act (107; 1998) section 23(1) & (2), 24(1); & 24(4)(b)(i) – (vii).	<p>[1] Impact Assessment;</p> <p>[2] Financial Provision;</p> <p>[3] Mitigation Measures; and</p> <p>[4] Public Participation.</p>	<p>[1] The receiving environment was thoroughly assessed;</p> <p>[2] Probable impacts were identified and their mitigation measures and monitoring mechanisms developed;</p> <p>[3] Financial Provision for rehabilitation was determined and the applicant will pay the amount before the right is issued;</p> <p>[4] Affected and Interested Parties were engaged and given opportunities to get involved in the proposed project.</p>

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.
NEMA Environmental Impact Assessment (EIA) Regulations, 2014; R 982 & R 983.	Entire document	<p>[1] All triggered listed activities have been identified and applied for;</p> <p>[2] The Basic Assessment Report and Environmental Management Programme were compiled in terms of these Regulations; and</p> <p>[3] The public participation was done as per the said Regulations.</p>
National Environmental Management: Waste Act	Used as guidance for mitigation measures as no listed activities were triggered.	The project activities do not trigger a waste management license but proper waste management measures will be addressed in the EMPr.
Section 38 of the National Heritage Resources Act (Act No. 25 of 1999)	Part A subsection 9.1.7	There are no graves inside the affected 5ha application, the grave areas will be marked as "no-go" areas.
The National Environmental Management Biodiversity Act (NEM:BA), 2004 (Act No.10 of 2004), provides for:	<p>[1] Impact Assessment</p> <p>[2] Site background description</p>	Impacts on the biodiversity have been identified and mitigation has been provided.

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.
<p>National Water Act The NWA (Act No. 36 of 1998)</p>	<p>Impact Assessment</p>	<p>[1] Water use license is not required for this application, the proposed mining activities do not trigger listed water uses in terms of Section 21 of the NWA.</p> <p>[2] The water resource will be protected and no activities will take place within 100 metres of any water resource; and</p> <p>[3] Any water required for mining activities will be obtained from a legal source within the area and brought to site by a tanker.</p>
<p>Regulation 704 (GN704) (Government Gazette 20118, 4 June 1999) was drawn up to address these issues in relation to mining activities. Compliance to the requirements of GN704 is a legal requirement for all mining operations.</p>	<p>Management measures</p>	<p>[1] No mining activities will take place within 100m of a recognized watercourse or wetland; and</p> <p>[2] No new access tracks will be created which cross a watercourse. (Only existing roads / tracks will be used).</p>

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.
National Environmental Management: Air Quality Act, 2004 (Act no.39 of 2004);	Impact assessment & Management	[1] Dust suppression methods will be used; [2] Operating vehicles and machineries will be kept in good working conditions to prevent excessive release of gases.
Mine Health and Safety Act, 1996 (Act No. 29 of 1996);	Impact assessment and management	Activity based risk assessment will be conducted prior undertaking the site prospecting activities.
2016 KwaZulu-Natal (KZN) Biodiversity Sector Plans	Impact Assessment & Description of receiving environment	There is an interception with CBA Optimal within the site. The CBA is unavoidable and must therefore be fully rehabilitated.
National Freshwater Ecosystems Priority Areas (NFEPA, Nel et al., 2011);	Impact Assessment & Description of receiving environment	There are no NFEPA Water resources to be affected.
Mining and Biodiversity Guidelines 2013	Impact Assessment & Description of receiving environment	No sensitive areas were identified according to the guideline.
National Development Plan 2030	Baseline environment description	Everything in the plan is aimed at reducing poverty and inequality. A mine will be developed that will contribute to the local socio-economy.

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.
White Paper on Environmental Management Policy, 1997		Impact management, sustainable development, consultation.

5.0. Need and desirability of the proposed prospecting activities

The need and desirability of the proposed mining activities were investigated and assessed based on the DEA (2017), Guideline on Need and Desirability. According to this guideline the concept of “need and desirability” can be explained in terms of the general meaning of its two components in which need primarily refers to time and desirability to place (i.e. is this the right time and is it the right place for locating the type of land-use/activity being proposed?), “need and desirability” are interrelated and the two components collectively can be considered in an integrated and holistic manner. The “need” relates to the interests and needs of the broader public.

Addressing the need and desirability of a development is a way of ensuring sustainable development – in other words, that a development is ecologically sustainable and socially and economically justifiable – and ensuring the simultaneous achievement of the triple bottom-line. The 2017 Need and Desirability Guideline sets out a list of questions which should be addressed when considering need and desirability of a proposed development. These are divided into questions that relate to ecological sustainability and justifiable economic and social development.

The questions that relate to ecological sustainability include how the development may impact ecosystems and biological diversity; pollution; and renewable and non-renewable resources. When considering how the development may affect or promote justifiable economic and social development, the relevant spatial plans must be considered, including Municipal Integrated Development Plans (IDP), Spatial Development Frameworks (SDF) and Environmental Management Frameworks (EMF). The assessment reports will need to provide information as to how the development will address the socio-economic impacts of the development, and whether any socio-economic impact resulting from the development impact on people’s environmental rights. Considering the need and desirability of a development entails the balancing of these factors.

In the National Spatial Development Perspective (NSDP) (2003 and updated in 2006) it is highlighted that, to achieve the goal of stimulating sustainable economic activities and to create long-term employment opportunities, it is required that spending on economic infrastructure is focused in priority areas

("spatial targeting") with potential for economic development, with development to serve the broader societies' needs equitably.

The New Growth Path (NGP) (2010) in turn highlights the need to focus on facilitating growth in sectors ("sectorial targeting") able to create employment on a large scale, while not neglecting more advanced industries that are crucial for sustained long-run growth, and encouraging stronger investment by the private and public sectors to grow employment-creating activities rapidly while maintaining and incrementally improving South Africa's core strengths in sectors such as capital equipment for construction and **mining, metallurgy**, heavy chemicals, pharmaceuticals, software, green technologies and biotechnology.

The National Development Plan 2030 (NDP) (2012) stresses that the threat to the "environment and the challenge of poverty alleviation are closely intertwined" and as such environmental policies should not be framed as a choice between the environment and economic growth. The NDP states that: South Africa faces urgent developmental challenges in terms of poverty, unemployment and inequality, and will need to find ways to "decouple" the economy from the environment, to break the links between economic activity, environmental degradation and carbon-intensive energy consumption.

The aspects of need and desirability of the proposed prospecting project are discussed below in subsection (5.1) and (5.2)

5.1 Securing ecological sustainable development and use of natural resources

5.1.1 How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?

The site assessment conducted has established that there are no protected ecosystems within the proposed site. According to the National Biodiversity Assessment (NBA) of 2018 the site is located on the least concern Northern KwaZulu-Natal Moist Grassland. The grassland is largely pristine providing grazing for local livestock.

According to the South African National Vegetation Map, the proposed site is located within the Sub-Escarpment Grassland Bioregion of the Grassland biome (Mucina and Rutherford, 2006). The site assessment has established that the endangered grassland has been partially modified by agricultural practices. There

are no formally protected sites within the proposed mining application area. There are no wetlands resources identified within the proposed site. The Inguduma River is located to the north of the proposed site together with the associated floodplain wetland.

The proposed mining activities have greatest potential to permanently impact the local ecology although the site will be rehabilitated thereafter. The remaining natural vegetation within the proposed mining area will be removed to make way for mining and infrastructures. The proposed mining will result in degradation and loss of ecological species of the CBA.

Contaminated storm water from the mine in the absence of management measures will flow in the Inguduma River affecting surface water quality.

Should the mining be authorised, the mining activities must be conducted according to the approved EMP to limit impact on the environment and to ensure the site is rehabilitated.

5.1.2 How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity?

The proposed mining project will have negative impact on the ecosystem as the natural environment will be disturbed to make way for the establishment of mining area and access roads. Mining activities are chiefly dictated to by the location of ore zones and can only be undertaken where ore deposits exists. Mining activities are one of the environmental degrading economic activities. Full impact assessment is provided in Part A, Section 10.0 & 12.0 and Part B, Section 4.0 in page 109 of this report.

5.1.3 How will this development pollute and/or degrade the biophysical environment?

There is a potential to pollute underground water resource during mining, soil contamination and loss of flora and fauna. Ecological species will be lost in the absence of sound environmental management measures. The operating equipment are mostly hydraulic and fuelled by hydrocarbons with potential to pollute the soil and water resources. Mining activities will generate dust impacting the local air quality. The EIA process has identified the potential impacts associated with the proposed mining activities and are discussed in Part A, Section 10.0 & 12.0 and Part B, Section 4.0 in page 109 of this report.

5.1.4 What waste will be generated by this development?

The mining activities are expected to generate both general wastes and hazardous waste. The generated wastes will include mine discards, used oils, and unusable hydrocarbons, contaminated stormwater, sewage, bio-waste (sanitary pads and used first aid materials) and general domestic waste and sewage waste. All the waste to be generated will be disposed of at registered waste facilities and disposal certificates will be kept on site.

5.1.5 How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage?

It is illegal in terms of the South African Heritage Resources Act (25; 1999) to destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority.

There were informal graves identified, located outside the proposed mining area. The proposed mining activities will not disturb the site graves and the graves will be demarcated as no-go area for all project related activities.

5.1.6 How will this development use and/or impact on non-renewable natural resources?

The project is aimed at mining for non-renewable coal resource. The operating machineries and equipment will also make use of non-renewable hydrocarbons. The project is not expected to excessively use non-renewable in such a way that it can affect other users.

5.1.7 How will the ecological impacts resulting from this development impact on people's environmental right?

There were no ecological resource harvesting and active conservation practice in the area. The proposed mining activities are not expected to directly impact on local community's environmental right. The nearest community is the informal settlement located at approximately a kilometre west of the proposed area. The proposed property is privately owned with no direct ecological benefits to the local community.

The proposed mining activities are to have a direct financial impact on the land owner and user than ecological impacts.

5.2 Promoting justifiable economic and social development

Mining activities through a mining permit can only be undertaken for a maximum of three years. During the three year periods the mining operation will require labour force from the local informal settlement. Mining activities also promote establishment of other secondary economic activities such as street vending providing food for the miners. The proposed mining activities will hire at least 30 people from the local informal settlement.

The mining sector contribute largely to the South African Gross Domestic Product (GDP). In 2018 the mining sector contributed R351 billion to the South African gross domestic product (GDP). A total of 456,438 people were employed in the mining sector in 2018.

Mining accounts for 11% of gross fixed capital formation, but also for 16% of all foreign direct investment in South Africa. The industry accounts for only 0.3% of corporate taxpayers, but they were responsible for 6% of tax assessed in 2014. Although mining employs almost half a million people, this is only 5% of the country's workforce.

According to Statistics South Africa (Stats SA), local and foreign mineral sales in 2016 totalled almost R424 billion. According to the Chamber of Mines, mining exports in 2015 amounted to R320 billion.

There are no human settlements within the proposed site which would have otherwise required resettlement. The informal settlement is located to the west of the proposed mining area and as such the mine development will not result in establishment of informal settlement to provide labour force to the mine.

The distribution of the related mining impact will not racially discriminate against anyone including the land owners. The proposed mining area was preferred based on site geology and sensitivity.

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

6.1 Preferred Site

The choice for the preferred site was based on the following aspects about the site:

Site geology: The proposed site is located within the Vryheid formation which has proven over time to contain coal deposits.

Site Infrastructure and human settlements: There are no established human settlements within the proposed site. The proposed site is primarily used agriculture with no established infrastructures.

Site Access: The site can be accessed via existing farm gravel road into the property from R34 (it runs along the north eastern side of the project from Newcastle).

6.2 Preferred Activities

There are various mining methods which are in the form of non-entry mining, underground and surface mining. The project preferred mining method is surface mining due to the shallow burial depth of the mineral deposits, Surface mining is less complex and safer with higher recovery rates when compared to underground mining operations.

7.0. Full description of the process followed to reach the proposed preferred alternatives within the site.

Alternatives were chosen based on the consideration of both geological attributes, and site sensitivity.

7.1 Details of the development footprint alternatives considered.

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

The proposed site was preferred based on available geological data which acknowledges the presence of coal deposits underneath the proposed area. The site is located within the Vryheid formation with proven mineable coal deposits.

There are also no existing infrastructures on the proposed site that would be affected by the proposed mining activities.

The site has low environmental sensitivity, the closest stream (Ngudumeni) is located approximately a kilometre to the north. According to various national and provincial ecological layers the site is not located in protected, critical biodiversity areas and ecological support areas. The vegetation map of South Africa, however, locates the proposed site within the Sub-Escarpment Grassland Bioregion of the Grassland biome, the grassland is however modified on site.

NO OTHER SITES WERE ASSESSED.

7.1.2 The type of activity to be undertaken;

The mining activities are the preferred option for the proposed site, the site is partially modified with no natural remaining and also covered by non-critical biodiversity. The site will be rehabilitated according to an approved rehabilitation plan. The disturbed ecology will be restored and functionality improved on cessation of the mining activities after the 03-year mine life period.

7.1.3 The design or layout of the activity;

The design and site layout for the proposed mining activities are chiefly dictated to by the distribution of the mineral deposits. The site infrastructures will be placed close to the mining area within the 5 ha application areas. The mining activities will be undertaken through surface mining methods.

7.1.4 The technology to be used in the activity;

Surface mining being the simple mining methods and requires simple technology to operate. The mining activities will be carried out using the front end loaders to remove topsoil and overburden, and excavators to extract coal deposits and articulated trucks for transportation, coal processing will be done off site.

7.1.5 Other operational aspects:

Water requirement

The water requirement for the mining activities will be met by bringing in water to site from a registered water source and stored in water tanks.

Waste Management

The principle of Reduce, Re-use and Recycle must be implemented at all times. The waste will be separated at source and disposed at an appropriate waste management facility.

7.1.6 The option of not implementing the activity

The option of not implementing the activity also referred to as a “No-Go” option ensures that the current status quo remains. The no-go options explores the option of not implementing the proposed mining activities. The no-go option assessment was informed by the need and desirability, site sensitivity and conservation targets in the area.

The proposed mining site is located in a non-critical biodiversity area in terms of the Kwazulu Natal Terrestrial Biodiversity Plan with the site largely modified according to the MBSP. According to the same MBSP the unmodified sections are considered “other natural”. It is the MBSP management objective to maintain the status quo of the ESAs and the CBAs. The proposed mining area is not located within the ESA and CBA.

According to the Mining and Biodiversity Guideline of 2013 the proposed site is located within an area with Highest Biodiversity to mining and moderate biodiversity importance. Site assessment has established that the site has been modified by agricultural practice and mostly characterised by “no natural remaining”.

The current status quo in terms of surface water and ecology have a low sensitivity impacted by the agricultural activities. The authorisation of the mine will have cumulative impacts compounding to the already degraded site environment. It will be very critically to develop a technically sound and implementable rehabilitation plan that must be communicated with all affected stakeholders and approved by the Department of Mineral Resources and Energy.

According to the National Freshwater Ecosystem Priority Areas, there are no freshwater wetlands within the proposed site and its 500 metres radius. According to Kwazulu Natal Terrestrial Biodiversity Plan Freshwater the proposed site is located away from any wetlands. The most significant wetland is located a kilometre away along the Ngudumeni River.

The proposed mining area is located approximately a kilometre to the south of Lennoxton and mining related impacts will affect the local community. The proposed 5 ha mining area is currently used for agricultural practices. Undertaking of mining activities will require the agricultural activities to cease for the three (03) duration of the mining permit. The mining activities and the agricultural practice cannot be undertaken simultaneously. The no-go option will ensure that

the current agricultural activities will continue without a three (3) year break. The proposed mining activities will have a maximum duration of three years as compared to the agricultural practices that can be sustainable over a longer period. The mining site must be fully rehabilitated in cessation of mining activities to allow for continuation of agricultural activities.

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8.0. DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

This section of the report provides an overview of the tasks undertaken for the Public Participation Process (PPP) for the Mining Permit application. The PPP is undertaken in terms of the EIA Regulations (GNR 326) of 07 April 2017. A full Public Participation Process (PPP) report will be attached as **Appendix 04**.

Land owners were identified through a search conducted via online search engines accessing the Title Deed office database. In addition to land owner's other relevant organisations were identified and notified of the application. This includes municipal and State departments with jurisdiction in the area and Non-Governmental Organisations (NGOs) with an interest.

The PPP tasks to be conducted for the proposed project to include:

- 1) Identification and registration of Interested and Affected Parties (IAPs). The IAPs includes the following:
 - a. The land owner;
 - b. Adjacent land owner;
 - c. Ward Councillor;
 - d. Newcastle Local Municipality LED and Environmental Management Departments;
 - e. Amajuba District Municipality Environmental Management Departments;
 - f. Kwazulu Natal Provincial Departments;
 - g. National Departments;
 - h. Organisations affected by the proposed mining activities;
 - i. NGOs, etc.
- 2) Written Notice to Interested and Affected;
- 3) Advertisement of the Project in Local Newspaper and Site Notices;
- 4) Provision of this report to all registered IAPs for at least 30 days; and
- 5) Consultation and correspondence with I&AP's and the addressing of their comments.

8.1 IAPs and Stakeholder identification, registration and the creation of an electronic database

Public Participation is the involvement of all parties who are either potentially interested and/ or affected by the proposed mining development. The principal objective of public participation is to inform and enrich decision-making.

Interested and Affected parties (IAPs) representing the following sectors of society has been identified:

- ✓ Land owners, Occupiers and Users;
- ✓ National, provincial and local government;
- ✓ Agriculture, including local landowners;
- ✓ Individual Community Members and Community Based Organisations;
- ✓ Non-Governmental Organisations;
- ✓ Water boards;
- ✓ Tourism;
- ✓ Industrial and mining;
- ✓ Commerce; and
- ✓ Other stakeholders.

8.2 Formal notification of the application to Interested and Affected Parties

The IAPs were informed of the project as follows:

8.2.1 Newspaper advertisement

A Newspaper Advert inviting and notifying the Interested and Affected Parties (IAPs) of the proposed project will be placed in Newcastle Observer Weekly Newspaper published on the 22 September 2023. The newspaper is distributed locally.

8.2.2 Site notice placement

In order to inform surrounding communities and adjacent landowners of the proposed development, site notices will be erected on site and at visible locations close to the site. The site notices will be shown in Appendix 04 of this report.

8.2.3 Written notification

IAPs and other key stakeholders were notified of the project. A background information document was sent out to the identified I&APs. Emails indicating the announcement of the Basic Assessment Process, a Background Information Document (BID) and a comment and registration form was sent to all registered IAPs. This communication was limited to electronic means due to limit human physical interactions as required by COVID-19 Regulations. Copies of the documents mentioned above will be appended to this report. The IAPs database is attached in Appendix: 04.

8.2.4 Telephonic conversations

Where necessary telephonic conversations were held prior to sending out information especially with land owners.

8.3 Consultation and Engagements with IAPs

8.3.1 Meetings

No meetings have been held to date.

8.3.2 Review of draft reports

This report will be released to the public for review and. All registered IAPs were notified of the report's availability for comment for 30 days. Additionally, electronic and or hard copies were made available to interested and affected parties who request for them. Copies of the report were also being submitted to affected organs of state and relevant authorities.

8.4 Summary of issues raised by Interested and Affected Parties

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
<u>Affected Parties</u>				
		✓	✓	

9.0. The Environmental attributes associated with the alternatives.

9.1 Type of environment affected by the proposed activity

. This section discusses the receiving environment, that is the environmental attributes to be affected by the proposed mining activities. Description of the environmental attributes provide basis for impact assessment and identifies receptors.

9.1.1 Topography

The site topography is located on a gentle sloping area on the northwest side of the site and relatively rugged on the south-east of the site. The altitude ranges between 1296 metres above mean sea level (mamsl) to 1374 mamsl, with the low lying area located towards the north of the site and the highest areas along the south border of the site. The east west orientation is sloping to the river with an elevation loss of 46m and an average slope of 2.5%.

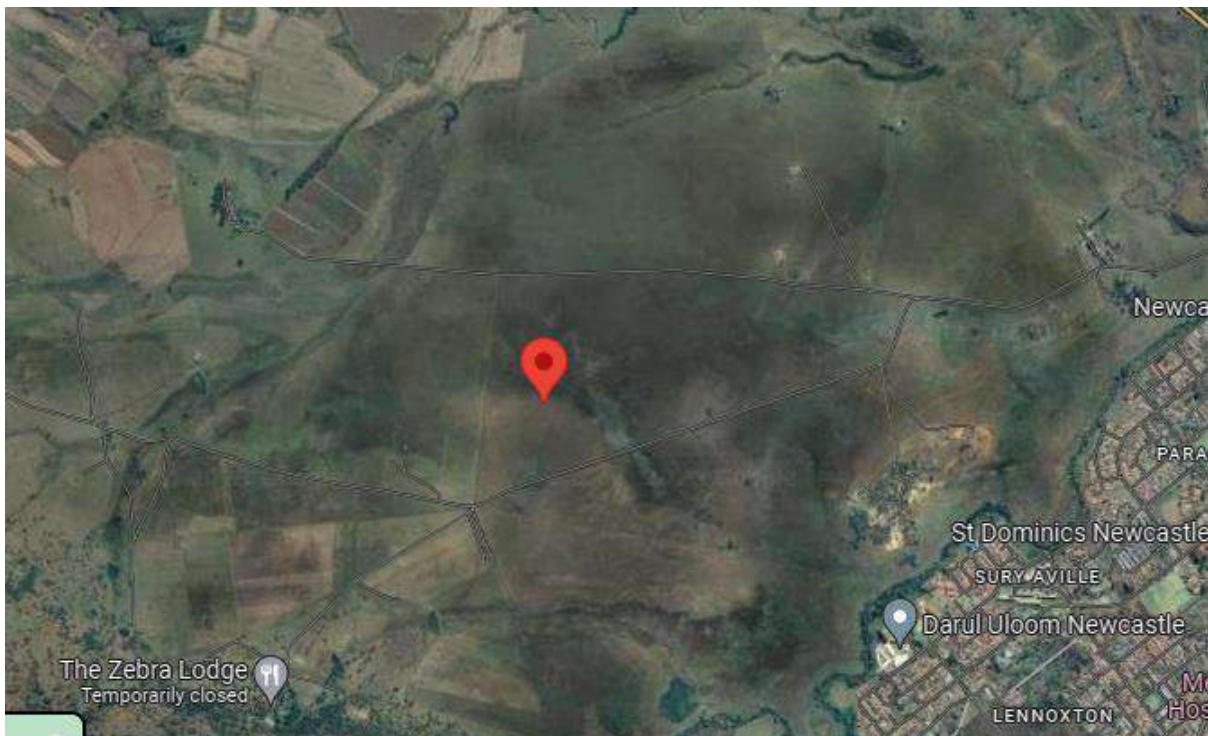


Figure 9-1: Site Contour Map

9.1.2 Climate

The site has a warm and temperate climate in which summers are much rainier than the winters. The Köppen-Geiger climate classification for the site is Subtropical highland climate (Cwb). The he subtropical highland climate is a

climate variety often grouped together with oceanic climates which exists in some mountainous or elevated portions of the world in either the subtropics or tropics. Despite the latitude, the higher elevations of these regions mean that the climate shares characteristics with oceanic climates.

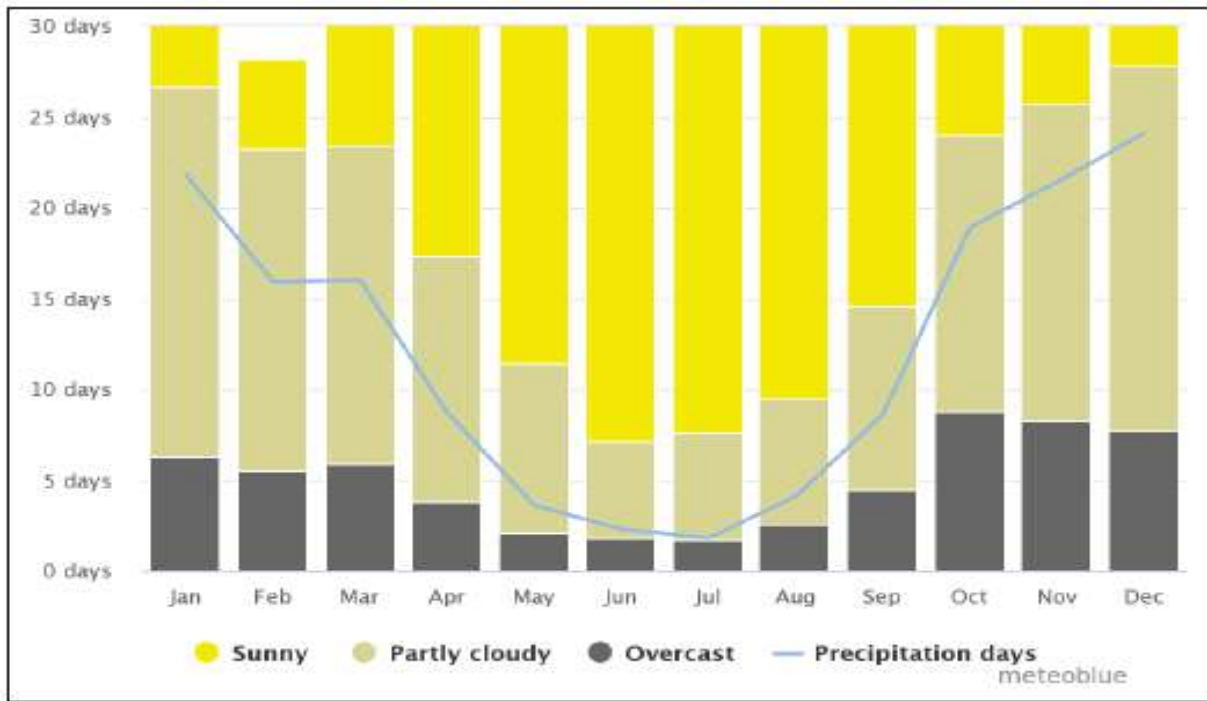


Figure 9-2: Climate Summary

9.1.3 Site Geology

9.1.3.1 Regional Geology

The site geology is discussed according to the 1:1 000 000 geology of South Africa Map and the 1:250 000 2728 Frankfurt Geology Map. According to these maps the site is located within the Ecca Sedimentary Group of the Karoo Supergroup.

Sediments of the Karoo Sequence were deposited in, and into, a large body of water, possibly marine. The basin into which these sediments were being deposited was quite large and today the sediments cover an area of roughly 550 000 km² on the southern African mainland. In the south the basin is bounded by the mountain chain of the Cape Fold Belt. In the north the sediments lap onto the Kaapvaal Craton.

Deposition of the Karoo Sequence sediments started with the melting of the glaciers that covered most of the African subcontinent in the Carboniferous, around 340 million years ago. The melting of the glaciers resulted in the deposition

of an extensive tillite horizon, called the Dwyka Formation. Following the retreat of the glaciers the basin was transgressed by the Ecca sea, with active sediment fill from the south and north. As the climate slowly warmed the sediment style became more terrestrial. The major depositional style in the Beaufort Group is fluvio-deltaic. Sediment deposition actively continued until it was interrupted by the outpouring of the Drakensberg lavas in the mid Jurassic, roughly 170 million years ago.

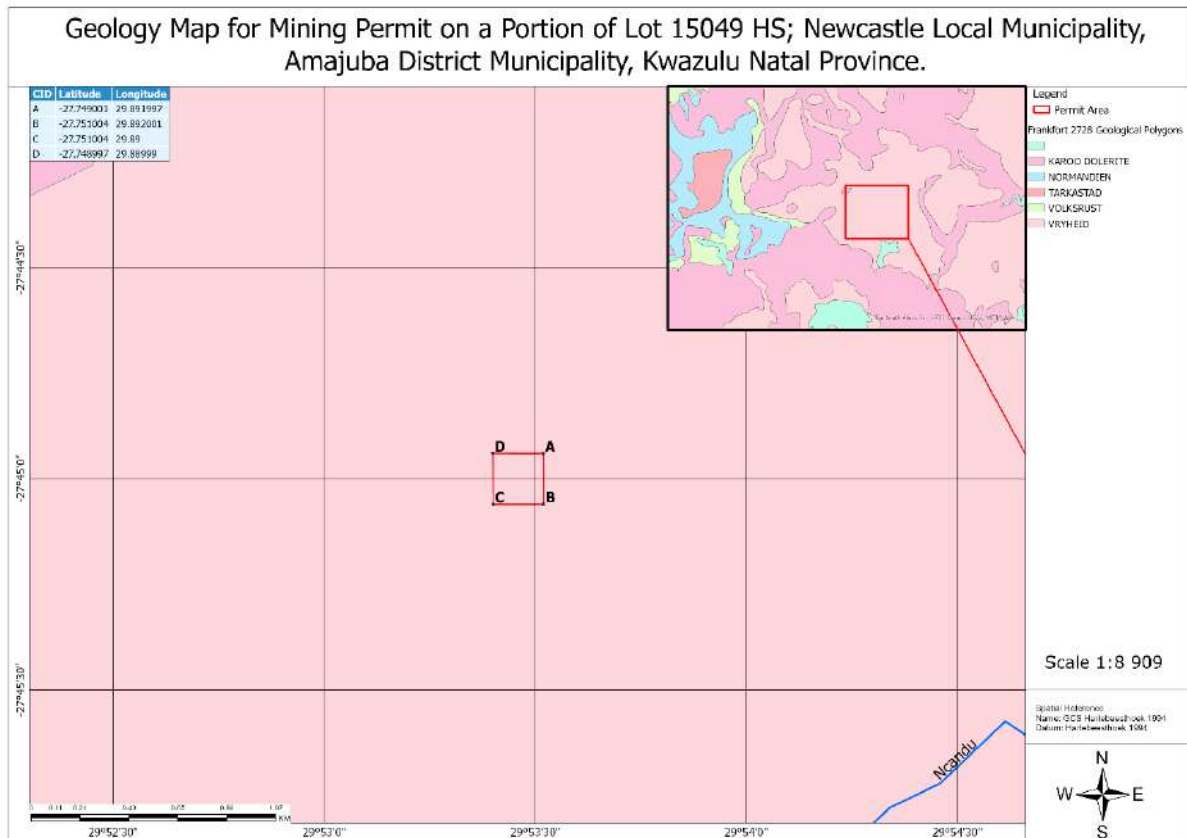


Figure 9-3: The Vryheid formation Coal fields isopach contours.

9.1.3.2 Local Geology

The site is located within the Vryheid formation of the Ecca group.

Vryheid Formation

The tectonic style changes from east to west and from north to south in the Karoo Basin. These factors are the main control on the distribution and stratigraphic thickness of the formation. The Vryheid Formation pinches out northward as a result of the asymmetry of the basin.

The Vryheid Formation consists mainly of sandstone and shale with some subordinate coal seams associated with it (SACS, 1980). The sediments of the Vryheid Formation probably represent alluvial plain, upper and lower delta plain deposits with associated shallow lagoon and coastal swamps (Jermy and Bell, 1990). The change from stable margin to subsiding foreland basin confined the Vryheid Formation and the shales of the succession to "pinch-out" to the north. This "pinching-out" results in a gradation of a fluvial valley-fill sequence into sediments of deltaic origin (Van Vuuren, 1981). According to Cadle et al. (1990) the sandstones become interfingered with the deeper water shales, a so-called "shale-out", approximately 500 km from the present northern basin margin. They state that this is due to rapid basinward facies migration down the southerly dipping paleoslope.

The Formation attains a maximum thickness of 500 m in the deeper part of the basin (SACS, 1980), but in the area of the Eastern Transvaal Coalfield only attains a maximum thickness of 170 m (Greenshields, 1986) and thins to about 80 m in thickness in the proximal basin settings (Cadle et al., 1990).

The Vryheid Formation contains 5 major coal seams, with locally developed partings and splits in the coal seams increasing the number to 8, within an 85 m thick stratigraphic horizon (Greenshields, 1986) although this horizon can attain thicknesses up to 160 m in the deeper parts of the basin (Cadle et al., 1990). According to Cadle et al. (1990) all five major seams are still present in the thinnest and most proximal parts of the formation. Greenshields (1986) states that all four cyclothems exhibit a regressive phase where sedimentation occurred in fluvio-deltaic environments, followed by a transgressive phase where sedimentation was typical of both marine and non-marine transgressive shorelines. A seam is therefore associated with clastic successions comprising carbonaceous shale or siltstone, fine to coarse grained sandstone and minor conglomerate (Cadle et al., 1990).

9.1.4 Soils

Soil Fertility: The site is located on a single soil type, which is the Sand Clay Loamy-Sand Clay (SaCILm-SaCl). According to the National Soil Fertility Map the site is located on soil with moderate base status (medium fertility).

The site is located on non-saline soils (<200 mS/m). The site soils erodability factor is relatively high (0.14 – 0.25) indicative of moderately prone loose soils.

The agricultural potential for crops is considered low - moderate with active subsistence crop farming.

9.1.5 Surface and Underground Water

9.1.5.1 Drainage Basin and Site Streams

The site falls within quaternary catchments V32C and V32D within the Thukela Water Management Area (WMA) in which the main river draining the area is the Thukela. There are many other secondary rivers such as Buffels River.

Ngudumeni River: the proposed mining permit area is located a kilometer south from the Ngudumeni River. The stream is periodically through the site, since the site is located in a summer rainfall region the stream flows during the season when the site receives the maximum rainfall. The stream is largely in its natural state. The stream is a tributary of the Mbizana River..

9.1.5.2 Site Wetlands

There are no wetlands identified within the proposed site and its 500 metres radius. The EIA process identified NFEPA and Non-NFEPA wetlands located within a 1 kilometre radius. The identified wetlands are less likely to be impacted by the proposed mine. The wetlands were identified from the 2014 Kwazulu Natal Terrestrial Biodiversity Plan, National Freshwater Ecosystem Priority Areas (NFEPA) Project by Nel et al and site assessment by the EAP. The identified wetlands are discussed below:

Seepage Wetlands: Non-NFEPA seepage wetland are located outside the site. The seepage wetland is also degraded by the cultivation activities. The site assessment has however identified that the wetland is completely modified by agricultural activities.

Depression Pans: There are depression wetlands outside by a kilometre radius. The pans are all NFEPA and identified by the NFEPA and MBSP Freshwater. All the pans have a wetland condition of **C: Moderately Modified** and threat status of **Critical**.

Channelled Valley Bottom Wetland: The channelled valley bottom wetland is along the Ngudumeni River and an unnamed stream on the west.

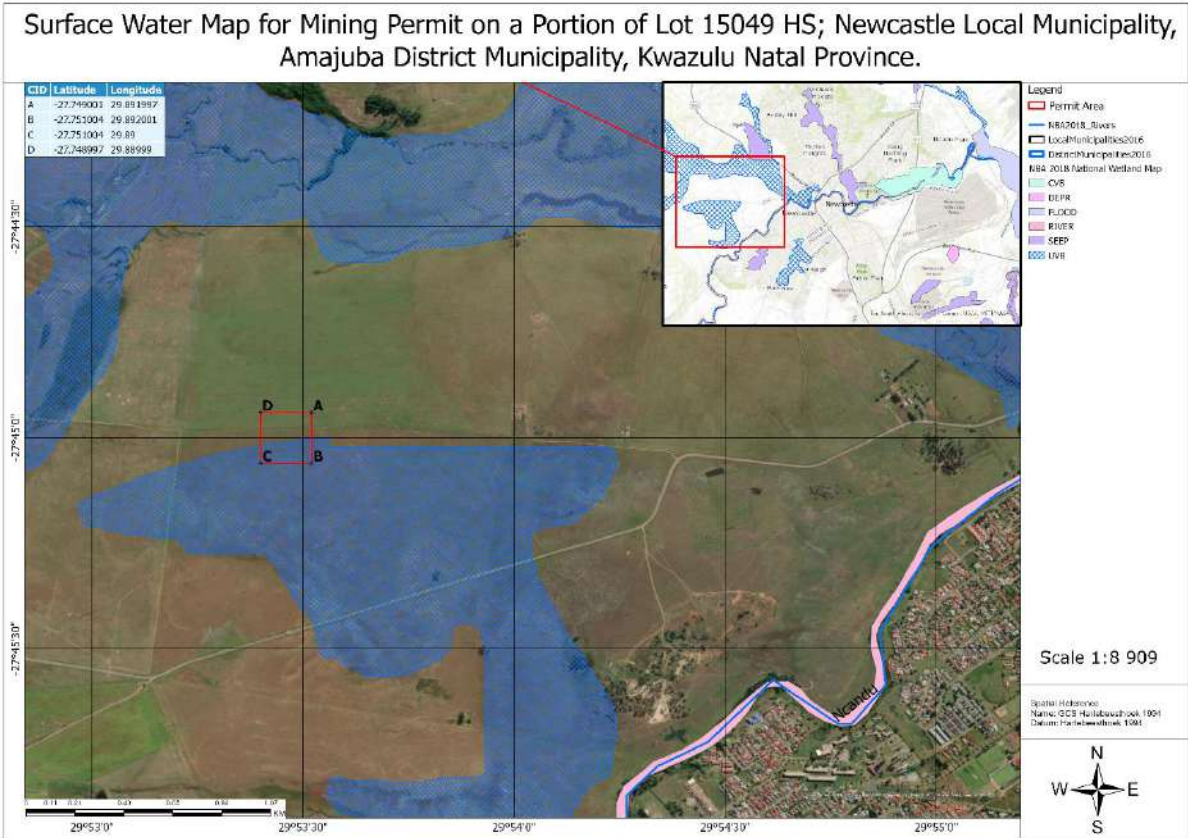


Figure 9-4: Surface Water Map

9.1.5.3 Underground Water

Groundwater is an important source of water for many small towns, villages and small- and large-scale farmers. Groundwater resources in the area can be divided into two distinct aquifers, namely a shallow perched aquifer in the weathered zone followed by a deeper fractured hard rock aquifer. The fractured rock aquifer occurs as transmissive fractures in undifferentiated assemblage of compact sedimentary extrusive and intrusive rocks and Porous unconsolidated and consolidated sedimentary strata of either the Karoo sediments. A third, deeper aquifer in the underlying basement granite can also occur..

The proposed site is located within region 44: Northwestern Middleveld of the Vegter’s Groundwater Region. The site is underlain by the compact, dominantly arenaceous strata of Ecca Gp, with borehole yield ranging between 0.5 – 2.0 l/s. The local transmissivity as determined by WRC Project in 2005 ranges between 70 - 300 mS/m. Most of the groundwater in the region is stored in the weathered zone as compared to the weathered zone. The site groundwater electrical conductivity as determined by Vegter is just under 112 mS/m (Murray R., Baker

K., Revenscroft P., Musekiwa C. and Dennis R. (2012) which is indicative of low salinity.

According to the aquifer classification map (2013), the proposed site is largely within the minor aquifer region. The site aquifers are moderately vulnerable according to the Aquifer Vulnerability Map of South Africa which indicates the likelihood for contamination to reach a specified position in the groundwater system after introduction at some location above the uppermost aquifer.

The site aquifer susceptibility is considered medium according to the SA Aquifer Susceptibility Map of South Africa which indicates the qualitative measure of the relative ease with which a groundwater body can be potentially contaminated by anthropogenic activities and includes both aquifer vulnerability and the relative importance of the aquifer in terms of its classification.

GROUNDWATER ASPECT	RECORD
Vegeter's Groundwater Region	44: Northwestern Middleveld
Electrical Conductivity	280 mS/m
Average Depth to Groundwater	18.85 m
Exploitation Factor	0.375
Mean Recharge	33.94 mm/a
Transmissivity	5 –25 m ² /day
Relative Transmissivity	Moderate
Thickness of Fractured zone	137.5 m
Thickness of Saturated Fractured zone	95 m
Storage Volume in the Fractured Zone	10486.93 m ³ /km ²
Thickness of Weathered Zone	42.5m
Thickness of Saturated Weathered Zone	23.65 m
Storage Volume in the Weathered Zone	71099.91 m ³ /km ²
Average Groundwater Resource Potential (AGRP)	28926.70 m ³ /km ² /a
Average Groundwater Exploitation Potential (AGEP)	14257.03 m ³ /km ² /a
Utilisable Groundwater Exploitation Potential (UGEP)	10635.23 m ³ /km ² /a
Potable Groundwater Exploitation Potential (PGEP)	6496.09 /km ² /a
Storage Volume in the aquifer	82665.42 m ³ /km ²
Yield	0.5 – 2.0 l/s

Source: WR 2012

9.1.6 Biodiversity

9.1.6.1 Biome

The proposed prospecting site is within the Grassland Biome, the second largest of the nine biomes in South Africa, occupying an area of approximately 355 000 km² or 27.9% of South Africa (Mucina and Rutherford, 2006). Although this biome is found in eight of the nine provinces of South Africa, it occurs mainly on the high central plateau (Highveld and Mpumalanga), the inland areas of the seaboard of KwaZulu Natal, mountainous areas of KwaZulu-Natal and the central parts of the Eastern Cape (Mucina and Rutherford, 2006). Altitude ranges from 300 m above sea level (mamsl) on the coastal plateau to 2 850 mamsl in the Drakensberg (Rutherford and Westfall, 1994).

Gs 4 Northern KwaZulu-Natal Moist Grassland

This grassland is distributed in KwaZulu-Natal Province more specifically in the Northern and north-western regions of the Province, where it forms a discontinuous rim around the upper Thukela Basin and is situated almost entirely within the catchment of the Thukela River. It lies between the drier Gs 6 KwaZulu-Natal Highland Thornveld and the moist upland vegetation of mainly Gs 3 Low Escarpment Moist Grassland to the north and Gs 10 Drakensberg Foothill Moist Grassland to the west. The most extensive areas are in the vicinity of Winterton, Bergville, Fort Mistake, Dannhauser, Dundee, north of Ladysmith and west of Newcastle. At higher altitudes this unit is usually surrounded by Gs 3 Low Escarpment Moist Grassland in the north and Gs 10 Drakensberg Foothill Moist Grassland in the west and south.

Vegetation & Landscape Features

Hilly and rolling landscapes supporting tall tussock grassland usually dominated by *Themeda triandra* and *Hyparrhenia hirta*. Open *Acacia sieberiana* var. *woodii* savannoid woodlands encroach up the valleys, usually on disturbed (strongly eroded) sites.



9.1.6.2 Regional Vegetation and Habitats

The proposed prospecting site is within the Sub-Escarpment Grassland Bioregion of the Grassland biome. The proposed site is specifically within the Income Sandy Grassland. The vegetation units are described below as adopted from Mucina and Rutherford; 2006: vegetation of South Africa, Lesotho and Swaziland.

Important Taxa of the Sub-Escarpment Grassland Bioregion of the Grassland biome.

Graminoids: *Alloteropsis semialata* subsp. *eckloniana* (d), *Aristida congesta* (d), *Cynodon dactylon* (d), *Digitaria tricholaenoides* (d), *Elionurus muticus* (d), *Eragrostis patentissima* (d), *E. racemosa* (d), *Harpochloa falx* (d), *Hyparrhenia hirta* (d), *Themeda triandra* (d), *Tristachya leucothrix* (d), *Abildgaardia ovata*, *Andropogon appendiculatus*, *A. eucomus*, *A. schirensis*, *Aristida junciformis* subsp. *galpinii*, *Brachiaria serrata*, *Cymbopogon caesius*, *C. pospischilii*, *Cynodon incompletus*, *Digitaria monodactyla*, *D. sanguinalis*, *Diheteropogon amplexans*, *D. filifolius*, *Eragrostis chloromelas*, *E. plana*, *E. planiculmis*, *E. sclerantha*, *Festuca scabra*, *Heteropogon contortus*, *Hyparrhenia dregeana*, *Melinis nerviglumis*,

Microchloa caffra, *Panicum natalense*, *Paspalum scrobiculatum*, *Setaria nigrirostris*, *Sporobolus africanus*.

Herbs: *Acanthospermum australe* (d), *Argyrolobium speciosum* (d), *Eriosema kraussianum* (d), *Geranium wakkerstroomianum* (d), *Pelargonium luridum* (d), *Acalypha peduncularis*, *Chamaecrista mimosoides*, *Dicoma anomala*, *Euryops transvaalensis* subsp. *setilobus*, *Helichrysum caespititium*, *H. rugulosum*, *Hermannia depressa*, *Ipomoea crassipes*, *Pearsonia grandifolia*, *Pentanisia prunelloides* subsp. *latifolia*, *Sebaea grandis*, *Senecio inornatus*, *Thunbergia atriplicifolia*, *Zaluzianskya microsiphon*.

Geophytic Herbs: *Chlorophytum haygarthii* (d), *Gladiolus aurantiacus* (d), *Asclepias aurea*, *Cyrtanthus tuckii* var. *transvaalensis*, *Gladiolus crassifolius*, *Hypoxis colchicifolia*, *H. multiceps*, *Moraea brevistyla*, *Zantedeschia rehmannii*.

Succulent Herb: *Aloe ecklonis*, *Lopholaena segmentata*

Low Shrubs: *Anthospermum rigidum* subsp. *pumilum*, *Erica oatesii*, *Hermannia geniculata*.

9.1.6.3 SANBI Quarter Degree Search results

The SANBI search did not return any species.

9.1.6.4 Site Ecological Sensitivity

The proposed site according to existing literatures located within the Sub-Escarpment Grassland Bioregion of the Grassland biome, however the site assessment has established that the proposed site (5 ha mining area) is completely modified by the cultivation activities in the area. Ecological the site has no natural remaining.

According to 2014 Kwazulu Natal Terrestrial Biodiversity Plan the proposed site is located within "other natural" and moderately modified old lands (Figure 9-5 below). The 2016 KZN CBA identifies Ecological Support Wetlands along the Ngudumeni River located on the north of the site.

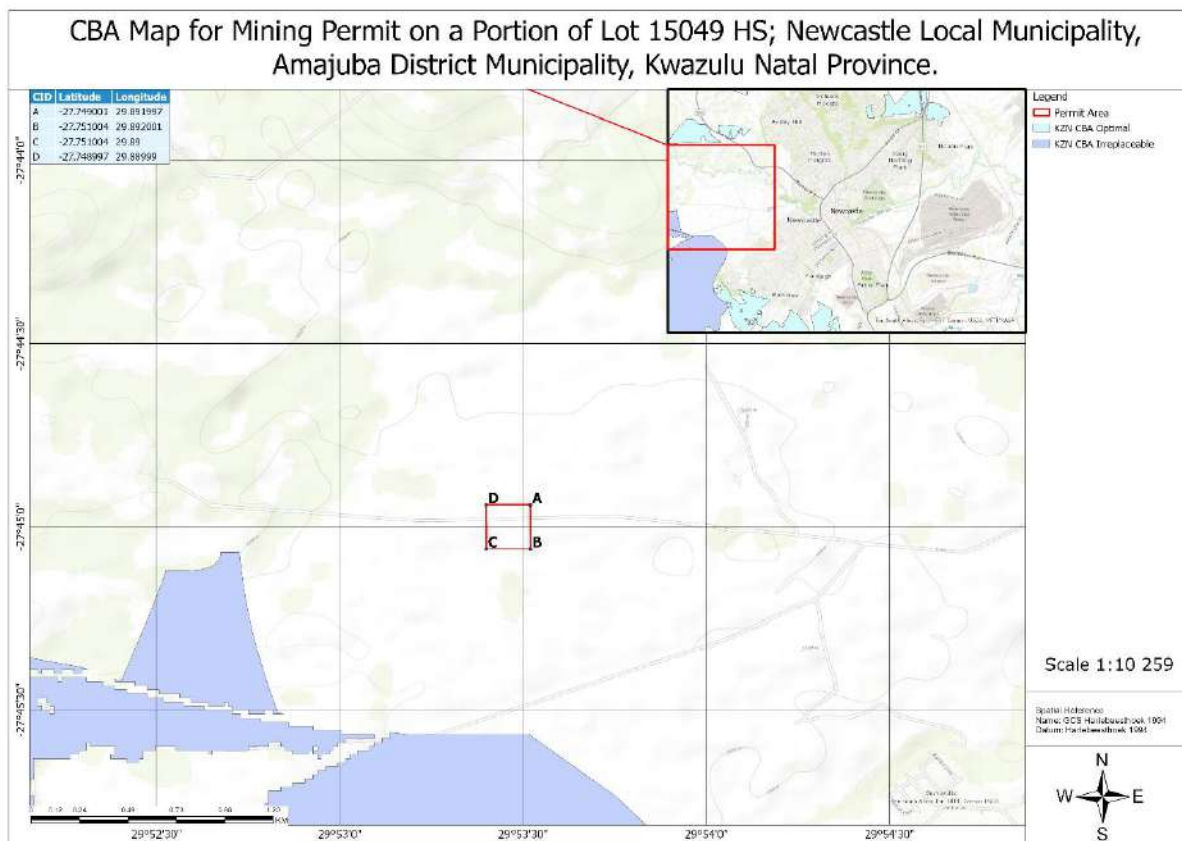


Figure 9-5: CBA Map

According to the Mining and Biodiversity Guideline, 2013, the proposed site is located within areas with Highest Biodiversity Importance to mining and moderate Ecological Importance. The present status of the site is different from the MBG as the site has been modified by the agricultural activities.

9.1.7 Heritage Resources

According to section 34 subsection 1 of the National Heritage Resources Act (NHRA) No 22 of 1999, no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority and according to the same Act section 36 subsection (3)(a), no person may, without a permit issued by SAHRA or a provincial heritage resources authority—destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

The proposed site is an agricultural area with no known heritage sites and historical significance areas. The proposed site is an active agricultural area completely cleared. There were no heritage significance artefacts such as buildings and graves identified on site to date.

A Heritage Impact study was not commissioned for this project; the site has been greatly impacted by the agricultural activities (grazing and cultivation) with no evidence of heritage resources.

Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority—

- (a) Carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and
- (b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-interment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.

9.2 Description of the current land uses.

- ❖ The proposed site is used for agricultural practice (grazing and crop farming Figure **9-6** below);
- ❖ There are no infrastructures on site.

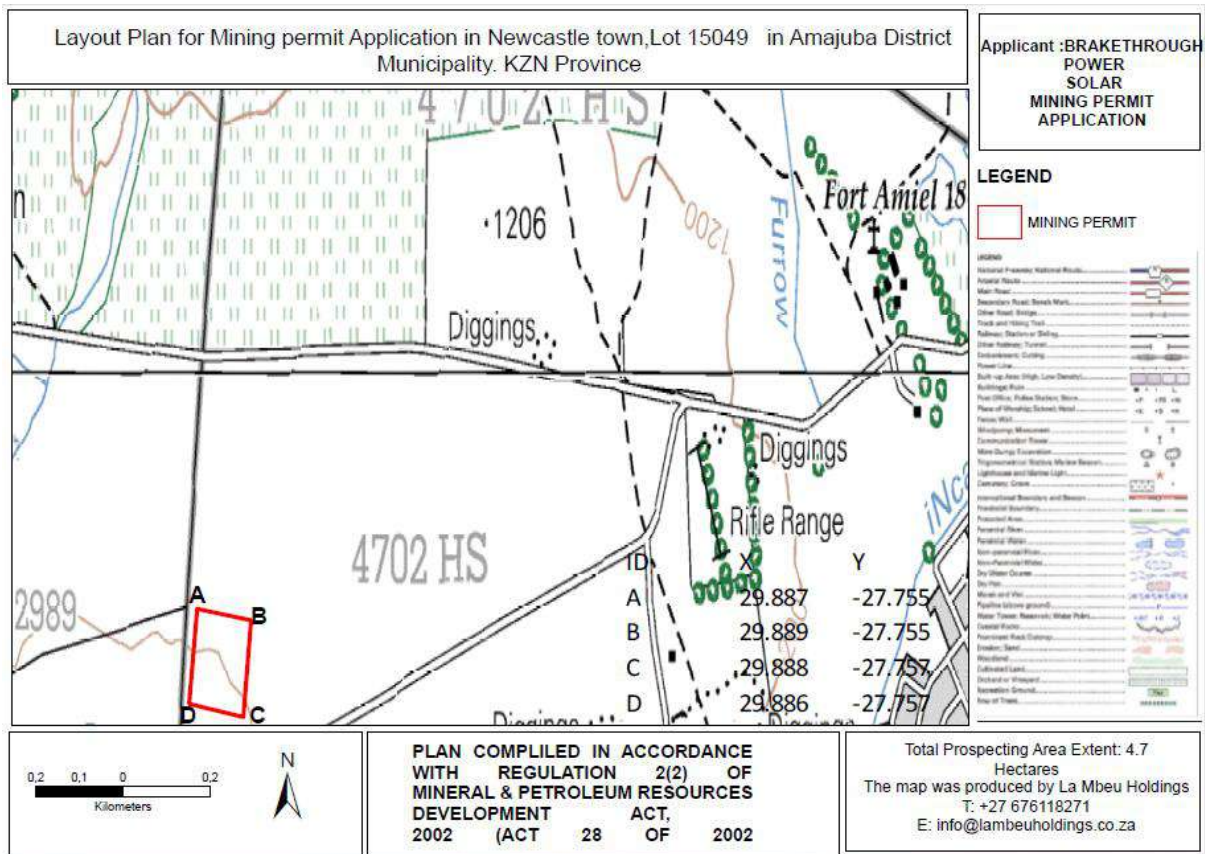


Figure 9-6: Image of the proposed site

9.3 Description of specific environmental features and infrastructure on the site

- ❖ The Ngudumeni River drains the site in an northern direction, the river is located approximately a kilometre to the north;
- ❖ There are no wetlands located within the proposed site and its 500 metres radius; several wetlands (Seepage, Depression and Channelled Valley Bottom) were identified within a kilometre radius of the proposed site; and
- ❖ The proposed site is an agricultural land for both livestock and crop farming.

9.4 Environmental and current land use map

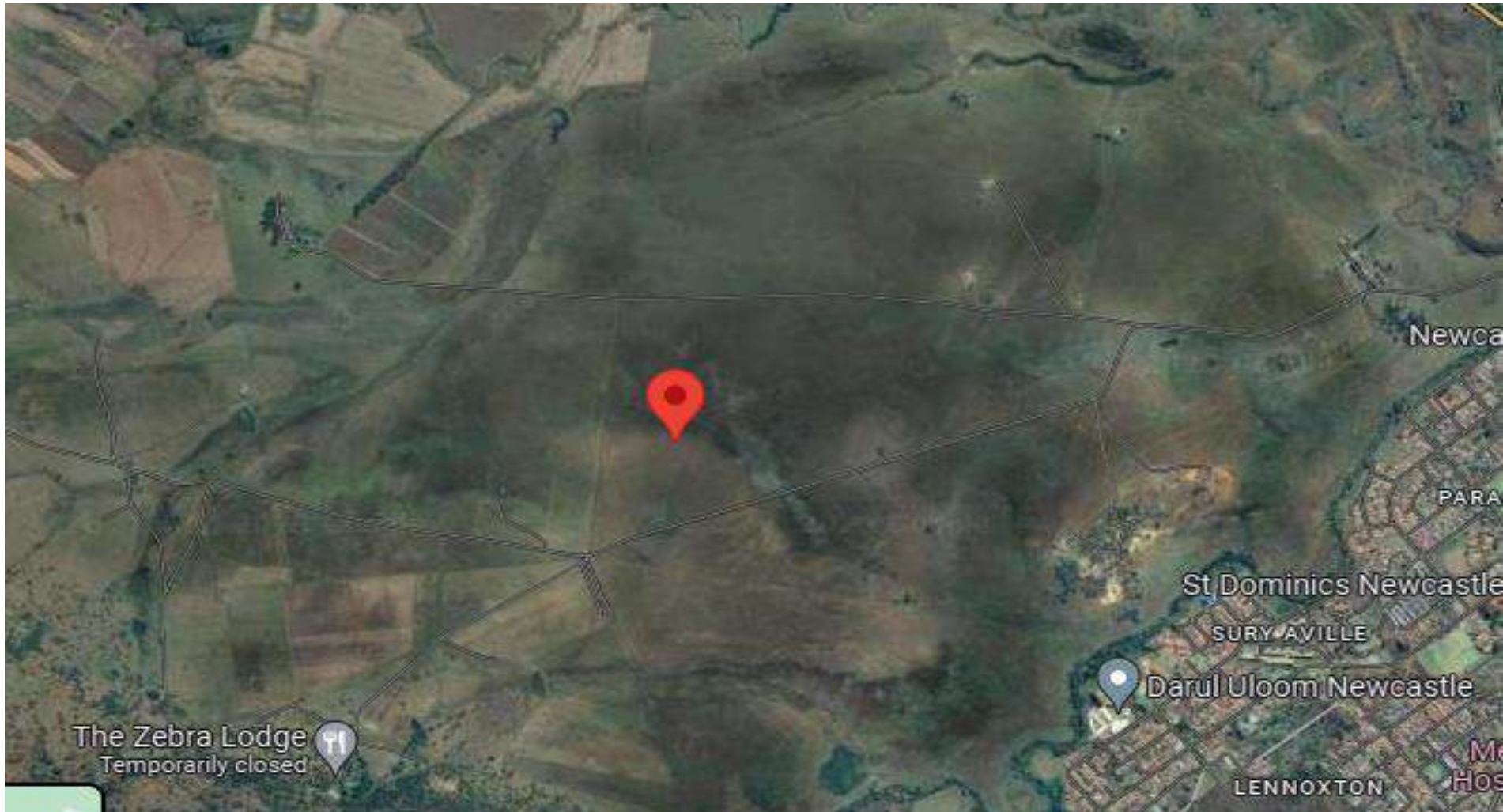


Figure 9-7: Land use and environmental map

10.0. The impacts and risks identified for each alternative and their assessment methodology

10.1 Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts.

E = Extent, D = Duration, I = Intensity, P = Probability of occurrence, L= Irreplaceable Loss of Resources, R = Impact Reversibility							Where (E + D + I + L + R) X P = Significance				
Activity	Environmental Aspect	Impacted Attributes	Potential Impacts	Rating Before Mitigation				Impact Importance		Importance Score (/8)	Significance Before Mitigation
				E	I	D	P	R	L		
Project Planning	Mining project planning and scheduling	Legal requirements	Misinterpretation of Legislations & Commencement of regulated activities without Licenses/Permits/ Authorisations	2	3	3	4	4	4	8	64
	Site Access	Legal requirements	Accessing privately owned properties without land owners permission	1	4	4	4	4	4	8	68
	Procurement of Services	Legal requirements	Disregard of BBBEE Regulations	3	2	4	2	2	2	4	26
		Legal requirements	Failure to appoint Environmental Control Officer for the Operation	3	4	4	4	4	4	8	76
Site Establishment	Fencing and securing proposed site	Legal requirements	Expansion of permitted area	2	3	3	3	3	4	7	45
		Vegetation	Clearing of vegetation beyond approved areas	2	2	3	4	2	3	5	48
		Vegetation	Removal of Protected and/ or Species of Conservation Concern	4	2	3	3	4	4	8	51
		Vegetation	Driving outside approved site routes	2	2	3	3	2	3	5	36
		Vegetation	Introduction of alien invasive plants along the fence (disturbed area)	2	2	4	3	2	3	5	39
		Soil	Mixing of topsoil and subsoil rendering topsoil less effective for rehabilitation	1	3	3	3	2	2	4	33

E = Extent, D = Duration, I = Intensity, P = Probability of occurrence, L= Irreplaceable Loss of Resources, R = Impact Reversibility								Where (E + D + I + L + R) X P = Significance			
Activity	Environmental Aspect	Impacted Attributes	Potential Impacts	Rating Before Mitigation				Impact Importance		Importance Score (/8)	Significance Before Mitigation
				E	I	D	P	R	L		
Site Establishment	Fencing and securing proposed site	Soil	Hydrocarbon and chemical contamination	2	2	3	3	1	2	3	30
		Fauna	Loss of fauna when establishing fencing corridors	2	1	3	2	2	2	4	20
		Fauna	Driving over and collision with site fauna	1	2	3	3	4	4	8	42
		Fauna	Capturing (Hunting and Trapping) of wild life by site crews	2	2	3	2	3	2	5	24
		Water	Contamination of water by flows from contaminated surfaces such as cement mixing areas and chemical storage and mixing areas	2	2	3	3	2	2	4	33
		Water	Excessive usage of available water in the area	2	1	3	2	2	2	4	20
		Water	Using water without consent from the Municipality and/or boreholes owners	1	2	3	2	2	2	4	20
		Waste	Generation of general domestic waste	1	1	3	4	1	1	2	28
		Waste	Generation of hazardous wastes such as contaminated soils and empty oil tins	1	2	3	4	1	1	2	32
		Waste	Generation of green waste (removed trees)	1	1	3	4	0	0	0	20
		Noise	Operating equipment resulting in noise affecting the wildlife and community	2	2	3	4	1	1	2	36
		Health and Safety	Safety hazards associated with handling of fencing materials such as wires	1	2	1	2	2	1	3	14
		Security	Theft of fencing materials	1	2	1	3	2	2	4	24
		Socio-Economic	Creation of Jobs	2	2	3	4	2	2	4	44

E = Extent, D = Duration, I = Intensity, P = Probability of occurrence, L= Irreplaceable Loss of Resources, R = Impact Reversibility								Where (E + D + I + L + R) X P = Significance			
Activity	Environmental Aspect	Impacted Attributes	Potential Impacts	Rating Before Mitigation				Impact Importance		Importance Score (/8)	Significance Before Mitigation
				E	I	D	P	R	L		
Site Establishment	Demarcation of stockpiling Areas	Legal Requirements	Demarcating stockpiling area outside permitted area	1	2	3	3	2	3	5	33
		Vegetation	Locating stockpiling area in no-go areas	1	2	3	2	4	4	8	28
		Water	Locating stockpiling area in natural storm water channels	2	2	3	2	3	2	5	24
	Placement of site temporary infrastructures such as mobile office, toilets, generators, etc	Legal Requirements	Undertaking unauthorised activities (not part of permitted activities)	3	3	3	2	4	4	8	34
		Vegetation	Removal of Protected and/ or Species of Conservation Concern	3	3	4	2	4	4	8	36
		Vegetation	Loss of vegetation as area is cleared	2	2	3	4	2	2	4	44
		Vegetation	Clearing of vegetation beyond approved areas	2	3	3	2	4	4	8	32
		Vegetation	Introduction of alien invasive plants	2	2	4	3	2	3	5	39
		Fauna	Capturing (Hunting and Trapping) of wild life by site crews	2	2	3	2	4	4	8	30
		Fauna	Driving over and collision with site fauna	2	3	3	3	4	3	7	45
		Fauna	Loss of habitats as vegetation is cleared	2	3	3	4	2	2	4	48
		Soil	Mixing of topsoil and subsoil rendering topsoil less effective for rehabilitation	2	2	2	2	3	2	5	22
		Soil	Hydrocarbon and chemical contamination	1	2	3	2	2	2	4	20
		Soil	Soil contamination by contaminated storm water from storage areas (Hydrocarbon & Chemicals)	1	1	2	2	1	2	3	14
Soil	Soil erosion due to surface disturbances	2	2	3	2	2	1	3	20		

E = Extent, D = Duration, I = Intensity, P = Probability of occurrence, L= Irreplaceable Loss of Resources, R = Impact Reversibility							Where (E + D + I + L + R) X P = Significance				
Activity	Environmental Aspect	Impacted Attributes	Potential Impacts	Rating Before Mitigation				Impact Importance		Importance Score (/8)	Significance Before Mitigation
				E	I	D	P	R	L		
Site Establishment	Placement of site temporary infrastructures such as mobile office, toilets, generators, etc	Water	Storm water flow from contaminated areas into local clean surface water bodies such as Ngudumeni River	3	2	3	2	2	2	4	24
		Water	Excessive usage of available water in the area	2	2	3	2	3	2	5	24
		Water	Water contamination by flows from waste storage areas	2	1	3	2	1	1	2	16
		Water	Water Contamination by flows from chemical and hydrocarbon storage areas	2	2	3	2	2	2	4	22
		Waste	Generation of general domestic waste	1	2	3	4	1	1	2	32
		Waste	Generation of hazardous wastes	1	2	3	4	2	1	3	36
		Waste	Burying and/or inappropriate disposal of waste	2	2	4	3	2	2	4	36
		Noise	Noise generated by operating machineries	2	2	3	4	1	1	2	36
		Air	Generation of dust from clearing and vehicle movement on site	2	2	3	4	2	1	3	40
		Air	Air pollution from vehicle hydrocarbon combustion	2	1	3	2	2	2	4	20
		Health and Safety	Health and safety hazards from operating machineries and equipment	2	2	3	2	3	4	7	28
		Health and Safety	Hazards from handling of chemicals	1	2	3	2	3	3	6	24
		Health and Safety	Encounters with dangerous wild life such as poisonous snakes	1	2	3	3	3	4	7	39
		Security	Theft of site properties	1	2	3	2	2	3	5	22
		Traffic	Increased Vehicles movement on local roads to and from site	2	2	3	2	1	2	3	20

E = Extent, D = Duration, I = Intensity, P = Probability of occurrence, L= Irreplaceable Loss of Resources, R = Impact Reversibility								Where (E + D + I + L + R) X P = Significance			
Activity	Environmental Aspect	Impacted Attributes	Potential Impacts	Rating Before Mitigation				Impact Importance		Importance Score (/8)	Significance Before Mitigation
				E	I	D	P	R	L		
Mining	Clearing of vegetation from mining area	Legal Requirements	Removal of species of conservation concern without permit	3	2	4	2	3	4	7	32
		Legal Requirements	Expansion of the mining area beyond the permitted 05 ha	2	3	4	2	4	4	8	34
		Vegetation	Loss of vegetation as area is cleared	2	4	3	4	3	2	5	56
		Vegetation	Introduction of alien invasive plants	2	3	3	2	2	3	5	26
		Fauna	Loss of habitats	2	3	3	4	3	3	6	56
		Fauna	Accidental Collision and driving over wildlife	2	2	3	3	4	3	7	42
		Fauna	Hunting and trapping of wildlife	2	2	3	3	4	3	7	42
		Soil	Soil erosion on bare land	1	2	3	3	2	2	4	30
		Soil	Compaction of fertile topsoil through repetitive driving	1	3	3	3	2	2	4	33
		Soil	Hydrocarbon contamination from operating trucks and vehicles	2	2	3	3	2	2	4	33
		Soil	Soil contamination by contaminated storm water from storage areas (Hydrocarbon & Chemicals)	2	2	3	3	2	2	4	33
		Water	Water contamination by flows from contaminated areas	2	2	3	3	2	2	4	33
		Water	Water contamination by flows from waste storage areas	2	1	3	2	1	1	2	16
		Water	Water Contamination by flows from chemical and hydrocarbon storage areas	2	1	3	2	2	2	4	20
		Air	Dust generation from vehicle movement	2	2	4	3	1	2	3	33
		Air	Air pollution from vehicle combustion	2	1	3	3	1	2	3	27

E = Extent, D = Duration, I = Intensity, P = Probability of occurrence, L= Irreplaceable Loss of Resources, R = Impact Reversibility

Where (E + D + I + L + R) X P = Significance

Activity	Environmental Aspect	Impacted Attributes	Potential Impacts	Rating Before Mitigation				Impact Importance		Importance Score (/8)	Significance Before Mitigation
				E	I	D	P	R	L		
Mining	Clearing of vegetation from mining area	Waste	Generation of general domestic waste	2	1	3	4	1	1	2	32
		Waste	Generation of hazardous wastes	2	1	3	4	1	1	2	32
		Waste	Burrying and/or inappropriate disposal of waste	2	2	4	3	2	2	4	36
		Noise	Noise impact from operating machinery affecting wild life and Optimum Informal Settlement Community	2	2	3	4	1	1	2	36
		Health and Safety	Hazards from operating soil handling machinery such as trucks and front end loaders	2	3	3	3	4	4	8	48
		Health and Safety	Encounter with dangerous wildlife such as snakes	2	2	3	2	3	3	6	26
		Traffic	Vehicle movement to and from site	2	2	3	4	1	2	3	40
	Removal and Stockpiling of topsoil	Soil	Topsoil compaction reducing soil fertility	2	2	4	2	3	3	6	28
		Soil	Contamination of topsoil by hydrocarbons	1	2	3	2	4	4	8	28
		Soil	Mixing of topsoil with other soil types	1	2	3	2	4	4	8	28
		Soil	Erosion of topsoil stockpiles	2	2	3	2	2	3	5	24
		Soil	Contaminated flows to the topsoil stockpiling area	1	2	3	2	2	2	4	20
		Soil	High stockpiling height exceeding 2 metres reducing fertility	1	1	3	3	3	3	6	33
		Soil	Unprotected stockpiles from the effect of wind and water	2	2	3	2	2	2	4	22
		Water	Increased suspended loads in storm water as topsoil gets eroded	2	2	3	2	2	2	4	22
		Waste	Generation of general domestic waste	1	2	3	4	1	1	2	32
		Waste	Generation of hazardous wastes	2	2	3	4	2	2	4	44

E = Extent, D = Duration, I = Intensity, P = Probability of occurrence, L= Irreplaceable Loss of Resources, R = Impact Reversibility

Where (E + D + I + L + R) X P = Significance

Activity	Environmental Aspect	Impacted Attributes	Potential Impacts	Rating Before Mitigation				Impact Importance		Importance Score (/8)	Significance Before Mitigation
				E	I	D	P	R	L		
Mining	Removal and Stockpiling of topsoil	Waste	Burying and/or inappropriate disposal of waste	2	2	3	2	2	2	4	22
		Air	Generation of dust from handling of topsoil	2	1	3	4	1	1	2	32
		Air	Generation of dust from unprotected stockpiling area	2	2	3	3	1	1	2	27
		Health and Safety	Hazards from operating soil handling machinery such as trucks and front end loaders	1	2	3	3	3	3	6	36
		Health and Safety	High stockpiling heights creating collapse hazards	1	1	3	2	4	4	8	26
		Visual impacts	The site has a natural vegetated look and stockpiles will be uncommon in the area	2	2	4	3	1	1	2	30
		Noise	Noise impact from operating machinery affecting wild life and Informal settlement	2	2	3	3	2	2	4	33
	Removal and stockpiling of overburden and Coal Material	Legal requirements	Extracting other ores than the permitted and not informing the DMRE	3	2	3	3	4	4	8	48
		Legal requirements	Operating the mine beyond the permitted 2 years period without applying for extension	3	2	4	3	4	4	8	51
		Water	Mixing of clean and dirty water	2	2	3	3	3	3	6	39
		Water	Releasing dirty water to the local surface water bodies	2	2	3	3	3	3	6	39
		Water	Mine flooding from rain events and/ or subsurface flows	2	3	3	3	4	4	8	48
		Water	Excessive usage of water for mining operations such as dust suppressions and cooling of equipment	2	2	3	2	2	2	4	22
		Water	Obstructing surface flows	2	2	4	2	2	2	4	24
	Water	Storage of hydrocarbons and chemicals on unbounded areas resulting in surface contaminations and the storm water contamination	2	2	3	2	3	3	6	26	

E = Extent, D = Duration, I = Intensity, P = Probability of occurrence, L= Irreplaceable Loss of Resources, R = Impact Reversibility							Where (E + D + I + L + R) X P = Significance				
Activity	Environmental Aspect	Impacted Attributes	Potential Impacts	Rating Before Mitigation				Impact Importance		Importance Score (/8)	Significance Before Mitigation
				E	I	D	P	R	L		
		Water	Acid mine drainage	2	2	3	3	4	4	8	45
Mining	Removal and stockpiling of overburden and Coal Material	Water	Contamination of the ground water	2	2	4	2	3	3	6	28
		Water	Lowered local water table due to mine decant	2	2	4	2	4	3	7	30
		Noise	Noise Impact from operating machinery and vehicles	2	2	3	3	2	2	4	33
		Air	Air Pollution from hydrocarbon combustion	2	1	3	2	2	2	4	20
		Air	Generation of dust from earth works and driving on gravel roads	2	3	3	3	2	1	3	33
		Waste	Generation of general domestic waste	1	2	3	3	2	1	3	27
		Waste	Generation of hazardous wastes	1	2	3	3	2	1	3	27
		Waste	Burying and/or inappropriate disposal of waste	2	2	3	3	2	2	4	33
		Health and safety	Collapsing of mine walls	1	2	3	2	4	4	8	28
		Health and safety	Flooding of working areas	2	2	3	2	3	3	6	26
		Health and safety	Fatalities and injuries from machinery, equipment and vehicles mechanical failures during operation	1	2	3	2	4	4	8	28
		Health and safety	Fatalities and injuries from human error when operating vehicles, equipment and machineries	1	2	3	2	4	4	8	28
		Noise	Noise nuisance from operating equipment and machineries	2	2	3	3	2	1	3	30
		Soil	Contamination of soils by hydrocarbons from vehicles	2	1	3	2	2	2	4	20
		Soil	Contamination by water flowing from storage areas	2	1	3	2	2	2	4	20
		Fire	Fire hazards from mining operations	2	2	3	2	4	4	8	30

E = Extent, D = Duration, I = Intensity, P = Probability of occurrence, L= Irreplaceable Loss of Resources, R = Impact Reversibility							Where (E + D + I + L + R) X P = Significance				
Activity	Environmental Aspect	Impacted Attributes	Potential Impacts	Rating Before Mitigation				Impact Importance		Importance Score (/8)	Significance Before Mitigation
				E	I	D	P	R	L		
		Traffic	Vehicle movement to and from the mining site	2	2	3	3	2	2	4	33
Mining	Drilling and blasting	Health and Safety	Health hazards associated with blasting activities such as flying rocks	2	3	3	3	4	4	8	48
			Mine wall collapse	1	2	3	2	3	3	6	24
		Noise	Noise impact from blasting activities	2	2	3	4	2	2	4	44
			Ground vibrations	2	2	3	3	4	3	7	42
			Impact on infrastructures of the Informal settlement	2	2	3	3	2	2	4	33
											0
	Haulage of coal from site	Security	Criminals targeting transportation vehicles	3	2	3	2	3	3	6	28
		Air	Air pollution from hydrocarbon combustion	2	1	3	2	2	2	4	20
		Air	Dust from the transported coal	2	2	3	3	2	2	4	33
		Health and Safety	Road accidents with fellow road users	3	2	3	2	4	4	8	32
		Fauna	Road accidents with wildlife	2	2	3	2	4	3	7	28
		Noise	Generation of excessive noise by site moving haulage trucks	2	2	3	3	2	2	4	33
		Infrastructure	Wearing of local roads due to introduction of mining fleet	2	2	4	3	2	2	4	36
	Ablution facility	Water	Contamination of surface water when the bushes are used for sanitation purpose	2	2	3	3	1	2	3	30
		Water	Flow of water from areas used for sanitation	2	1	3	3	1	2	3	27
Soil		Contamination of soil when the bushes are used for sanitation purpose	2	1	3	3	1	2	3	27	

E = Extent, D = Duration, I = Intensity, P = Probability of occurrence, L= Irreplaceable Loss of Resources, R = Impact Reversibility							Where (E + D + I + L + R) X P = Significance				
Activity	Environmental Aspect	Impacted Attributes	Potential Impacts	Rating Before Mitigation				Impact Importance		Importance Score (/8)	Significance Before Mitigation
				E	I	D	P	R	L		
		Soil	Leakages of sewage waste onto the surface	2	2	3	2	1	2	3	20
Mining	Ablution facility	Air	Smell nuisance from the ablution area	2	1	3	3	1	1	2	24
	Employment of mining labourers	Socio-Economic	The mining activities will require skilled and general workers	2	2	3	4	2	2	4	44
Rehabilitation	Pit Backfilling	Water	Acid Mine Drainage	3	3	4	3	2	3	5	45
		Water	Pit Flooding	2	3	4	2	2	3	5	28
		Soil	Shortage of backfill materials	2	2	4	2	3	3	6	28
		Soil	Contamination of topsoil on handling	1	2	4	3	4	4	8	45
		Vegetation	Poor vegetation regrowth	1	2	4	3	3	3	6	39
		Vegetation	Introduction and infestation by alien invasive plants	2	3	4	3	2	3	5	42
		Land Use	Failure to meet the requirements of the intended post land use	2	3	4	2	3	3	6	30

10.2 Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks

The potential environmental impacts associated with the project will be evaluated according to its nature, extent, duration, intensity, probability and significance of the impacts, whereby:

Nature: A brief written statement of the environmental aspect being impacted upon by a particular action or activity.

Extent: The area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment phase of a project in terms of further defining the determined significance or intensity of an impact. For example, high at a local scale, but low at a regional scale;

Duration (D): Indicates what the lifetime of the impact will be;

Intensity (I): Describes whether an impact is destructive or benign;

Probability (P): Describes the likelihood of an impact actually occurring;

Impact Reversal (R): The probability and the degree of reversing the activity impact;

Irreplaceable Loss (L): Loss of resources that cannot be replaced; and

Cumulative: In relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

The significance of each risk/impact will be identified as follows:

$$\text{Significance} = P \times (E + D + I + R + L)$$

The impact importance is determined by its reversibility and loss/gain of irreplaceable resources (R + L).

Table 10-1: Criteria Used for Rating of Impacts

CRITERIA	DESCRIPTION			
Extent	National (4)	Regional (3) Provincial and parts of neighbouring provinces	Local (2)	Site (1) Within the immediate site
Duration	Permanent (4) Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient	Long-term (3) The impact will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter. The only class of impact which will be non-transitory	Medium-term (2) The impact will last for the period of the construction phase, where after it will be entirely negated	Short-term (1) The impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase
Intensity	Very High (4) Natural, cultural and social functions and processes are altered to extent that they permanently cease	High (3) Natural, cultural and social functions and processes are altered to extent that they temporarily cease	Moderate (2) Affected environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way	Low (1) Impact affects the environment in such a way that natural, cultural and social functions and processes are not affected
Probability Of Occurrence	Definite (4) Impact will certainly occur	Very Likely (3) Most likely that the impact will occur	Possible (2) The impact may occur	Unlikely (1) Likelihood of the impact materialising is very low

CRITERIA	DESCRIPTION			
Impact Reversal	Highly Impossible (4) Impact reversal will certainly be impossible	Moderate (3) Impact can be reversed to some extent with loss of natural resources	Possible (2) High possibility of impact reversal	Definite (1) Impact can be totally reversed
Loss of irreplaceable resources	Definite (4) Resources definitely be lost	Very Likely (3) Most likely that resources will be lost	Possible (2) Resources may be lost	Unlikely (1) Loss of resources is highly unlikely

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

Table 10-2: Criteria for Rating of Classified Impacts

Negligible (5 -10 points)	A negligible impact that can be easily managed and avoided.
Low impact/ Minor (11 -20 points)	A low impact has no permanent impact of significance. Mitigation measures are feasible and are readily instituted as part of a standing design, construction or operating procedure.
Moderate impact/ (21 - 30 points)	Mitigation is possible with additional design and construction inputs.
High impact (31 – 50 Points)	The design of the site may be affected. Mitigation and possible remediation are needed during the construction and/or operational phases. The effects of the impact may affect the broader environment.
Very high impact/ Major (51 - 80 points)	Permanent and important impacts. The design of the site may be affected. Intensive remediation is needed during construction and/or operational phases. Any activity which results in a “very high impact” is likely to be a fatal flaw.

Status	Denotes the perceived effect of the impact on the affected area.
Positive (+)	Beneficial impact.
Negative (-)	Deleterious or adverse impact.

The suitability and feasibility of all proposed mitigation measures is included in the assessment of significant impacts. This was achieved through the comparison of the significance of the impact before and after the proposed mitigation measure is implemented.

10.3 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

10.3.1 Positive Impacts

The mining industry contributes largely to the South African GDP through exports, job creations and community development projects. Although the mining sector no longer dominates the South African economy as it once did, mining accounts for a major proportion of the country's earnings of foreign exchange. The economies of four of the nine provinces and of several large towns are dominated by mining.

Mine wages, once among the lowest in the country, are now among the highest. Wages account for some 40% of expenditure by the industry. In addition, over and above what they pay in royalties and tax, mining companies contribute to local communities, either voluntarily or in terms of statutory requirements.

The impact of mining on living standards is not easy to measure. Rising real mine wages have not necessarily translated into higher standards of accommodation, as many miners may have chosen to remain in shacks and spend their higher earnings on things other than better housing, such as satellite television. Data on living standards broken down by economic sector or type of employment is not available. Given that mine wages are now among the highest in the country, mining families are almost certain to be among those whose "living standards measures" (LSMs) are higher now than was the case 10 years ago. Mining households are among those who have been able to buy movable assets such as motor vehicles. They are also certain to be among those who have purchased cellular telephones.

Although once dominant, mining and quarrying now account for only 8% of South African gross domestic product (GDP). Since the middle of the last century the relative contributions of agriculture and manufacturing have also shrunk, while those of other sectors have grown. Finance at 20% is now the biggest sector, followed by government at 17%. Mining accounts for 11% of gross fixed capital formation, but also for 16% of all foreign direct investment in South Africa. The industry accounts for only 0.3% of corporate taxpayers, but they were responsible for 6% of tax assessed in 2014. Although mining employs almost half a million

people, this is only 5% of the country's workforce. Mining currently accounts for a third of all merchandise exports.

The industry also spends almost as much on the purchase of goods and services from other sectors of the economy as it generates in its own output.

(a) Coal sales

According to Statistics South Africa (Stats SA), local and foreign mineral sales in 2016 totalled almost R424 billion.

(b) Mineral exports

In the last 20 years, the contribution of mining to commodity exports has varied from a high point of 44% in both 1996 and 2010, to a low of just above 31% in 2003, to 34% in 2015. The fluctuations are partly the result of fluctuations in commodity prices. Even when down to only a third of merchandise exports, mining exports are major earners of foreign exchange, so helping to finance a large proportion of the country's imports. Among South Africa's top ten commodity exports, minerals outstrip motor vehicles by a factor of 2.7 to 1.

Although mining per se accounts for only a third of merchandise exports, if secondary beneficiated products are taken into account, then 60% of export revenue is derived from this broader category, according to the government's National Development Plan (NDP), which was adopted in 2012. According to the Chamber of Mines, mining exports in 2015 amounted to R320 billion.

(c) Royalties and taxes

Figures produced by the minister of finance show that commodity prices have a major impact on mining corporate tax. In the 2008 tax year, for example, 574 mining companies were assessed between them for R26.3 billion in income tax. In the 2012 year, by contrast, 437 companies were assessed for a total of almost R13.0 billion in such tax. The figures for the following year show that R16.1 billion was assessed in mining company tax, mining companies accounting for only 0.3% of corporate taxpayers but 9.1% of all tax assessed, although the latter proportion dropped to 6.1% in 2015. The taxable income of mining companies dropped from R93.2 billion in 2008 to R10 billion in 2013.

The mining industry pays royalties as well as income taxes. Royalty payments in the last three tax years totalled R15.57 million. The minister of finance has pointed out that mining also contributes significantly to personal income tax, in that R15.2 billion was collected from mine employees in pay-as-you-earn (PAYE) tax in 2013/14. Mining of course also contributes to VAT and other taxes.

(d) Contribution to national, provincial, and local economic output

As we saw above, the relative contribution of mining and quarrying to national output as measured by GDP has dropped to only 8%. Although falls in commodity prices, rising costs, damaging policies, and strikes have caused the mining industry to be smaller than it might otherwise have been, the decline in its relative contribution over time is largely explained by the growth of other sectors as the South African economy has matured with the expansion of the secondary and tertiary sectors of the economy.

Initially triggered by the needs of the mining industry, these other sectors have developed momentum of their own. In real terms, however, the output of the mining industry has shrunk 7.3% since its peak in 2005. This can be directly measured. What cannot be directly measured is the extent to which the decline of the mining industry has resulted in lower growth than might otherwise have been the case in other sectors of the economy, and therefore in the economy as a whole. Lower growth invariably means lower rates of job creation.

Despite its relatively small contribution to national output, mining accounts for the single largest proportion of the output of four of the nine provinces. Thanks in large part to iron ore, almost a fifth of the output of the Northern Cape comes from mining, while the dominance of coal in Mpumalanga ensures that almost a fifth of that province's output also comes from mining, although copper makes a contribution too. Limpopo, which contains diamonds, iron ore, and various other minerals, relies on mining for nearly 25% of its output. Largely because of platinum, the North West province relies on mining for almost 30% of its output.

(e) Purchases

All of these figures and considerations nevertheless understate the importance of mining to the South African economy. In 2016, for example, according to the Chamber, mining contributed R291 billion to GDP directly, but spent R245 billion on purchases of goods and services from the other sectors of the economy. These

purchases ranged from footwear through construction to business services. The largest single component was transport and storage; the second largest was petroleum chemicals, rubber, and plastic; the third largest was metals, machinery, and equipment; and the fourth largest was electricity, gas, and water. Of the total of R245 billion, R89 billion was for capital expenditure, leaving R156 for current spending.

All other sectors buy goods and services necessary for their own generation of output. But given the nature of the industry, mining arguably purchases a far wider range than other sectors. The very process of digging minerals out of the ground requires enormous expenditure on goods and services of a kind not required in other sectors.

To give an idea of how large the sum of R245 billion is, it is worth comparing it with the government's own expenditure. The budget for current spending by central government on goods and services in 2015/2016 was R188 billion (against the mining industry's figure of R156 billion). Total comparable expenditure by all the municipalities in the country in 2015/2016 was R169 billion. Total public infrastructure spending by all three levels of government and state-owned companies was budgeted in that same year at R290 billion (against the R89 billion in capital expenditure by the mining industry alone).

(f) Employment Opportunities

The proposed mining activities will create jobs for the duration of the mining permit period. Preference must be given to the local Informal settlement.

(g) SMME and Street Vendor Support

The mining team will require basic services from the local community which would mainly be provided by the Small businesses and street vendors.

10.3.2 Negative Impacts

Acid Mine Drainage: The mining activities generate acid mine drainage that persist long post mining activities;

Land use alternative conflicts: The site is actively used for agricultural purposes and not zoned for mining/industrial activities. This will create a parallel demand for land;

Loss of arable land: The proposed site is actively used for agriculture. For the duration of the mine the agricultural activities will cease at the proposed 5 ha mining area. In the absence of a technically good and implementable rehabilitation plan the land arability may be completely lost;

Loss of fertile topsoil: Topsoil will be removed to establish mining area and fertility is affected during handling.

Loss of biodiversity: The site is located on an area with Highest Biodiversity Importance ecological in terms of the Mining and Biodiversity Guideline of 2013, and also within the endangered eastern grassland according to the Vegetation Map of South Africa, vegetation will be cleared to establish mining area and habitats will also be lost affecting the fauna.

Introduction of Alien Invasive Plants on site: Invasive plants flourish where there are disturbances and ecological imbalances. The clearing of vegetation to establish drill pads area has the potential to attract invasive alien plants;

Contamination of water: The Ngudumeni River is located to the north of the proposed site. There is a huge potential for contamination of the stream from mining activities;

Destruction of wetlands: there are several wetlands identified in close proximity to the site, a potential exist for the destruction of these wetlands during activities such as roads establishment;

Generation of dust: The Optimum informal settlement is located a kilometre from the proposed site, dust generated by the mining activities will affect the community;

Soil Erosion: ground disturbances promote soil erosion, stockpiles are also prone to erosion;

Noise Generation: The mining activities will generate excessive noise affecting the informal settlement and wildlife. The noise source will be the truck movement and blasting activities;

Generation of waste: The mining activities will generate both the general and hazardous wastes. The waste will be managed using the “triple R” principle, Reduce, Reuse and Recycle;

Criminal activities: Crime in South Africa is a social challenge faced by almost everyone, the presence of mining machinery and equipment on site will attract criminals who would seek to steal and sell such equipment;

Ground vibrations and tremors: The use of explosive during blasting may create ground vibrations affecting the local community;

Destruction of graves: Graves were identified during site assessment, a potential exist for the destruction of the graves although they are located outside the proposed mining area;

Health and Safety: Mining activities pose health and safety concerns for both the mining personnel operating mining machineries and equipment, and the local communities;

Influx of migrant labour: Mine establishment is often associated with influx of migrant labour and establishment of informal settlement area.

10.4 The possible mitigation measures that could be applied and the level of risk

The mitigation measures have been thoroughly discussed in Part A Section 12.0 and Part B Section 4.0. Below a summative impact/risk management is provided.

Loss of arable land: The mining site must be fully rehabilitated on cessation of mining activities according to an approved rehabilitation plan;

Loss of biodiversity: The site ecology must be fully understood and rehabilitated on completion of mining activities. The indigenous plants must be replanted in the rehabilitated area to recreate pre-mining conditions;

Loss of fertile topsoil: The topsoil must be stripped and stockpiled separately from any other materials, contamination must be prevented

Introduction of Alien Invasive Plants on site: Invasive species monitoring and control plan must be developed for implementation during mining and rehabilitation phases of the mining activities;

Contamination of water: The contaminated water including storm water must be contained within the dirty area of the proposed site, only clean water may be allowed to flow off site;

Destruction of wetlands: all wetlands must be declared a no-go zone;

Generation of dust: Dust monitoring and control programme must be developed and implemented throughout the mining period;

Soil Erosion: All stockpiles must be protected and erosion controlled;

Destruction of identified graves: the grave sites must be demarcated as no-go zones for the duration of the mine;

Noise Generation: The operating times of the mine must be clearly defined and all affected parties informed, the affected parties must be given a weeks' notice for all blasting activities;

Generation of waste: The waste will be managed using the "triple R" principle, Reduce, Reuse and Recycle;

Criminal activities: The mining area must be fenced and access into the site controlled;

Ground vibrations and tremors: All blasting activities must be effectively communicated with all affected parties and given a week's notice;

Health and Safety: All mining activities must be conducted according to the Mine Health and Safety Act, 29 of 1996;

Influx of migrant labour: Hiring must be done off site and locals must be given preference.

10.5 Motivation where no alternative sites were considered

- ✓ Mining developments are dictated to by the presence and distribution of coal deposits. The proposed area was chiefly preferred because of the presence of coal deposits;
- ✓ There are no surface water resources within the proposed area and 500 metres radius of the proposed site;
- ✓ The site environmental sensitivity is relatively low as the site has been disturbed by agricultural activities;
- ✓ There are no human settlements within the proposed site;
- ✓ No heritage resources were identified within the proposed site;
- ✓ The proposed site is easily accessible.

10.6 Statement motivating the alternative development location within the overall site

The site layout was mainly influenced by the presence of the coal deposit within the proposed site. There are no surface water resources within the proposed mining area and its immediate surrounding and no occupants who would require resettlement.

11.0. Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site

In order to identify the potential impacts associated with the proposed mining activity the following methods were adopted:

11.1 Project Screening

Screening was the initial identification of potential interactions between the Project and physical, ecological and human receptors. The project applicant (Breakthrough Power Solar (Pty) Ltd) briefed the EAP (Mielelani Consultancy) about the proposed mining activities. All the project activities were identified, described and project layout plans acquired from the applicant. During screening process all relevant policies and regulations were identified and their applicability to the project was identified. Screening also included identification of likely physical, ecological and human receptors based on existing knowledge of the environmental and social baseline conditions and professional expertise.

The project screening also included the National Department of Environmental Affairs and Forestry (DEFF) screening through their screening website. The screening report as generated by the website is attached to this report as Appendix 05.

11.2 Project Scoping

Following the Screening Stage, Scoping was undertaken to provide further detail of potential environmental and social effects of the Project. The Scoping Stage intended to facilitate impact identification in a consistent and robust manner. The scoping process intended to identify environmental impacts, receptors and alternatives assessments. The following are the process undertaken during project scoping:

11.2.1 Desktop Study

Desktop study was undertaken for systematic identification of potential interactions between project activities or events and known receptors, i.e. identification of potential physical, ecological, and human receptors that may be affected by the Project. This was done through review of existing environmental

and social information, and gap analysis to identify additional baseline information required for the impact assessment.

11.2.1.1 GIS Review

The project made use of ArcMap, ArcGIS Pro, Google Earth and Bing Maps to identify and assess probable impacts, various data sources were consulted to define the receiving environment and identification of probable impacts. Overlay of proposed activities on site GIS data from various sources enables for detailed identification of probable impacts and impact receptors. The GIS data used to identify probable impacts included the following:

Earth Image (ESRI, Google & Bing Map) – The imagery provides review of site setting and also provide review of changes over time as the images can be back dated. The Images provide vegetation cover, site land uses, identification of environmental features such as streams and natural habitats;

Mpumalanga Tourism & Parks Agency– Provides data on site ecological sensitivities with categories Critical Biodiversity Area (1 & 2), Ecological Support Area (ESA) 1 & 2, Other Natural, and No Natural Remaining;

National Vegetation Map – The layer/ shapefiles provides data on vegetation cover of South Africa as mapped by Mucina and Rutherford in 2006. The vegetation map provided data on expected site vegetation types to be affected by the proposed waste handling facility;

SANBI Plants of South Africa Quarter Degree Search – The website provided probably plant species on site.

National Freshwater Ecosystem Priority Areas (NFEPA) – The data provides mapped wetlands and streams of South Africa with their respective Present Ecological Status, Wetland/ river condition and their flow season;

South Africa 1:50 000 Vector Data – The data maps out most of the site features which include open spaces, roads, rivers, vegetated areas, protected areas, graveyards, agricultural and residential areas;

Important Birds Areas – Provides bird areas of South Africa and their respective birds' species;

DWS Aquifer Classification, Vulnerability and Susceptibility – Provide site aquifer information.

Vegter's Underground Water Resource – The water reports shapefiles provide data such as depth to underground water, available water in aquifers and flow potentials.

11.2.1.2 Literature Review

Literature review is the review of existing literatures pertaining to the proposed activities and the receiving environments. The review included review of metadata and explanatory documents for GIS data. The following are some existing literatures reviewed:

- ✓ Local and District Municipalities By-Laws, Integrated Developments Plans (IDP) and Spatial Development Framework (SDF);
- ✓ The National Development Plan (NDP);
- ✓ Mining reports for South Africa;
- ✓ The National Acts, Regulations, Guidelines and Policies;
- ✓ Provincial Legislations, Guidelines and Policies;
- ✓ Newcastle Municipalities Integrated Plans; and
- ✓ Review of Books, Journals and Unpublished Papers.

11.2.2 Field Investigation

A site visit will be conducted to ensure that the information gathered as part of the Desktop investigation reflects the current status of the site. The site visit is planned between 18 – 22 September 2023. Target areas for further investigation were determined through GIS review. The field investigation was aimed at assessing site land uses, vegetation cover, habitats, flora and fauna, water resources, heritage resources and any other sensitive environmental receptor as determined by the desktop review.

11.2.3 Stakeholder consultation

Project stakeholders included the applicant, specialists, land owners and users, municipalities, provincial and national departments such as Department of Water Affairs and Sanitation, Ezemvelo KZN Wildlife and NGOs.

All the stakeholder will be notified of the proposed project and encouraged to participate. The stakeholders were sent background documents explaining the proposed project and identified probable impacts. The project stakeholders engaged the EAP on site background and probable impacts.

11.3 Impacts assessment, rating and management

The process for assessing potential Project impacts involved:

- ✓ Prediction: What will happen to the environment as a consequence of this Project (i.e. defining Project activities and impacts)?
- ✓ Evaluation: Will it have a beneficial or adverse effect? How big is the change expected to be? How important will it be to the affected receptors?
- ✓ Mitigation: If the impact is of concern, can anything be done to avoid, minimise, or offset the impact? Or to enhance potential benefits?
- ✓ Residual Impact: After mitigation, is the impact still of concern?

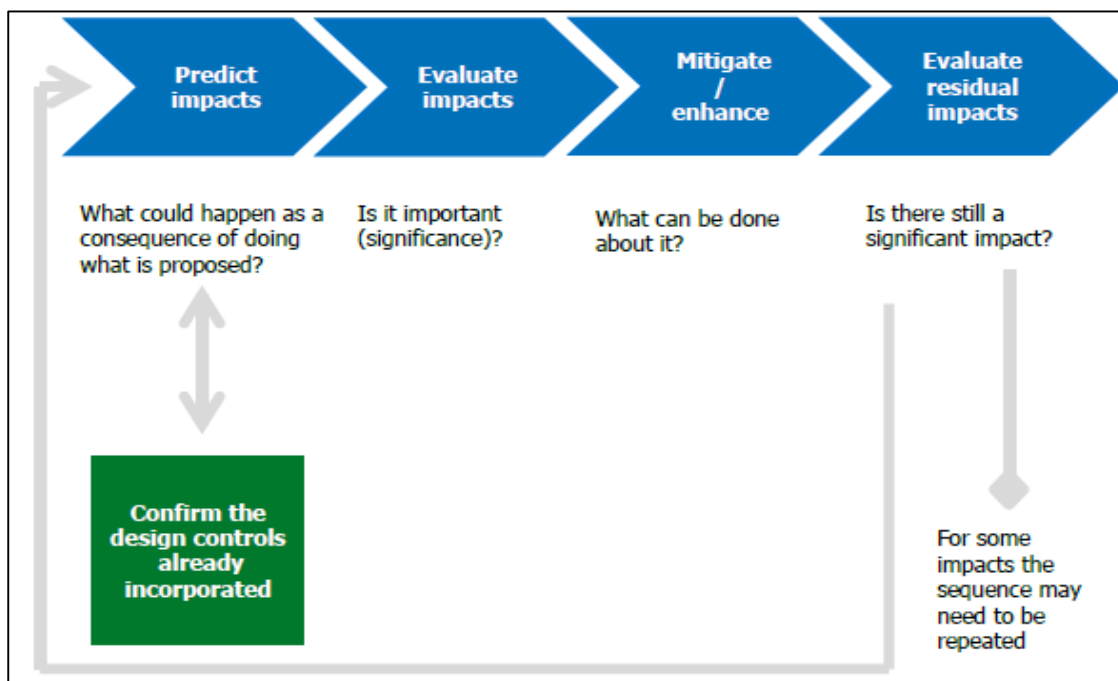


Figure 11-1: Impact Identification and Assessment Process

Impact significance was assessed with and without mitigation measures in place. Impacts without mitigation measures in place are not representative of the Project's actual extent of impact, and are included to facilitate understanding of how and why mitigation measures were identified.

The residual impact is what remains following the application of mitigation and management measures, and is thus the final level of impact associated with the development of the Project. Residual impacts also serve as the focus of management and monitoring activities during Project implementation to verify that actual impacts are the same as those predicted in this EIA Report.

For some types of impact there are empirical, objective and established criteria for determining the potential impact significance (e.g. if a standard is breached or a protected area is damaged). However, in other cases assessment criteria are more subjective and require professional judgement to a greater degree.

12.0. Assessment of each identified potentially significant impact and risk

E = Extent, D = Duration, I = Intensity, P = Probability of occurrence, L= Irreplaceable Loss of Resources, R = Impact Reversibility; all impacts are negative in nature unless indicated											Where (E + D + I + L + R) X P = Significance & IS = R + L		
Activity	Environmental Aspect	Impacted Attributes	Potential Impacts	Rating Before Mitigation				Impact Importance		Importance Score (/8)	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
				E	I	D	P	R	L				
Project Planning	Mining project planning and scheduling	Legal requirements	Misinterpretation of Legislations & Commencement of regulated activities without Licenses/Permits/ Authorisations	2	3	3	4	4	4	8	64	An EAP was appointed to identify all legislative requirements related to Environmental Management. Mielelani Consultancy is the appointed project EAP.	10
	Site Access		Accessing privately owned properties without land owners permission	1	4	4	4	4	4	8	68	The land belongs to private individual and consent letter will be provided to the owner as from the prospecting phase of the project.	8
	Procurement of Services		Disregard of BBBEE Regulations	3	2	4	2	2	2	4	26	The Appointed EAP is a Level 1 BBBEE Contributor.	8
			Failure to appoint Environmental Control Officer for the Operation	3	4	4	4	4	4	8	76	Breakthrough Power Solar Pty Ltd will appoint and ECO for the Project.	8
Site Establishment	Fencing and securing proposed site	Legal requirements	Expansion of permitted area	2	3	3	3	3	4	7	45	Breakthrough Power Solar Pty Ltd must strictly be undertaken within the permitted area.	8
		Vegetation	Clearing of vegetation beyond approved areas	2	2	3	4	2	3	5	48	<ul style="list-style-type: none"> ✓ Vegetation clearing must be done according to the approved plan; ✓ Vegetation clearing must be done progressively with planned invasive activities; 	8
			Removal of Protected and/ or Species of Conservation Concern	4	2	3	3	4	4	8	51	<ul style="list-style-type: none"> ✓ The SCC must be noted and their location be precisely known; ✓ Removal of SCC must be according to a Permit issued by relevant authority; 	20
			Driving outside approved site routes	2	2	3	3	2	3	5	36	<ul style="list-style-type: none"> ✓ Vehicles must strictly drive on approved site access routes; ✓ Driving on unapproved routes must be punishable; 	14
			Introduction of alien invasive plants along the fence (disturbed area)	2	2	4	3	2	3	5	39	<ul style="list-style-type: none"> ✓ Common alien invasive plants must be communicated with all site personnel; ✓ They must be removed mechanically as soon as they are noticed. 	21
		Soil	Mixing of topsoil and subsoil rendering topsoil less effective for rehabilitation	1	3	3	3	2	2	4	33	<ul style="list-style-type: none"> ✓ Topsoil must be removed and stockpiled according to site plan, separately from any other materials; ✓ Topsoil must be protected from contamination. 	12
			Hydrocarbon and chemical contamination	2	2	3	3	1	2	3	30	<ul style="list-style-type: none"> ✓ Soil contamination must be cleaned as soon as they occur; ✓ All vehicles must be maintained in good working conditions; ✓ Stationery trucks must have drip trays placed underneath; 	20
		Fauna	Loss of fauna when establishing fencing corridors	2	1	3	2	2	2	4	20	<ul style="list-style-type: none"> ✓ All fauna trapped within the site on fencing must be captured and released to the wild; ✓ No hunting must be allowed in and around the mining site; ✓ Professional handlers must be invited to site to capture dangerous faunas 	18
			Driving over and collision with site fauna	1	2	3	3	4	4	8	42	<ul style="list-style-type: none"> ✓ All drivers must have relevant driver's license; ✓ Speed limit and all applicable road rules must be adhered to; ✓ A 40 km/h driving speed must not be exceeded in all site roads; ✓ Drivers' must be extra vigilant when driving on site roads 	18

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Activity	Environmental Aspect	Impacted Attributes	Potential Impacts	Rating Before Mitigation				Impact Importance		Importance Score (/8)	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation	
				E	I	D	P	R	L					
Site Establishment	Fencing and securing proposed site	Fauna	Capturing (Hunting and Trapping) of wild life by site crews	2	2	3	2	3	2	5	24	<ul style="list-style-type: none"> ✓ No hunting is allowed on site and immediate areas; ✓ Any carcass found on site must be reported to site manager and the 	10	
		Water	Contamination of water by flows from contaminated surfaces such as cement mixing areas and chemical storage and mixing areas	2	2	3	3	2	2	4	4	33	<ul style="list-style-type: none"> ✓ Mixing of mortar must be done in demarcated area as per the site plan; ✓ Storage area must be bunded and protected from rain; ✓ Any flows from the storage and cement mixing area must be contained on site; ✓ Dirty and clean must be separated. 	14
			Excessive usage of available water in the area	2	1	3	2	2	2	4	4	20	<ul style="list-style-type: none"> ✓ Water usage must be controlled; ✓ Water usage must be recorded and included in the site environmental file; 	12
			Using water without consent from the Municipality and/or boreholes owners	1	2	3	2	2	2	4	4	20	<ul style="list-style-type: none"> ✓ Water sourcing must be authorised by the Municipality if from the Municipality connection; and ✓ If from a borehole the owner must give consent. 	8
		Waste	Generation of general domestic waste	1	1	3	4	1	1	2	2	28	<ul style="list-style-type: none"> ✓ The waste management hierarchy must be applied (Reduce, Reuse and Recycle); ✓ The generated waste must be placed in marked and coloured coded bins; ✓ Waste must be separated; ✓ Waste must be disposed in registered facility and disposal certificate must be kept on site. 	12
			Generation of hazardous wastes such as contaminated soils and empty oil tins	1	2	3	4	1	1	2	2	32	<ul style="list-style-type: none"> ✓ Hazardous wastes must be stored separately from general wastes; ✓ General wastes must be disposed in a facility permitted to accept hazardous wastes; ✓ Disposal certificate must be kept on site; 	16
			Generation of green waste (removed trees)	1	1	3	4	0	0	0	0	20	<ul style="list-style-type: none"> ✓ The green waste must be cut to manageable size and temporarily stored on site for disposal in a general waste facility; ✓ Disposal certificate must be kept on site. 	16
		Noise	Operating equipment resulting in noise affecting the wildlife and community	2	2	3	4	1	1	2	2	36	<ul style="list-style-type: none"> ✓ All equipment must be kept in good working conditions to ensure noise levels are within acceptable range; ✓ The fencing activities must be undertaken during the day; ✓ The operating times must be clearly indicated on the site notice board and the Optimum Informal settlement formally informed. 	21
		Health and Safety	Safety hazards associated with handling of fencing materials such as wires	1	2	1	2	2	1	3	3	14	<ul style="list-style-type: none"> ✓ The employees must be provided with relevant PPEs. 	10
		Security	Theft of fencing materials	1	2	1	3	2	2	4	4	24	<ul style="list-style-type: none"> ✓ Breakthrough Power Solar Pty Ltd must hire security personnel to provided security services for the mining operations. 	10
Socio-Economic	Creation of Jobs	2	2	3	4	2	2	4	4	44	<ul style="list-style-type: none"> ✓ The Lennoxton residents must be given preference whenever labourers are required. 	44		

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				E	I	D	P	R	L				
Site Establishment	Demarcation of stockpiling Areas	Legal Requirements	Demarcating stockpiling area outside permitted area	1	2	3	3	2	3	5	33	✓ All mining activities must be restricted to the approved 5 ha area.	8
		Vegetation	Locating stockpiling area in no-go areas	1	2	3	2	4	4	8	28	✓ There are no ecologically sensitive areas within the proposed site;	8
		Water	Locating stockpiling area in natural storm water channels	2	2	3	2	3	2	5	24	✓ All site natural stormwater drainage must be identified to prevent locating storage and stockpiling area in the drainage; ✓ Stormwater must be diverted away from active areas to prevent contamination and erosion.	10
	Placement of site temporary infrastructures such as mobile office, toilets, generators, etc	Legal Requirements	Undertaking unauthorised activities (not part of permitted activities)	3	3	3	2	4	4	8	34	✓ Only permitted activities can be undertaken; ✓ Any addition of regulated activity must be applied for.	6
		Vegetation	Removal of Protected and/ or Species of Conservation Concern	3	3	4	2	4	4	8	36	✓ The SCC must be noted and their location be precisely known; ✓ The study did not identify any SCC ✓ Removal of SCC must be according to a Permit issued by relevant authority;	12
		Vegetation	Loss of vegetation as area is cleared	2	2	3	4	2	2	4	44	✓ Vegetation clearance must be according to an approved method statement; ✓ Vegetation clearing must be done progressively with site planned activities; ✓ Vegetation must be replanted during rehabilitation phase.	22
		Vegetation	Clearing of vegetation beyond approved areas	2	3	3	2	4	4	8	32	✓ Vegetation clearing must be strictly restricted to the approved area.	12
		Vegetation	Introduction of alien invasive plants	2	2	4	3	2	3	5	39	✓ Common alien invasive plants must be communicated with all site personnel; ✓ They must be removed mechanically as soon as they are noticed; ✓ Alien invasive plants monitoring programme must be developed and implemented from construction to rehabilitation phase.	18
		Fauna	Capturing (Hunting and Trapping) of wild life by site crews	2	2	3	2	4	4	8	30	✓ No hunting is allowed on site and immediate areas; ✓ Any carcass found on site must be reported to site manager and the	16
		Fauna	Driving over and collision with site fauna	2	3	3	3	4	3	7	45	✓ All drivers must have relevant driver's license; ✓ Speed limit and all applicable road rules must be adhered to; ✓ A 40 km/h driving speed must not be exceeded in all site roads; ✓ Drivers' must be extra vigilant when driving on site roads	21
		Fauna	Loss of habitats as vegetation is cleared	2	3	3	4	2	2	4	48	✓ All fauna must be captured, rescued and released to the wild outside the mining area; ✓ Vegetation clearance and disturbance must be restricted to active areas only.	26
		Soil	Mixing of topsoil and subsoil rendering topsoil less effective for rehabilitation	2	2	2	2	3	2	5	22	✓ Topsoil must be removed and stockpiled according to the site plan; ✓ Topsoil and subsoil must never be mixed; ✓ Topsoil must be handled as few times as possible, preferably twice; ✓ Contaminated topsoil must be treated or disposed without coming into contact with clean topsoil; ✓ Erosion control measures must be implemented at round the stockpiling area to prevent loss of topsoil.	8

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				E	I	D	P	R	L				
Site Establishment	Placement of site temporary infrastructures such as mobile office, toilets, generators, etc	Soil	Hydrocarbon and chemical contamination	1	2	3	2	2	2	4	20	<ul style="list-style-type: none"> Storage of all hydrocarbons must be in a bunded area; All site vehicles and equipment must be kept in good working condition to prevent mechanical breakdown resulting in release of hydrocarbons; All leakages and spillages must be cleaned as soon as they occur; Drip trays must be placed beneath all trucks; Breakthrough Power Solar Pty Ltd must provide spill kit; 	12
		Soil	Soil contamination by contaminated stormwater from storage areas (Hydrocarbon & Chemicals)	1	1	2	2	1	2	3	14	<ul style="list-style-type: none"> Stormwater flow from contaminated and storage areas must be directed to the dirty water containment area; Servicing of trucks and equipment must be done in a hardened and bunded area; Major spillages must be reported to the DMRE and DWS. 	8
		Soil	Soil erosion due to surface disturbances	2	2	3	2	2	1	3	20	<ul style="list-style-type: none"> Vegetation clearance and soil disturbance must be restricted to planned areas; Erosion control measures must be implemented; The created site access roads must have controlled stormwater drainage. Beams may be used to reduce stormwater flow speed and the erosion; Mined out areas must be rehabilitated as soon as work is done at that particular area; 	12
		Water	Storm water flow from contaminated areas into local clean surface water bodies such as Klien Olifants River	3	2	3	2	2	2	4	24	<ul style="list-style-type: none"> All site dirty water must be directed to the PCD; Dirty water must never be allowed to mix with clean water; All site vehicles and equipment must be kept in good working condition to prevent mechanical breakdown resulting in release of hydrocarbons; Only clean water must be allowed to exit the site; 	10
		Water	Excessive usage of available water in the area	2	2	3	2	3	2	5	24	<ul style="list-style-type: none"> Water usage must be controlled and recorded; Water must be obtained from authorised sources. 	8
		Water	Water contamination by flows from waste storage areas	2	1	3	2	1	1	2	16	<ul style="list-style-type: none"> Storage areas must be bunded; Waste must be stored in closed waste bins and skips; 	8
		Water	Water Contamination by flows from chemical and hydrocarbon storage areas	2	2	3	2	2	2	4	22	<ul style="list-style-type: none"> Littering must be prevented; Outflows from storage areas must be contained within the site; 	6
		Waste	Generation and management of general domestic waste	1	2	3	4	1	1	2	32	<ul style="list-style-type: none"> The waste management hierarchy must be applied (Reduce, Reuse and Recycle); The generated waste must be placed in marked and coloured coded bins; Waste must be separated; Waste must be disposed in registered facility and disposal certificate must be kept on site. 	16

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				E	I	D	P	R	L				
Site Establishment	Placement of site temporary infrastructures such as mobile office, toilets, generators, etc	Waste	Generation and management of hazardous wastes	1	2	3	4	2	1	3	36	<ul style="list-style-type: none"> ✓ The hazardous waste source will include: <ul style="list-style-type: none"> ✓ Hydrocarbon and chemical contamination; ✓ Empty hydrocarbon and chemical containers; ✓ The ore containing wastes. ✓ Hazardous waste must not be mixed with general wastes; ✓ Hazardous waste must be disposed in a registered facility licensed to accept hazardous waste; ✓ Disposal certificates must be kept on site for the duration of the mine. 	14
		Waste	Burying and/or inappropriate disposal of waste	2	2	4	3	2	2	4	36	<ul style="list-style-type: none"> ✓ Burying of waste will be considered a criminal offence and perpetrators must stand before a court of law; ✓ All site personnel must be properly inducted and trained on waste management principles; ✓ Waste management must form part of the daily toolbox talks; 	8
		Noise	Noise generated by operating machineries	2	2	3	4	1	1	2	36	<ul style="list-style-type: none"> ✓ The mining activities must be undertaken according to the approved schedule and plan; ✓ The mining equipment must be kept in good working condition to prevent malfunction and noise generation; 	26
		Air	Generation of dust from clearing and vehicle movement on site	2	2	3	4	2	1	3	40	<ul style="list-style-type: none"> ✓ The gravel access roads and working areas must be watered to control dust; ✓ Dust control will be monitored by the project Environmental Officer and the ECO and determines the dust suppression intervals as per the site needs. 	16
		Air	Air pollution from vehicle hydrocarbon combustion	2	1	3	2	2	2	4	20	<ul style="list-style-type: none"> ✓ The site vehicles must be kept in good working condition; ✓ Each site vehicle must have a traceable service history 	16
		Health and Safety	Health and safety hazards from operating machineries and equipment	2	2	3	2	3	4	7	28	<ul style="list-style-type: none"> ✓ The site vehicles must be kept in good working condition; ✓ Each site vehicle must have a traceable service history; ✓ Equipment and machinery operators must be competent and copies of their competence kept within the site environmental file; ✓ The equipment must be operated according to their specifications; ✓ All workers must be provided with PPE. 	10
		Health and Safety	Hazards from handling of chemicals	1	2	3	2	3	3	6	24	<ul style="list-style-type: none"> ✓ All chemicals must have their MSDS available on site; ✓ Handling of chemicals must be according to their MSDS; ✓ All hazardous human contact must be given medical attention as soon as they occur; ✓ All chemical handlers must be provided with appropriate PPEs. 	10
		Health and Safety	Encounters with dangerous wild life such as poisonous snakes	1	2	3	3	3	4	7	39	<ul style="list-style-type: none"> ✓ Killing of wildlife is prohibited; ✓ Competent animal handlers must be invited to site in cases where dangerous animals are within the site; ✓ Captured animals must be released to the wild outside the perimeter of the mining area; 	22

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				E	I	D	P	R	L				
Site Establishment	Placement of site temporary infrastructures such as mobile office, toilets, generators, etc	Security	Theft of site properties	1	2	3	2	2	3	5	22	<ul style="list-style-type: none"> ✓ Breakthrough Power Solar Pty Ltd must place 24-hour security personnel on site; ✓ The mining area must be completely secured with controlled access gates; ✓ All site visitors must be recorded; ✓ No weapons and pets must be allowed into the site. 	12
		Traffic	Increased Vehicles movement on local roads to and from site	2	2	3	2	1	2	3	3	20	<ul style="list-style-type: none"> ✓ Breakthrough Power Solar Pty Ltd must through consultation with Lennoxton Community and through their Corporate Social Responsibility maintain local roads to keep them in good condition; ✓ All site vehicles must be road worthy; ✓ The mine fleet must adhere to road rules.
Mining	Clearing of vegetation from mining area	Legal Requirements	Removal of species of conservation concern without permit	3	2	4	2	3	4	7	32	<ul style="list-style-type: none"> ✓ The SCC must be noted and their location be precisely known; ✓ The study did not identify any SCC ✓ Removal of SCC must be according to a Permit issued by relevant authority; 	20
		Legal Requirements	Expansion of the mining area beyond the permitted 05 ha	2	3	4	2	4	4	8	34	<ul style="list-style-type: none"> ✓ The mining activities must be strictly confined to the permitted 05 ha; ✓ No activity may be undertaken beyond the perimeter fence. 	4
		Vegetation	Loss of vegetation as area is cleared	2	4	3	4	3	2	5	56	<ul style="list-style-type: none"> ✓ Vegetation clearance must be restricted to approved areas only; ✓ Concurrent rehabilitation must be implemented; ✓ Haphazard vegetation clearing must be prevented; ✓ Vegetation clearing must be according to an approved method statement. 	24
		Vegetation	Introduction of alien invasive plants	2	3	3	2	2	3	5	26	<ul style="list-style-type: none"> ✓ Common alien invasive plants must be communicated with all site personnel; ✓ They must be removed mechanically as soon as they are noticed; ✓ Alien invasive plants monitoring programme must be developed and implemented from construction to rehabilitation phase. 	18
		Fauna	Loss of habitats	2	3	3	4	3	3	6	56	<ul style="list-style-type: none"> ✓ All fauna must be captured, rescued and released to the wild outside the mining area; ✓ Vegetation clearance and disturbance must be restricted to active areas only. 	30
		Fauna	Accidental Collision and driving over wildlife	2	2	3	3	4	3	7	42	<ul style="list-style-type: none"> ✓ All drivers must have relevant driver's license; ✓ Speed limit and all applicable road rules must be adhered to; ✓ A 40 km/h driving speed must not be exceeded in all site roads; ✓ Drivers' must be extra vigilant when driving on site roads 	18

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		Fauna	Hunting and trapping of wildlife	2	2	3	3	4	3	7	42	<ul style="list-style-type: none"> ✓ No hunting is allowed on site and immediate areas; ✓ Any carcass found on site must be reported to site manager and the 	8
Mining	Clearing of vegetation from mining area	Soil	Soil erosion on bare land	1	2	3	3	2	2	4	30	<ul style="list-style-type: none"> ✓ A stormwater management plan must be developed for the site; ✓ Storm water must be directed away from active areas; ✓ Stormwater drains must be developed along access roads; ✓ Sand bags may be used to reduce stormwater flow speed; and ✓ Soil disturbance must be limited to active areas only. 	20
			Compaction of fertile topsoil through repetitive driving	1	3	3	3	2	2	4	33	<ul style="list-style-type: none"> ✓ Driving must be through approved roads; ✓ Driving outside approved roads must be punishable; ✓ Creation of new roads must be done in consultation with the EO and the ECO. 	21
			Hydrocarbon contamination from operating trucks and vehicles	2	2	3	3	2	2	4	33	<ul style="list-style-type: none"> ✓ All vehicles must be kept in good working condition; ✓ The service plan for each vehicle must be maintained; ✓ Spillages and leaks must be cleaned as they occur; ✓ Spillage kits must be provided on site; ✓ Drip trays must be placed underneath stationary trucks; 	12
			Soil contamination by contaminated stormwater from storage areas (Hydrocarbon & Chemicals)	2	2	3	3	2	2	4	33	<ul style="list-style-type: none"> ✓ Storage of all hydrocarbons must be in a bunded area; ✓ All site vehicles and equipment must be kept in good working condition to prevent mechanical breakdown resulting in release of hydrocarbons; ✓ All leakages and spillages must be cleaned as soon as they occur; ✓ Drip trays must be placed beneath all trucks; ✓ Breakthrough Power Solar Pty Ltd must provide spill kit; Stormwater flow from contaminated and storage areas must be directed to the dirty water containment area; ✓ Servicing of trucks and equipment must be done in a hardened and bunded area; ✓ Major spillages must be reported to the DMRE and DWS. 	8
		Water	Water contamination by flows from contaminated areas	2	2	3	3	2	2	4	33	<ul style="list-style-type: none"> ✓ Storage areas must be bunded; ✓ Materials must be stored according to the approved site plan; 	12
		Water	Water contamination by flows from waste storage areas	2	1	3	2	1	1	2	16	<ul style="list-style-type: none"> ✓ Contaminated surfaces must be cleaned immediately; ✓ Waste must be stored in closed waste bins and skips; 	10
		Water	Water Contamination by flows from chemical and hydrocarbon storage areas	2	1	3	2	2	2	4	20	<ul style="list-style-type: none"> ✓ Littering must be prevented; ✓ Outflows from storage areas must be contained within the site; 	10
		Air	Dust generation from vehicle movement	2	2	4	3	1	2	3	33	<ul style="list-style-type: none"> ✓ The gravel access roads and working areas must be watered to control dust; ✓ Dust control will be monitored by the project Environmental Officer and the ECO and determines the dust suppression intervals as per the site needs. 	12

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		Air	Air pollution from vehicle combustion	2	1	3	3	1	2	3	27	<ul style="list-style-type: none"> ✓ The site vehicles must be kept in good working condition; ✓ Each site vehicle must have a traceable service history 	20
Mining	Clearing of vegetation from mining area	Waste	Generation and management of general domestic waste	2	1	3	4	1	1	2	32	<ul style="list-style-type: none"> ✓ The waste management hierarchy must be applied (Reduce, Reuse and Recycle); ✓ The generated waste must be placed in marked and coloured coded bins; ✓ Waste must be separated; ✓ Waste must be disposed in registered facility and disposal certificate must be kept on site. 	12
		Waste	Generation and management of hazardous wastes	2	1	3	4	1	1	2	32	<ul style="list-style-type: none"> ✓ The hazardous waste source will include: <ul style="list-style-type: none"> ✓ Hydrocarbon and chemical contamination; ✓ Empty hydrocarbon and chemical containers; ✓ The ore containing wastes. ✓ Hazardous waste must not be mixed with general wastes; ✓ Hazardous waste must be disposed in a registered facility licensed to accept hazardous waste; ✓ Disposal certificates must be kept on site for the duration of the mine. 	16
		Waste	Burying and/or inappropriate disposal of waste	2	2	4	3	2	2	4	36	<ul style="list-style-type: none"> ✓ Burying of waste will be considered a criminal offence and perpetrators must stand before a court of law; ✓ All site personnel must be properly inducted and trained on waste management principles; ✓ Waste management must form part of the daily toolbox talks; 	8
		Noise	Noise impact from operating machinery affecting wild life and Optimum Informal Settlement Community	2	2	3	4	1	1	2	36	<ul style="list-style-type: none"> ✓ The mining activities must be undertaken according to the approved schedule and plan; ✓ The mining equipment must be kept in good working condition to prevent malfunction and noise generation; 	24
		Health and Safety	Hazards from operating soil handling machinery such as trucks and front end loaders	2	3	3	3	4	4	8	48	<ul style="list-style-type: none"> ✓ The site vehicles must be kept in good working condition; ✓ Each site vehicle must have a traceable service history; ✓ Equipment and machinery operators must be competent and copies of their competence kept within the site environmental file; ✓ All operators must be trained and competent and their competence certificates kept in site file. ✓ The equipment must be operated according to their specifications; ✓ All workers must be provided with PPE. 	20
		Health and Safety	Health hazards from handling of chemicals	2	2	3	3	3	3	6	48	<ul style="list-style-type: none"> ✓ All chemicals must have their MSDS available on site; ✓ Handling of chemicals must be according to their MSDS; ✓ All hazardous human contact must be given medical attention as soon as they occur; ✓ All chemical handlers must be provided with appropriate PPEs. 	18

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		Health and Safety	Encounter with dangerous wildlife such as snakes	2	2	3	2	3	3	6	26	<ul style="list-style-type: none"> ✓ Killing of wildlife is prohibited; ✓ Competent animal handlers must be invited to site in cases where dangerous animals are within the site; ✓ Captured animals must be released to the wild outside the perimeter of the mining area; 	18
Mining	Clearing of vegetation from mining area	Safety and security	Theft of site property and threats to social site workers	2	2	3	3	3	3	6	48	<ul style="list-style-type: none"> ✓ Breakthrough Power Solar Pty Ltd must place 24 hour security personnel on site; ✓ The mining area must be completely secured with controlled access gates; ✓ All site visitors must be recorded; ✓ No weapons and pets must be allowed into the site. 	12
		Traffic	Vehicle movement to and from site degrading local roads and creating road safety risks	2	2	3	4	1	2	3	40	<ul style="list-style-type: none"> ✓ Breakthrough Power Solar Pty Ltd must through consultation with Lennoxton Community and through their Corporate Social Responsibility maintain local roads to keep them in good condition; ✓ All site vehicles must be road worthy; ✓ The mine fleet must adhere to road rules. 	24
		Soil	Topsoil compaction reducing soil fertility	2	2	4	2	3	3	6	28	<ul style="list-style-type: none"> ✓ Topsoil must be removed only in impacted areas (planned areas of development); ✓ Removal of topsoil must be done after clearing of vegetation; ✓ Topsoil stockpiles must not exceed 1.5 metres in height; ✓ Topsoil must preferably be handled only twice, i.e. on removal-stockpiling and re-spreading. 	14
	Removal and Stockpiling of topsoil	Soil	Contamination of topsoil by hydrocarbons	1	2	3	2	4	4	8	28	<ul style="list-style-type: none"> ✓ Contaminated topsoil must be separated from clean soils; ✓ Soils that cannot be cleaned must be disposed at appropriate registered waste facility; ✓ Hydrocarbons storage must be in a hardened surface with a bund wall; ✓ All site vehicles and equipment must be in good working conditions; ✓ Drip trays must be placed underneath stationary trucks and equipment; ✓ Topsoil stockpiling area must be established away from potentially contaminating activities. 	12
		Soil	Mixing of topsoil with other soil types	1	2	3	2	4	4	8	28	<ul style="list-style-type: none"> ✓ Topsoil must be stored separately from any other materials; ✓ Topsoil stockpile must be established as per the approved site plan 	8
		Soil	Erosion of topsoil stockpiles	2	2	3	2	2	3	5	24	<ul style="list-style-type: none"> ✓ Topsoil stockpiling area must be established within 32 metres of any watercourse and away from stormwater drains; ✓ Stormwater channels must be created around the stockpiling area to prevent soil erosion; ✓ The topsoil must be seeded to establish grass cover for prevention of wind and rain effect. 	10
		Soil	Contaminated flows to the topsoil stockpiling area	1	2	3	2	2	2	4	20	<ul style="list-style-type: none"> ✓ Stormwater control channel must be created around the stockpiling area to divert water away from the stockpiling area; 	12

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				E	I	D	P	R	L				
											<ul style="list-style-type: none"> Contaminated surfaces must be cleaned as soon as they occur/noticed. 		
		Soil	High stockpiling height exceeding 2 metres reducing fertility	1	1	3	3	3	3	6	33	<ul style="list-style-type: none"> Topsoil stockpile must never exceed 2 metres in height; The ECO must conduct monthly compliance audit 	10
Mining	Removal and Stockpiling of topsoil	Water	Increased suspended loads in stormwater as topsoil gets eroded	2	2	3	2	2	2	4	22	<ul style="list-style-type: none"> Stockpiling area must be established away from drainage lines; Stormwater channel must be created around the stockpiling area to control and divert stormwater away from the stockpiling area; Clean and dirty water must be separated through demarcating dirty and clean water areas 	8
		Waste	Generation and management of general domestic waste	1	2	3	4	1	1	2	32	<ul style="list-style-type: none"> The waste management hierarchy must be applied (Reduce, Reuse and Recycle); The generated waste must be placed in marked and coloured coded bins; Waste must be separated; Waste must be disposed in registered facility and disposal certificate must be kept on site. 	10
		Waste	Generation and management of hazardous wastes	2	2	3	4	2	2	4	44	<ul style="list-style-type: none"> The hazardous waste source will include: <ul style="list-style-type: none"> Hydrocarbon and chemical contamination; Empty hydrocarbon and chemical containers; The ore containing wastes. Hazardous waste must not be mixed with general wastes; Hazardous waste must be disposed in a registered facility licensed to accept hazardous waste; Disposal certificates must be kept on site for the duration of the mine. 	12
		Waste	Burying and/or inappropriate disposal of waste	2	2	3	2	2	2	4	22	<ul style="list-style-type: none"> Burying of waste will be considered a criminal offence and perpetrators must stand before a court of law; All site personnel must be properly inducted and trained on waste management principles; Waste management must form part of the daily toolbox talks; 	4
		Air	Generation of dust from handling of topsoil	2	1	3	4	1	1	2	32	<ul style="list-style-type: none"> The mining activities must be undertaken according to the approved schedule and plan; The mining equipment must be kept in good working condition to prevent malfunction and noise generation; 	16
		Air	Generation of dust from unprotected stockpiling area	2	2	3	3	1	1	2	27	<ul style="list-style-type: none"> The stockpiles must be seeded to grow grasses to reduce wind effect; During extreme wind conditions the stockpiles must be watered with a water spray. 	20

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Activity	Environmental Aspect	Impacted Attributes	Potential Impacts	Rating Before Mitigation				Impact Importance		Importance Score (/8)	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
				E	I	D	P	R	L				
		Health and Safety	Hazards from operating soil handling machinery such as trucks and front end loaders	1	2	3	3	3	3	6	36	<ul style="list-style-type: none"> ✓ The site vehicles must be kept in good working condition; ✓ Each site vehicle must have a traceable service history; ✓ Equipment and machinery operators must be competent and copies of their competence kept within the site environmental file; ✓ The equipment must be operated according to their specifications; ✓ All workers must be provided with PPE. 	20
Mining	Removal and Stockpiling of topsoil	Health and Safety	High stockpiling heights creating possible soil slides	1	1	3	2	4	4	8	26	<ul style="list-style-type: none"> ✓ Stockpiles must not exceed 2 metres in height; ✓ A method statement for stockpiling must be developed and approved by site engineer, environmental officer and the ECO. 	8
		Visual impacts	The site has a natural vegetated look and stockpiles will be uncommon in the area	2	2	4	3	1	1	2	30	<ul style="list-style-type: none"> ✓ Concurrent rehabilitation must be the preferred option to reduce stockpiling and restoring the natural site look. 	21
		Noise	Noise impact from operating machinery affecting wild life and Optimum Informal Settlement Community	2	2	3	3	2	2	4	33	<ul style="list-style-type: none"> ✓ The mining activities must be undertaken according to the approved schedule and plan; ✓ The mining equipment must be kept in good working condition to prevent malfunction and noise generation; 	24
	Removal and stockpiling of overburden and Coal Material	Legal requirements	Extracting other ores than the permitted and not informing the DMRE	3	2	3	3	4	4	8	48	<ul style="list-style-type: none"> ✓ The mining activities must be conducted according to the granted Mining Permit and the Environmental Authorisation; ✓ Any other minerals must be reported to the DMRE 	4
		Legal requirements	Operating the mine beyond the permitted 2 years period without applying for extension	3	2	4	3	4	4	8	51	<ul style="list-style-type: none"> ✓ The mining activities must be completed in the two years' period and/or an additional of optional one-year extension; ✓ Operating beyond the 3 years period will be considered illegal and the ECO must report to the DMRE. 	6
		Water	Mixing of clean and dirty water	2	2	3	3	3	3	6	39	<ul style="list-style-type: none"> ✓ Dirty and clean water catchments must be clearly demarcated; ✓ Dirty water channels must be created to collect water from dirty water catchment to the PCD; 	12
		Water	Releasing dirty water to the local surface water bodies	2	2	3	3	3	3	6	39	<ul style="list-style-type: none"> ✓ Clean water channel must be created to direct clean water away from the mining area. 	12
		Water	Mine flooding from rain events and/ or subsurface flows	2	3	3	3	4	4	8	48	<ul style="list-style-type: none"> ✓ The subsurface flow has very little potential to flood the mine workings; ✓ Rain events are most likely to flood the mine workings; ✓ Water pumping process will be undertaken and the dirty water from the mine will be directed to the site PCD. 	24
		Water	Excessive usage of water for mining operations such as dust suppressions and cooling of equipment	2	2	3	2	2	2	4	22	<ul style="list-style-type: none"> ✓ Water usage must be controlled, recorded and stored in the site environmental file. ✓ Water management must form part of site induction and environmental awareness training as well as tool box talks. 	12
		Water	Obstructing surface flows	2	2	4	2	2	2	4	24	<ul style="list-style-type: none"> ✓ There are no aquifers to be affected by the proposed mining activities; ✓ Borehole water levels will be monitored quarterly in each year. 	18

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Activity	Environmental Aspect	Impacted Attributes	Potential Impacts	Rating Before Mitigation				Impact Importance		Importance Score (/8)	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
				E	I	D	P	R	L				
		Water	Storage of hydrocarbons and chemicals on unbounded areas resulting in surface contaminations and the stormwater contamination	2	2	3	2	3	3	6	26	<ul style="list-style-type: none"> ✓ Storage areas must be banded; ✓ Materials must be stored according to the approved site plan; ✓ Contaminated surfaces must be cleaned immediately; ✓ Waste must be stored in closed waste bins and skips; ✓ Littering must be prevented; ✓ Outflows from storage areas must be contained within the site; 	5
Mining	Removal and stockpiling of overburden and Coal Material	Water	Acid mine drainage	2	2	3	3	4	4	8	45	<ul style="list-style-type: none"> ✓ A passive AMD treatment method will be implemented; ✓ Breakthrough Power Solar Pty Ltd will construct an artificial wetland downstream of the PCD. ✓ The wetland will passively treat the PCD out flow before discharging to the Ngudumeni River. 	21
		Water	Contamination of the ground water	2	2	4	2	3	3	6	28	<ul style="list-style-type: none"> ✓ The dirty water channel must be lined to prevent dirty water infiltration; ✓ The dirty water channel must be designed to withstand 1:100 floods without overflow; ✓ The PCD must be designed such that it can withstand 1:100 flood events; ✓ The PCD must be lined; ✓ Dirty water in the mining pit must be pumped out to the PCD. 	14
		Water	Groundwater level drawdown.	2	2	4	2	4	3	7	30	<ul style="list-style-type: none"> ✓ The site aquifers are below the mining area (WRC and Vegter underground water resource); ✓ The drawdown is expected to be less than 2 metres over the life span of the mine. 	22
		Noise	Noise Impact from operating machinery and vehicles	2	2	3	3	2	2	4	33	<ul style="list-style-type: none"> ✓ The mining activities must be undertaken according to the approved schedule and plan; ✓ The mining equipment must be kept in good working condition to prevent malfunction and noise generation; 	24
		Air	Generation of dust from earth works and driving on gravel roads	2	3	3	3	2	1	3	33	<ul style="list-style-type: none"> ✓ The gravel access roads and working areas must be watered to control dust; ✓ Dust control will be monitored by the project Environmental Officer and the ECO and determines the dust suppression intervals as per the site needs. 	20
		Waste	Generation and management of general domestic waste	1	2	3	3	2	1	3	27	<ul style="list-style-type: none"> ✓ The waste management hierarchy must be applied (Reduce, Reuse and Recycle); ✓ The generated waste must be placed in marked and coloured coded bins; ✓ Waste must be separated; ✓ Waste must be disposed in registered facility and disposal certificate must be kept on site. 	8

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				E	I	D	P	R	L				
		Waste	Generation of hazardous wastes	1	2	3	3	2	1	3	27	<ul style="list-style-type: none"> ✓ The hazardous waste source will include: <ul style="list-style-type: none"> ✓ Hydrocarbon and chemical contamination; ✓ Empty hydrocarbon and chemical containers; ✓ The ore containing wastes. ✓ Hazardous waste must not be mixed with general wastes; ✓ Hazardous waste must be disposed in a registered facility licensed to accept hazardous waste; ✓ Disposal certificates must be kept on site for the duration of the mine. 	10
Mining	Removal and stockpiling of overburden and Coal Material	Waste	Burying and/or inappropriate disposal of waste	2	2	3	3	2	2	4	33	<ul style="list-style-type: none"> ✓ Burying of waste will be considered a criminal offence and perpetrators must stand before a court of law; ✓ All site personnel must be properly inducted and trained on waste management principles; ✓ Waste management must form part of the daily toolbox talks; 	6
		Health and safety	Collapsing of mine walls	1	2	3	2	4	4	8	28	<ul style="list-style-type: none"> ✓ Mining activities must be conducted in benches to prevent high walls; ✓ The stopes must be inclined to increase stability 	20
		Health and safety	Flooding of working areas	2	2	3	2	3	3	6	26	<ul style="list-style-type: none"> ✓ Rain water must be continuously pumped out into the site PCD; ✓ Underground water inflow must be monitored weekly; 	20
		Health and safety	Fatalities and injuries from machinery, equipment and vehicles mechanical failures during operation	1	2	3	2	4	4	8	28	<ul style="list-style-type: none"> ✓ The site vehicles must be kept in good working condition; ✓ Each site vehicle must have a traceable service history; ✓ Equipment and machinery operators must be competent and copies of their competence kept within the site environmental file; ✓ The equipment must be operated according to their specifications; ✓ All workers must be provided with PPE. 	16
		Health and safety	Fatalities and injuries from human error when operating vehicles, equipment and machineries	1	2	3	2	4	4	8	28	<ul style="list-style-type: none"> ✓ Operators must be trained and competent. Copies of their competence certificates must be kept on site; ✓ The operators must be vigilant at all times; ✓ Long and non-stopping shifts must be avoided; ✓ All activities must be conducted according to approved method statements. 	20
		Noise	Noise nuisance from operating equipment and machineries	2	2	3	3	2	1	3	30	<ul style="list-style-type: none"> ✓ The mining activities must be undertaken according to the approved schedule and plan; ✓ The mining equipment must be kept in good working condition to prevent malfunction and noise generation; 	22
		Soil	Contamination of soils by hydrocarbons from vehicles	2	1	3	2	2	2	4	20	<ul style="list-style-type: none"> ✓ All vehicles must be kept in good working condition; ✓ The service plan for each vehicle must be maintained; ✓ Spillages and leaks must be cleaned as they occur; ✓ Spillage kits must be provided on site; ✓ Drip trays must be placed underneath stationary trucks; 	12
		Soil	Contamination by water flowing from storage areas	2	1	3	2	2	2	4	20	<ul style="list-style-type: none"> ✓ Storage of all hydrocarbons must be in a bunded area; ✓ All site vehicles and equipment must be kept in good working condition to prevent mechanical breakdown resulting in release of hydrocarbons; 	10

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				E	I	D	P	R	L					
											<ul style="list-style-type: none"> ✓ All leakages and spillages must be cleaned as soon as they occur; ✓ Drip trays must be placed beneath all trucks; ✓ Breakthrough Power Solar Pty Ltd must provide spill kit; ✓ Stormwater flow from contaminated and storage areas must be directed to the dirty water containment area; ✓ Servicing of trucks and equipment must be done in a hardened and bunded area; ✓ Major spillages must be reported to the DMRE and DWS. 			
Mining	Removal and stockpiling of overburden and Coal Material	Fire	Fire hazards from mining operations	2	2	3	2	4	4	8	30	<ul style="list-style-type: none"> ✓ Firefighter must be designated for each team; ✓ Breakthrough Power Solar Pty Ltd must supply firefighting equipment which must include fire extinguishers; ✓ The mining workers must all be inducted and trained on fire emergency drills; 	20	
		Traffic	Vehicle movement to and from the mining site degrading local roads and creating road safety concerns	2	2	3	3	2	2	4	4	33	<ul style="list-style-type: none"> ✓ Breakthrough Power Solar Pty Ltd must through consultation with Lennoxton community and through their Corporate Social Responsibility maintain local roads to keep them in good condition; ✓ All site vehicles must be road worthy; ✓ The mine fleet must adhere to road rules. 	21
	Drilling and blasting	Health and Safety	Health hazards associated with blasting activities such as flying rocks	2	3	3	3	4	4	8	8	48	<ul style="list-style-type: none"> ✓ Blasting activities must be done according to approved method statement; ✓ The blasting schedule must be indicated on the site notice board by the entrance gate; ✓ The immediate blasting site must be cleared of personnel before the activities are undertaken; ✓ A blasting supervisor with proven competence must be appointed and proof of competence kept on site; ✓ The blasting team must be provided with appropriate PPEs 	30
			Mine wall collapse	1	2	3	2	3	3	6	6	24	<ul style="list-style-type: none"> ✓ Mining activities must be undertaken progressively in benches to avoid long walls; ✓ Inclined walls must be created over upright stopes to increase wall stability; ✓ A full risk assessment must be conducted before the blasting activities are undertaken; ✓ The conducted risk assessment must be stored in the site file; 	21
		Noise	Noise impact from blasting activities	2	2	3	4	2	2	4	4	44	<ul style="list-style-type: none"> ✓ Blasting activities must be conducted during the day (07:00 – 18:00); ✓ Blasting schedule must be indicated on the mine notice board. 	24
			Ground vibrations	2	2	3	3	4	3	7	7	42	<ul style="list-style-type: none"> ✓ Blasting activities must be undertaken according to an approved method statement. 	31
	Haulage of Coal from site	Security	Criminals targeting transportation vehicles	3	2	3	2	3	3	6	6	28	<ul style="list-style-type: none"> ✓ Drivers must always be on high alert; ✓ All incidents and near misses must be reported to the SAPS; 	20
		Air	Air pollution from hydrocarbon combustion	2	1	3	2	2	2	4	4	20	<ul style="list-style-type: none"> ✓ The site vehicles must be kept in good working condition; ✓ Each site vehicle must have a traceable service history 	16

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				E	I	D	P	R	L				
		Air	Dust from the transported Coal	2	2	3	3	2	2	4	33	✓ The loads must be completed covered.	10
		Health and Safety	Road accidents with fellow road users	3	2	3	2	4	4	8	32	<ul style="list-style-type: none"> ✓ The drivers must all have appropriate driver's license; ✓ The vehicles must be road worthy and in good working conditions; ✓ The drivers must obey the rules of the road; ✓ All accidents and near misses must be reported, investigated and recorded on the site file; 	20
Mining	Haulage of coal from site	Fauna	Road accidents with wildlife	2	2	3	2	4	3	7	28	<ul style="list-style-type: none"> ✓ The drives must be on high alert for wild life; ✓ All accidents must be reported; ✓ Carcass must never be used as food or trophy hunting as this may promote accidents. 	18
		Noise	Generation of excessive noise by site moving haulage trucks	2	2	3	3	2	2	4	33	<ul style="list-style-type: none"> ✓ The Lennoxton must be informed of the trucks operating times; ✓ The trucks must strictly operate during the approved hours only. 	24
		Infrastructure	Wearing of local roads due to introduction of mining fleet	2	2	4	3	2	2	4	36	<ul style="list-style-type: none"> ✓ Breakthrough Power Solar Pty Ltd must through consultation with Lennoxton and through their Corporate Social Responsibility maintain local roads to keep them in good condition; ✓ All site vehicles must be road worthy; ✓ The mine fleet must adhere to road rules. 	24
	Ablution facility	Water	Contamination of surface water when the bushes are used for sanitation purpose	2	2	3	3	1	2	3	30	<ul style="list-style-type: none"> ✓ The mining company must provide site workers with chemical toilets; ✓ The toilets must be provided at a ratio of 1:8 and a separate toilet must be provided for females; ✓ Under no circumstances may bushes be used for sanitation ✓ The chemical toilets must be emptied by a registered sewage waste handler; ✓ A service agreement with the waste handler must be kept on site; ✓ Sewage waste disposal certificates must be kept on site; ✓ All sewage spillages must be cleaned as soon as they are noticed; ✓ The ablution area must be kept clean at all times. 	8
		Water	Flow of water from areas used for sanitation	2	1	3	3	1	2	3	27		8
		Soil	Contamination of soil when the bushes are used for sanitation purpose	2	1	3	3	1	2	3	27		8
		Soil	Leakages of sewage waste onto the surface	2	2	3	2	1	2	3	20		8
		Air	Smell nuisance from the ablution area	2	1	3	3	1	1	2	24		8
	Employment of mining labourers	Socio-Economic	The mining activities will require skilled and general workers	2	2	3	4	2	2	4	+44	<ul style="list-style-type: none"> ✓ The Lennoxton must be given preference when hiring; ✓ Skills transfer programmes must be developed to train the local communities in core mining activities. 	44
	Rehabilitation	Pit Backfilling	Water	Acid Mine Drainage	3	3	4	3	2	3	5	45	<ul style="list-style-type: none"> ✓ The site must be levelled to avoid ponding; ✓ A passive AMD treatment method will be implemented; ✓ Breakthrough Power Solar Pty Ltd will construct an artificial wetland downstream of the PCD. ✓ The wetland will passively treat the PCD out flow before discharging to the Ngudumeni River.
Water			Pit Flooding	2	3	4	2	2	3	5	28	<ul style="list-style-type: none"> ✓ The mining pit must be backfilled according to an approved method statement developed by the site engineer; 	21
Soil			Shortage of backfill materials	2	2	4	2	3	3	6	28	<ul style="list-style-type: none"> ✓ Topsoil must never be used as backfill materials; 	12

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				E	I	D	P	R	L				
											<ul style="list-style-type: none"> ✓ If in shortage backfill materials must be legally sourced from outside the mining site; ✓ Only materials approved by the site engineer may be used for backfilling; 		
		Soil	Contamination of topsoil on handling	1	2	4	3	4	4	8	45	<ul style="list-style-type: none"> ✓ Topsoil must only be handled when re-spreading; ✓ Topsoil handling must be according to an approved method statement; ✓ Contaminated topsoil must not be used for rehabilitation; 	16
Rehabilitation	Pit Backfilling	Vegetation	Poor vegetation regrowth	1	2	4	3	3	3	6	39	<ul style="list-style-type: none"> ✓ Revegetation plan must be developed by a botanist; ✓ Re-vegetation must be done using local indigenous vegetation; ✓ The re-vegetation process must be done according to an approved method statement; ✓ The growth of the vegetation must be closely monitored; ✓ Interventions must be made where regrowth is slower than anticipated; 	21
		Vegetation	Introduction and infestation by alien invasive plants	2	3	4	3	2	3	5	42	<ul style="list-style-type: none"> ✓ Common site invasive plants must be identified; ✓ All invasive plants must be mechanically removed; ✓ The spread of alien invasive plants must be monitored for a period of two years post mining. 	16
		Land Use	Failure to meet the requirements of the intended post land use	2	3	4	2	3	3	6	30	<ul style="list-style-type: none"> ✓ A Mining permit application has been accepted by the DMRE lodged by Breakthrough Power Solar (Pty) Ltd; ✓ The post mining land use must therefore be aligned with the rest of the farm should the mining permit be granted; ✓ During the mining phase of the mining permit project, Breakthrough Power Solar Pty Ltd must engage local stakeholders and landowner to determine post mining land use. 	20

12.1 Summary of specialist reports

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT <i>(Mark with an X where applicable)</i>	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
<p>No Specialist studies were conducted for the proposed mining activity. Below is the motivation for exclusion of specialists studies that were considered for the application:</p> <p>1. Wetland, Surface Water and floodline Studies:</p> <p>The site assessment did not identify any drainage lines and water bodies within the proposed site and its 500 metres radius that would be affected by the proposed mining activities. The closest stream is the Ngudumeni River located a kilometre to the north of the proposed site.</p> <p>The are no wetlands located within the 500 metres radius of the proposed site, the closest wetland is the seepage wetland located approximately 800 metres to the south of the proposed site. The proposed mining activities are not expected to impact the identified wetlands which will be demarcated as a no-go zone for all mining related activities including access roads.</p> <p>2. Heritage Study</p> <p>The proposed site is located within an active agricultural area that has been ploughed seasonally for a continuous period. There are no expected heritage significance resources within the proposed site. Graves were identified outside the proposed mining area, and these will be demarcated as the project no-go zones.</p>			

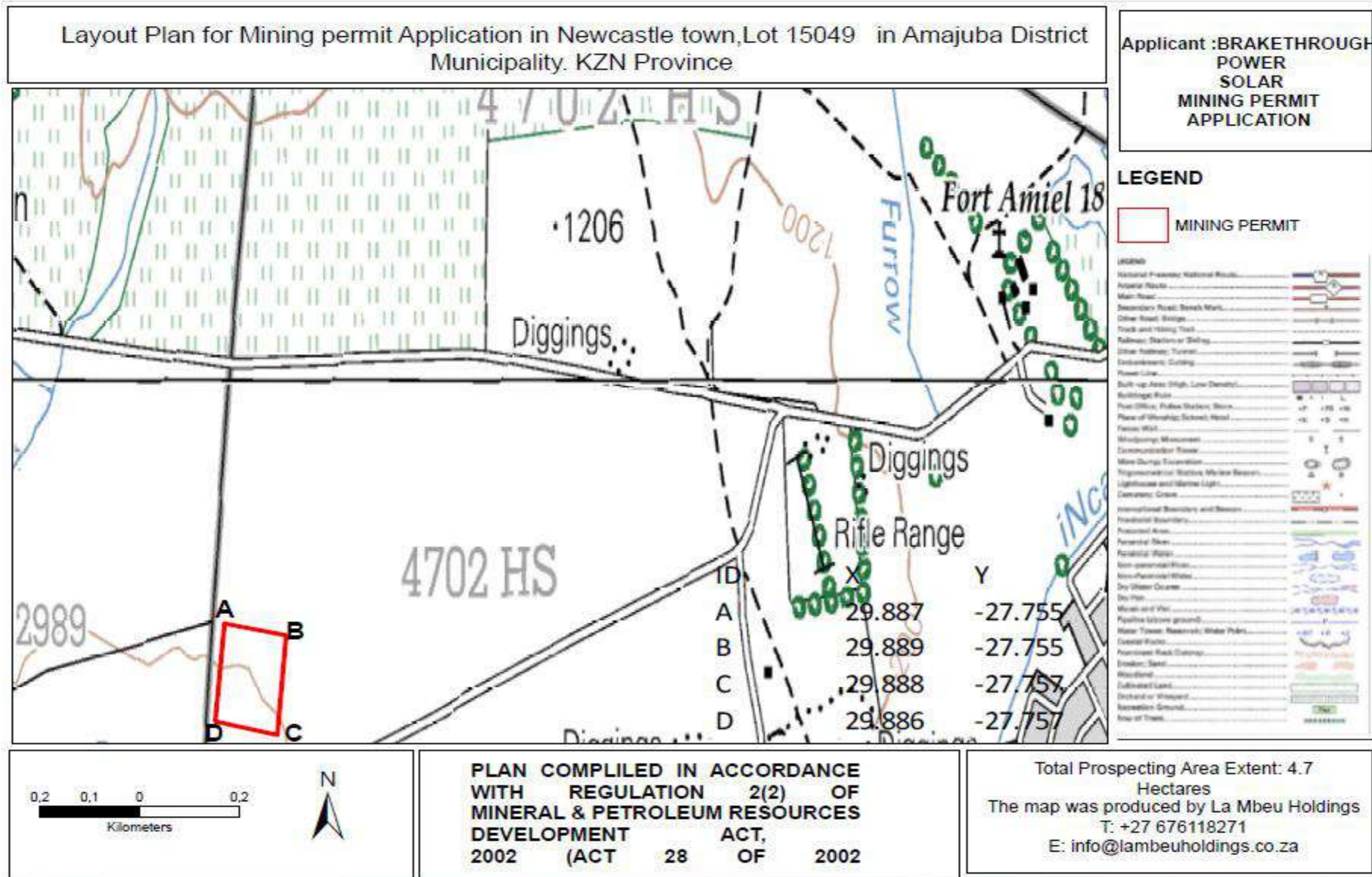
12.2 Environmental impact statement

12.2.1 Summary of the key findings of the environmental impact assessment

- ❖ The site lies within the Sub-Escarpment Grassland Bioregion of the Grassland biome according to the National Vegetation Map, however the site assessment has established that the site has been transformed by agricultural practices, the proposed mining activities will therefore not be undertaken within a pristine ecological environment;
- ❖ According to the MBG, 2013 the site is located within Highest Biodiversity Importance to mining. However, the site assessment established that the site has been transformed;
- ❖ According to the MBSP Terrestrial the proposed site is located within other natural and moderately modified old lands, this was found to be correct during the EIA site assessment;
- ❖ The SANBI quarter degree tree species search for the area did not return any species of conservation concern, it should also be noted that the site is highly degraded;
- ❖ No NEMBA listed invasive plants were identified within the proposed mining area;
- ❖ According to the MBSP Freshwater and NFEPA there are no wetlands within the proposed site and its 500 metres radius. The proposed mining activities are not expected to interact with any of the identified surface water resource in the area;
- ❖ The local wetlands including the Ngudumeni River are critically endangered from both the mining and agricultural practice, no further impact on these water resources can be allowed;
- ❖ Gravel farm access roads exist to the proposed mining site, however the use of these roads for mining and related activities is subjected to agreements with affected farm owners and users, maintenance agreements must be established and approved by all affected parties;

- ❖ There is no established human settlement area within the proposed mining area, the closest established community is the Lennoxton located more than a kilometre to the east of the proposed site;
- ❖ The proposed site is not idle, and is actively used for agricultural practice, the mining and agricultural activities cannot be undertaken simultaneously. The affected land owners/ users must be compensated for their loss during the mining period and also for their return in site agricultural development. The site must be rehabilitated such that it accommodate future agricultural practice;
- ❖ The local community is poverty stricken and a potential job creation opportunity in the area will be significant;
- ❖ Coal mining result in acid mine drainage (AMD) during and post mining, the AMD generation is manageable and avoidable. A rehabilitation plan will be required that addresses both the post mining land use and acid mine drainage;

12.2.2 Final Site Map



12.2.3 Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

12.2.3.1 Positive Impacts

The mining industry contributes largely to the South African GDP through exports, job creations and community development projects. Although the mining sector no longer dominates the South African economy as it once did, mining accounts for a major proportion of the country's earnings of foreign exchange. The economies of four of the nine provinces and of several large towns are dominated by mining.

Mine wages, once among the lowest in the country, are now among the highest. Wages account for some 40% of expenditure by the industry. In addition, over and above what they pay in royalties and tax, mining companies contribute to local communities, either voluntarily or in terms of statutory requirements. Although black mine labour is no longer subject to racial restrictions, the migratory labour system continues to operate for large numbers of miners in that they leave their families behind them in rural areas in South Africa or in neighbouring states. Remittances to these areas by absent miners are an important source of their income. Most of the shares of mining companies in South Africa belong to large institutional investors, including pension funds.

The impact of mining on living standards is not easy to measure. Rising real mine wages have not necessarily translated into higher standards of accommodation, as many miners may have chosen to remain in shacks and spend their higher earnings on things other than better housing, such as satellite television. Data on living standards broken down by economic sector or type of employment is not available. Given that mine wages are now among the highest in the country, mining families are almost certain to be among those whose "living standards measures" (LSMs) are higher now than was the case 10 years ago. Mining households are among those who have been able to buy movable assets such as motor vehicles. They are also certain to be among those who have purchased cellular telephones.

Although once dominant, mining and quarrying now account for only 8% of South African gross domestic product (GDP). Since the middle of the last century the relative contributions of agriculture and manufacturing have also shrunk, while

those of other sectors have grown. Finance at 20% is now the biggest sector, followed by government at 17%. Mining accounts for 11% of gross fixed capital formation, but also for 16% of all foreign direct investment in South Africa. The industry accounts for only 0.3% of corporate taxpayers, but they were responsible for 6% of tax assessed in 2014. Although mining employs almost half a million people, this is only 5% of the country's workforce. Mining currently accounts for a third of all merchandise exports.

The industry also spends almost as much on the purchase of goods and services from other sectors of the economy as it generates in its own output.

According to the government, South Africa is the biggest producer of Coal, chromium and vanadium ores, and a leading supplier of their alloys. It is, in addition, a significant producer of iron and manganese ores.

(h) Mineral sales

According to Statistics South Africa (Stats SA), local and foreign mineral sales in 2016 totalled almost R424 billion.

(i) Mineral exports

In the last 20 years, the contribution of mining to commodity exports has varied from a high point of 44% in both 1996 and 2010, to a low of just above 31% in 2003, to 34% in 2015. The fluctuations are partly the result of fluctuations in commodity prices. Even when down to only a third of merchandise exports, mining exports are major earners of foreign exchange, so helping to finance a large proportion of the country's imports. Among South Africa's top ten commodity exports, minerals outstrip motor vehicles by a factor of 2.7 to 1.

Although mining per se accounts for only a third of merchandise exports, if secondary beneficiated products are taken into account, then 60% of export revenue is derived from this broader category, according to the government's National Development Plan (NDP), which was adopted in 2012. According to the Chamber of Mines, mining exports in 2015 amounted to R320 billion.

(j) Royalties and taxes

Figures produced by the minister of finance show that commodity prices have a major impact on mining corporate tax. In the 2008 tax year, for example, 574 mining companies were assessed between them for R26.3 billion in income tax. In the 2012 year, by contrast, 437 companies were assessed for a total of almost

R13.0 billion in such tax. The figures for the following year show that R16.1 billion was assessed in mining company tax, mining companies accounting for only 0.3% of corporate taxpayers but 9.1% of all tax assessed, although the latter proportion dropped to 6.1% in 2015. The taxable income of mining companies dropped from R93.2 billion in 2008 to R10 billion in 2013.

The mining industry pays royalties as well as income taxes. Royalty payments in the last three tax years totalled R15.57 million. The minister of finance has pointed out that mining also contributes significantly to personal income tax, in that R15.2 billion was collected from mine employees in pay-as-you-earn (PAYE) tax in 2013/14. Mining of course also contributes to VAT and other taxes.

(k) Contribution to national, provincial, and local economic output

As we saw above, the relative contribution of mining and quarrying to national output as measured by GDP has dropped to only 8%. Although falls in commodity prices, rising costs, damaging policies, and strikes have caused the mining industry to be smaller than it might otherwise have been, the decline in its relative contribution over time is largely explained by the growth of other sectors as the South African economy has matured with the expansion of the secondary and tertiary sectors of the economy.

Initially triggered by the needs of the mining industry, these other sectors have developed momentum of their own. In real terms, however, the output of the mining industry has shrunk 7.3% since its peak in 2005. This can be directly measured. What cannot be directly measured is the extent to which the decline of the mining industry has resulted in lower growth than might otherwise have been the case in other sectors of the economy, and therefore in the economy as a whole. Lower growth invariably means lower rates of job creation.

Despite its relatively small contribution to national output, mining accounts for the single largest proportion of the output of four of the nine provinces. Thanks in large part to iron ore, almost a fifth of the output of the Northern Cape comes from mining, while the dominance of coal in Mpumalanga ensures that almost a fifth of that province's output also comes from mining, although copper makes a contribution too. Limpopo, which contains diamonds, iron ore, and various other minerals, relies on mining for nearly 25% of its output. Largely because of platinum, the North West province relies on mining for almost 30% of its output.

(l) Purchases

All of these figures and considerations nevertheless understate the importance of mining to the South African economy. In 2016, for example, according to the Chamber, mining contributed R291 billion to GDP directly, but spent R245 billion on purchases of goods and services from the other sectors of the economy. These purchases ranged from footwear through construction to business services. The largest single component was transport and storage; the second largest was petroleum chemicals, rubber, and plastic; the third largest was metals, machinery, and equipment; and the fourth largest was electricity, gas, and water. Of the total of R245 billion, R89 billion was for capital expenditure, leaving R156 for current spending.

All other sectors buy goods and services necessary for their own generation of output. But given the nature of the industry, mining arguably purchases a far wider range than other sectors. The very process of digging minerals out of the ground requires enormous expenditure on goods and services of a kind not required in other sectors.

To give an idea of how large the sum of R245 billion is, it is worth comparing it with the government's own expenditure. The budget for current spending by central government on goods and services in 2015/2016 was R188 billion (against the mining industry's figure of R156 billion). Total comparable expenditure by all the municipalities in the country in 2015/2016 was R169 billion. Total public infrastructure spending by all three levels of government and state-owned companies was budgeted in that same year at R290 billion (against the R89 billion in capital expenditure by the mining industry alone).

(m) Employment Opportunities

The proposed mining activities will create jobs for the duration of the mining permit period.

(n) SMME and Street Vendor Support

The mining team will require basic services from the local community which would mainly be provided by the Small businesses and street vendors.

12.2.3.2 Negative Impacts

Acid Mine Drainage: The mining activities generate acid mine drainage that persist long post mining activities;

Land use alternative conflicts: The site is actively used for agricultural purposes and not zoned for mining/industrial activities. This will create a parallel demand for land;

Loss of arable land: The proposed site is actively used for agriculture. For the duration of the mine the agricultural activities will cease at the proposed 5 ha mining area. In the absence of a technically good and implementable rehabilitation plan the land arability may be completely lost;

Loss of fertile topsoil: Topsoil will be removed to establish mining area and fertility is affected during handling.

Loss of biodiversity: The site is located on an area Highest Biodiversity Importance ecological importance in terms of the Mining and Biodiversity Guideline of 2013, and also within Sub-Escarpment Grassland Bioregion of the Grassland biome according to the Vegetation Map of South Africa, vegetation will be cleared to establish mining area and habitats will also be lost affecting the fauna.

Introduction of Alien Invasive Plants on site: Invasive plants flourish where there are disturbances and ecological imbalances. The clearing of vegetation to establish drill pads area has the potential to attract invasive alien plants;

Contamination of water: The Ngudumeni River is located to the north of the proposed site. There is a huge potential for contamination of the stream from mining activities;

Destruction of wetlands: there are several wetlands identified in close proximity to the site, a potential exist for the destruction of these wetlands during activities such as roads establishment;

Generation of dust: The Optimum informal settlement is located a kilometre from the proposed site, dust generated by the mining activities will affect the community;

Soil Erosion: ground disturbances promote soil erosion; stockpiles are also prone to erosion;

Noise Generation: The mining activities will generate excessive noise affecting the Optimum informal settlement and wildlife. The noise source will be the truck movement and blasting activities;

Generation of waste: The mining activities will generate both the general and hazardous wastes. The waste will be managed using the “triple R” principle, Reduce, Reuse and Recycle;

Criminal activities: Crime in South Africa is a social challenge faced by almost everyone, the presence of mining machinery and equipment on site will attract criminals who would seek to steal and sell such equipment;

Ground vibrations and tremors: The use of explosive during blasting may create ground vibrations affecting the local community;

Destruction of graves: Graves were identified during site assessment, a potential exist for the destruction of the graves although they are located outside the proposed mining area;

Health and Safety: Mining activities pose health and safety concerns for both the mining personnel operating mining machineries and equipment, and the local communities;

Influx of migrant labour: Mine establishment is often associated with influx of migrant labour and establishment of informal settlement area.

12.3 Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;

Impact management objectives are described in terms of the Mitigation Hierarchy of the ERM Impact Assessment Standard. The mitigation hierarchy is as follows:

Avoid at Source: Reduce at Source: avoiding or reducing at source through the design of the Project (e.g., avoiding by siting or re-routing activity away from sensitive areas or reducing by restricting the working area or changing the time of the activity).

Abate on Site: add something to the design to abate the impact (e.g., pollution control equipment, traffic controls, perimeter screening and landscaping).

Abate at Receptor: if an impact cannot be abated on-site then control measures can be implemented off-site (e.g., noise barriers to reduce noise impact at a nearby residence or fencing to prevent animals straying into the site).

Repair or Remedy: some impacts involve unavoidable damage to a resource (e.g. agricultural land and forestry due to creating access, work camps or materials storage areas) and these impacts can be addressed through repair, restoration or reinstatement measures.

Compensate in Kind; Compensate Through Other Means: where other mitigation approaches are not possible or fully effective, then compensation for loss, damage and disturbance might be appropriate (e.g., planting to replace damaged vegetation, financial compensation for damaged crops or providing community facilities for loss of fisheries access, recreation and amenity space).

12.3.1 The project impact management objectives:

- ✓ Provide sufficient information to strategically plan the mining activities as to avoid unnecessary social and environmental impacts;
- ✓ Provide sufficient information and guidance to plan the mining activities in a manner that would reduce impacts (both social, environmental, health and safety) as far as practicable;
- ✓ Ensure an approach that will provide the necessary confidence in terms of environmental compliance;

- ✓ Provide a management plan that is effective and practical for implementation;
- ✓ Ensure that the mining activities are undertaken such that no water resource (Ngudumeni River and any other wetland) are not impacted;
- ✓ Ensure that the mining activities are undertaken in a safe manner, and health and safety risks are identified and mitigated;
- ✓ Conservative use of resources: water and power (electricity);
- ✓ Recording and reporting of accidents to relevant authorities;
- ✓ An independent environmental control officer must be appointed to monitor and audit site environmental Compliance &
- ✓ Maximum recovery of ore.

Through the implementation of the proposed mitigation measures, it is anticipated that the identified economic, social and environmental impacts can be managed and mitigated effectively.

12.3.2 Impact management Outcome

- ✓ Site fully rehabilitated on mining closure and post closure land use feasible;
- ✓ An Environmental Control Officer is designated,
- ✓ Risk impact register with management options,
- ✓ All site workers inducted on all applicable environmental policies, authorization and licenses;
- ✓ Site Environmental File compiled and kept on site,
- ✓ Dirty and clean water separation;
- ✓ Stormwater control drains are constructed;
- ✓ Waste disposal certificates kept on site;
- ✓ Access into the site is controlled;
- ✓ Employees provided with personal protective equipment (PPE);
- ✓ Safety drills are conducted and records kept;
- ✓ Firefighting equipment provided;

- ✓ Complain and Impact Register up to date and kept on site;
- ✓ Environmental Management Programme and EA kept on site;
- ✓ Work conducted according to approved method statements; &
- ✓ A developed and operating monitoring programme for air, noise and water quality.

12.4 Aspects for inclusion as conditions of Authorisation

- ✓ Protection and controlled usage of water resources;
- ✓ Activities restricted to approved area and for the approved duration;
- ✓ Annual environmental compliance audit by an independent environmental officer;
- ✓ Demarcation of all no-go areas;
- ✓ Site employee's induction;
- ✓ Ensure health and safety of mine workers and local community;
- ✓ Access agreement contracts;
- ✓ Protection of heritage resources;
- ✓ Impact monitoring and auditing;
- ✓ Mining scheduling; and
- ✓ Waste handling and management.

12.5 Description of any assumptions, uncertainties and gaps in knowledge

- ✓ No Heritage Impact Study was conducted, the information on this report is based on the EAP's site understanding, desktop review and consultation with affected parties;
- ✓ Presence of species of concern cannot be completely ruled out and as such caution must be taken when clearing vegetation. A database of removed vegetation must be maintained;
- ✓ No prospecting report was provided to the EAP, the EAP's confidence on the existence of the coal resources is based on existing literature including the mapped coalfields of South Africa.

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

It is the opinion of the EAP that the activity be authorised based on the following:

- ✓ The proposed site lies within the Vryheid Formation mineable through surface mining method;
- ✓ The proposed site is fairly dry with no wetlands and running streams, all identified wetlands and drainage wetlands are located outside the proposed site and its 500 metres radius. The main stream in the area, the Gudumeni River is located to the north of the proposed site;
- ✓ The site environmental sensitivity can be considered to be low as the site has been largely impacted by agricultural activities;
- ✓ There are no existing infrastructures within the proposed site to be affected by the proposed site;
- ✓ The proposed mining activities will be limited to a three years period, and will be rehabilitated suitably for post closure land use and/or restoration of agricultural arable land;
- ✓ There are existing access routes to the proposed property.

12.7 Conditions that must be included in the authorisation

- ✓ No activities can take place within the 100 metre buffers of any water source;
- ✓ All wastes generated must be disposed of at an appropriate registered landfill and disposal certificate be kept on site;
- ✓ Monthly environmental monitoring must be conducted throughout the life span of the mine;
- ✓ Action plans must be developed to address all issues picked up during compliance monitoring;
- ✓ Monitoring Boreholes (Upstream and Downstream) must be drilled to monitor impacts on ground water resource;
- ✓ The financial provision must be reviewed annually to determine if it's still appropriate to site activities;

- ✓ Alien invasive species monitoring and control programme must be developed;
- ✓ A database of site vegetation species must be developed before invasive activities are undertaken to ensure all species are identified prior removal;
- ✓ Rehabilitation plan must be developed for the approval by the DMRE before mining activities commence;
- ✓ Air quality monitoring points must be identified and monitoring reports compiled monthly;
- ✓ Blasting activities must be only carried out after relevant authorization is obtained and limited to only during the day time (07:00 – 18:00);
- ✓ A complaints register must be kept on site, recording each complaint and how it was addressed; and
- ✓ The impact management and mitigation measures as described in this report are mandatory.

12.8 Period for which the Environmental Authorisation is required

The Mining Permit has been applied for a period of two years with an option of one year renewal. The Environmental Authorisation should therefore be aligned to the Mining Permit.

13.0. Undertaking

An undertaken by the EAP and the client is provided for in Part B Section 7.0 page on page 132 of the EMPr.

14.0. Financial Provision

The site rehabilitation processes will require **R 1 018 769,73**

14.1 Explain how the aforesaid amount was derived.

The aforesaid amount was derived using the Department of Mineral Resource and Energy “guideline document for the evaluation of the quantum of closure-related financial provision provided by a mine”.

14.2 Confirm that this amount can be provided for from operating expenditure

It is hereby undertaken that the amount of R 1 018 769,73 in the form of a bank guarantee for rehabilitation purposes as required in terms of section 24P (1) of the NEMA, will be provided to the DMRE upon granting of the requested Mining Permit.

15.0. Specific Information required by the competent Authority

15.1 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:-

15.1.1 Impact on the socio-economic conditions of any directly affected person.

The proposed site is privately owned and currently used for agricultural practice. For the duration of the mine if approved, the agricultural activities will cease to accommodate mining activities. The 5 ha mining area will be unavailable for 3 years; it should be noted that this is agriculturally developed land with investment by the land users.

The land users will be inconvenienced by the establishment of the mine as there will be a direct loss of income and agricultural land during the mining period. It is therefore imperative that the land owners be compensated for the losses they will incur due to the establishment of the mine.

An independent evaluate may be appointed if required to assess the net losses.

15.1.2 Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act.

The desktop study and site walk has established that there are no heritage and cultural artefacts and sites within the proposed mining area, however this does not absolve the applicant from exercising cautious approach when prospecting.

15.2 Other matters required in terms of sections 24(4) (a) and (b) of the Act.

The requirements of the Act in terms of section 24(4) (b) (i) – (vii) as guided by section 24(4A) are provided below with sections in which they have been addressed:

(i) Investigation of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity:

- ✓ **Part A section 10.1:** Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts
- ✓ **Part A section 10.3:** 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;
- ✓ **Part A section 12.0:** Assessment of each identified potentially significant impact and risk;
- ✓ **Part B section 4.0:** Impacts to be mitigated in their respective phases, the Impact Management Outcomes and Management Actions.

(ii) Investigation of mitigation measures to keep adverse consequences or impacts to a minimum:

- ✓ **Part A section 10.4:** The possible mitigation measures that could be applied and the level of risk;
- ✓ **Part A section 12.0:** Assessment of each identified potentially significant impact and risk; *and*
- ✓ **Part B section 4.0:** Impacts to be mitigated in their respective phases, the Impact Management Outcomes and Management Actions.

(iii) Investigation, assessment and evaluation of the impact of any proposed listed or specified activity on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999), excluding the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act;

- ✓ **Part A section 9.1.7:** Heritage Resources.
- (iv) Reporting on gaps in knowledge, the adequacy of predictive methods and underlying assumptions, and uncertainties encountered in compiling the required information:
 - ✓ **Part A section 12.5:** Description of any assumptions, uncertainties and gaps in knowledge;
- (v) Investigation and formulation of arrangements for the monitoring and management of consequences for or impacts on the environment, and the assessment of the effectiveness of such arrangements after their implementation;
 - ✓ **Part B section 5.2:** Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including, Monitoring of Impact Management Actions, Monitoring and reporting frequency, Responsible persons, Time period for implementing impact management actions, Mechanism for monitoring compliance.
- (vi) Consideration of environmental attributes identified in the compilation of information and maps contemplated in subsection (3);
 - ✓ **Part A section 9.0:** The Environmental attributes associated with the alternatives.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1.0. Details of the EAP

The requirement for the provision of the details and expertise of the EAP are included in PART A, section 1.

2.0. 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 already included in PART A, Section 3.

2.1 Composite Map

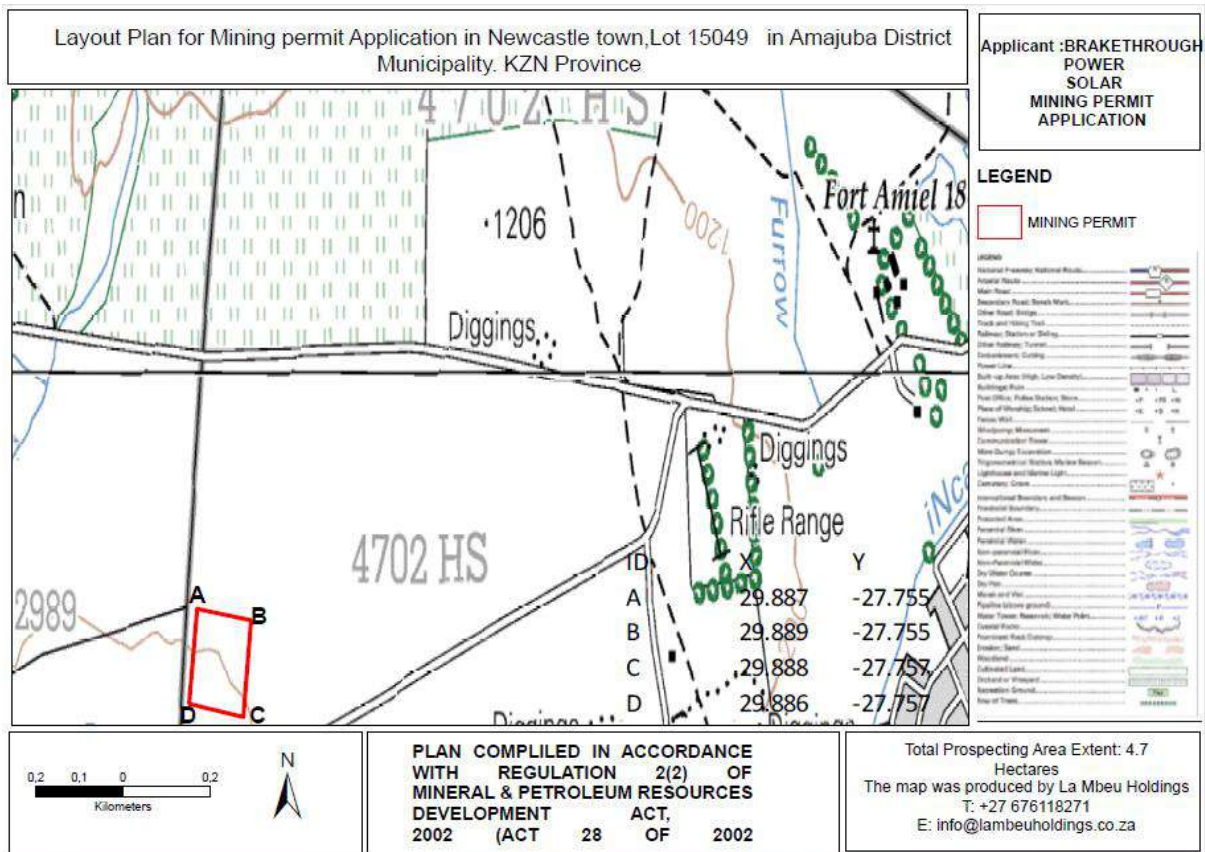


Figure 2-1: Composite Map

3.0. Description of Impact management objectives including management statements

3.1 Determination of closure objectives

The closure objectives thus are as follows:

- ❖ Eliminate any safety risk associated with mining activities on decommission;
- ❖ Remove and / or rehabilitate all pollution and pollution sources such as waste materials and spills;
- ❖ To loosen the hardened surfaces which were used temporary site camp or access roads and re-vegetate with indigenous species;
- ❖ Backfill the mining pit and revegetate the site to restore pre-mining conditions;
- ❖ Establish rehabilitated area which is not subjected to soil erosion which may result in the loss of soil, degradation of the environment and cause pollution of surface water resources;
- ❖ Restore disturbed area and re-vegetate these areas with indigenous vegetation to restore the ecological function of such areas as far as is practicable.

3.2 Volumes and rate of water use required for the operation.

The operation will require \pm 200 litres a day which will be obtained in town from the municipality connection. This will not affect the Municipality bylaws and water use permission will be obtained from the municipality.

3.2.1 Has a water use licence has been applied for?

A water use licence is not required for this project.

4.0. Impacts to be mitigated in their respective phases, the Impact Management Outcomes and Management Actions

Measures to rehabilitate the environment affected by the undertaking of any listed activity and the description of impact management outcomes, identifying the standard of impact management required for the aspects, and description of impact management actions, identifying the manner in which the impact management objectives and outcomes will be achieved.

Table 4-1: Impacts Control and Management

IMPACTS MANAGEMENT								
Activity	Aspect Affected	Size and Scale of Disturbance	Potential Impact	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
Planning Phase								
Identification of relevant legislation and Associated requirements	Legal Requirement	5 Ha	<ul style="list-style-type: none"> Commencement of Activities without Authorisation from the Competent Authority. Resistance by land owners and Occupiers Removal of Protected Species Establishments on Environmental Sensitive Areas Disregards of Municipal bylaws 	Control through appointment of Independent Environmental Assessment Practitioner	Appoint an Independent EAP to undertake the EIA as required by NEMA.	<ul style="list-style-type: none"> EIA Regulation 2014 as amended. 	<ul style="list-style-type: none"> The land owner was identified and consulted; Identify sensitive environments; The I&APs were identified and were awarded a 30 days Public Participation Period to raise their concerns or comments on the proposed Project 	Before the Authorisation is granted by the DMR
Site Establishment	Biodiversity	5 Ha	<ul style="list-style-type: none"> Restricted Movement of Fauna after the site is fenced off from its surroundings; Loss of fauna due to accidents with moving site machineries and vehicles 	Rehabilitation;	<ul style="list-style-type: none"> The site should be completely fenced off from its surrounding to prevent animals from entering and get stuck with the site; Search and rescue operation should be undertaken to ensure that all animals are taken offsite; Access gates should remain closed when not supervised; No animal must be killed on site, any animals found on site must be taken offsite; 	<ul style="list-style-type: none"> NEMA NEMA: Biodiversity Act Fencing Act 	<ul style="list-style-type: none"> No fauna trapped on site; No hunting; Carcass reported 	Throughout the Project
	Land Contamination	5 Ha	<ul style="list-style-type: none"> Loss of topsoil fertility Leaks and Spills of hydrocarbons from operating machineries; Contamination of storm water runoff 	<ul style="list-style-type: none"> Control through Impact Register 	<ul style="list-style-type: none"> Contaminated topsoil must be separated from clean soils; Soils that cannot be cleaned must be disposed at appropriate registered waste facility; Hydrocarbons storage must be in a hardened surface with a bund wall; All site vehicles and equipment must be in good working conditions; 	<ul style="list-style-type: none"> None required by the Competent Authority (CA), NEMA 	<ul style="list-style-type: none"> Contaminated soil cleaned up Drip trays provided and placed under trucks and machineries; Topsoil stockpiled separately 	Throughout the Project

IMPACTS MANAGEMENT								
Activity	Aspect Affected	Size and Scale of Disturbance	Potential Impact	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
					<ul style="list-style-type: none"> Drip trays must be placed underneath stationery trucks and equipment; Topsoil stockpiling area must be established away from potentially contaminating activities. Topsoil must be stored separately from any other materials; Topsoil stockpile must be established as per the approved site plan Topsoil stockpiling area must be established within 32 metres of any watercourse and away from stormwater drains; Stormwater channels must be created around the stockpiling area to prevent soil erosion; The topsoil must be seeded to establish grass cover for prevention of wind and rain effect. Stormwater control channel must be created around the stockpiling area to divert water away from the stockpiling area; Contaminated surfaces must be cleaned as soon as they occur/ noticed. Topsoil stockpile must never exceed 2 metres in height; The ECO must conduct monthly compliance audit 			
Construction Phase								
Construction of Water Control trenches and berms	Land contamination	0.6 Ha	Hydrocarbons leaks from machineries digging trenches	Control though Vehicle and Machinery maintenance	<ul style="list-style-type: none"> Ensure that all vehicles are properly serviced and maintained; Drip trays must be placed underneath all heavy trucks and operating machinery 	<ul style="list-style-type: none"> NEMA; NWA 	Ensure topsoil fertility is maintained	Throughout the project

IMPACTS MANAGEMENT								
Activity	Aspect Affected	Size and Scale of Disturbance	Potential Impact	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
					<ul style="list-style-type: none"> Spill kit must be readily available onsite and personnel must be trained on its application 			
	Water Contamination	5 Ha	Hydrocarbons leaks from machineries digging trenches	Control through clean and dirty water separation	<ul style="list-style-type: none"> Dirty and clean water catchments must be clearly demarcated; Dirty water channels must be created to collect water from dirty water catchment to the PCD; The dirty water channel must be lined to prevent infiltration; Clean water channel must be created to direct clean water away from the mining area. 	<ul style="list-style-type: none"> NWA NEMA 	Ensure that water quality is maintained	Throughout the project
	Biodiversity disturbances	0.6 Ha	<ul style="list-style-type: none"> Animals falling and getting trapped within the trenches Animals drowning within water control trenches 	<ul style="list-style-type: none"> Control through rehabilitation. Control through storm water management Control through mine technical designs 	<ul style="list-style-type: none"> The trenches must be established within the perimeter fence of the mining area; All fauna must be captured and released to the wild off the secured mining site 	None provided by the Competent Authority (CA),	No fauna trapped within water trenches	Throughout the project life span
Creation of Access Road	Land Contamination		Loss of grazing Land	Control through rehabilitation	<ul style="list-style-type: none"> Access roads must be created according to approved site plan; No new unplanned roads can be created; Minimize the width of access roads Long and winding access roads should be avoided Use existing farm roads network 	<ul style="list-style-type: none"> None provided by the Competent Authority (CA), NEMA 	<ul style="list-style-type: none"> No Multiple access roads created No access roads created outside authorised properties 	Throughout the project life span
Construction of Water Control trenches and berms	Water Contamination	5 Ha	Surface water Contamination through contamination of road side storm water.	Control through Storm Water Management	<ul style="list-style-type: none"> All soil contamination on the access road should be attended to as soon as they are observed; Spill kit must be provided on site 	<ul style="list-style-type: none"> None provided by the Competent Authority (CA), NWA NEMA 	Site Surface Water Quality Maintained	Throughout the project
	Air contamination		Generation of dust increasing particulate in the atmosphere giving rise to global warming	Control through Suppression	Gravel access roads must be watered or environmentally friendly dust suppressant must be applied	<ul style="list-style-type: none"> None provided by the Competent Authority (CA), NEMA: Air Quality Municipality bylaws 	Mpumalanga air quality threshold not exceeded	Throughout the project

IMPACTS MANAGEMENT								
Activity	Aspect Affected	Size and Scale of Disturbance	Potential Impact	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
	Noise Nuisance		Noise emanating from moving construction vehicles	Control through Consultation	<ul style="list-style-type: none"> Mining activities must be conducted according to an approved schedule; The Optimum Informal settlement must be informed of the operating times; The vehicles must be maintained and be in good working conditions at all times. 	<ul style="list-style-type: none"> Municipality bylaws NEMA None provided by the Competent Authority (CA), 	No complaints received from surrounding communities	Throughout the project
Creation of Access Road	Water Contamination	0.6 Ha	Increased surface runoff from the site office	Control through storm water management	<ul style="list-style-type: none"> Clean storm water must be directed off site; The operating equipment must be in good working conditions to prevent leakages; Drip trays must be placed underneath all stationery trucks and equipment; Dirty storm water must be contained within the site Storm water channels must be properly designed and maintained to prevent soil erosion 	<ul style="list-style-type: none"> None provided by the Competent Authority (CA), NWA Municipality Bylaws 	Erosion prevented Contaminated water separated from clean water	Throughout the project
Operational/ Mining Phase								
Water Management	Water Contamination	5 Ha	Flow of contaminated water from the mine into local streams	Control through storm water management	<ul style="list-style-type: none"> Ensure that the water from the mining area is directed to the dirty water trench leading to the retention dam; Erosion control measures must be implemented at all the stockpiles to prevent erosion; Water flows from outside the perimeter must be diverted away from the site perimeters; Dirty water must be contained within the site; 	<ul style="list-style-type: none"> None provided by the CA Municipality bylaws NWA 	Contaminated water contained with the site	Operational Phase
Chemical Storage	Land Contamination	300 m ²	Chemical Spillages and Leaks	Control through Proper Storage	<ul style="list-style-type: none"> Chemical Storage Container must be placed on bunded wall; All chemicals must be stored according to an approved site plan; 	<ul style="list-style-type: none"> None provided by the CA Municipality bylaws 	Chemical spills cleaned up as soon as they occurred	Operational/Mining Phase

IMPACTS MANAGEMENT								
Activity	Aspect Affected	Size and Scale of Disturbance	Potential Impact	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
					<ul style="list-style-type: none"> Each chemical on site must have MSDS; Chemical spills must be cleaned up immediately 			
	Water Contamination		Chemical spills washed off by storm water	Control through storm water management	<ul style="list-style-type: none"> Chemical Storage Container must be placed on bunded wall; Chemical spills must be cleaned up immediately; Any flow from the storage area must be directed to the dirty water trench to the site PCD; The storage area must be established outside natural drainage lines; All major incidents must be reported to the DWS. 	<ul style="list-style-type: none"> None provided by the CA Municipality bylaws 	Chemical spills cleaned up as soon as they occurred	Operational/Mining Phase
	Fire Hazards		<ul style="list-style-type: none"> Chemicals reacting spontaneously and causing fires Accidental fires 	Control through Proper Storage	<ul style="list-style-type: none"> Flammable chemicals must be stored separately from other chemicals; MSDS must be made available for all chemicals on site; A designated firefighter must be always present with each mining team; Firefighting equipment must be made available at all times; Emergency contact numbers must be placed visibly within the site; Emergency assembly point must be clearly indicated on the site plan; Emergency training drills must be undertaken with all site workers; 	<ul style="list-style-type: none"> None provided by the CA Municipality bylaws 	No fire breakouts	Operational/Mining Phase
Hydrocarbon Storage	Land Contamination	05 ha	Spillages and leaks into the ground	Control through rehabilitation	<ul style="list-style-type: none"> Hydrocarbons must be stored away from other flammable chemicals; Hydrocarbons storage containers must be placed on a raised bund wall; 	<ul style="list-style-type: none"> None provided by the CA Municipality bylaws 	Spills cleaned up as soon as they occurred	Operational/Mining Phase

IMPACTS MANAGEMENT								
Activity	Aspect Affected	Size and Scale of Disturbance	Potential Impact	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
					<ul style="list-style-type: none"> Not more than 30 CM³ must be stored on site; Hydrocarbons spillages and leaks must be cleaned up immediately; Major leakages must be reported to the DWS and DMRE 			
Hydrocarbon Storage	Water Contamination	05 ha and beyond	Spillages and leaks onto the surface	Control through storm water management	<ul style="list-style-type: none"> Hydrocarbons storage containers must be placed on a raised bund wall; All leakages and spills must be cleaned as soon as they are noticed; Storm water runoff from the storage area must be contained within the site and directed to the oil water separation tank; 	<ul style="list-style-type: none"> None provided by the CA Municipality bylaws 	Water quality maintained	Operational/Mining Phase
	Fire Hazards			Control through awareness training	<ul style="list-style-type: none"> No smoking near the storage area Activities that creates sparks, such as welding and steel cutting must never be carried out near the storage area 	<ul style="list-style-type: none"> None provided by the CA Municipality bylaws 	Fire hazard risk eliminated	Operational/Mining Phase
Topsoil Removal & Stockpiling	Land Contamination Water Contamination Air Contamination	5 Ha	Soil Erosion Loss of fertility Health and Safety Hazard Suspended loads	Control through Soil Management Plan	<ul style="list-style-type: none"> Topsoil must be removed only in impacted areas (planned areas of development); Removal of topsoil must be done after clearing of vegetation; Topsoil stockpiles must not exceed 1.5 metres in height; Topsoil must preferably be handled only twice, i.e. on removal-stockpiling and re-spreading. Contaminated topsoil must be separated from clean soils; Soils that cannot be cleaned must be disposed at appropriate registered waste facility; Hydrocarbons storage must be in a hardened surface with a bund wall; 	<ul style="list-style-type: none"> None provided by the CA Municipality bylaws 	Fertility of the storm water is maintained	Operational/Mining Phase

IMPACTS MANAGEMENT								
Activity	Aspect Affected	Size and Scale of Disturbance	Potential Impact	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
					<ul style="list-style-type: none"> All site vehicles and equipment must be in good working conditions; Drip trays must be placed underneath stationary trucks and equipment; Topsoil stockpiling area must be established away from potentially contaminating activities. Topsoil must be stored separately from any other materials; Topsoil stockpile must be established as per the approved site plan Topsoil stockpiling area must be established within 32 metres of any watercourse and away from stormwater drains; Stormwater channels must be created around the stockpiling area to prevent soil erosion; The topsoil must be seeded to establish grass cover for prevention of wind and rain effect. Stormwater control channel must be created around the stockpiling area to divert water away from the stockpiling area; Contaminated surfaces must be cleaned as soon as they occur/ noticed. Topsoil stockpile must never exceed 2 metres in height; The ECO must conduct monthly compliance audit 			
Overburden Removal & Stockpiling	Land Contamination Air Contamination Water Contamination	5 ha	Soil Erosion Health and Safety Hazard Suspended loads	Control through Soil Management Plan	<ul style="list-style-type: none"> The overburden must not be mixed with hazardous substances; The operating equipment must be in good working conditions to prevent leakages; 	<ul style="list-style-type: none"> None provided by the CA Municipality bylaws 		Operational/Mining Phase

IMPACTS MANAGEMENT								
Activity	Aspect Affected	Size and Scale of Disturbance	Potential Impact	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
					<ul style="list-style-type: none"> Drip trays must be placed underneath all stationary trucks and equipment; Stockpile must be shielded from wind; Storm water diversion channel must be developed around the stockpiles to prevent erosion; Stockpile area must be established away from chemical storage areas; Dust suppression must be applied as required; 			
Box-Cut Excavation	Water Contamination Air Contamination	5 Ha	<ul style="list-style-type: none"> Flooding of the excavation area Generation of dust Wall fall risk from unstable walls Lowering of Ground Water Table Contamination of Ground Water Safety Risks 	<ul style="list-style-type: none"> Control Through Health and Safety Standards Control through storm water management Control through air quality management Control through Monitoring 	<ul style="list-style-type: none"> Box cut flooding prevention measures should be incorporated into mine designs Water from the mining area should be contained on site Dust particulate must be monitored on a monthly basis Mine walls must not be 90 degrees vertical to prevent rock falls The mining area and access roads must be watered if dust exceeds local threshold. 	<ul style="list-style-type: none"> None provided by the CA Municipality bylaws Mine Health and Safety Act 	<ul style="list-style-type: none"> No Accidents Mining Area Flooding under control Local Air quality threshold not exceeded 	Operational/Mining Phase
Drilling & Blasting	Health and Safety Hazards	5 Ha	<p>Loss of Human Life Loss of Equipment Serious body injuries</p>	Control through Health and Safety Standards.	<ul style="list-style-type: none"> Drilling and blasting must be conducted according to an approved method statement; All legislative requirements must be satisfied before blasting is undertaken; The Optimum Informal Settlement must be informed about the blasting programme; The workers must be provided with appropriate PPE. 	<ul style="list-style-type: none"> None provided by the CA Municipality Mine Health and Safety Act 	No Accidents	Operational/Mining Phase
Coal extraction	Water; Air; Soil and Health & Safety	5 ha	<p>Contamination of water; Pit Flooding; Wall collapse</p>	Control through method statement	<ul style="list-style-type: none"> The coal extraction process must be undertaken according to an approved methods statement; 	<ul style="list-style-type: none"> None provided by the CA Municipality bylaws 	No accidents	Operational/Mining Phase

IMPACTS MANAGEMENT								
Activity	Aspect Affected	Size and Scale of Disturbance	Potential Impact	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
			Equipment and tools mechanical failures; Human error and negligence resulting in safety hazards		<ul style="list-style-type: none"> Mining must be conducted in benches to improve wall stability; Bench stopes must be inclined to improve stability; Workers must be provided with appropriate PPE; Equipment and tools operators must be trained and competent; Water must be pumped out of the Pit to the dirty water PCD; No dirty water must be released to the surface streams; 	<ul style="list-style-type: none"> Mine Health and Safety Act 		
Coal Stockpiling	Water; Soil; Air quality	5 ha	Erosion of stockpiled coal; Water contamination from erosion; Dust from the stockpiling area;	Control through storm water management plan; Control through covering	<ul style="list-style-type: none"> The stockpiling area must be clearly demarcated on the site plan; All stockpiling activities must be strictly according to the site plan; A stockpiling method statement must be developed and approved; Stormwater control trenches must be created around the stockpiling area to prevent erosion of the COAL; Water from the stockpiling area must be directed to the PCD via dirty water channel; 	<ul style="list-style-type: none"> None provided by the CA Municipality bylaws Mine Health and Safety Act 	<ul style="list-style-type: none"> 	Operational/Mining Phase
Coal haulage off site	Air Contamination; Water Contamination Road accidents;		Spillages of coal during loading; Generation of dust Road accidents with fellow road users	Control through Health and Safety Standards; Control through road rules observation; Control through spillage cleaning	<ul style="list-style-type: none"> All drivers and operators must be competent and their driver's / operating license kept on site; Coal spillages during loading must be cleaned and taken back to the stockpiles; The loading area must be part of the stockpiling area; A speed limit of 40 km/h should be maintained on site gravel roads; Dust Suppression must be undertaken on all haulage roads; All vehicles and equipment onsite must be serviced and service 	<ul style="list-style-type: none"> None provided by the CA Municipality bylaws Mine Health and Safety Act 	<ul style="list-style-type: none"> No Accidents Air Quality maintained 	Operational/Mining Phase

IMPACTS MANAGEMENT								
Activity	Aspect Affected	Size and Scale of Disturbance	Potential Impact	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
					certificate be made available onsite; <ul style="list-style-type: none"> Traffic control signage must be placed strategically onsite; The road rules must be observed on a public roads at all times; 			
Rehabilitation Phase								
Rehabilitation of Mining Area	Air Contamination Land Contamination Water Contamination Health and Safety Hazards	5 Ha	Increased atmospheric particulates concentration. Hydrocarbon Spills from rehabilitation machineries Flow of contaminated water into local water stream	<ul style="list-style-type: none"> Control through storm water management Control through monitoring 	<ul style="list-style-type: none"> The rehabilitation process must be undertaken according to an approved rehabilitation plan; All vehicles and machinery used in rehabilitation must be in good working conditions; Materials from the second strip must be disposed of at the first strip; The overburden materials must be hardened by driving over; Contaminated materials must not be used for rehabilitation; Water must be diverted away from the active rehabilitation site to prevent flooding and erosion Topsoil must be spread on top of hardened materials at a thickness of 150 mm Topsoil must never be compacted. Seeds of indigenous plants can then be spread 	<ul style="list-style-type: none"> None provided by the CA Municipality bylaws Mine Health and Safety Act 	<ul style="list-style-type: none"> Air quality maintained No Accidents Replanted vegetation flourishing 	Once the first strip has been mined out.
Removal of Site Infrastructures	Waste Generation Land Contamination Water Contamination	5 Ha	Contamination of water and land during demolition of site infrastructures	<ul style="list-style-type: none"> Control through monitoring Control through standards 	<ul style="list-style-type: none"> Generated wastes must be disposed of at appropriate waste management facility; General and hazardous waste must never be mixed. Bunded surfaces must be ripped and rubbles be disposed of at a landfill or used for gravel roads after agreement with land owners All infrastructures must be taken off site. 	<ul style="list-style-type: none"> None provided by the CA Municipality bylaws Mine Health and Safety Act 	Rehabilitate the land to its previous state	After cessation of mining activities

IMPACTS MANAGEMENT								
Activity	Aspect Affected	Size and Scale of Disturbance	Potential Impact	Mitigation Type	Mitigation Measures	Standard to be Achieved	Compliance with Standards	Time Period for Implementation
Ripping of Access Roads	Air Quality Contamination Water Contamination	0.6 Ha	<ul style="list-style-type: none"> Dust created during ripping of access roads as well as the visual impact Water contamination from loosened soil erosion 	<ul style="list-style-type: none"> Control through monitoring Control through storm water management 	Ripping of roads should be done in consultation with land owners	<ul style="list-style-type: none"> None provided by the CA Municipality bylaws 	Rehabilitate the land to its previous state	As soon as all equipment is taken offsite.

5.0. Financial Provision

5.1 Determination of the amount of Financial Provision

5.1.1 Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.

- a) The facilitation of the re-establishment of the land use and capability to as close as reasonable to the original conditions;
- b) Prevention and management of acid mine drainage;
- c) Removal of all infrastructure and material introduced to site;
- d) Removal of all wastes and their disposal;
- e) Ensure that all roads rehabilitated and or left behind is safe in a good working condition, ensuring public safety and access to site and monitoring points;
- f) Any degradation to roads will be repaired with consultation of the roads department;
- g) Rehabilitated profiles must ensure free drainage of water and should be contoured to fit in with the catchment dynamics;
- h) Ensure land is rehabilitated to, as far as practicable, its natural state, or to a predetermined and agreed standard or land use which conforms to the concept of sustainable development.
- i) Promotion of the rapid re-establishment of the natural vegetation and the restoration of the site ecology. The disturbed areas shall be rehabilitated to ensure that:
 - ❖ The biodiversity habitat is encouraging the new land use after the prospecting;
 - ❖ Eliminate any safety risk associated with drill holes and sumps through adequate drill hole capping and backfilling;

- ❖ Environment and resources are not subjected to physical and chemical deterioration;
- ❖ The site is reversed to almost its original state;
- ❖ The after-use of the site is beneficial and sustainable in a long term;
- ❖ All socio-economic benefits are maximized

The rehabilitation plan shall entail removal of all generated wastes, infrastructure and materials, backfilling of mining pits, mine decommission after care, re-vegetation of disturbed and cleared areas, rehabilitation of access roads, ensuring the growth of the existing grasses and plants species and cleaning of spillages.

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

This Basic Assessment Report and Environmental Management Plan will be made available to each registered stakeholder for review and comment.

5.1.3 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.

A detailed rehabilitation plan will be developed and attached to this report. Below is a summary of the proposed rehabilitation plan.

(a) Backfilling of the Mining Pit,

The mining pit must be backfilled using the overburden materials as removed from the mining area. The pit must be backfilled to establish the pre-mining conditions.

(b) Removal and levelling of stockpiles;

All excess soils on site (not used for backfilling) must be levelled and profiled to enable revegetation.

(c) Removal of Surface Infrastructures;

All site infrastructures must be removed on decommission of mining activities.

(d) Rehabilitation of created access roads and drill stations

The internal access roads that were created solely for prospecting activities will be ripped to facilitate vegetation regrowth. The drill stations will also be ripped and topsoil will be re-spread for vegetation regrowth. The rehabilitation of access roads will be done in consultation with the land owners and the roads will not be ripped should they want to continue using the access roads. This will be done within the limitations of all the relevant Legislations.

(e) Re-vegetation

It is recommended that a standard commercial fertilizer high in the standard elements is added to the soil before re-vegetation, at a rate of 10 -20k g/ha (application rate to be confirmed based on input from a suitably qualified specialist). The fertilizer should be added to the soil in a slow release granular form. A suitably qualified ecologist will be appointed to determine the appropriate veld grass mix for hand seeding.

Re-vegetation efforts will be monitored every second month for a period of six months after initial seeding. An effective vegetation cover of 45% must be achieved. Re-seeding will be undertaken if this cover has not been achieved after six months.

5.1.4 Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives

The closure objectives aim at restoring the site to its original state, i.e. conditions that were existing before the prospecting activities were undertaken. The closure objectives were identified before the rehabilitation plan was designed to ensure that all aspects are covered. The rehabilitation plan will ensure that the following objectives are met:

- ✓ Management accountability and ownership of closure activity;
- ✓ Comply with relevant or applicable legislative requirements;
- ✓ Ensure the health, safety and welfare of all humans and animals are safeguarded from hazards resulting from mining operations that have been terminated;
- ✓ Limit or mitigate adverse environmental effects to an extent that it is acceptable by all parties;

- ✓ Provide a reasonable basis on which the financial consequences of closure can be estimated, recognised and managed including any tax consequences so that mines are closed efficiently and cost effectively; and
- ✓ Ensure land is rehabilitated to, as far as is practicable, its natural state, or to a predetermined and agreed standard or land use which conforms with the concept of sustainable development

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

CALCULATION OF THE QUANTUM (REAL RATES)

Applicant:
Evaluators:

**Sibhuku Trading Enterprise (Pty) Ltd
Mugagadeli Phathutshedzo**

Ref No.: 10892 MP
Date: 12/09/2023

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	m3	0	17,4	1	1	R0,00
2 (A)	Demolition of steel buildings and structures	m2	0	238,71	1	1	R0,00
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	351,79	1	1	R0,00
3	Rehabilitation of access roads	m2	200	42,72	1	1	R8 544,00
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	414,61	1	1	R0,00
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	226,15	1	1	R0,00
5	Demolition of housing and/or administration facilities	m2	0,1	477,42	1	1	R47,74
6	Opencast rehabilitation including final voids and ramps	ha	1	242984,15	1	1	R242 984,15
7	Sealing of shafts adits and inclines	m3	0	128,15	1	1	R0,00
8 (A)	Rehabilitation of overburden and spoils	ha	0,1	166847,44	1	1	R16 684,74
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	207805,47	1	1	R0,00
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0,1	603565,59	1	1	R60 356,56
9	Rehabilitation of subsided areas	ha	0	139709,6	1	1	R0,00
10	General surface rehabilitation	ha	2	132171,31	1	1	R264 342,62
11	River diversions	ha	0	132171,31	1	1	R0,00
12	Fencing	m	100	150,77	1	1	R15 077,00
13	Water management	ha	2	50255,25	1	1	R100 510,50
14	2 to 3 years of maintenance and aftercare	ha	1	17589,34	1	1	R17 589,34
15 (A)	Specialist study	Sum	0	0	1	1	R0,00
15 (B)	Specialist study	Sum	0	0	1	1	R0,00
Sub Total 1							R726 136,66
1	Preliminary and General		87136,3986		weighting factor 2		R87 136,40
2	Contingencies				1		R72 613,67
Subtotal 2							R885 886,72
VAT (15%)							R132 883,01
Grand Total							R1 018 769,73

5.1.6 Confirm that the financial provision will be provided as determined.

It is hereby undertaken that the amount of **R 1 018 769,73** in the form of a bank guarantee for rehabilitation purposes as required in terms of section 24P (1) of the NEMA, will be provided to the DMR upon granting of the requested Mining Permit.

5.2 Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including, Monitoring of Impact Management Actions, Monitoring and reporting frequency, Responsible persons, Time period for implementing impact management actions, Mechanism for monitoring compliance.

Table 5-1: Compliance Monitoring

Source Activity	Impacts Requiring Monitoring Programmes	Functional Requirements For Monitoring	Roles and Responsibilities	Monitoring and Reporting Frequency and Time Periods for Implementing Impact Management Actions
Site establishment	Legal transgression; Accidents and Incidents	<ul style="list-style-type: none"> ✓ Mining Permit; ✓ Environmental Authorisation; ✓ Acts, Regulations and any other site permits; and ✓ Access agreements; & ✓ Emergency Preparedness and Response Plan 	Applicant/ Site EO/ ECO	Weekly monitoring; Monitoring reports must be submitted monthly to DMRE
Creation of access roads	Soil Erosion; Vegetation Clearing; Introduction of alien invasive plants.	<ul style="list-style-type: none"> ✓ Existing roads are used as far as practicable; ✓ No multiple tracks are created; ✓ Erosion control beams effectiveness; ✓ Vegetation clearing limited to working area; ✓ Site walk to identify absence/ presence of threatened and/or protected species; ✓ Control of alien invasive plants; 	Applicant/ Site EO/ ECO	After creation of each access road; Weekly monitoring; Monitoring reports must be submitted monthly to DMRE.
Establishment of mining area	Loss of vegetation	<ul style="list-style-type: none"> ✓ Vegetation cleared according to approved method statement; ✓ Vegetation clearing limited to approved area; Vegetation clearing limited to working area; ✓ Site walk to identify absence/ presence of threatened and/or protected species; ✓ Control of alien invasive plants; 	Applicant/ Site EO/ ECO	Weekly monitoring; Monitoring reports must be submitted monthly to DMRE
Stripping and stockpiling of Topsoil	Loss of fertile soils; Contamination of topsoil; Topsoil stockpile erosion	<ul style="list-style-type: none"> ✓ Topsoil stripping and stockpiled separately; ✓ Topsoil protected against erosion; ✓ Topsoil located away from potential contaminants. 	Applicant/ Site EO/ ECO	Weekly monitoring; Monitoring reports must be submitted monthly to DMRE

Source Activity	Impacts Requiring Monitoring Programmes	Functional Requirements For Monitoring	Roles and Responsibilities	Monitoring and Reporting Frequency and Time Periods for Implementing Impact Management Actions
Operation of site machinery	<ul style="list-style-type: none"> ✓ Noise generation; ✓ Soil contamination; ✓ Dust generation 	<ul style="list-style-type: none"> ✓ Dust suppression; ✓ Machinery operational standards; ✓ IAPs consultation. 	Applicant/ Site EO/ ECO	Weekly monitoring; Monitoring reports must be submitted monthly to DMRE
Mining activities and operation of machinery	<ul style="list-style-type: none"> ✓ Health and safety 	<ul style="list-style-type: none"> ✓ Provision of PPE; ✓ Environmental awareness programme; ✓ Toolbox talks and inductions 	Applicant/ Site EO/ ECO	Weekly monitoring; Monitoring reports must be submitted monthly to DMRE
Mining activities and operation of machinery	<ul style="list-style-type: none"> ✓ Water contamination 	<ul style="list-style-type: none"> ✓ Water quality of the Ngudumeni River; ✓ Biomonitoring of the Ngudumeni River; ✓ Underground water monitoring. 	Applicant/ Site EO/ ECO	Weekly monitoring; Monitoring reports must be submitted monthly to DMRE
Mining activities and operation of machinery	<ul style="list-style-type: none"> ✓ Air Pollution 	<ul style="list-style-type: none"> ✓ Monitoring of ambient air quality 	Applicant/ Site EO/ ECO	Weekly monitoring; Monitoring reports must be submitted monthly to DMRE
Site Personnel	Security breach	<ul style="list-style-type: none"> ✓ Site employees' identification; ✓ Land owners' complaints; ✓ Access restriction to private properties (beyond prospecting area). 	Applicant/ Site EO/ ECO	Weekly monitoring; Monitoring reports must be submitted monthly to DMRE
Ablution facility	Soil and water contamination	<ul style="list-style-type: none"> ✓ Provision of portable chemical toilets; ✓ Disposal of sewage wastes 	Applicant/ Site EO/ ECO	Weekly monitoring; Monitoring reports must be submitted monthly to DMRE

Source Activity	Impacts Requiring Monitoring Programmes	Functional Requirements For Monitoring	Roles and Responsibilities	Monitoring and Reporting Frequency and Time Periods for Implementing Impact Management Actions
Water requirements	Over extraction of water	<ul style="list-style-type: none"> ✓ Water usage 	Applicant/ Site EO/ ECO	Water usage must be recorded on a daily basis and Monitoring reports must be submitted monthly to DMR
Rehabilitation	Erosion;	<ul style="list-style-type: none"> ✓ Backfilling of the mining area; ✓ Re-spreading of topsoil ✓ Rehabilitation rate and success ✓ Vegetation regrowth 	Applicant/ Site EO/ ECO	Post closure and findings submitted to DMRE

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

The mining activities must be audited monthly against the conditions of the approved EMPr, the Environmental Authorisations and any other applicable legislations. These reports must also include the assessment of the financial provision. The reports should be submitted to the DMR as per the requirement of section 24P(3) of NEMA (107;1998).

5.3 Environmental Awareness Plan

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

All the employees including visitors will undergo an environmental induction to ensure that all potential impacts, best practice guidelines and policies are communicated. The induction process will be conducted as per the attached Awareness Program (**Appendix 03**). The induction will cover amongst others the following:

- ❖ Legal requirements for the site i.e. EA, and EMPr;
- ❖ Waste management;
- ❖ Incident and accident Management; and
- ❖ Emergency Response Procedure.

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

The following steps will be undertaken to ensure that risks are identified at the earliest and ensure that they are avoided:

(a) Appointment of the Environmental Control Officer (ECO)

The applicant must appoint the ECO before the mining activities are undertaken. The ECO will provide monitoring and auditing services to the mining activities.

(b) Delegation of a Project Environmental Officer

An Environmental Officer (EO) must be appointed before any activity can be undertaken on site. The officer must be a qualified environmental Practitioner.

(c) Notice of Commencement

Department of Mineral Resource and Energy must be notified in writing 2 weeks before the mining activities are undertaken.

(d) Environmental Documents

Prior to commencement of work on site, the EO is to ensure that the following documents are available on site:

- ✓ The Environmental Authorisation;
- ✓ The final approved Environmental Management Programme (EMPr); and
- ✓ Method statements for different site activities

(e) Environmental Monitoring

The ECO is to undertake monthly environmental compliance audits and prepare monthly environmental audit reports throughout the mining period. The environmental audit must include the following information:

- (i) An assessment of the Contractor's compliance with:
 - ✓ The relevant conditions of all permits: EA, EMPr, etc.;
 - ✓ The approved Environmental Management Programme;
 - ✓ The approved Construction Site Plan;
 - ✓ The approved Construction Method Statements.
- (ii) Provide feedback on:
 - ✓ Environmental training undertaken;
 - ✓ Any environmental incidents or complaints;
 - ✓ Waste type quantities recycled and disposed;
 - ✓ Any environmental issues identified;
 - ✓ The results of any environmental investigations;
 - ✓ Actions undertaken from previous audits; and
 - ✓ Recommended actions to be undertaken.

(f) Environmental Training

Prior to working on site, every person that will be undertaking any mining activities must receive training on the relevant environmental management requirements. The EO is to ensure that the environmental training includes the relevant requirements from:

- ✓ All site authorisations; and
- ✓ The final approved Environmental Management Programme.

(g) Development of procedures and checklists

The following procedures will be developed and all staff and workers will be adequately trained on the content and implementation thereof.

Emergency Preparedness and Response: The procedure will be developed to specifically include risk identification, preparedness, response measures and reporting. The procedure will specifically include spill and fire risk, preparedness and response measures. The appropriate emergency control centres (fire department, hospitals) will be identified and the contact numbers obtained and made available on site. The procedure must be developed in consultation with all potentially affected land owners. In the event that risks are identified which may affect adjacent landowners (or other persons), the procedure will include the appropriate communication strategy to inform such persons and provide response measures to minimize the impact.

Incident Reporting Procedure: Incident reporting will be undertaken in accordance with an established incident reporting procedure to (including but not limited to):

- ✓ Provide details of the responsible person including any person who: (i) is responsible for the incident; (ii) owns any hazardous substance involved in the incident; or (iii) was in control when the incident occurred;
- ✓ Provide details of the incident (time, date, location);
- ✓ The details of the cause of the incident;
- ✓ Identify the aspects of the environment impacted;
- ✓ The details corrective action taken, and
- ✓ The identification of any potential residual or secondary risks that must be monitored and corrected or managed.

Environmental and Social Audit Checklist: An environmental audit checklist will be established to include the environmental and social mitigation and management measures as developed and approved as part of the Environmental Management Plan. Non- conformances will be identified and corrective action taken where required.

6.0. Specific information required by the Competent Authority

No specific information was required by the Competent Authority.

7.0. 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.



Signature of the environmental assessment practitioner:

Mielelani Consultancy

Name of company:

September 2022

Date:

-END-

APPENDICES

APPENDIX 01: A: EAP CV

APPENDIX 01: B: EAP Qualification

APPENDIX 02: ENVIRONMENTAL AWARENESS PLAN

1. Introduction

Legislation requires that mining company who prepares an environmental management programme must develop an environmental awareness plan describing the manner in which the company intends to inform their employees of any environmental risks which may result from their work and the manner in which the risks must be dealt with in order to avoid pollution or the degradation of the environment. In recognition of the need to protect our environment, environmental management should not only be seen as a legal obligation but also as a moral obligation.

1.1. The Environmental Awareness Plan (EAP)

The EAP forms part of the EMPr and is intended to create the required awareness and culture with personnel and contractors/service providers on environmental safety and health issues associated with the prospecting activities.

1.2. The applicant's policy on environmental awareness

This Environmental Awareness Plan (EAP) will serve as the basis for the induction of all new employees (as well as contractors pending the nature of their work on site) on matters as described herein and read in conjunction with the EMPr. The Plan will also be used to hone awareness of all employees on a continuous basis. Specific environmental awareness performance criteria will also form part of the job descriptions of employees, to ensure diligence and full responsibility at all levels of the organisational work force.

1.3. Fostering environmental awareness

General environmental awareness will be fostered among the project's workforce to encourage the implementation of environmentally sound practices throughout its duration. This will ensure that environmental accidents are minimized and environmental compliance maximized.

Environmental awareness will be fostered in the following manner:

- a) Induction course for all workers on site, before commencing work on site.
- b) Refresher courses as and when required
- c) Daily toolbox talks at the start of each day with all workers coming on site, where workers can be alerted to particular environmental concerns

associated with their tasks for that day or the area/habitat in which they are working.

- d) Taking part in national and international environmental campaigns like National Marine Week, National harbour day, National Wetlands day exacta.
- e) Displaying of information posters and other environmental awareness material in the general assembly points.

1.4. Training and environmental awareness

The company accepts that environmental awareness training is critical for the workforce to understand how they can play a role in achieving the objectives specified in the EMPr and ensure that the actions specified in the EMPr are implemented effectively and efficiently. It is vital that all personnel are adequately trained to perform their designated tasks to an acceptable standard.

2. The environmental awareness training course

All employees should attend the course, regardless of position, status or level of responsibility. With a background of basic environmental awareness and an understanding of basic environmental issues and sensitivities, personnel may be motivated and empowered to do their share in helping to maintain the integrity of the environment on the prospecting site through environmental impact management.

The goal of this course is therefore to enable a shared understanding and common vision of the environment, the impact of a prospecting operation on the environment (and why this is important) and the role of prospecting personnel in terms of environmental management and compliance.

The induction course will compose of the following steps:

- The first step will include background discussion of the environment concept: of what it comprises and how we interact with it;
- The second step will be a description of the components and phases of the specific Prospecting operation;
- The third step will be a general account of how the Prospecting operation and its associated activities can affect the environment, giving rise to what we call Environmental Impacts; and

- The fourth and most important step will be a discussion of what staff can do in order to help prevent the negative environmental impacts from degrading our environment. This is known as Environmental Impact Management.

3. Course content

The following can be seen as draft course content as it will be building on as specific needs arises and will be supplemented with the handout of reading material and extracts of the EMPr on which the course will be based.

3.1. The environment

The environment consists essentially of the living environment, the non-living environment and the man-made environment. The living environment consists of our plant and animal resources. The non-living environment includes the soil, water and geological resources. The man-made environment comprises our infrastructure, social, cultural and archaeological resources.

These environments depend on one another, and man depends on them all for his survival. Damage to one will be felt by so we must try to protect the as well as their interactions with one another as they occur in nature.

When undertaking a Prospecting operation or any other form of development this concept must be kept in mind. Development must be implemented in such a way that we benefit today without compromising the ability of future generations to benefit as well. Employees should understand this concept of sustainability and sustainable development.

3.2. Description of the components and phases of the operation

The project description should be explained as part of induction together with the main components or activities that can affect the environment, giving rise to what we call environmental impacts. The Prospecting operation consists of a number of different components.

3.3. Description of Environmental Impacts

A general account of how the mining operation and associated activities can affect the environment must be explained. This is basically a description of concept of environmental impacts.

a) What is an Environmental Impact?

An environmental impact is the result, either good or bad, of man's actions on the natural environment. This results in one or many changes in the environment may also affect the availability of resources and the environment's capacity to function.

Impacts can occur either as a result of:

- The use of a resource;
- Or the pollution of a resource.

In addition, impacts can be categorised as the following:

- Foreseen, such as the necessary clearing of the vegetation before Prospecting begins, or Unforeseen, such as the flooding of an area following heavy rains;
- **Avoidable**, such as the unnecessary spillage of diesel during refuelling- or **Unavoidable**, such as the disturbance created during drilling; **Simple**- such as litter untidying the prospecting site, or **Cumulative** which is a collective impact from different existing activities.

Typical environmental impacts anticipated on a Prospecting site include the following:

The loss of plants; the loss of animals; Soil pollution; Dust liberation; Soil compaction and erosion; and Water pollution;

b) Causes of environmental impacts

These environmental are caused primarily by inadequate planning & not adhering to the EMPr Specifications'.

- The inadequate planning & preparation of the Prospecting site;
- The uncontrolled expansion of the Prospecting site footprint;
- The uncontrolled activity of Prospecting staff;
- The injudicious removal / disturbance of vegetation and habitat;
- The unnecessary loss of soil;
- Uncontrolled vehicular movement & circulation;
- The haphazard storage of vehicles, equipment and material;
- The uncontrolled servicing, repair and refuelling of vehicles;
- Unclear policy on solid waste management;

- Unclear policy on waste water;
- The uninformed use, storage and disposal of hazardous material;
- The erosive power of storm water and runoff;
- Unintentional fires;

3.4. Description of Environmental Impacts Mitigation

The fourth and most important step of an induction course will be a discussion of what staff can do in order to help prevent the negative environmental impacts from degrading their environment. This is known as Environmental Impact Management and is also described in the Environmental Management Programme. The course discussion should also include general environmental code of conduct practices such as:

Impact management: Mining site establishment (general):

- Do not cross any site fences;
- Use of fire to clear vegetation is prohibited;
- Do not walk, drive or store material in rehabilitating areas;
- Report any access into fenced off areas to the foreman environmental manager;
- Use only areas designated for certain construction activities;
- Do not access any stream or water body without permission; &
- Report any headstones, graves or human remains you may find to the foreman environmental manager.

Impact management: Construction phase (general):

- Only eat, cook, sleep and recreate in the areas designated on site;
- Do not bathe anywhere except in the designated areas on site;
- Always use the toilet facilities provided;
- Only use the water provided on site- do not collect water from or dispose water into a natural water course;
- Topsoil and subsoils must be separated;
- Topsoil must be handled on removal, stockpiling and re-spreading;
- Always make use of the specified Prospecting site safety measures;
- Do not hunt, kill or injure any animals anywhere on site;
- Inform the foreman environmental of any dangerous or problem

- Do not leave any food or rubbish where scavengers can get at it. Impact management: Health and safety (general):
- Always use the toilet & hand washing facilities provided.
- Only use the water provided on site - do not collect water from or dispose water into a natural water course.
- Make use of the specified protective gear for noisy and dusty conditions.
- Always wear proper protective head and foot gear while on site.
- Know where to find a list of emergency numbers in the event of one.
- Report accidents, injuries and unsafe site conditions to the Safety Officer.

Impact management: Vegetation clearing (general):

- Do not damage, destroy or remove any significant tree that has been marked:
- No firewood may be harvested without permission;
- Newly planted trees may not be disturbed in any way;
- Do not excavate beneath the crown of any tree that has been marked;
- No conserved tree may be used to support or hang anything in;
- Report to the foreman environmental manager any damage to any significant tree that has been marked.

Impact management: Top Soil removal and storage (general):

- Only excavate soil, gravel, rock etc. from designated areas;
- Stockpile soil only as instructed and at the time it is instructed;
- Do not make new stockpiles without permission;
- Do not use soil or remove soil from any stockpile without permission;
- Do not walk, drive or store any equipment, machinery or material on any stockpile.

Impact management: Access and transport (general):

- Only drive on designated roads and tracks;
- Move obstacles out of the way rather than drive around them;
- Only cross drainage lines at designated points;
- Always drive within the specified speed limit.

Impact management: Storage of vehicles, equipment and material (general):

- Do not leave machinery and equipment standing around if not in use;
- Only park vehicles in designated areas;
- Do not park heavy vehicles or store equipment under or near trees
- Do not store machinery, vehicles or materials in undisturbed or rehabilitating areas.

Impact management servicing repair and refuelling of vehicles (general).

- Only service machinery and vehicles in designated areas;
- Regularly check your vehicle for fuel and oil leaks;
- Inform the foreman environmental manager of leaking vehicles and machinery so that he can schedule repairs;
- Only refuel by means of a pump and on the bund created for that purpose;
- Immediately clean any accidental fuel and oil spills - do not hose spills into the natural environment;
- Dispose of contaminated soil as hazardous waste in the correct location on site.

Impact management: Solid waste management (general):

- Do not litter - make use of refuse bins provided;
- Concrete may only be mixed in designated areas and not directly on the ground;
- Do not hose spills into the natural environment - inform the foreman environmental manager of spills you are unable to clean yourself;
- Dispose of construction rubble only in specified storage areas - if in doubt, ask;
- Do not bury, hide or burn any waste of any nature;
- Inform the foreman of any illegal litter or dumping site that you encounter.
- Impact management: Waste water management (general):
- Do not use any natural water course to wash machinery, vehicles or equipment;
- Only wash machinery, vehicles or equipment in designated areas;
- Conserve water and report any leaks and overflow to the foreman,

Impact management: Management of hazardous material (General):

- Make sure that you know how to handle all hazardous substances;
- Do not access stores for hazardous substances without permission;
- Immediately clean any minor accidental spills and leaks;
- Do not hose any leaks or spills into the natural environment;
- Dispose of all hazardous waste in specified storage areas - if in doubt, ask;
- Immediately report any major leaks and spills to the foreman environmental manager.

Impact management: Fire management (General)

- Do not make open fires except in permitted areas and at permitted times;
- Do not leave any fires unattended. Extinguish these before you leave the area;
- All cooking is to be done on gas / electric stoves and only in the areas provided;
- Ensure that you know where firefighting equipment is located.

APPENDIX 03: REHABILITATION PLAN

APPENDIX 04: PUBLIC PARTICIPATION PROCESS REPORT

APPENDIX 05: SCREENING REPORT