BASIC ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT FOR MINING PERMIT APPLICATION ON PORTION OF PORTION 61 & 62 OF THE FARM NOOITGEDATCHT 300-JS (COAL)

DMR Ref: MP 30/5/1/1/3 12282 MP

DRAFT REPORT

1 JUNE 2021

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COMPANY NAME:	**Manmol Investments (Pty) Ltd**
REPORT TITLE:	BASIC ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT FOR MINING PERMIT APPLICATION
PROJECT:	MINING PERMIT APPLICATION
DRAFT REPORT DATE:	1 June 2021
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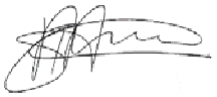
REVIEWER:	**Malehase Tshia (Pr. Sci. Nat & EAPASA)** Environmental Consultant Signature:  Date: 23 February 2021
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Note: Color pages are used to separate the sections

EXECUTIVE SUMMARY

The purpose of this document is to provide supporting environmental insights to an application for a coal mining permit at portion 61 & 62 of Nooitgedacht farm No 300 JS in eMalahleni Local Municipality, Ward No 29 which is under the Nkangala District Municipality, Mpumalanga Province. The total mining site covers an area of 5 hectares. The proposed area can be accessed from Pretoria central is by joining N4 to Mpumalanga or using the access road from KG Mall in Mpumalanga Kwaguqa Township and R104 Road.

It is worth noting that the proposed mining project will comply with the undertaking of activities that are considered as listed activities in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) as amended. In terms of the above-mentioned legislation, an integrated application for an environmental authorisation and waste management license was submitted to the MP Department of Mineral Resources in DMR Ref: MP 30/5/1/1/3 12282 MP.

The application was accepted on the 31 March 2021; hence, a basic environmental assessment was undertaken in support of the environmental authorisation application for the proposed mining permit. In view of the above, Manmol Investments (Pty) Ltd, have appointed Basia Environmental Consultant as an independent Environmental Assessment Practitioner to undertake and manage the environmental authorisation application.

The Department of Environmental Affairs (DEA) has identified the need for the alignment of environmental authorisations and has promulgated a single environmental management system under NEMA whereby the DMR has become the competent authority for the authorisation of mining-related projects under the NEMA Environmental Impact Assessment (EIA) Regulations 326 of 2017. This will result in simultaneous decisions in terms of NEMA, the National Environmental Management: Waste Act (Act No. 59 of 2008) (NEMWA) and other environmental management Acts.

The public participation process (PPP) and stakeholder engagement process, as part of the Environmental Authorisation process was conducted in terms of Section 41 of NEMA:

EIA regulation 326 of 2017 which provides clear guidelines for PPP and stakeholder engagement during Basic Assessment process. One of the general objectives of integrated environmental management is to ensure an "adequate and appropriate opportunity for public participation in decisions that may affect the environment". The PPP is primarily aimed at affording Stakeholders and Interested and Affected Parties (I&APs) an opportunity to gain an understanding of the project. In addition, to afford an opportunity to inform and consult with the landowners, I&APs and to provide them with the necessary information about the proposed project. Thus, they can make informed decisions as to whether proceed or decline and to weigh the consequences of the project.

Before an EAP submits a final report an opportunity must be provided to registered I&AP's access to comment on the report prior to the submission of the final report to the competent authority for approval. Stakeholders and I&AP's were therefore be invited to participate in the public review of the Draft BAR from **2 June 2021 to 3 July 2021** (period of 30 days). Three copies were placed at three convenient places for all the communities in proximity. Other copies were delivered to the identified stakeholders. After the public review period, the report will be updated with comments received from stakeholders, I&AP's as well as comments received during the public participation meeting.

This document provides a basic assessment study with identified environmental impacts, mitigation measures and Environmental Management Plan (EMP) for the proposed mining permit application. This document focuses on providing an insight of the proposed activities and their potential impact on the receiving environment, and how the identified potential impacts will be managed. This document is compiled in line with the NEMA:EIA Regulation 326 of 2017.

PART A: BASIC ASSESSMENT REPORT

1. OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

The objective of the basic assessment process is to, through a consultative process;

1. 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;
2. Identify the alternatives considered, including the activity, location, and technology alternatives;
3. Describe the need and desirability of the proposed alternatives,
4. Through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage , and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on the these aspects to determine:
    a. the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
    b. 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;

5. 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—

    a. Identify and motivate a preferred site, activity and technology alternative; and

    b. Identify suitable measures to manage, avoid or mitigate identified impacts; and identify residual risks that need to be managed and monitored

2. DETAILS OF THE APPLICANTS AND EAPs

2.1. CONTACT PERSON AND CORRESPONDENCE ADDRESS

Applicant's Contact Details

ITEM	COMPANY CONTACT DETAILS
ITEM	COMPANY CONTACT DETAILS
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Cellular no:	082 823 8871
E-mail address:	Thabo.moloto@manmol.co.za

Details of the EAP	
Name of the Practitioner	Tshia Malehase
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Email address	info@basiec.co.za
Company Name	Basia Environmental Consultant
Postal Address	Unit 10 Oakview, 40 Lynn Road, Karenpark Ext 42, Akasia, 0182
Name of the Practitioner	Seli Mahlangu
Tel No	076 025 8684
Email address	mahlangup@basiec.co.za
Company Name	Basia Environmental Consultant

Expertise of the EAP

The qualifications of the EAP

The EAP holds' M.Tech in Environmental Management from Tshwane University of Technology (TUT) which was completed in 2016. His research project was titled "Determination of mercury and its fractionation products in gold mine tailings dams and their surrounding areas in Gauteng. He was able to publish two scientific papers in reputable journals from this project and co-authored two scientific publication. He is registered as a Professional Natural Scientist with SACNASP in the field of Environmental Science (SACNASP: Reg no; 117391) and with Environmental Assessment Practitioners Association of South Africa (EAPASA: Reg: 2020/1413).

Ms. S.Mahlangu holds a National Diploma in Environmental Sciences from Tshwane University of Technology (TUT) which was completed in 2019 and she is currently in pursuit of an Advanced Diploma qualification in the same field. She is a registered Candidate Natural Scientist with SACNASP in the field of Environmental Science (SACNASP: Reg no; 134515).

Summary of the EAP's experience

1) Mr. Tshia Malehase is an Environmental Assessment Practitioner with extensive experience in a wide-range of environmental related projects, processes and Mining permit applications.

Mr. T. Malehase have been trained and worked in different Environmental Consulting Company for six (6) years, where he was groomed and exposed into different environmental applications, processes and documentation. This includes Environmental Impact Assessment, Basic assessment, Water Use Licences. He also had a privilege to work at the Department of Mineral resources where he worked with the applications for Mining permit, mining permit and mining rights applications including the contingency plans and rehabilitation strategies.

He has undertaken environmental compliance (including basic assessments, water use

license applications, social and environmental management systems, mining permits and prospecting right applications) and public participation processes. Overall, he has been in the field of environmental science and management, environmental chemistry and mining for over twelve (12) years. Please refer to Appendix A for Malehase's CV which provides a detailed list of projects which illustrate Mr. Malehase's competence in carrying out the EIA process.

Ms. S Mahlangu is an Environmental Assessment Practitioner (Junior) with over one year experience in a wide-range of environmental related projects, processes and Mining permit applications. She has been training and working in an Environmental Consulting Company where she is being groomed and exposed into different environmental applications, processes and documentation. This includes Environmental Impact Assessment, Basic assessment and Water Use License.

As a student, Ms. Mahlangu was part of the green campus initiative team which was responsible for promoting green leadership on campus by raising environmental awareness and building sustainable living practices through advocating for water conservation, energy conservation and efficiency, recycling and waste reduction. She would attend Educational excursions which involved training on aspects of wetland and nature reserve science and the facilitation of wetland education.

3. LOCATION OF THE OVERALL ACTIVITY

Table 1: *Location of overall activity*

Farm Name	Nooitgedatcht 300-JS
Application area (Ha)	Approximately 5 Ha
Magisterial district	Nkangala district
Distance and direction from nearest town	20 km North West of Witbank
21 digit Surveyor General Code for each farm portion	

4. DETAILS OF THE PROPOSED PROJECT

Table 2*: Details of the farms and owners*

LIST OF LAND OWNERS			
PORTION		**OWNER**	**TITLE DEEDS**
61		VUHLALU CREATION CC	T156690/2004
62		MOKOENA NTWANA ANN	T71786/1991

Table 3: *Mining Permit boundary co-ordinates (WGS 84)*

ID	LATITUDE	LONGITUDE
A	25.852463	29.077185
B	25. 852734	29.079433
C	25.854304	29.079355
D	25.854205	29.077108

Proposed mine site

The proposed site is located within eMpumelelweni Township opposite KwaGuqa township eMalahleni Local Municipality, Ward No 29. It is under the Nkangala District Municipality, Mpumalanga Province. The mining application will include portion 61 & 62 of Nooitgedacht farm No 300 JS. Access road to the site from Pretoria central is by joining N4 to Mpumalanga (85.2km) and take exit 86 (off ramp R104/Highveld/Wakefield/Kromdraai). After off ramping, you take the second immediate left which is a gravel road, turn right after 595m and continue straight until you arrive at the proposed site. Another access road from KG Mall in Mpumalanga Kwaguqa Township is to head east for about 96m then turn left towards Mathews Phosa St/R104 (7.4km) then at the roundabout, take the 3rd exit onto Mathews Phosa St/R104. Continue to follow R104, Turn right to merge onto N4 toward Pretoria, Take exit 86 toward R104/Highveld/Wakefield/Kromdraai. Then Sharp right then you take the second immediate left which is a gravel road, turn right after 595m and continue straight until you arrive at the site.

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Figure 16: Locality of the proposed site

5. DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY

The following information provide a guideline or an insight on how mining operation will be executed on the above mentioned farm. This document also assures the mine health and Safety Inspectorate that the applicant will execute the operation in a manner that satisfy the requirements of the Petroleum and Mineral Resources Development Act, act 28 of 2002.

6. LISTED ACTIVITIES (IN TERMS OF THE NEMA EIA REGULATIONS)

The proposed mining activity triggers activities listed in NEMA GNR 327 (7 April 2017): Listing Notice 1 as follows:

Activity 21: "*Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks directly related to the extraction of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)*".

7. Summary of activities to be undertaken

Description of construction, operational, and decommissioning phases. The following section serves as a summary of the three phases which have been described in more detail in more details in section 2 of this document.

CONSTRUCTION PHASE

The mining activities will only take place during daylight hours. The following activities during the construction phase will be executed:

- Refurbishing and Maintenance of existing access roads.
- Temporally fencing the site and fence signage.
- Installing temporal site offices, security office, and ablution facilities.
- Construction of stores yard, workshop and maintenance area
- Construction and installation of bulk fuel storage
- Demarcating mine fleet hard park, staff and visitors parking
- Construction of runoff settling dam
- Stripping and removal of existing topsoil and stockpiling
- Assembling and preparation of the screening plant

During the construction assessment phase it is expected that, the main sources of impact will result due to the refurbishing of access road, construction of storage and maintenance area, assemblage and striping of top soil. The construction phase is commonly of a temporary nature with a definite beginning and end. Construction usually consists of a series of different operations, each with its own duration and potential for impacts.

OPERATIONAL PHASE

The operation phase will only take place during daylight hours. The proposed mining activity will involve/include the following activities:

- Assemblage and proper storage previously discarded top soil

- Establishing the mining starting point
- Removing and stockpiling of topsoil;
- Construction of the runoff settling dam (water will also be used for dust suppression)
- Trenching around the mining footprint to ensure that stormwater is diverted into the runoff-settling dam.
- Excavation of the initial strip of the open cast mining (Contour strip mining)
- Excavation of ore;
- Crushing, screening and stockpiling aggregate;
- Backfill rehabilitation concurrently as mine progress forward.

DECOMMISSIONING, REHABILITATION AND CLOSURE PHASE

The decommissioning and closure activities will only take place during daylight hours. The decommissioning phase is associated with activities related to the demolition of infrastructure and the rehabilitation of disturbed areas. The following activities are associated with the decommissioning phase:

- Demolishing of stores yard, workshop and maintenance area (rubble removed and safe disposal)
- Demolishing of bulk fuel storage (rubble removed and safe disposal)
- Remaining exposed excavated areas filled and levelled using overburden recovered from stockpiles;
- Leveling the area with waste aggregate and toping with topsoil.
- Top soiling replaced using topsoil recovered from stockpiles; and
- Removal of temporal site offices, security office and ablution facilities buildings and structures demolished, rubble removed and the area levelled;
- Disturbed land fertilized and prepared for re-vegetation.
- Seeding of land with indigenous species.
- Truck and shovel methods would be used during roll-over backfilling of cut/strips. Compaction and final top soiling will be conducted to bring the final desired topography. Finally seeding will be conducted in accordance with the seasonal precipitation in order to facilitate quick root establishment and therefore minimise erosion potential.

Mine Planning and scheduling (for mining permit)

Mine design plans including structures to be temporarily erected offices required for the mining operations including the location of residue deposits. The following mining layout plan will be used in the mining activity. An area of 0.20 Ha (2000m^2) will be used for setting all equipment and resources necessary for the operation. The site will be fence and notice with be plugged to alert trespasses about the danger on the site. The figure 2 below the mine setting layout that will be following through the duration of a mining.

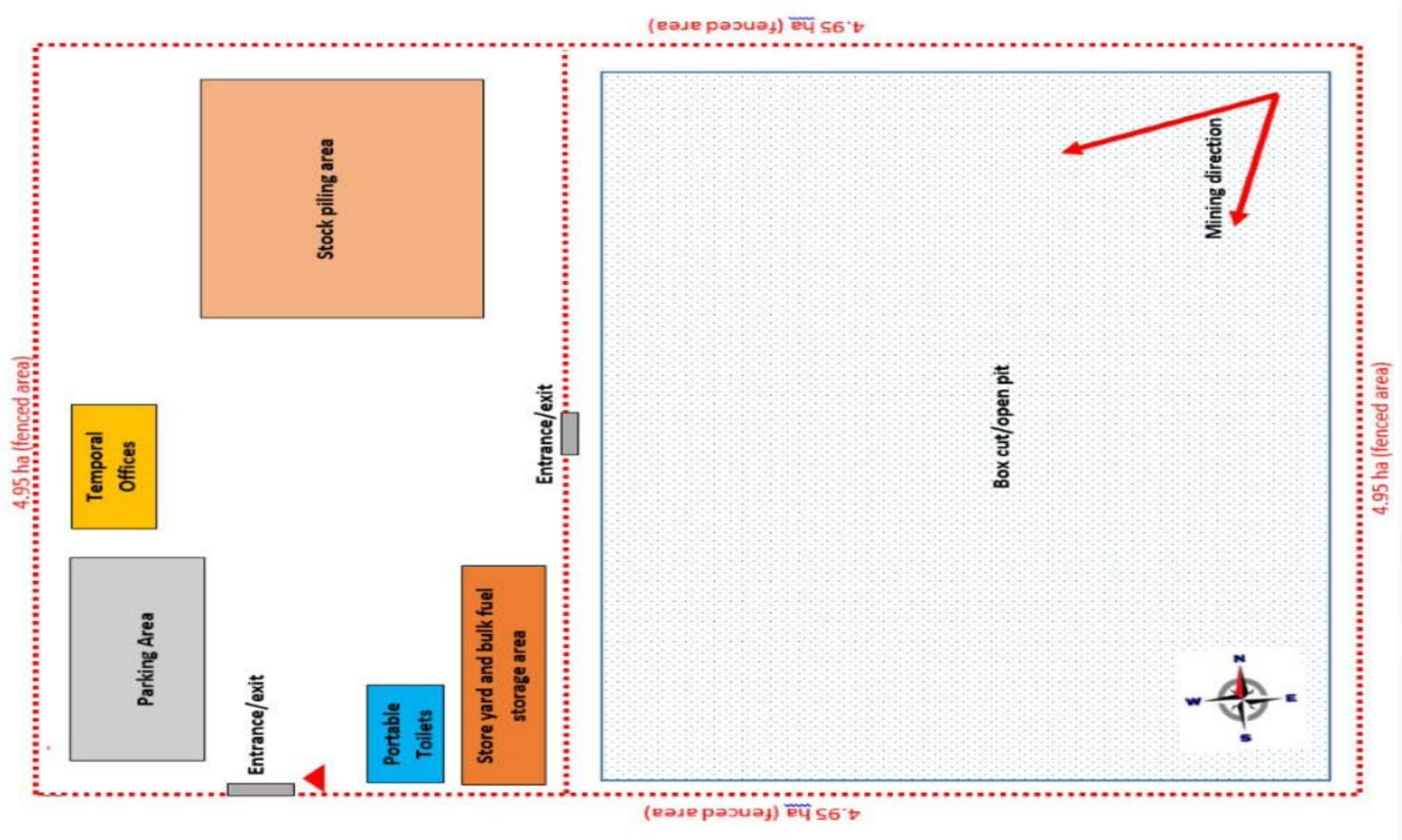


Figure 2: A below the mine settings layout that will be following through the duration of a mining.

Mining timeframe

Timeframes or scheduling on construction phase, operational phase, decommissioning and rehabilitation Phase will be as follows. The quarry will be allowed to operate within the permitted area for a period of 3 years, thereafter; further extensions of 2 years will be applied up to a maximum of an additional 4 years. The mining area including all stockpile areas, offices, parking area etc will ultimately measure 5 ha in total, although mining will be carried out in phases so that only portions of the 5 ha site will be mine at a time. It is anticipated that less than 1ha will be cleared during the first year of operation however, in the long term, the activity will result in the transformation of more than 1ha with concurrent rehabilitation.

Legal appointment

Details of the list of all the job categories that will be employed on the mine, from the mine manager to the unskilled labours, including those of subcontractors and service providers will be provided in the technical ability report document that which will also be submitted to the competent authority. In this section, we highlight that the following essential and legally required skills will be employed on all phases of the mine.

i) Engineering personnel*:* An engineer with at least 5 years of experience must be responsible to ensure that mining and rehabilitation program is implemented as outlined. The engineer must also enforce the following;

- confirming that workers are trained and competent for the task undertaken
- providing clear work instructions
- inspecting and monitoring workplace conditions
- continuously evaluating worker performance and correcting unsafe acts
- reporting and rectifying hazards
- assuring implementation of the company's safety systems
- demanding compliance with safety rules and procedures

- conducting meaningful observations, consultation and interventions

ii) Environmental, Health and safety personnel: with at least 5 years' experience in relevant fields of environmental assessment, monitoring and rehabilitation.

- Monitor and report the potential environmental, health and safety risk
- Identify priorities for replacing or modifying the rehabilitation plan.
- Develop an action plan with due dates and responsibilities for the rehabilitation process
- Conduct an audit of rehabilitation to ensure that all practical measures have been taken to control risk associated
- Produce and environmental, health and safety report monthly and quarterly

iii) Geologist with at least 5 years' experience on exploration of coal or relevant work.

- Will be responsible for identifying and assessing the location, quantity and quality of mineral deposits.
- Planning programmes for Mining and taking samples
- Collecting and recording samples and data from test sites
- Analysing geological data using specialist computer applications
- Produce a report on quantity, quality and depth of coal reserves

iv) Ecologist with at least 5 years minimum experience.

- Responsible for assessing the site specific ecological risk by inspect the area to be mined and ensure that plants and animals are not harmed or affected by the activities.
- Ensure enough time is given for animal species to move away from the area to be mined.
- Keep a register of identified species.
- Recommend alternatives and mitigation measures.

SECTION 1: DESCRIPTION OF RECEIVING ENVIRONMENT

1.1 The receiving environment

The proposed site is located within eMpumelelweni Township opposite KwaGuqa township eMalahleni Local Municipality, Ward No 29 in Mpumalanga Province. The site can be accessed through N4 and R104 road (as illustrated on picture). eMpumelelweni is the closest residential area that is located approximately 346m East of the proposed area. Gravel road joining in from the R104 National Road leading straight towards the proposed mining area.

Accessibility

Picture 1

Picture 2

Picture 3

Access routes within the site. The roads are steep and in poor conditions.

1.1 1 Biodiversity

The vegetation in this proposed site can be classified as moderately modified and there are no ESAs close to the site. The site is located within the Eastern Highveld Grassland Bioregion of the Mesic Highveld Grassland Bioregion of the Grassland Biome. This area is dominated by a Highveld grassland vegetation and only 3 tree species are found within the site.

Picture 4

Picture 5

Picture 5

1.1.2 Geology

The Geology of the proposed site is underlain by Vryheid formation which is characterized by fine-to coarse- grained sandstone, shale and coal seams. The Permian Vryheid formation hosts most of Southern Africa's economic coal reserves. The Witbank coalfield in particular has produced a large proportion of coal mined for export as well as for the local market. As such, it is one of the most important geographic as well as geological regions with respect to coal distribution and coal production

1.1.3 Surface water

There are no major wetlands or rivers within the proposed area. The closest river is located within 1km east of the proposed area. The river buffer zone is 50m. There is a bridge 1m from the railway which can be mistaken for a wetland, water is only available during rainy seasons.

Picture 7

1.1.4 Land-use

Opposite point B, there is a used oil recycling site with spilled oil tank and shale remains inside the recycling site.

Picture 8

Picture 9

Picture 10

In one of the residences, there is a farm with a few goats and sheep. There is also a yard just next to the proposed area where trucks are being fixed.

Picture 11

A second construction site is located at 764.62m away from the proposed site.

Picture 12

1.1.5 Servitudes

There is a railway, that is no longer operating which used to link Kromdraai and Navigation Plant, this railway was used to transport coal from Kromdraai to Navigation Plant. There are no power lines situated in the proposed area.

Picture 13

There is a fence that goes along the proposed site. The fence belongs to the household that resides next to the proposed house there is residential farming inside the fence.

Picture 14

1.1.6 Heritage

Approximately 292.25m away from point A there is a church, The Alliance Church Centre/ Tasca Church Centre. Church buildings are a living cultural heritage which have been continuously used for a long time.

Picture 15

Picture 16

Figure 3: Google Earth map of the proposed locality

1.2 DESCRIPTION OF THE REGIONAL ENVIRONMENTAL SETTINGS

1.2.1 Socio-economic settings

The area is composed of Emalahleni Municipality is both an urban and rural area that includes large farms, dispersed urban settlements, coal mines, and power stations. The nearest farmhouses about 180m from the proposed site. The larger proportion is characterized by open bushveld covered by shrubs and grasslands. As a typical rural settlement, a large number of the population is not employed in the vicinity. According to the Gross Value Added (GVA), the largest economic sector is community services with 48.6% study area while mining activities are the least contributors to the economy of eMalahleni with a contribution of 0.12% of the total GVA. Residents of the area rely on the larger surrounding urban centers for employment opportunities and higher-order goods and services.

The rapid population growth in the municipality put a strain on the provision of basic services (e.g. water, sanitation, public road, and electricity). The rapid expansion of informal settlements presents huge challenges. According to an informal settlement survey conducted, the municipality has 71 Informal settlements with approximately 30 000 households.

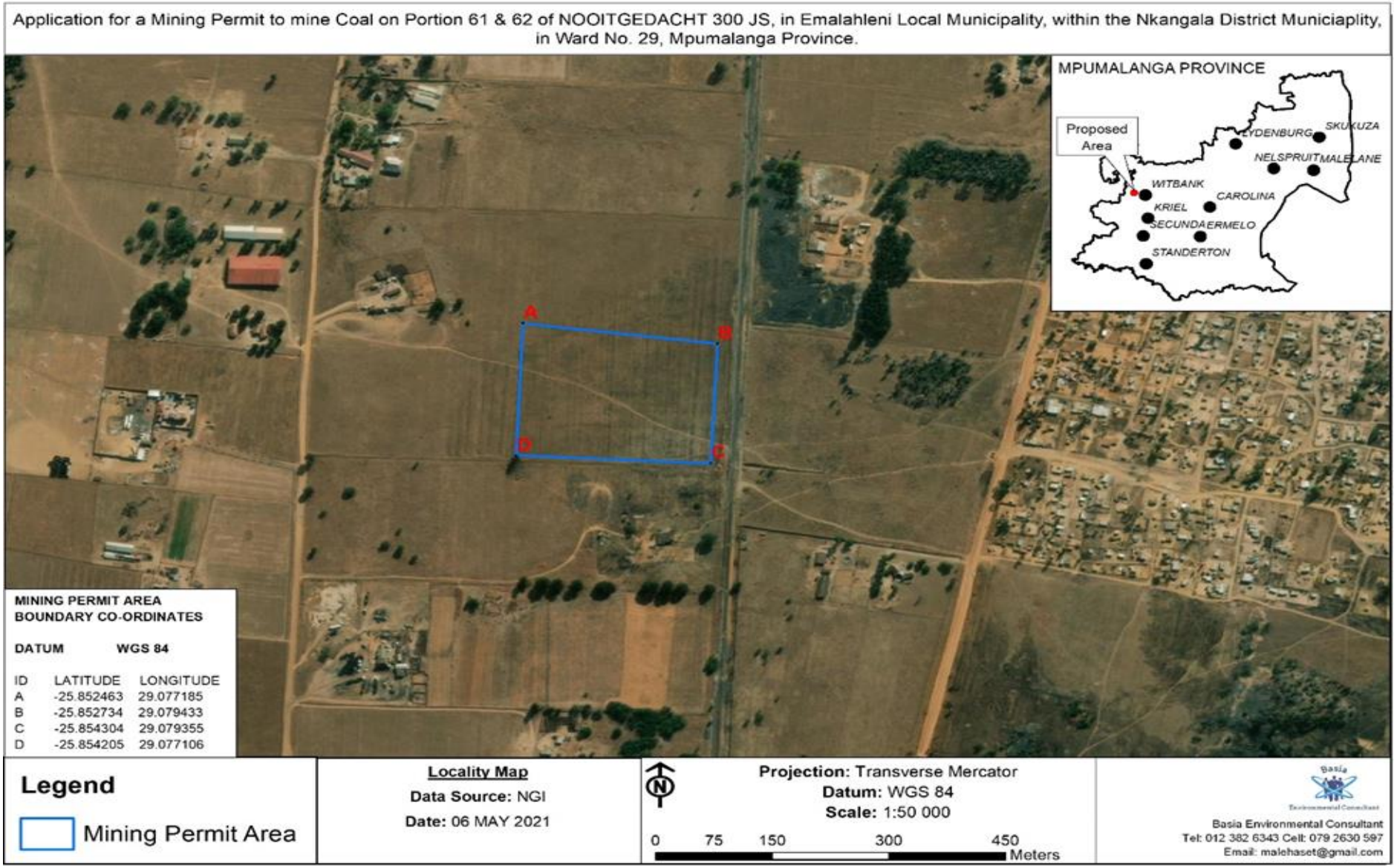
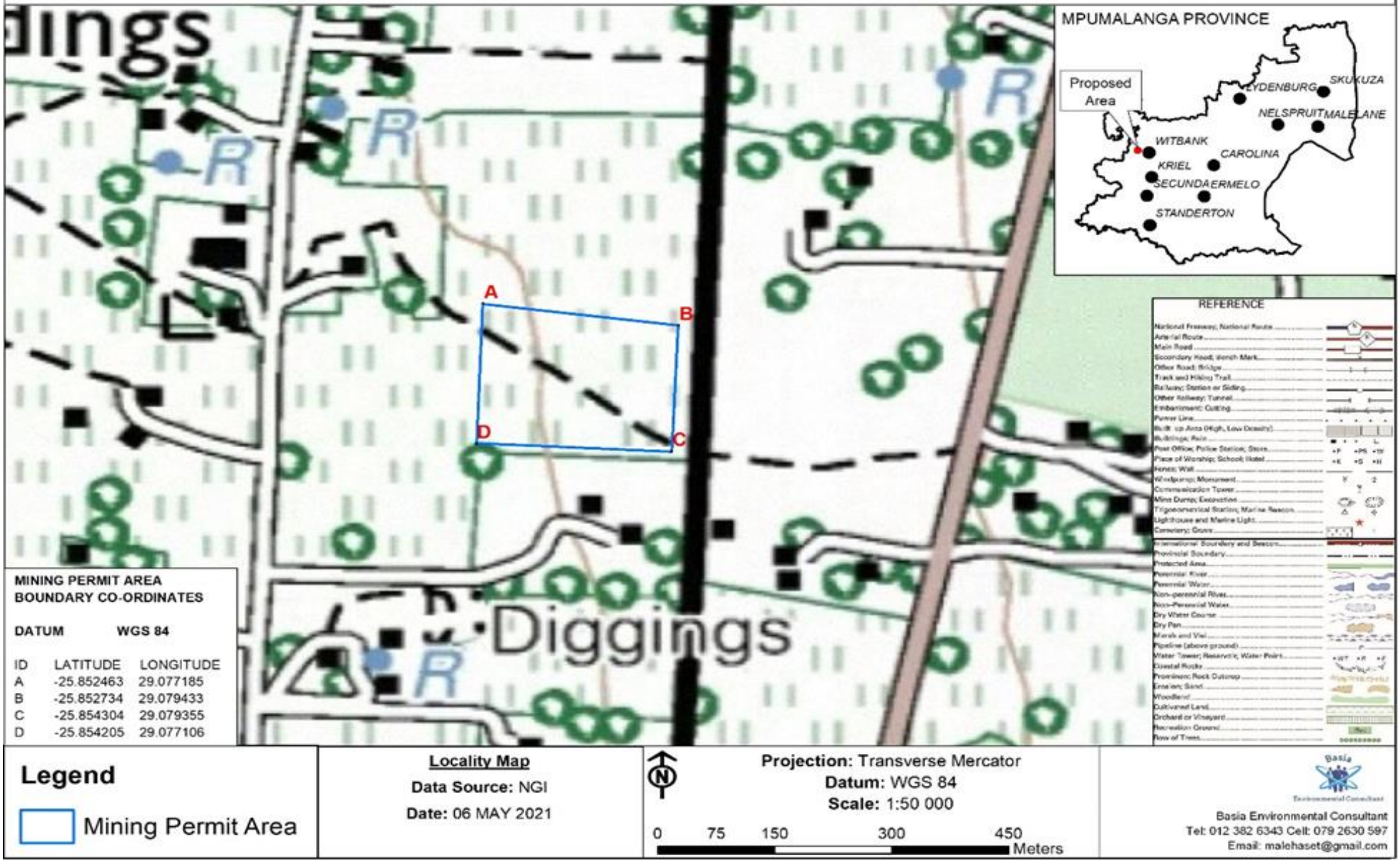


Figure 4: Locality of the proposed site

Application for a Mining Permit to mine Coal on Portion 61 & 62 of NOOITGEDACHT 300 JS, in Emalahleni Local Municipality, within the Nkangala District Municiaplity, in Ward No. 29, Mpumalanga Province.



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Email: malehaset@gmail.com

1.2.2 Climate

Emalahleni is 1572m above sea level. Emalahleni's climate is classified as warm and temperate. In winter, there is much less rainfall in Emalahleni than in summer. According to Köppen and Geiger, this climate is classified as Cab. In Emalahleni, the average annual temperature is 16.3 °C | 61.4 °F. About 760 mm | 29.9 inch of precipitation falls annually.

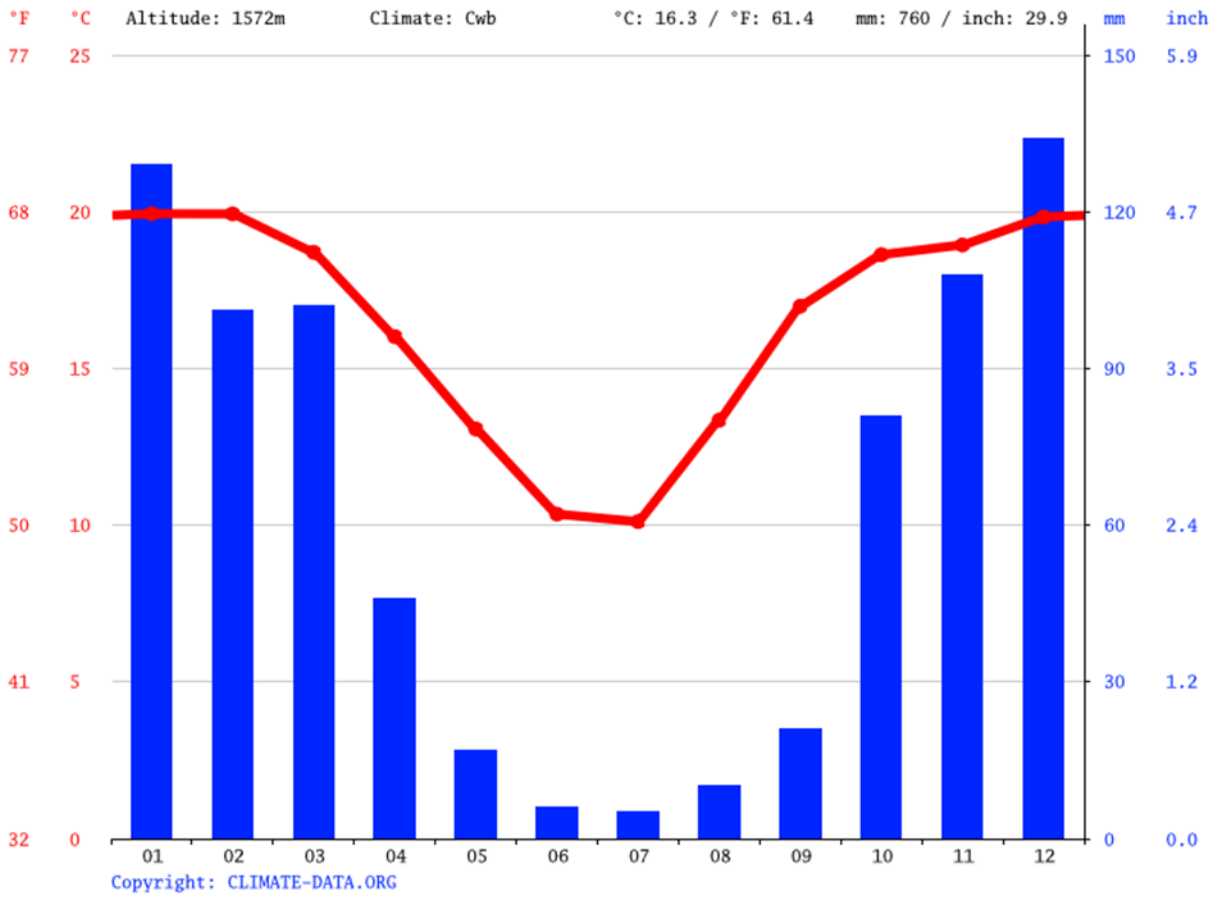


Figure 5: Climate graph

1.2.3 Geology

The Geology of the proposed site is underlain by Vryheid formation which is characterized by fine-to coarse- grained sandstone, shale and coal seams. The Permian Vryheid formation hosts most of Southern Africa's economic coal reserves. The Witbank coalfield in particular has produced a large proportion of coal mined for export as well as for the local market. As such, it is one of the most important geographic as well as geological regions with respect to coal distribution and coal production (Cadie, 1987).

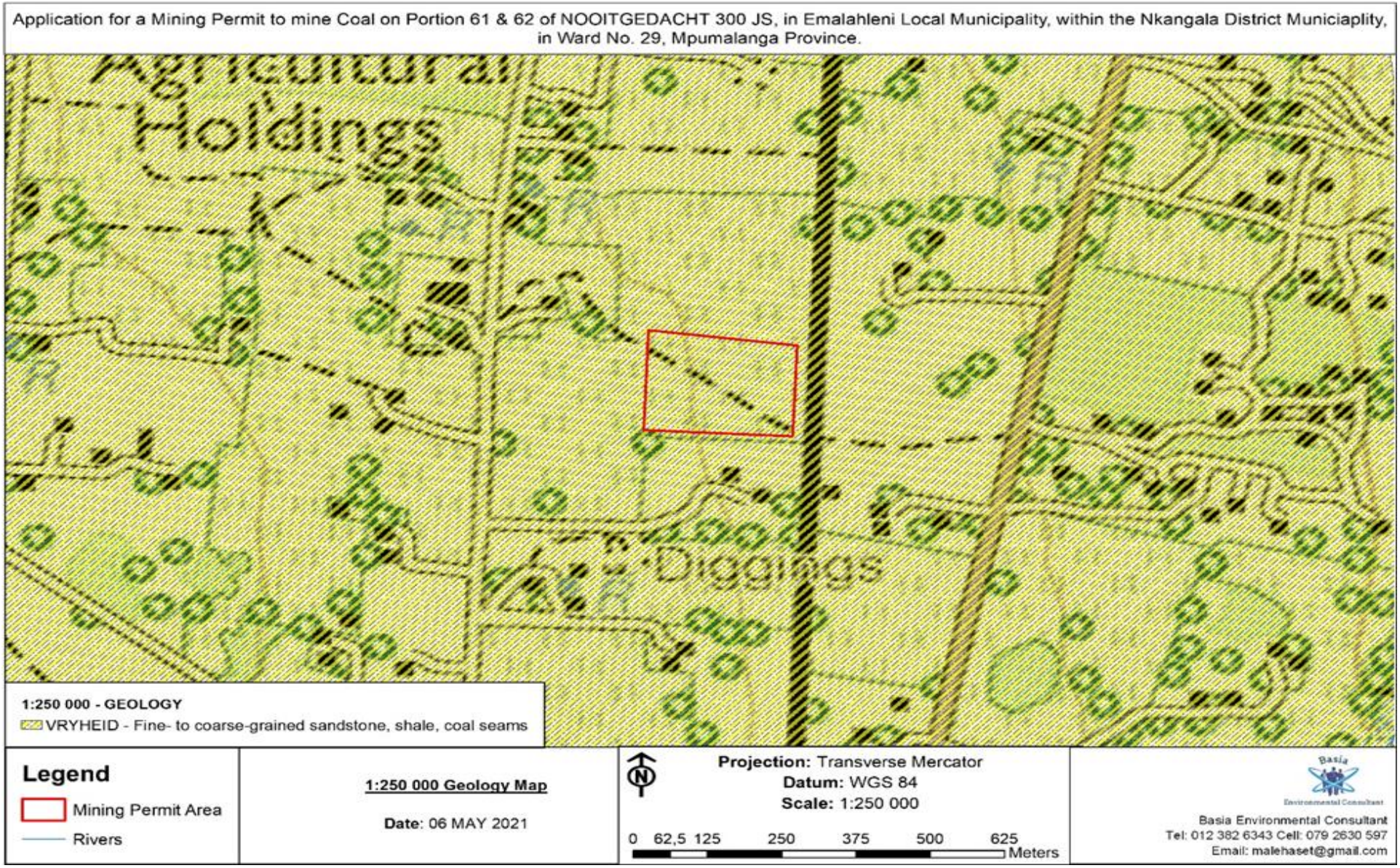


Figure 6: Geology of the proposed site

1.2.4 Vegetation

The proposed area is located in the Eastern Highveld Grassland of the Mesic Highveld Grassland Bioregion of the Grassland Biome, which is a threatened species with a vulnerable status. This group of ecosystem climate is characterized by warm, wet summer and cool, dry winters; this, combined with the effects of altitude, results in; a long growing season (centered over summer) lasting about six to seven months, alternating with unproductive winter and early spring seasons; high primary productivity leading to rapid buildup of biomass, resulting in a high fuel load and potentially intense fires. Mesic Highveld grasslands are located in high rainfall regions and are vitally important for water production. The characteristically dense vegetation cover traps surface water, slowing run-off and allowing more time for water to drain vertically through the porous soil profile. The diverse geology underlying Mesic Highveld Grassland correlates closely with high levels of plant species richness and endemism. The soil derived from the diverse types of parent rock vary in texture from sandy to clayey and the sandier solid tend to support lower basal cover but higher plant species diversity than less sandy ones. The main concerns in this grassland arise from the expansion of activities such as coal-mining, commercial agriculture and unplanned urban development (SANBI, 2018).

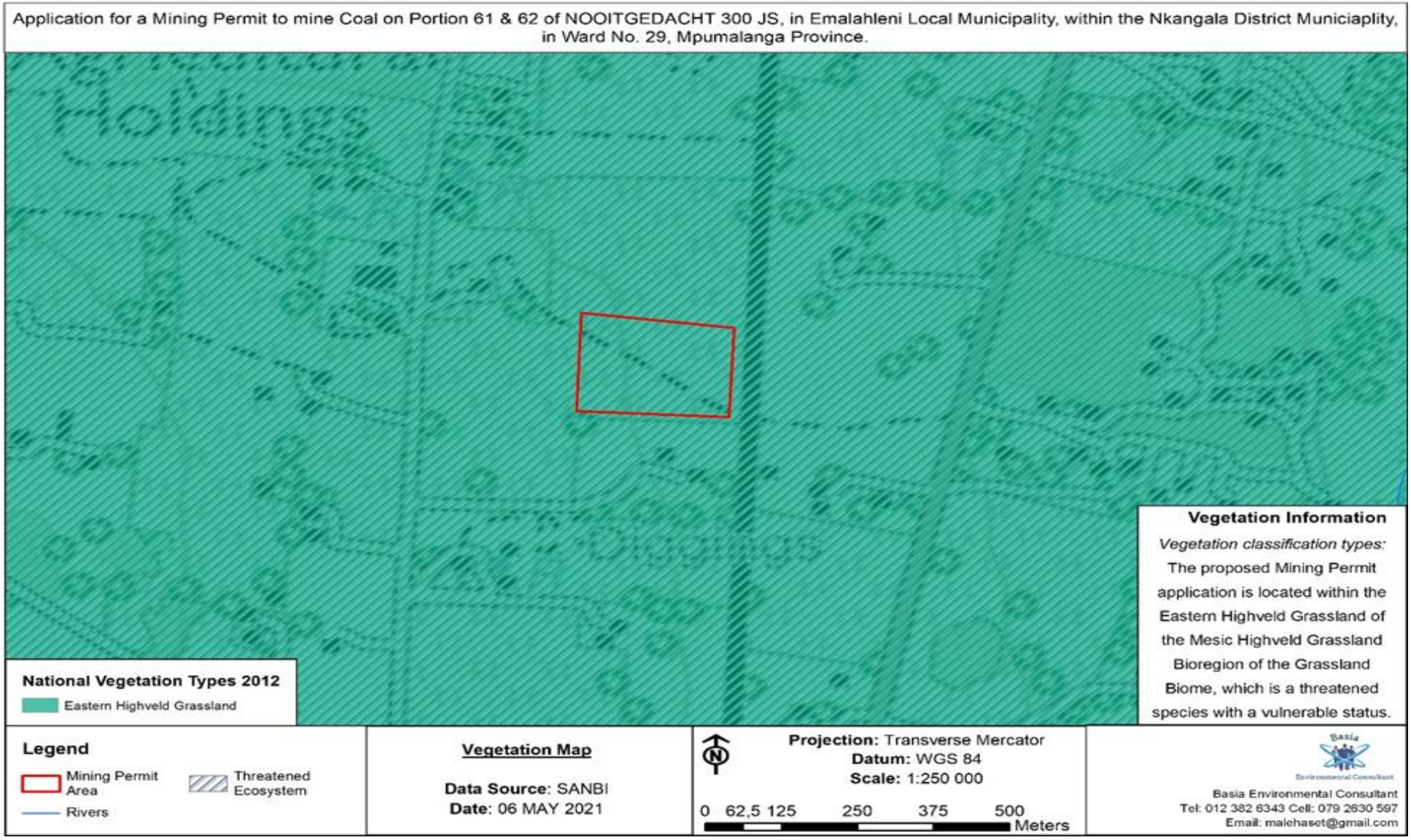


Figure 7: Type of available vegetation.

1.2.5 Surface Water

The area is located in the Olifants River Catchment area. There are major wetlands cutting through the proposed area. The affected quaternary catchment is the B11K.The Olifants Basin is a principal sub-catchment of the Limpopo River; it rises in the north of South Africa (in the Mpumalanga Province) and flows north-east (through Northern Province) into Mozambique. The Witbank Dam catchment is located at the headwaters of the Olifants River. The Witbank Dam catchment covers an area of 3,256km2 and has mean annual run-off of 125× 106m3 a-1. A total of 29 major collieries and a number of smaller operations are active in the catchment, producing approximately 47 percent of the country coal production. The water quality in the Witbank Dam catchment is rapidly deteriorating, mainly due to coal mining (The Witbank Dam catchment, 1993)

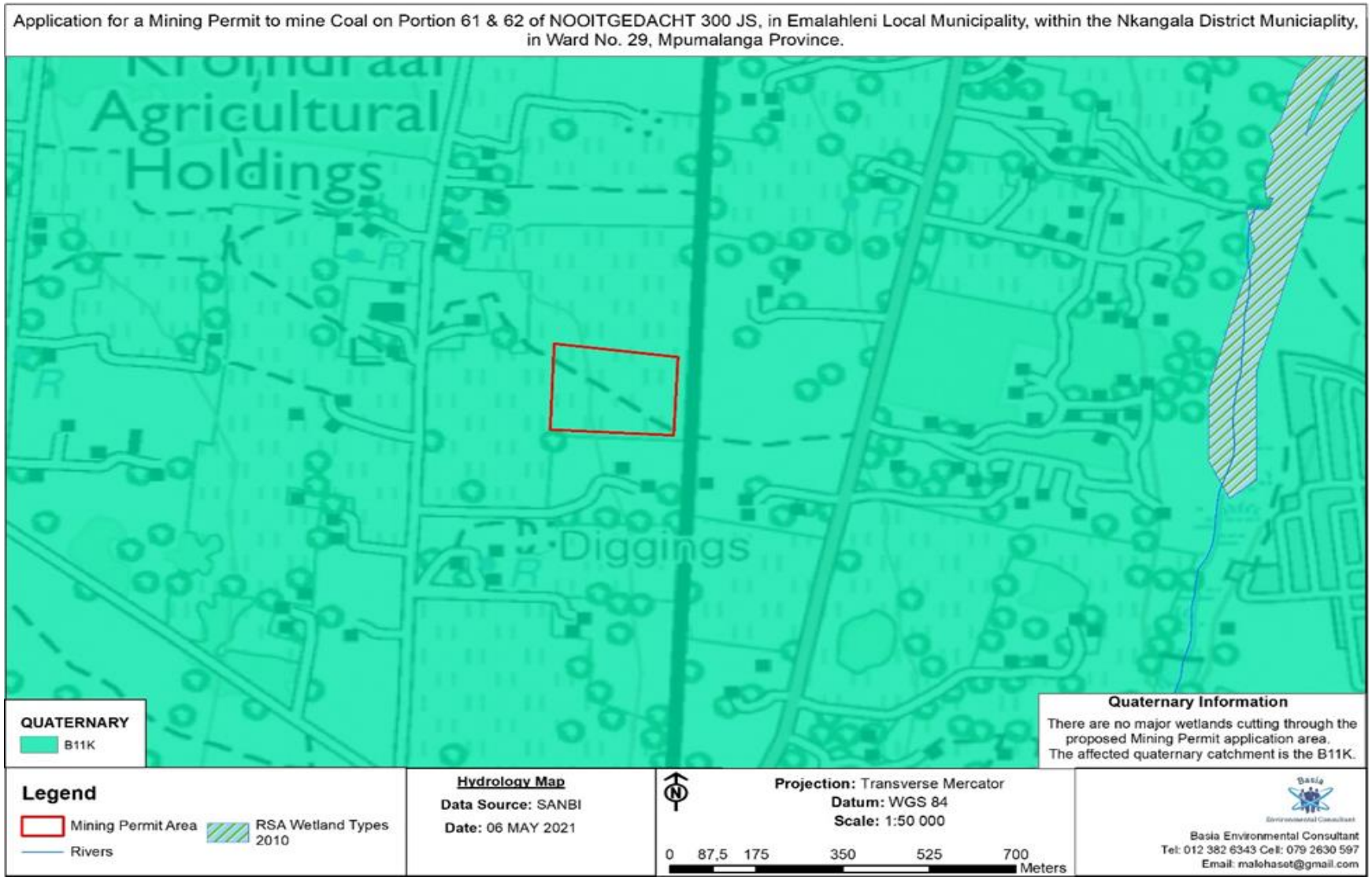


Figure 8: Hydrology of the proposed site

1.2.6 Sensitivity

There are no major Wetlands or Rivers Within the proposed area. The closest river or wetland is located within 1km east of the proposed area. The river buffer zone is 50m.The proposed area is located within a heavily or moderately modified area. There are no ESAs close to the proposed area. The proposed area is located in the Eastern Highveld Grassland of the Mesic Highveld Grassland Bioregion of the Grassland Biome, which is a threatened species with a vulnerable status. There is no protected area located within or near the proposed site.

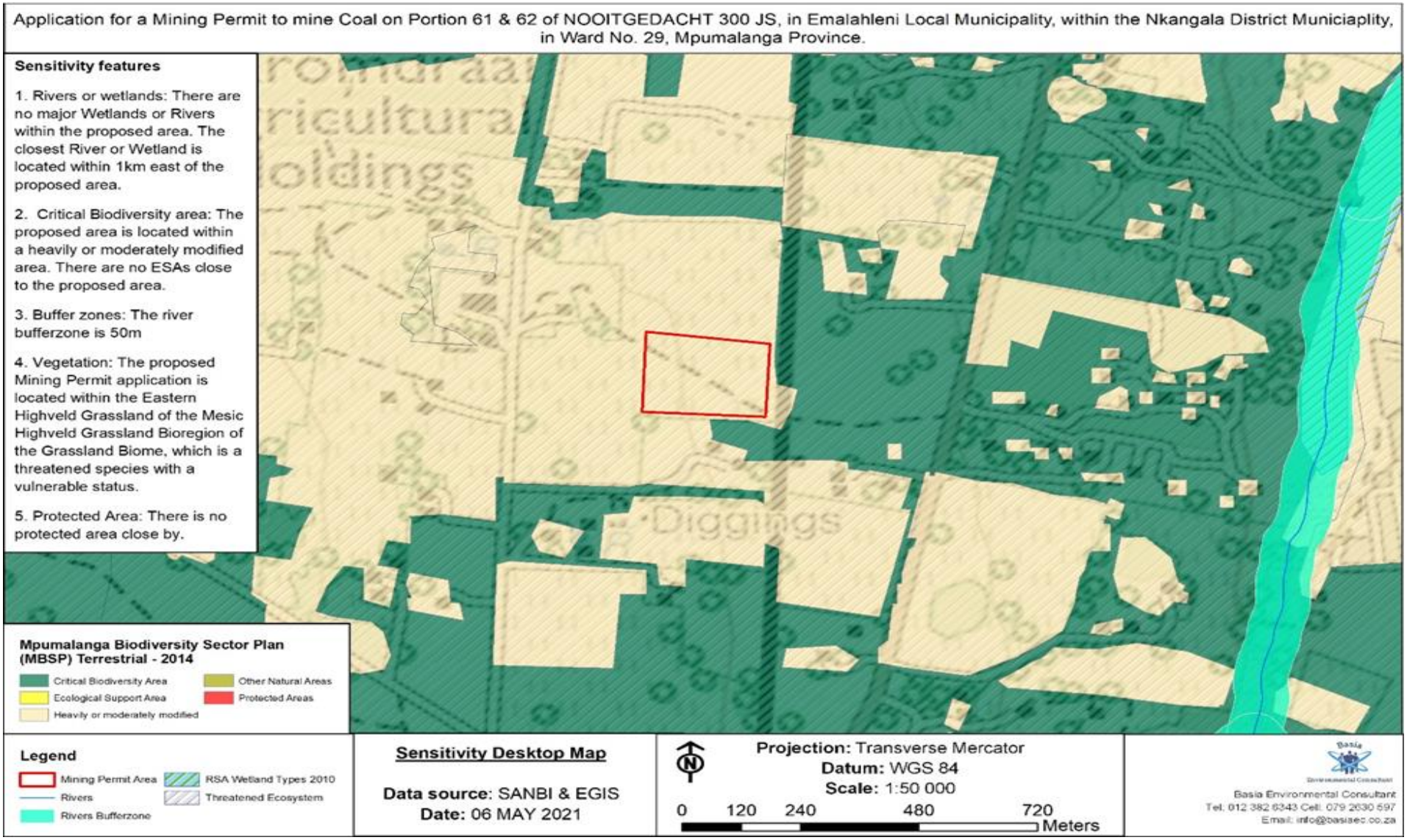


Figure 9: Sensitivity map

1.2.7 Traffic

- Based on the analysis conducted the following conclusion can be drawn with regards to the traffic impact by the proposed mining project.
- It is transversed by R104 and the N4 highway National route, which forms the foundation for future infrastructure and spatial development.
- The analysis of the additional development traffic and the five-year predicted traffic show a good level of service (LOS), with minimal delays and queue lengths at the road.
- The impacts to the surrounding road network are insignificant, due to the small size of the development.
- Due to the nature of the farm and the community, pedestrian movement and public transport usage in the area are minimal.
- The road safety around the development area is poor, providing no pedestrian sidewalks, road signage, road marking and laybys for public transport.

Figure 11: Existing access road to the site

1.2.8 Heritage

No heritage sites occur on the footprint. The study area was surveyed by foot yet no archaeological sites or artefacts were observed. Furthermore, the area is also not part

of any known Cultural landscape. The study area does not form part of any known cultural landscape. Therefore, the proposed development may proceed as no heritage site would be affected.

1.2.9 Water Supply

EMalahleni Local Municipality (ELM) is a Water Service Authority (WSA) and Water Service Provider (WSP) according to Water Services Act and delegation by provincial Department of Water and Sanitation. Emalahleni operates with three Water Treatment Works (WTW) schemes namely Witbank WTW, Ga-Nala WTW, and Rietspruit WTW. The water network has 950 km of pipelines and still some large components are of Asbestos Pipes. There is a very limited use of ground water resources available within the area of the municipality mainly due to the seeping of acid mine water into sub-surface aquifers. The majority of existing boreholes are privately owned and mainly located in the agricultural small holdings.

1.2.10 Land Use and Capability

Land cover

The proposed area is largely covered by Grassland. There is a residential settlement called eMpumelelweni located at 346m from the proposed mining site. Apart from the settlement, the land is also used for commercial as well subsistence agricultural activities.

Broad Land Uses

The current land use pattern in the proposed site and surrounding areas is also largely covered by Highveld grassland vegetation. Adjacent to the proposed mining site, there is a forest located at 470m from the proposed site.

Land use character of surrounding area

The following land uses and/or prominent features are currently occur within a 500 m radius of the site, therefore, a description of how these features may be influenced impacted upon by the project is summarized:

Land use character	Description
Natural area	Some of the surrounding land can be classified as natural as it is undeveloped. No impact is envisaged for such areas.
Medium density residential	The residential area is around the site, impacts to these residential areas will be both positive and negative in nature.
Retail commercial & warehousing	The site is not surrounded by any developments.
Industrial developments	There are no industrial development in the vicinity of the site.
Railway line	No Railway line closer to the site.
Plantation	There is no impact expected land use change.

SECTION 2: DESCRIPTION OF ACTIVITIES TO BE UNDERTAKEN ONSITE

This section clearly elaborate on activities that will be undertaken onsite from the construction, operational and deconditioning phase and how they will be executed. The applicant and the environmental, health and safety officer should ensure that the specifications of this activities are adhered to throughout the project. The following activities will be carried out and are associated with the proposed mine.

2.1. Construction Phase

2.1.1 Technique for mining coal

The proposed area does not have deposits of coal that are visible within layers of rock known as coal seams because the area is covered with highveld grassland. These seams undergo normal coal formation and serve as a conventional coal resource. The reserves of coal are immense, and are the largest of all of the fossil fuels. In surface mining, the coal is accessed directly from the Earth's surface, and contact is maintained with the surface throughout the operation. Surface mining is suitable for large, low-grade ore deposits which occur below a thin layer of rock therefore it is safe to say, surface mining is a more approachable way of mining coal because it is not costly, and less labour is required compared to underground mining.

Surface coal mining generally involves the following sequence of unit operations:

- Clearing the land of trees and vegetation.
- Removing and storing the top layers of the unconsolidated soil (topsoil).
- Drilling the hard strata over the coal seam.
- Fragmenting or blasting the hard strata with explosives.
- Removing the blasted material, exposing the coal seam, and cleaning the top of the coal seam.
- Fragmenting the coal seam, as required, by drilling and blasting.
- Loading the loose coal onto haulage conveyances.
- Transporting the coal from the mine to the plant.
- Reclaiming lands affected by the mining activity.

Wind fence can also be considered around the site of the coal yard to reduce the wind speed in the yard and minimize the amount of dust blown into the surrounding environment. Although this is optional, installation of a wind and dust controlling system can play a role in protecting surrounding residences who will be affected and reduce the pollution of coal dust.

2.1.2 Access and haul roads construction

The R104 road will be used to access the site, thereafter off ramp on the dirt road entering the farm to the proposed site. Aggregate transportation trucks will use this road to enter and exit the mine premises. These road will also be used by mine personnel to access the mine areas for their day to day duties and the dump trucks will use the road for haulage of material.

Figure 12: Existing access road to the site

The dirt road will be refurbished and maintained to suitable construction road standards upgraded to the applicable standards which includes a gravel road leading into the mine. Within the proposed site a road will be demarcated and to access the mine offices, workshop, and mining area (including mobile crushing and screening facility and stockpiles). The roads will be constructed to have a width of 8m while dust suppression will be done using water carts.

Regardless of the location, the basic shape of the cross section must be correct or a gravel road will not perform well, even under very low traffic. The figure below illustrates the components of a typical cross section of a gravel road that must be implemented.

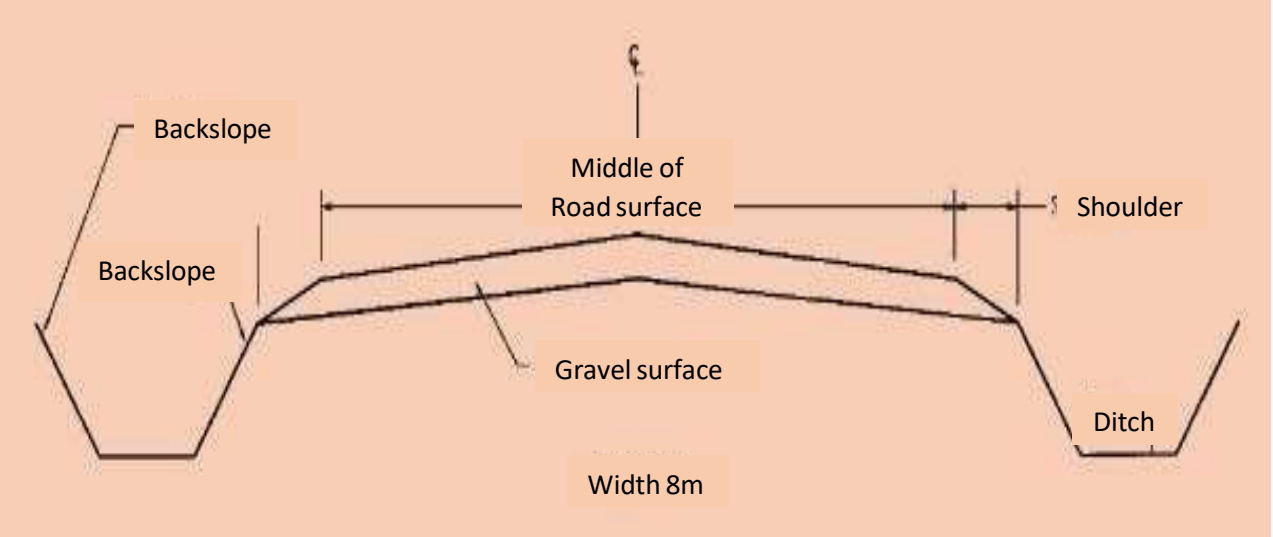


Figure 13: The components associated with a gravel road section

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

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

2.1.3 Temporary site and security offices

The site offices for the project, including a small security hut at the entrance of the mining area next to the main entrance road will consist of container-type offices that is commercially available, as illustrated in the image below. This ensures minimal construction requirements on site and also minimal degradation footprint. Keeping the disturbance area minimal and ensuring ease of mine closure and rehabilitation after life of mine make the temporary offices ideal, especially considering the short duration of the proposed activities and requirement of these offices. The visual impact associated with the structures will also be considered and natural colour paint will be applied to the structures to blend in with the background features.

Storm water management around the facilities must be considered. No housing facilities will be required as personnel will not be allowed to reside on site for the duration of the project but instead live off site from the mine. The security will however be present 24 hours a day on the mine for the duration of the project and even longer during the mine closure and rehabilitation period.

2.1.4 Temporary sanitation and change house

Similar to the structure indicated in the section above, the temporal sanitation and change house will be a container type facilities which can easily be brought to site and also removed after life of mine. A two change rooms must be provided, one for designated for male and the other for females. Four temporal toilets must be provided, two for females and two for males. The mining area will not constitute or host more than 15 people/personnel at the same time. Temporal toilets will be supplied and serviced by an independent contractor whom will be responsible for the management and disposal of waste.

This ensures no major construction and approval is required for a full scale sewage treatment facility. Water requirements relating to ablutions and drinking water are expected to be minimal and will be brought to the site by a tanker. The current expectation is that 30 employees will require 45 liter per person per day (liter pp/day) amounting to 1350 liters per day.

Image 1: A temporal security office

Image 2: A temporal toilet

Image 3: A temporary site offices

2.1.5 Storage yard, workshop and maintenance area

The storage yard, workshop and maintenance area are all related activities and therefore discussed under one heading. All these facilities will be constructed with heavy steel structural support frames, covered with light steel sheet metal roofing and side panels (typically corrugated iron sheets) to prevent rain water from entering the facilities. These areas will house various hydrocarbon and chemical materials such as oils, greases and paints required for maintenance and operational purposes and therefore the need exist to keep such materials in designated bays designed specifically to ensure no contamination to the receiving environment. The floors of

these areas will be constructed of impermeable layers typically concrete lined with polyethylene.

Storm water management will be ensured around these areas to ensure clean and dirty water separation. An oil trap (oil-water separator) will be constructed to ensure oils and greases can be separated and oils/grease can be removed by an approved subcontractor for recycling purposes. All harmful materials will be properly stored in a dry, secure environment, with concrete or sealed flooring and a means of preventing unauthorised entry. Furthermore, it will be ensured that material storage facilities are cleaned/maintained on a regular basis, and that leaking containers are disposed of in a manner that allows no spillage onto the bare soil. The management of such storage facilities and means of securing them shall be agreed.

The general working of an oil-water separator as illustrated below can be summarized as follow (take note, final design might vary depending on the contracting technology acquired);

1. The oil/water/sludge mixture enters the oil water separator;
2. The heavier sludge and particulates fall out of the fluid and are captured in the sludge hopper;
3. The oil and water mixture with lighter particulates travels up the inclined plates;
4. The inclined plates start to separate the mixture. Some oil rises to the top of the separator and the remainder of the particulates slide back down to the sludge hopper;
5. The remaining oil and water mixture then moves through the media packs where the majority of the smaller oil particles attach to the media and combine together to form larger oil particles;
6. These larger oil particles become so buoyant that they release from the media and travel to the top of the separator;
7. As the oil volume in the separator reaches a certain level, the oil is drained to through piping to an oil storage tank;
8. The clean water continues over the weir to the clean water chamber where it goes through a final polishing pack and out to the sewer.

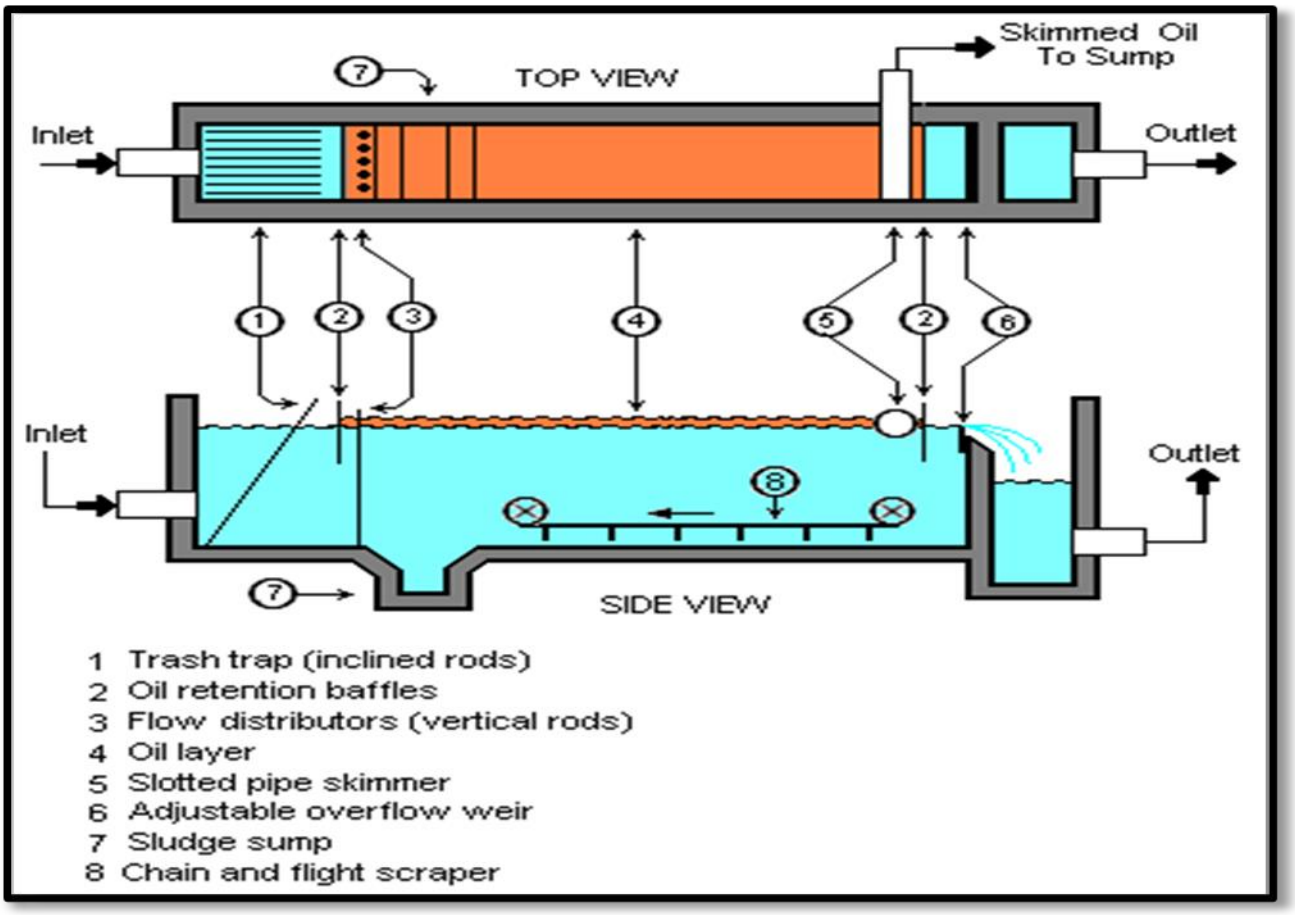


Diagram 2: Typical oil trap (oil-water separator) system cross sectional design

The following principles of safe design will be adhered to during the design of the storage yard, and workshop and maintenance area;

Table 2: Principles of safe design

Principle 1:	**People with control**	**Safe design is everyone's responsibility** – ensuring safe design rests with all parties influencing the design of a building or structure.
Principle 2:	**The life cycle**	**Safe design employs life cycle concepts** – applying to every phase in the life cycle of a building or structure, from conception through to redevelopment and demolition.
Principle 3:	**Risk management**	**Safe design implements risk management** – through systematically identifying, assessing and controlling hazards.
Principle 4:	**Knowledge and capability**	**Safe design requires knowledge and capability** – which should be either demonstrated or accessed by any person influencing design.
Principle 5:	**Information transfer**	**Safe design relies on information** – requiring effective documentation and communication between everyone involved in the life cycle of a building or structure.

The main fuel storage will be diesel in above ground storage tanks with an impermeable floor and berms designed to hold 120% the capacity of the tanks. The berms will also have release valves in the case of a spillage to ensure the diesel can safely be removed. An important aspect is to ensure the area is covered to ensure rain water does not enter the bounded holding areas.

Image 4: Typical surface fuel storage tank with spillage control bounding

2.1.6 Fencing of mining area

Fencing of the entire mining area will be required as a means of ensuring safety and restricting trespassers. The fencing however will be ecologically sensitive to ensure that species habitat is not divided. Fences will be clearly demarcated and appropriate signage will be displayed, similar to the signs in the images below. The necessary signage will also be erected in the vicinity of the sites to ensure visitors can easily and safely access the premises.

Image 5: Typical mine fence signage

2.1.7 Mine fleet hard park, staff and visitors parking

Designated parking areas will be constructed by compaction of the subsoil after removal, storage and preservation of the valuable layer of topsoil. Uncovered parking areas for mine fleet vehicles will be constructed in a separate area to the staff and visitors parking as a safety measure as the mine fleet vehicles are very large and pose

a safety hazard. The staff and visitors parking will be separate from the latter and temporarily covered/shaded with a cloth. Storm water management control around these areas will be implemented while the necessary signage will be erected to ensure optimal safety while reverse parking will be implemented at all parking bays. The necessary waste receptacles as well as oil spill kits will be provided at these sites in case of accidental spillage or leakage of hydrocarbon fuel/oil/greases from the vehicles.

2.2 OPERATIONAL PHASE

2.2.1 Site Preparation (soil and land)

The aim of soil and land preparation is to ensure that the area impacted is kept to an absolute minimum. The mining activities need to be designed with closure in mind. Top soil stockpile areas must be demarcated as no-go areas. Site preparation mainly deals with the stripping and stockpiling of topsoil prior to the mining activities commencing as this might affect the quality and quantity of available valuable topsoil resources.

The main objectives of soil management are to:

- Provide sufficient stable topsoil material for rehabilitation (in this case concurrently as mining continues);
- Optimise the preservation and recovery of topsoil for rehabilitation;
- Identify soil resources and stripping guidelines;
- Identify surface areas requiring stripping (to minimise over clearing);
- Manage topsoil reserves so as to not degrade the resource;
- Identify stockpile locations and dimensions; and
- Identify soil movements for rehabilitation use.

2.2.2 Soil Stripping

To reach the underground aggregate and gravel, the mining process need to remove the topsoil, sub-soil soft overburden and hard overburden. This section explains the correct measures that should be followed during the stripping of soil. This is a key rehabilitation activity as lost soils cannot be regenerated in the lifetime of the mining activities. Correct stripping of soils will firstly ensure that enough soils are available for

rehabilitation and secondly, that the soils are of adequate quality to support vegetation growth and thus ensure successful rehabilitation.

2.2.3 Soil Stripping Depths

The topsoil of the soil profile can be stripped to a total depth of 0.3m and stockpiled, separately from the sub-soil as this is where the seed bank is. The sub-soil approximately 0.7– 0.9m thick will then be stripped and stockpiled separately. The different soil forms/types will only need to be stripped to 0.3m and also stored separately. The maximum estimated volume of topsoil that will be stripped over the proposed 5 ha may be 15,000m^3 or less.

2.2.4 Soil Stripping Method

Soils should be stripped and replaced using the truck and shovel method as far as possible. This method will limit the compaction of soils. If bowl scrapers are used then the soils must be dry during stripping to minimise compaction. The best time for stripping of soils is when soil moisture content is low which will be during the dry season/months/weeks.

2.2.5 Soil Stripping Supervision

Supervision by an environmentalist (or trained supervisor) must be done to ensure that the soils are being stripped from the correct areas and to the correct depths, and placed on the correct stockpiles with a minimum of compaction. Soils are most susceptible to compaction when the moisture content is high. The dry winter months (April- August) are thus more suitable for the stripping and replacement of soils. If soils have to be moved during wet months then special care should be taken to adopt methods that cause minimum compaction.

2.2.6 Soil Stockpiling

This section explains the correct measures to be followed during the stockpiling of soil. Stockpiling should be minimised as far as possible as it increases compaction and decreases the viability of the seed bank.

2.2.7 Stockpile Locations

The soils should be stockpiled on the parent soils and as close to the originally stripped and final rehabilitation areas as possible. The top and sub soils are to be stockpiled in a berm like manner within the study area.

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

- stockpiles to be safely located within the proposed mine, however outside the disturbance areas as per the mining plan layout;
- construction of stockpiles by dozers rather than scrapers to minimise surface degradation;
- construction of stockpiles with a “rough” surface condition to reduce erosion hazard, improve drainage and promote revegetation; and
- revegetation of stockpiles with indigenous and appropriate fertiliser and seed in order to minimise weed infestation, maintain soil organic matter levels, soil structure and microbial activity and maximise the vegetative cover of the stockpile depending on the exposure timeframes.

Disturbance areas will be stripped progressively (i.e. only as required) so as to reduce erosion and sediment generation, to reduce the extent of topsoil stockpiles and to utilise stripped topsoil as soon as possible for rehabilitation. Rehabilitation of disturbed areas (i.e. roads, embankments and stripped mining footprint) will be undertaken as practicable after these structures are completed or as areas are no longer required.

Based on the final void having a considerable surface area relative to the total area mined and topsoil being recovered from all areas to be mined, it is considered that a topsoil surplus over the life of mine will occur. However, the Project topsoil budget will be reviewed following completion of topsoil recovery from the deeper profiles within the mining area.

A general protocol for soil handling is presented below and includes soil handling measures which optimise the retention of soil characteristics (in terms of nutrients and micro-organisms) favourable to plant growth:

- The surface of the completed topsoil stockpiles will be left in a “rough” condition to help promote water infiltration and minimise erosion prior to

vegetation establishment;

- Topsoil stockpiles to have a maximum height of 3m in order to limit the potential for anaerobic conditions to develop within the soil pile;
- Topsoil stockpiles will be seeded and fertilised;
- Soil rejuvenation practices will be undertaken if required prior to re-spreading as part of rehabilitation works; and
- A hump or embankment will be erected with waste rocks around the stockpiles to trap potentially eroded material.

2.2.8 Contour strip mining with a Roll-over rehabilitation sequence

Mining should operate only where technically feasible and economically justifiable. The most economical method of extraction of aggregate depends on the location, depth and quality of the ore, and also the geology and environmental factors of the area being mined. The operation proposes to use the contour striping and rollover mining and rehabilitation method. Roll- over opencast mining is typical of small scale opencast mining operations in the many regions of South Africa, and it is generally known as a quarry. However, the mining method does not create a pit.

Contour strip mining method will be used, because the ore is placed in a hilly topography. The same method of mining is commonly implemented by quarries in the vicinity of the proposed area. This method is convenient when the ores are located at a certain elevation or elevations through a mountain or hill. The diagram below show a typical contour strip mining and benching.

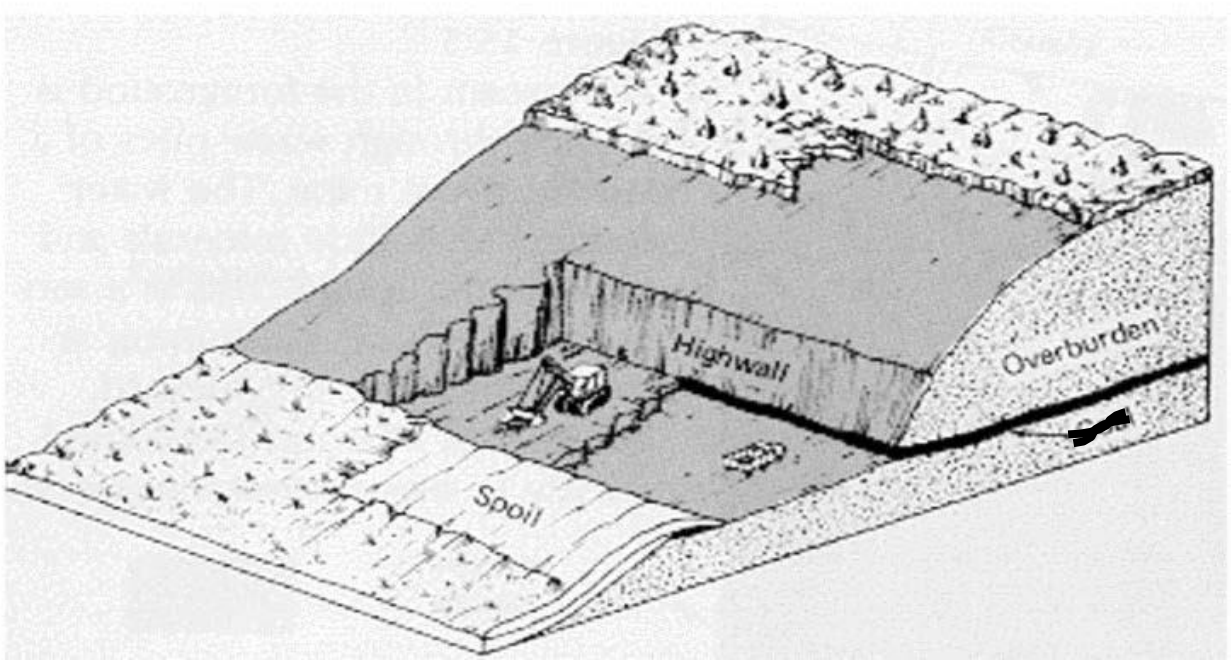


Image 6: contour stripping method

The open-castable reserves will be mined in conventional truck and shovel mining methods using the lateral roll-over technique in a single direction. This would mean mining from the one side of the development footprint in a linear fashion towards the opposite side while backfilling and rehabilitating the area that has already been mined, thus creating the effect that the mining cuts are rolling over in a single direction. Sustainable development applied to mining works necessarily includes rehabilitation with the aim of either restoring the land to its original use, or eliminating or reducing adverse environmental impacts to a long-term acceptable condition. The process is driven primarily by legislation which ensures that the mine owner must comply with the intention of achieving those end conditions, which are defined in broad terms by guidelines.

The ramp will have a maximum slope of 12˚. After removal of the aggregate from the initial contour strip, subsequent contour strip will be made. When the aggregate “blue stone” is been removed, and the desired leveled with with the stockpiled hard overburden, sub-soil and finally topsoil which will then be seeded and grasses to re-establish vegetation coverage to grazing capability.

The above figure can be summarized as; initial removal of the overburden which will then be stockpiled behind the mining area to ensure it can be replaced back to the

mining area. The physical mining of the aggregate follows which is then placed into trucks to be taken to the crushing and screening facility. From here waste rocks will be extracted and placed separately, while the product will be loaded onto the trucks and then removed off site. The overburden is replaced back while the mining progress leaving a minimum area open at a single time. The topsoil which was stripped and stockpiled separately before mining commenced is then replaced and according to the land capability and prepared to the optimal composition to ensure the field can be restored to grazing land as it was the pre-mining land use.

In summary;

- The topsoil will be stripped and stockpiled separately.
- Trenching around the mining footprint to ensure storm water is diverted away from the open cast pit;
- Overburden is then removed by conventional truck and shovel methodology and stockpiled separately within the mining footprint.
- Removal of under burden which is typically associated with more hard material than fine material (typical of overburden) and is usually the sandstone layer on top of the aggregate. This material is also stockpiled separately.
- Physical extraction of aggregate (blue stone) or winning of the mineral takes place
- Crushing, screening and stockpiling aggregate;
- The trucks are loaded on conventional truck and the material is removed from the mining area.
- Backfill rehabilitation concurrently as mine progress forward

2.2.9 Topsoil, subsoil, overburden, waste rocks and aggregate stockpiles

Positions of the topsoil, subsoil and overburden stockpiles have been indicated on the mine layout plan. All topsoil, subsoil and overburden material will be removed during the mining operation and stockpiled separately for the purpose of backfill rehabilitation as discussed earlier. The stripping, handling and preservation of topsoil have also been discussed earlier in this report as a separate chapter due to the importance of topsoil for rehabilitation purposes. The topsoil stockpiles will not exceed a height of 4m 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 2ha, of which the topsoil will be stripped and stockpiled separately. The hard overburden stockpiles will contain approximately 50m^3 (bulking factor of 1.1) of blasted overburden material.

Stockpiles may be used in some instances to provide visual and noise barriers between the mining operations and neighbouring land users. These stockpiles will be constructed from either overburden or from soil and will be in place for the life of mine and will be top-soiled and grassed immediately after their construction. Topsoil removal will take place by means of excavators and hauled with Articulate Dump Trucks (ADT's).

The stockpiling area will be constructed to cover an area of approximately 20m^2 and will not contain more than 5 000 tons of aggregate at one period. The stockpile will also not exceed a height of 4m.

2.2.10 Crushing and Screening

The proposed project entails to make use of a mobile crushing and screening facility to ensure it can be easily moved and also reduce the footprint required for rehabilitation post life of mine. The final product from the mobile crushing and screening facility will be taken away off site, and therefore significantly reducing the amount of aggregate stored on site and associated environmental and health impacts. The image below is a typical representation of a mobile crushing and screening plant with associated activities.

Aggregate from the mining site is loaded into trucks and then hauled to a feed din from where it is fed via a conveyor into the crushing and screening facility. Aggregate is then stockpiled according to the required top sizes from where it can be loaded transported to the weighbridge once again via truck hauling, weighed and taken off site. The process in itself is quite simple and straight forward as no significant environmental impacts.

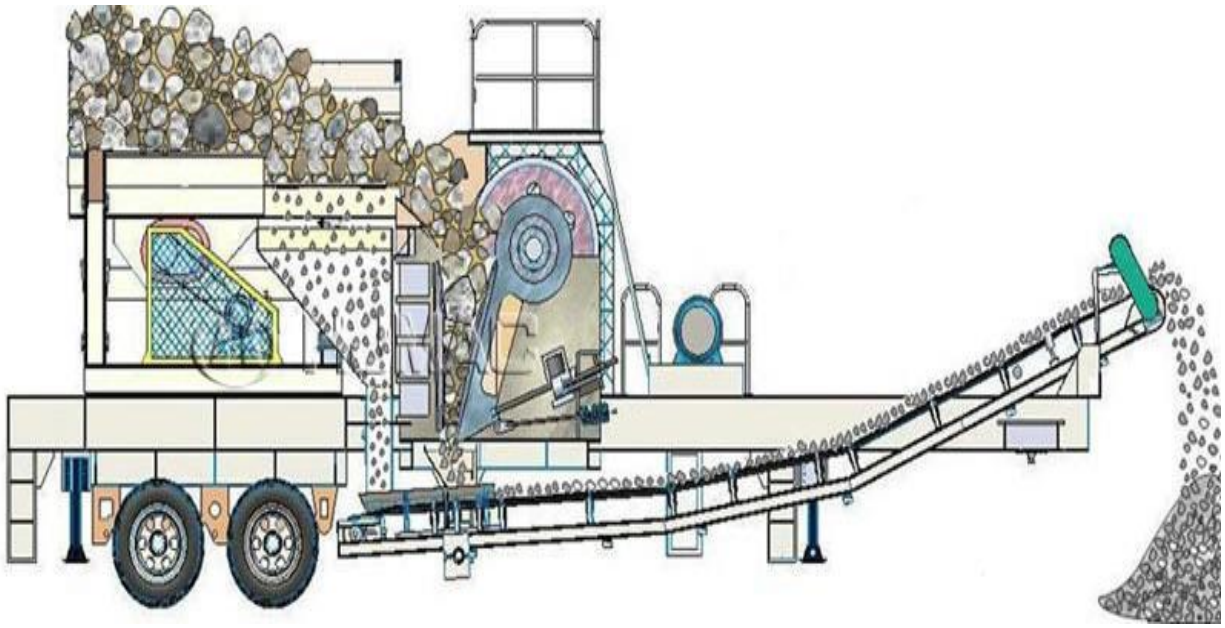


Figure 15: Typical mobile crushing and screening facility illustration

2.2.11 Mining equipment and operation

Typically, quarrying is a truck and shovel operation, the rock being excavated and loaded out for transport by truck to the crushing and screening plant. The loading formats are primarily wheeled front end loaders and track and backhoe excavators ranging from 80 to 220t machines. The dumper fleet typically will comprise vehicles up to 50t carrying capacity.

All benches will have the bench heights at a minimum of 10 m and will not exceed 12 m. This bench height range is matched to the loading equipment and enables the machines to relatively easily clear any loose rock in the face.

The loading format of front end loaders and excavator is generally suitable for the conditions in a quarry. The front end loaders provide the mobility to quickly change from level to level while the excavator has particular application in dealing with hanging or elevated rock structures.

Table 4: Equipment's to be used or needed

Equipment and/or Technology to be used	Excavator
	Bulldozer and Tipper truck
	Water cart
	4x4 Bakkies/Trucks
Materials required	Diesel
	Grease
	Hydraulic Oil
	Picks, shovels
Storage Facility	Diesel, Grease and Oil
Spillage control	Dip trays
Sanitation Facility	Chemical toilets
Waste Management	Waste skip and Bins
Water	Water will be transported to site
Safety	Safety Boards and proper PPE

2.2.12 Plant operation

The earth moving fleet will work 9 hour days, Monday to Saturday. Plant maintenance will be carried out periodically, any waste emanating from plant maintenance will be removed from the site immediately.

2.2.13 Water supply

The water will be purchased from local contractors and brought onto site by water tank truck to the identified drill sites. Portable on-site storage tanks (water bowsers) will be installed for the water supply. Water bowsers with the capacity of 500 gallon will be deployed to the sites and filled with water that will be used during the operational phase such as for dust suppression. Consumable waste for personnel will be purchased from local stores.

- **Volumes and rate of water use required for the operation**

The rate of water use required for the operation is about 200 liters a day which is;

- ✓ 150 liters for dust suppression;
- ✓ 50 liters for drinking and sanitation.

- **Has a water use license has been applied for?**

There will be no abstraction of water from the watercourses nor working on the river bed. No listed activity on Section 21 of the Water Act has been triggered.

2.2.14 Waste management

The necessary waste receptacles will be in place for general domestic waste separation and management. Two mobile Waste Skips (one for hazardous waste and one for non-hazardous waste) and four mobile waste bins (two for hazardous waste and two for non-hazardous waste) to be clearly labeled and place in strategic area on site to ensure easy access. These waste bins will be used for collection of different types of waste and will be removed from the site to a licensed waste facility by a registered and approved contractor. The diagram below show the mobile waste skips and waste bins. Mobile waste skips ensures minimal adverse impact on the environment.

Image 4: Mobile waste skips

Image 5: Mobile waste skips

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 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.

Several waste streams are likely to originate from the activities associated with day to day activities in the workplace. Some of these waste streams may not be hazardous, but the majority may contain a component(s) that may need special treatment. The nature of these waste streams may also vary due to composition and physical form. In order to make informed decisions on determining the appropriate waste management options to handle, treat and dispose of waste, the different waste streams must be identified in terms of hazardous and non-hazardous wastes.

Waste streams can be categorised into 6 (six) different streams, based on similar health and environmental concerns namely:

- ***Inorganic wastes*** – acids, alkalis and other solid residues.
- ***Oily wastes*** – primarily from the processing, storage and use of mineral oils.
- ***Organic wastes*** – halogenated solvents residues, non-halogenated solvent residues, polycarbon based (PCB) wastes from paint and resin wastes.

- ***Putrescible Organic Waste*** – wastes from production of edible oils, slaughter houses, tanneries and other *animal based products.*
- ***High Volume/Low Hazard Wastes*** – waste based on their intrinsic properties present relatively low hazards but may pose problems due to high volumes such as plastics.
- ***Miscellaneous Wastes*** – infectious waste from diseased human/animal tissue, redundant chemicals, laboratory wastes and explosive wastes from manufacturing operations or redundant munitions.

The following shall apply to the temporary storage of waste at source:

- The employer shall provide adequate and appropriate containers/receptacles for the temporary storage of waste at source;
- Adequate containers must be available to store different types of waste separately to allow for recycling and disposal according to the waste management plan;
- Dedicated storage areas for various types of waste must be allocated and clearly demarcated;
- Waste collected at source shall be collected on a daily basis;
- Waste must be stored in such a manner that it can be safely accessed and loaded;
- Should waste be stored in containers, drums or skips care must be taken that:
    - Waste types (special vs. controlled vs. general waste) are not mixed.
    - Waste is not kept in a corroded or worn container.
    - The container is secure so as to prevent accidental spillage or leakage.
    - All waste skips and containers are labelled with their contents.
    - Skips or containers do not overflow.
    - Skips for special waste is always covered.
    - Skips for controlled waste is covered skips wherever possible.
- Waste must be kept in such a way as to prevent it falling while in storage or while it is being transported;
- Waste must be protected from scavenging by people and animals;

- Do not dispose of (burn, bury or treat) waste on site;
- Collection of waste must be scheduled and the site/location manager must be notified beforehand of collection times and type of waste to be collected; and
- Implement dust suppression measures, such as wetting of access routes and accumulated controller waste.

2.2.15 Mining, blasting and explosives handling

The risks associated with blasting have been identified and include blast and potential fly-rock. These impacts mainly include vibration through the air (overpressure) and earth (ground vibration) along with the generation of dust and fume. Overpressure and ground vibration limits in place for private residences and structures in the vicinity.

3.16. Runoff settling dam facility (evaporation and dust suppression usages)

Mining operations can further substantially alter the hydrological and topographical characteristics of the mining areas and subsequently affect the surface runoff, soil moisture, evapotranspiration and groundwater behaviour. Failure to manage impacts on water resources (surface and groundwater) in an acceptable manner throughout the life-of- mine and post-closure, on both a local and regional scale, will result in the mining industry finding it increasingly difficult to obtain community and government support for existing and future projects. Consequently, sound management practices to prevent or minimise water pollution are fundamental for mining operations to be sustainable.

Pro-active management of environmental impacts is required from the outset of mining activities. Internationally, principles of sustainable environmental management have developed rapidly in the past few years. Locally the Department of Water and Sanitation (DWS) and the mining industry have made major strides together in developing principles and approaches for the effective management of water within the industry. This has largely been achieved through the establishment of joint structures where problems have been discussed and addressed through co-operation.

The National Water Act (Act 36 of 1998) requires that the dirty water originating from the mining operations be kept separate from the clean water systems outside and on top of the mining area. Hence a runoff retention dam will be constructed to retain runoff erosion from the site and to minimize sedimentation of agricultural fields towards the

bottom of the hill.

3.17. Dust suppression

Dust suppression measures must be implemented in the mining, crushing, hauling and stockpiling areas.

2.3 DECOMMISSIONING PHASE

2.3.1 Mine closure and rehabilitation

2.3.1.1 Basic rehabilitation principles (roll-over mining)

The following basic principles of rehabilitation form the basis of the roll-over mining methodology that entails concurrent rehabilitation as mining progress. Briefly;

- Prepare a rehabilitation plan prior to the commencement of mining which includes detailed surveys of the pre-mining environment to ensure the landscape can be restored to the pre-mining environment as close as feasible;

  Agree on the long-term post-mining land use objective for the area with the relevant government departments, local government councils and private landowners. The land use must be compatible with the climate, soil, topography of the final landform and the degree of the management available after rehabilitation;
- Progressively rehabilitate the site, where possible, so that the rate of rehabilitation is similar to the rate of mining;
- Prevent the introduction of noxious weeds and alien vegetation (typical to areas of disturbance);
- Minimise the area cleared for mining and associated infrastructure to only what is ultimately required and no additional clearance of unnecessary areas;
- Reshape the land disturbed by mining operations so that it is stable, adequately drained and suitable for the desired long-term land use;
- Minimise the long-term visual impact by creating landforms which are compatible with the surrounding landscape;
- Reinstate natural drainage patterns disrupted by mining wherever possible;
- Minimise the potential for erosion by wind and water both during and following

mining;

- Characterise the topsoil and retain it for use in rehabilitation. It is preferable to reuse the topsoil immediately rather than storing it in stockpiles. Only discard if it is physically or chemically undesirable, or if it contains high levels of weed seeds or plant pathogens;
- Consider spreading the cleared vegetation on disturbed areas;
- Deep rip compacted surfaces to encourage infiltration, allow plant root growth and key the topsoil to the subsoil, unless subsurface conditions dictate otherwise;
- Ensure that the surface one or two metres of soil is capable of supporting plant growth;
- If topsoil is unsuitable or absent, identify and test alternatives substrates, e.g. overburden that may a suitable substitute after addition of soil improving substances;
- Re-vegetate the area with plant species consistent with the post mining land use; and
- Monitor and manage rehabilitation areas until the vegetation is self-sustaining.

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

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

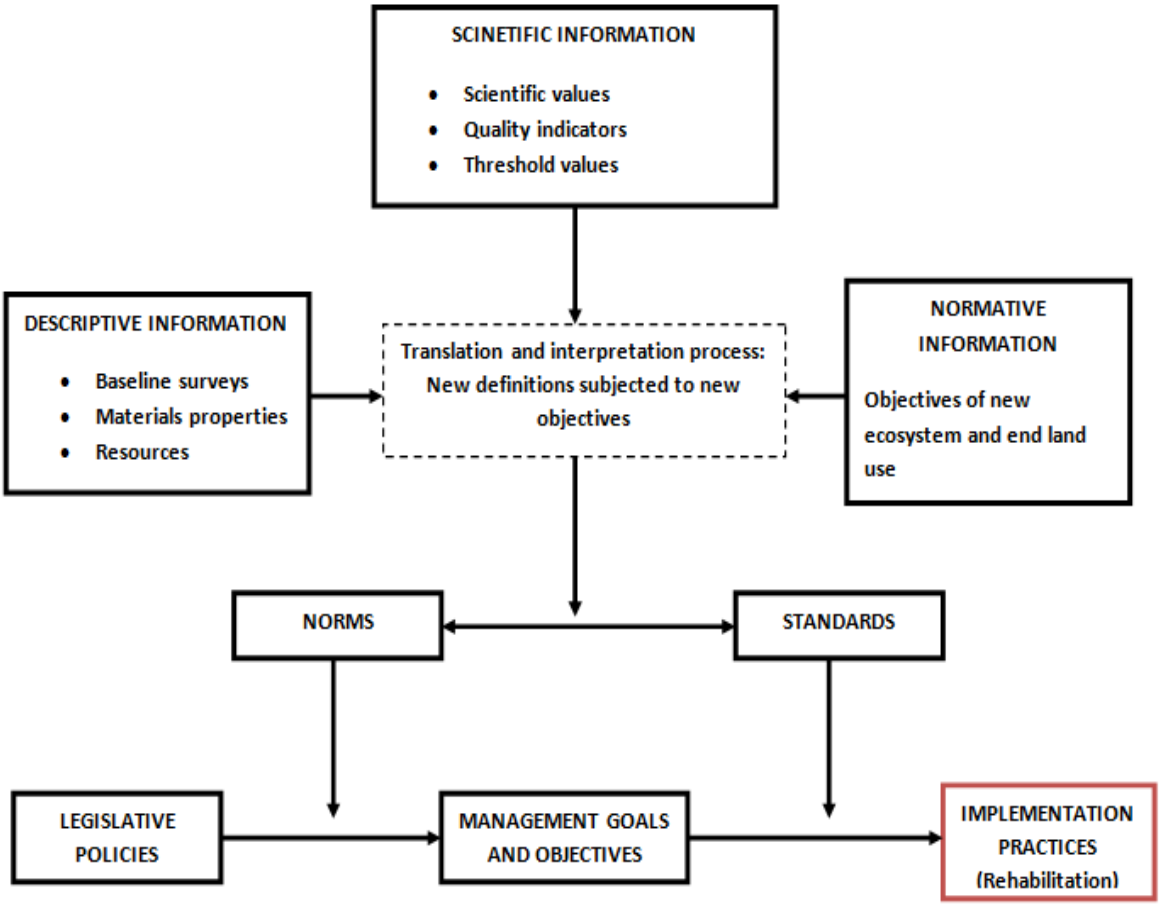
Impacts that change conditions affecting these objectives are often broadly discussed as the 'impacts' or the environmental impacts of a site or a closure plan. It is convenient to consider potential impacts in four groupings:

- **Physical stability** - buildings, structures, workings, pit slopes, underground openings etc. must be stable and not move so as to eliminate any hazard to the public health and safety or material erosion to the terrestrial or aquatic receiving environment at concentrations that are harmful. Engineered structures must not

deteriorate and fail.

- **Geochemical stability** - minerals, metals and 'other' contaminants must be stable, that is, must not leach and/or migrate into the receiving environment at concentrations that are harmful. Weathering oxidation and leaching processes must not transport contaminants, in excessive concentrations, into the environment. Surface waters and groundwater must be protected against adverse environmental impacts resulting from mining and processing activities.
- **Land use** - the closed mine site should be rehabilitated to pre-mining conditions or conditions that are compatible with the surrounding lands or achieves an agreed alternative productive land use. Generally the former requires the land to be aesthetically similar to the surroundings and capable of supporting a self-sustaining ecosystem typical of the area.
- **Sustainable development** - elements of mine development that contribute to (impact) the sustainability of social and economic benefit, post mining, should be maintained and transferred to succeeding custodians.

The diagram below illustrates the typical requirements and flow of information to reach a point where rehabilitation practices can be implemented. Various forms of information exists that must be integrated in a translation and interpretation process where new definitions subjected to new objectives can be reached. Basically the information gathering process will guide the development of a site specific rehabilitation plan. From the information gathered new rehabilitation and closure objectives can be established. The flow diagram below shows the information that will be established to inform the rehabilitation program.



Flow diagram 2: Diagrammatic illustration of rehabilitation plan development

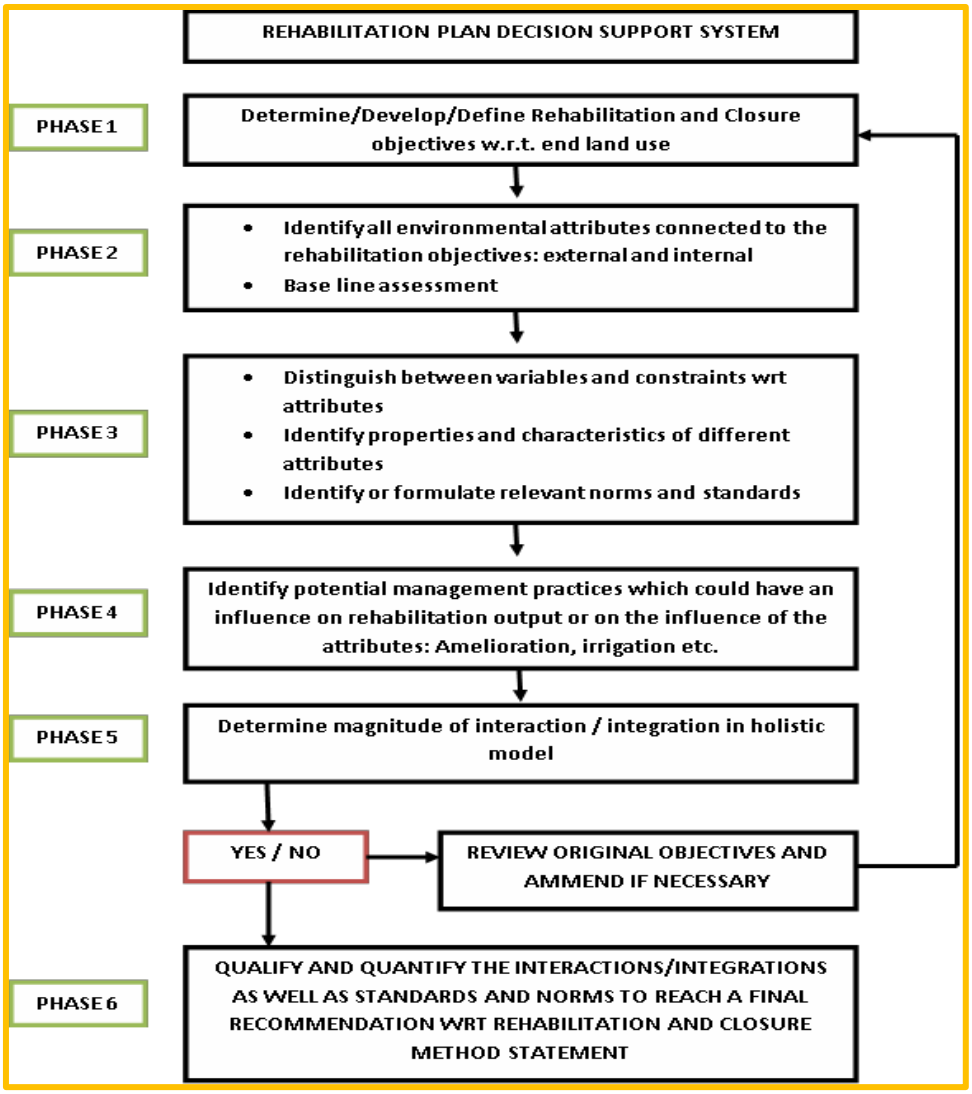
The current main aspects of the mine closure and rehabilitation plan are to remove all infrastructures at closure. The offices, workshops and other facilities will be removed and sold for their salvage value in order to be re-used or disposed of as scrap (re-use and recycling is encouraged).

Electrical and water supply connections (cables and taps) to the mining area will be terminated and made safe. Surface haul roads and compacted surfaces will be ripped, top soiled where necessary and vegetated.

In general, the current planning without the necessary inputs of the specialist studies and investigations include;

- The introduction of both organic and inorganic ameliorants (fertilizers) where required;
- Soil testing will be undertaken to determine the fertility status of the soils, which will then be compared to the baseline levels to determine the ameliorant requirements;

- Topsoil will be replaced, ameliorants added and planted with and appropriate seed mixture.



Flow diagram 3: Typical water balance considerations during the design of a clean and dirty water separation system

2.3.1.2 Rehabilitation of surface trenches/pits

On completion of operations, all structures or objects at the site camp shall be dealt with in accordance with Section 44 of the MPRDA. After all foreign matter has been removed from site; excavations shall be backfilled with subsoil, compacted and levelled with previously stored topsoil. No foreign matter such as cement or other rubble shall be introduced into such backfilling.

On completion of the mining operation, the areas shall be cleared of any contaminated

soil. The surface shall then be ripped or ploughed to a depth of at least 300mm and the topsoil previously stored adjacent to excavations, shall be spread evenly to its original depth over the whole area. The area shall then be fertilised. The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora. Where sites have been rendered devoid of vegetation or where soils have been compacted by heavy machinery, the surface shall be scarified and ripped.

Photographs of the different mining target sites, before, during mining and after rehabilitation and closure, will be taken at selected fixed points and kept on record for regional manager's information.

Rehabilitation of the new landscape would be done in such a manner to blend in with the surrounding landscape and allow normal surface drainage to continue. Water control systems must be implemented to prevent erosion.

The visual impact would be addressed by means of:

- Re-vegetation with grasses
- Removal of any infrastructure, scrap, waste that would contribute to a negative impact.

2.3.1.3 Fertilisation of Areas to be rehabilitated

If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, it may be required that soil be analysed and any effects from mining be corrected and the area be seeded with a seed mix to his or her specification.

2.3.1.4 Seeding of Grass Seed Mixture and planting of Woody Species

The seed mix must therefore take into account the availability of indigenous grass seeds as per the above, different soil situations and the prevailing climatic conditions of the area.

2.3.1.5 Demolition / Removal of infrastructure

On completion of operations all structures or other infrastructure on the mining terrain shall be dealt with in accordance with Section 44 of the MPRDA.

2.3.1.6 Monitoring and Maintenance

The post-monitoring period following decommissioning of mining activities must be implemented by a suitable qualified independent party for a minimum of 2 years unless otherwise specified by the DMR. The monitoring activities during this period would include:

- Inspect and remedy of erosion around rehabilitated trench and drill sites
- Inspect rehabilitated areas re-vegetation rate
- Remove alien invader species

Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed mining activities and incorporated into post closure monitoring and management.

2.3.1.7 Post Closure Monitoring and Maintenance

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

- Confirm all de-contaminated sites are free of latent pollution after decommissioning;
- Confirm all waste, wastewater or other pollutants generated as a result of decommissioning will be managed appropriately, as per requirements of the Final Rehabilitation Plan;
- Confirm acceptable cover has been achieved in areas where indigenous vegetation is re- established;
- Confirm that trench, pit and drilled holes on site (all mining target areas) are safe and not a potential hazard for humans, wild animals or livestock.

Annual Environmental Report will be submitted to the DMR at least one year post decommissioning. The monitoring reports shall include a list of any remedial action required to ensure that the site remains safe and pollution free after infrastructure has

been removed and alien invader species free.

2.3.1.8 Managerial Capacity

The applicant will be responsible for ensuring compliance with all the provisions of the mining permit and supporting plans and documentation. The Applicant must have the knowledge and understanding of the applicable legislation and guidelines. The applicant must where necessary appoint suitably qualified specialists, engineers and other internal and external resources to comply with the applicable commitments and requirements. The applicant must also ensure that suitable communication avenues are in place with local communities and relevant stakeholders.

An independent Environmental Assessment Practitioner shall be appointed to ensure compliance with requirements of the Final Rehabilitation, Decommissioning and Closure Plan and to undertake the following tasks:

- Conduct pre-closure environmental site assessment, risk assessment and landowner consultation
- Compile a site specific final closure and decommissioning plan; and
- Conduct periodic compliance monitoring and reporting during closure.

2.3.1.9 Relinquishment Criteria

The end land use is natural/grazing as the study site is covered in pristine indigenous vegetation and is a declared nature reserve.

The relinquishment criteria therefore include:

- No waste materials must have remained on site
- The vegetation cover of the disturbed target sites must be consistent with the surrounding vegetation cover, biodiversity levels restored and no faunal mortalities due to mining.
- All complaints registered during the mining and closure must have been addressed

2.3.1.10 Closure cost calculation

This Financial Provision Calculation has been undertaken as per the Department of Mineral Resource (DMR) “Guideline Document for Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine” published in January 2005. The DMR Guideline format makes use of a set template for which defined rates and multiplication factors are used. The multiplication and weighting factors which ultimately define the rate to be used are determined by amongst others the topography, classification of the mine according to the mineral mined, the risk class of the mine and its proximity to built-up or urban areas. The 2005 DMR Master Rates were updated and published by the DMR in 2018. These quantum has been used to calculate the financial provision for rehabilitation cost. The total rehabilitation costs are **R 170 478.00**.

Table 3: Financial Provision Calculation

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	14,05	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	195,76	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	288,49	1	1	0
3	Rehabilitation of access roads	m2	0,01	35,03	1	1	0,3503
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	340,01	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	185,46	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	391,53	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0,5	205242,16	1	1	102621,08
7	Sealing of shafts adits and inclines	m3	0	105,09	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0,1	136828,1	1	1	13682,81
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	170416,93	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	494971,55	1	1	0
9	Rehabilitation of subsided areas	ha	0	114572,93	1	1	0
10	General surface rehabilitation	ha	0,01	108390,94	1	1	1083,9094
11	River diversions	ha	0	108390,94	1	1	0
12	Fencing	m	10	123,64	1	1	1236,4
13	Water management	ha	0	41213,28	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0,2	14424,65	1	1	2884,93
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum				1	0
					Sub Total 1		121509,4797

1	Preliminary and General	14581,13756	**weighting factor 2** 1	14581,13756
2	Contingencies	12150,94797		12150,94797
			Subtotal 2	148241,57
			VAT (15%)	22236,23
			Grand Total	**170478**

2.4 DMR Classification

The DMR Guideline Document classifies a mine/activity according to a number of factors which allows one to determine the appropriate weighing factors to be used during the quantum calculation which include:

- Mineral mined/explored
- Risk class of mine/operation
- Environmental sensitivity of site
- Type of operation proposed
- Geographic location

Once the risk class (Class A, B or C) and the sensitivity of the area where the mine is located (High Medium, Low) had been determined using the appropriate tables the unit rates for the applicable closure components were identified. The primary risk class is categorised as Class A (High Risk), Class B (Medium Risk) or Class C (Low Risk). Mining can be considered as Class B – Medium Risk operation. The study site sensitivity was determined by establishing the overall sensitivity of the area by accepting the most sensitive of the three (biophysical, social, and economic).

In terms of biophysical the site is of low sensitivity due to it being largely natural with a vibrant fauna and flora and as it forms part of an overall ecological regime of conservation value. From a social perspective, the site is of medium sensitivity due to local communities being within sighting distance of some of the target areas. The overall activity class is to be Class B.

2.5 Closure monitoring, auditing and reporting

Monitoring is of ultimate importance as closure will only be obtained once evidence can be presented to the DMR that the closure objectives have been achieved and that closure plans have been effectively implemented and rehabilitation is sustained.

The mechanisms that will be applied to monitor the success of the EMPr include:

- Performance Assessment Report of the EMPr and Closure Plan
- Physical monitoring
- Compliance Audits
- Addressing external complaints, incident reporting

The Project Geologist, normally, will be responsible for daily monitoring. Internal monthly and annual performance assessment would be conducted of which records would be kept to inform an annual Performance Assessment Report of the EMPr and Closure Plan which will be submitted to the DMR. An external audit in the form of an EMPr Performance Assessment will be conducted every two years by an independent consultant and submitted to the DMR.

According to Regulation 34 of the NEMA EIA Regulations of 2014, the holder of an environmental authorisation must for the period during which the environmental authorisation, EMPR and Closure Plan remain valid:

- Ensure compliance with the conditions of the environmental authorisation and the EMPR and where applicable the closure plan, is audited and;
- Submit an environmental audit report to the relevant competent authority.

2.6 Overall Mine Stability

New working bench heights will be limited to 12m based on geotechnical and stability considerations and is matched to the fleet size to be used. Working benches will have a minimum width of 15m. The strategy of bench mining in its self is the single biggest contributor to overall mine stability.

Typical modes of failure in open cast mines, which are hazardous due to falls of ground include;

- Failure of soft Overburden.
- Failure of intact rock material.
- Failure along pre-existing discontinuities such as joints and faults.
- Falls of wedges of ground due to combinations of joints.
- Toppling of steeply dipping discontinuities from the highwall.
- Combinations of the above.
- Circular failure in overburden soil, waste rock or heavily fractured rock with no identifiable structural pattern. This type of failure can be avoided by reducing the bench height.
- Rock mass failures can occur through broken blocky rock with a similar mode of failure. The strength of the rock mass is difficult to measure and a number of rock

classification systems are normally used to estimate the strength of the rock mass and recommend suitable slope angles.

2.7 Summary

- The perimeter fencing shall be standard stock-proof fencing which shall be maintained at all times.
- Twenty-four hour controlled access shall be maintained at all access points to the mining and stockpile areas.
- No personnel shall be housed on site and no fires are permitted on the site.
- On site sanitation shall be provided.
- Provision for diesel storage on site shall be made including all necessary approvals and risks according to the EMPr.
- No fauna or flora shall be removed without prior authorization.
- All haul roads and stockpile areas shall be rehabilitated as per the EMPr including the ripping of compacted areas, covering with the available topsoil and revegetation.

(i) Listed and specified activities

The proposed mining activity triggers activities listed in NEMA GNR 327 of 2017: Listing Notice 1 as follows:

Activity 21: "*Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks directly related to the extraction of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)*".

Table 5: Summary of NEMA Listed activities being applied for:

NAME OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY Ha OR m²	LISTED ACTIVITY	APPLICABLE LISTING NOTICE
Office/camp facilities	(100m²)	Activity 21	GNR 327, Listing Notice 1
Stores	(100m²)	Activity 21	GNR 327, Listing Notice 1
Topsoil Stockpile Areas	(450m³)	Activity 21	GNR 327, Listing Notice 1
Box cut	(40000m²)	Activity 21	GNR 327, Listing Notice 1
Product Stockpile Area	(625m²)	Activity 21	GNR 327, Listing Notice 1
Vehicle & Loading Bay	(300m²)	Activity 21	GNR 327, Listing Notice 1
Screening plant	(225m²)	Activity 21	GNR 327, Listing Notice 1
Ablution	(6m²)	Activity 21	GNR 327, Listing Notice 1
Backfill Overburden & Discard	(50m³)	Activity 21	GNR 327, Listing Notice 1
Perimeter Fence	(100m X 150m)	Activity 21	GNR 327, Listing Notice 1
Mobile Crusher	(Metso LT 105 Jaw Crusher)	Activity 21	GNR 327, Listing Notice 1
Mobile Weighbridge	12m, 40ton	Activity 21	GNR 327, Listing Notice 1
Total Affected Mining Area	5 ha		

2.8 Policy and Legislative Context

Table 6: 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 (Act 108 of 1996)	Everyone has the right to a safe environment	Social and environmental impact assessment were conducted, and potential measures are being outlined in the EMP.
Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA)	The department of Mineral Resources is a custodian of minerals in South Africa. An Application for Prospecting has been logged and accepted.	A mining permit application was submitted to the DMR and due processes are followed.
National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)	There are no aspects of heritage importance in the area.	This study have assessed the site, no evidence of heritage resources were observed.
National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)	EIA regulations and guidelines are being followed throughout the application process.	This BA is being undertaken in terms of NEMA in order to determine any possible impacts on the environment and to undertake mitigation measures that reduce any potential harm to the environment. An application for an Environmental Authorisation is submitted to the DMR with supporting documents. The EDTEA MP is consulted for comments.
National Environmental Management: Waste Act (Act No. 59 of 2008) (NEM: WA)	Waste generated from mining activities	Mitigation measure has been outlined to prevent, reduce, reuse or safe disposal of waste. The EDTEA MP is consulted for comments.
National Environmental Management Air Quality Act (act no. 39 of 2004)	Dust generated by mining activities.	Mitigation measure has been outlined to prevent, manage and mitigate dust from mining activities. The EDTEA MP is consulted for comments.

National Environmental Management Biodiversity Act (act no. 10 of 2004) (NEMBA)	Biodiversity rich area	The area is located within the CBA, measures has been put in place in accordance with the act not to affect the agricultural resources. DAFF is consulted in this regard.
National Water Act (act no. 36 of 1998) (NWA)	There will be no abstraction of water from the watercourse or working within the water course.	This study have assessed the site, there is no evidence of water resources were observed. No need to apply for water use licence
The National Environmental Management: Protected Areas Act (act no. 57 of 2003)	Biodiversity rich area	The area was scanned through the SANBI database of protected area. The area is not protected. DAFF & EDTEA is consulted in this regard.
National Forest Act (act no. 84 of 1998)	Biodiversity rich area	There area has been assessed, there are no protected trees. DAFF is consulted in this regard.
Municipal Integrated Development Plans (IDPs)	Mining development within the area demarcated for fore	One of the key issues identified by the IDPs is to facilitate the land claims. Municipal plans were used to identify relevant socio-economic information and spatial development information within which the area falls under. The District and Local municipality have been consulted.
Occupational Health and Safety Act: Act No 85 of 1993	Safety of workers and the community	Health and Safety are key components of any mining activity. Health and Safe measured are provided in this report. Measures included are in accordance with this Act. The DMR is consulted in relation to health and safety.
Conservation of Agricultural Resources Act: Act No 43 of 1983.	Biodiversity rich area	The area it is located within the CBA and Agricultural area, measures has been put in place in accordance with the act not to affect the biodiversity and agricultural resources. DAFF is consulted in this regard.
National Environmental Management: biodiversity Act 10 of 2004.	Biodiversity rich area	The area is located within the CBA, measures has been put in place in accordance with the act not to affect the agricultural resources. DAFF is consulted in this regard.
Environmental Conservation Act: Act No 73 of 1989.	Biodiversity rich area	Elements of this Act were used as a guideline for best practice. DAFF is consulted in this regard.

2.9 Need and Desirability of the proposed activities

Sustainable development

South Africa is a signatory to the sustainable development (SD) resolutions. It is described by the Brundland report as the “development that meets the current needs of the present generations, without compromising the needs of the future generations. Furthermore, the concept of SD strive for the balance between society, economy and environment. The diagram below illustrates how SD show be perceived. The “three overlapping cycles” model of sustainable development (see diagram below) where the economy, environment and society are equally considered for any development.

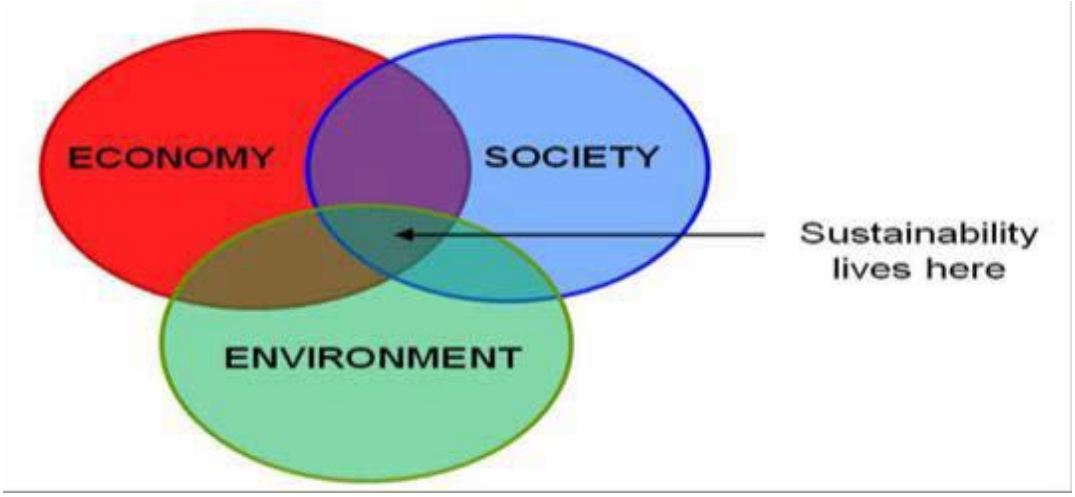


Diagram 4: The sustainability model that drives application

Moreover, SD goals are aimed at eradicating poverty, decent work and economic growth as well as industrial and infrastructure development.

2.9.1 Mining and Biodiversity Guidelines

The Mining and Biodiversity Guidelines (2013)2 state that: “Sustainable development is enshrined in South Africa’s Constitution and laws. The need to sustain biodiversity is directly or indirectly referred to in a number of Acts, not least the National Environmental Management: Biodiversity Act (No. 10 of 2004) (here as the Biodiversity Act), and is fundamental to the notion of sustainable development. International guidelines and commitments as well as national policies and strategies are important in creating a shared vision for sustainable development in South Africa”.

DMR, as custodian of South Africa's mineral resources, is tasked with enabling the sustainable development of these resources. This includes giving effect to the constitutional requirement to "prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development".

2.9.2 Environmental desirability

The proposed area is located within the proposed site is characterised by summer rainfall with very dry winters. Temperature fluctuations generally correspond with those of the rainfall patterns of the proposed area, which makes it convenient to effectively mine throughout the year.

2.9.3 Overall desirability

Coal mining is an important mineral resource used to strengthen the community development. The mining operation will help to boost the economy of the Local Municipality. Many local people will be hired to during the lifetime of the project. The services required can also be sourced locally depending on their availability thus growing the economy of the area.

The broader socio-economic benefits of the project include employment, skills development, local economic development, and increased business development for the area generally. While the project is small in operation, the providing of high quality Aggregate/Gravel to be used will aid the construction sector in the area in terms of service delivery and local economic development.

2.10 Motivation for the overall preferred site, activities and technology alternatives

Mining is important for economic development, to construct durable, modern structures, employment creation and revenue collection.

The preferred site was chosen, as it will result in minimal adverse socio-economic impacts and a level of environmental impacts that can be managed and rehabilitated through effective EMPr and rehabilitation plan implementation. The technology to be used, involve mechanical removal of gravel using an excavator, on site screening and loading of materials with a front-end loader, was deemed the most feasible technology for the purpose of mining operation. Minimal infrastructure will result in cheaper and more effective rehabilitation upon mine closure.

The methods to be used have been determined in the design phase and have considered potential environmental impacts when identifying the preferred methods.

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

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

(i) Details of the development footprint alternatives considered

With reference to the site plan provided as Appendix D and the location of the individual activities on site, provide details of the alternatives considered with respect to:

(a)) the property on which or location where it is proposed to undertake the activity;
(b)) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d)) the technology to be used in the activity;
(e)) the operational aspects of the activity; and
(f) the option of not implementing the activity.

(a) <u>The property on which or location where it is proposed to undertake the activity</u>
The proposed coal mine will take place on portion 61 & 62 of Nootgedacht J300. All infrastructures and activities will take place on the aforementioned site.

Quality coal is evenly distributed over the entire area. Hence, there is no alternative location of the proposed mining permit.

The type of activity to be undertaken

Other activity alternatives have therefore not been considered as the sole purpose of the proposed project is to mine from the section of the. The only other activity required to be assessed in terms of NEMA is the “do-nothing” alternative.

The application is for mining permit and alternatives were considered. The proposed site is the only land that is within reasonable reach to the applicant.

The design or layout of the activity

The location of the infrastructure will be determined based on the location of the mining activities. All infrastructure will be temporary and/or mobile. The site layout will be determined by considering both spatial and practical mining operation aspects. The proposed layout and temporary nature of the mining activity and associated infrastructure will be implemented with the aim to reduce substantial impacts on the area.

The technology to be used in the activity

The technology used in a mining project is determined by the shape, position and orientation of the mineral resource, with the technology alternative for gravel mining being restricted to the use of excavator, bulldozer and tipper truck, water cart and hauling vehicles (trucks/ 4x4 bakkies

The topsoil will be removed and stockpiled for rehabilitation and the gravel material mined will be stockpiled and sold as building sand. No sand washing will be required thus no infrastructure (wash plant and associated infrastructure) will be required onsite.

The option of not implementing the activity

The ‘no-go’ alternative is the option of not undertaking mining permit activities on the project site. The no-go option assumes the site remains in its current state. The no go alternative would result in no impacts on the social and biophysical environment.

The Project Manager and Safety Officers shall ensure that all “no go” areas are demarcated and that no unauthorised entry, litter, stockpiling, dumping or storage of equipment or materials shall be allowed within the demarcated “no go” areas. Once mining activities within an area has been completed and the area has been rehabilitated and re-vegetated, it shall be considered a “no go” area.

The option of not implementing the activity has been considered. It also assumes that the high possibility of this activity to lead to socio-economic gains will not be realised and, therefore the option of not implementing the activity will not be pursued at this stage.

(ii) Details of the Public Participation Process Followed

The Public Participation Process (PPP) has been structured to provide I&APs with an opportunity to gain more knowledge about the proposed project, to provide input through the review of documents/reports, and to voice any issues or concern at various stages throughout the EIA process. This process includes all I&AP’s (e.g. directly affected landowners, national-, provincial- and local authorities, and local communities etc.).

The Public Participation Process (PPP) was conducted in terms of Chapter 6 of the National Environmental Management Act, 1998 (Act 107 of 1998).

The Public Participation Process conducted to date is summarised below, please refer to Appendix B for a detailed Public Consultation Report

Table 7: Summary of the PPP undertaken to date

Task	Details	Date
I&AP notification		
I&AP identification	An I&AP database was developed for the project by establishing the jurisdiction of organisations, individuals and businesses in proximity to the project site or within an interest in the proposed development. The database of I&APs includes the landowner, the adjacent landowners, relevant district and local municipal officials, relevant national and provincial government officials, and organisations. This database is being augmented via chain referral during the BA process and will be continually updated as new I&AP's are identified throughout the project lifecycle. The current list of potential I&APs is attached.	Continuous process
Site notices	A3 Site notices were placed at strategic points to inform the general public, I&AP's of the proposed project and the PPP. Photos of the site notices have been included in Appendix B	2 June 2021
Media Adverts	Newspaper advert on Witbank News	9 June 2021
Comments received	The comments received from the landowners, adjacent quarry and other	Continuous
Comment on DBAR	All the relevant stakeholders will be notified of the availability of the	
Public meeting	Meeting of all interested parties	

Final BA Report Phase

All comments raised by I&AP's during the 30-day review period of the Draft BA Report will be included in the enclosed Final Basic Assessment Report to be submitted to DMR.

SECTION 3: IDENTIFICATION AND RISK RATINGS OF POTENTIAL IMPACTS

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

Table 5: Impact assessment table for the construction phase

Environmental Aspect	**Nature of potential impact/risk**	**Environmental Impact Significance Before Mitigation**										
		Severity	Spatial Scale	Dura-tion	**Conse q-uence**	Frequ-ency of Activity	Freque-ncy of impact	Legal issues	Detection	**Likeli-hood**	Signif-icance/risk	Risk Rating
Socio-economic	Influx of job seekers will have a negative social impact on the landowners and land occupiers.	2	1	3	**6**	4	2	5	1	**12**	72	Moderate
	Unauthorised access to private property outside of the demarcated areas will result in conflict with landowners.	2	1	3	**6**	4	2	5	1	**12**	72	Moderate
	Increased traffic in the area will increase the likelihood of accidents on the roads, posing a health and safety issue for the land owners and land occupiers.	2	1	3	**6**	4	2	5	1	**12**	72	Moderate
	The influx of job seekers in the area may result in an increase in petty crimes.	2	1	3	**6**	4	2	5	2	**13**	78	Moderate
	Possible boost in short term local small business opportunities.	3	3	3	**9**	4	2	5	1	**12**	108	Moderate

Ground water through soil contamination	Localised spillages of oils from machinery leaching to groundwater contamination.	2	1	3		6		4	2	5	1		**12**		78		Moderate
	Box cutting and excavation in the area may impact the flow the groundwater flow unless sealed.	2	1	3		**6**		4	2	5	1		**12**		78		Moderate
Surface Water through soil contamination	Increase in silt load in runoff due to site clearing, grubbing and the removal of topsoil from the footprint area associated with the drill sites and associated infrastructure.	2	3	1		**6**		4	2	5	1		**12**		78		Moderate
	Potential deterioration in water quality due to the potential accidental spillages of hazardous substances.	2	3	2				4	2	5	1		12		78		Moderate
	Debris from poor handling of materials and/or waste blocking watercourses, resulting in flow impediment and pollution.	2	2	2													
	Contaminated dirty water runoff to surrounding areas	2	3	2		6		4	2	5	1		12		78		Moderate

	resulting in the impact on local surface water quality.												
	Increase of surface runoff and potentially contaminated water that needs to be maintained in the areas where site clearing occurred.	2	2	2	6	4	2	5	1	12	78		Moderate
Wetlands and Aquatic Ecosystems	Localised changes to the riparian areas as a result of vegetation clearing.	3	3	3	9	4	2	5	1	12	108		Moderate
	Loss of habitat and wetland ecological structure as a result of site clearance activities and uncontrolled wetland degradation.	3	3	3	9	4	2	5	1	12	108		Moderate
	Impact on the wetlands systems as a result of changes to the sociocultural service provisions.	3	3	3	9	4	2	5	1	12	108		Moderate
	Increased runoff due to topsoil removal and vegetation clearance leading to possible erosion and sedimentation of wetland and riparian resources.												

	Soil compaction and levelling as a result of construction activities and vehicle movement leading to loss of wetland and riparian habitat.	3	3	3		**9**		4	2	5	1		12		108		Moderate
	Impact on the hydrological functioning of the wetland systems.	3	3	3		**9**		4	2	5	1		12		108		Moderate
Heritage Resources	The proposed project has the potential to impact on local graves within the area.	2	1	2		**5**		4	2	5	1		12		108		Moderate
Palaeontological Resources	The proposed project has the potential to impact on sites of archaeological importance.	2	1	2		**5**		4	2	5	1		12		108		Moderate
	Excavation of exploratory boreholes has potential to impact on palaeontological resources	2	1	2		**5**		4	2	5	1		12		60		Moderate
Flora	Loss of localised biodiversity habitats within sensitive areas due to site clearance and establishment of drill sites.	2	1	2		5		4	2	5	1		12		60		Moderate
	Loss of localised floral species diversity including RDL and medicinal protected	2	1	2		5		4	2	5	1		12		60		Moderate

	species due to site clearance and establishment of drill sites.													
	Potential spreading of alien invasive species as indigenous vegetation is removed and pioneer alien species are provided with a chance to flourish.	2	1	2		5	4	2	5	1		12	60	Moderate
Fauna	Vegetation clearance may result in loss of faunal habitat ecological structure, species diversity and loss of species of conservation concern.	2	1	2		5	4	2	5	1		12	60	Moderate
	Habitat fragmentation as a result of construction activities of the access roads leading to loss of floral diversity.	2	1	2		5	4	2	5	1		12	60	Moderate
	Loss of faunal diversity and ecological integrity as a result of construction activities, erosion, poaching and faunal specie trapping.	2	1	2		5	4	2	5	1		12	60	Moderate
	Movement of construction vehicles and machinery may	2	1	2		5	4	2	5	1		12	60	Moderate

	result in collision with fauna, resulting in loss of fauna.												
Air Quality	Possible increase in dust generation, PM10 and PM2.5 as a result of bulk earthworks, operation of heavy machinery, and material movement.	2	1	2	5	4	2	5	1	12	60		Moderate
	Increase in carbon emissions and ambient air pollutants (NO2 and SO2) as a result of movement of vehicles and operation of machinery/equipment.	2	2	2	6	4	2	5	1	12	78		Moderate
Visual	Scaring of the landscape as a result of the clearance of vegetation.	2	1	2	5	4	2	5	1	12	60		Moderate
	Visual intrusion as a result of the movement of machinery and the establishment of the required infrastructure.	2	2	2	6	4	2	5	1	12	78		Moderate
	Indirect visual impact due to dust generation as a result of the movement of vehicles and materials, to and from the site area.	2	2	2	6	4	2	5	1	12	78		Moderate
Noise	The use of vehicles and machinery during the	2	2	2	6	4	2	5	1	12	78		Moderate

	construction phase may generate noise in the immediate vicinity.													
Soil, Land use and Land Capability	Localised chemical pollution of soils as a result of vehicle hydrocarbon spillages and compaction.	2	1	2		6		4	2	5	1		12		78		Moderate
	Localised clearing of vegetation and compaction of the construction footprint will result in the soils being particularly more vulnerable to soil erosion.	2	1	2		6		4	2	5	1		12		78		Moderate
	Localised loss of resource and its utilisation potential due to compaction over unprotected ground/soil.	2	1	2		6		4	2	5	1		12		78		Moderate
	Localised loss of soil and land capability due to reduction in nutrient status - de-nitrification and leaching due to stripping and stockpiling footprint areas.	2	1	2		6		4	2	5	1		12		78		Moderate
Traffic	Increase in traffic volumes as a result of pre-construction activities which may lead to an increase in	2	3	2		7		4	2	5	1		12		84		Moderate

	traffic congestion along the roads as well as the farm roads around the excavation area.														
Climate	Emissions of Green House Gases as a result of the use of plant, heavy moving machinery, generators etc.	2	2	2		6		4	2	5	1		12		78		Moderate
Waste Management	Potential water and soil pollution as a result of inappropriate waste management practices.	2	3	2		6		4	2	5	1		12		78		Moderate

3. Environmental Impact statement

3.1. Summary of the key findings of the environmental impact assessment;

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

Manmol Investments (Pty) Ltd will undertake measures to ensure that the identified impacts are minimised. Assessment of the impacts with the proposed mitigation measures has shown the significance of the impacts on all affected environmental aspects to be reduced from medium and low to low and negligible significance.

Land use will not change. Several landowners and land occupiers within the proposed project area may be affected although on a temporary basis due to the need to access the sites and the establishment and use of the campsite. Measures such as safety along the roads and dust suppression will be undertaken to ensure that the impacts on the land owners and land occupiers are minimised.

Storm water runoff from the dirty water areas of the excavation sites, its associated surface infrastructure (campsite) may have a detrimental impact on the surrounding water environment should this water be released to the environment. In order to prevent the occurrence of the above-mentioned impacts, dirty water collection sump will be used to collect all dirty water from the excavation site. The water collected from the sump will be re-used, evaporated and the sump will be rehabilitated once the excavation is finished. Sediments will be created from the site during the construction, operational and decommissioning phase, which may impact negatively on the surrounding water environment. The sediments will be treated should they contain hydrocarbon waste.

The employees will undergo training and will be given strict instruction not to undertake activities that will affect the environment and that may have an impact on the landowners. Waste generated from the site will be collected in proper receptacles and disposed of in registered waste disposal sites.

Impacts during the Construction phase

The construction phase of the project will entail the site establishment for the access roads as well as surveying and pegging sites. Environmental impacts on the biophysical and socioeconomic environment which are anticipated to occur throughout the construction phase were identified as follows:

Socio-Economic

The main positive impacts of the excavation activities will be the temporary creation of jobs during the construction phase of the project. The project may also result in a temporary boost in small local businesses in the area.

It is expected that the final site layout will take into account all the sensitive environment in the area and will avoid graves and other heritage and cultural resources in the area (if any). Movement of construction vehicles on the roads and other farm roads may increase the risks accidents on the roads. Other health and safety risks may be as a result on construction workers lighting fires on site and littering.

The risk will be low to medium

Groundwater

The use of earth moving machinery and construction vehicles on site poses the risk of chemical spillages including fuel and oils, which may leach into the groundwater. The removal of vegetation could furthermore lower the evapo-transpiration rates, thereby allowing a greater volume of potentially contaminated water to percolate to the underlying aquifer in the event of an accidental spill from the machinery. It must however be noted that the removal of vegetation will be limited to the required footprints for the access roads, the boreholes and sumps as well as the camp sites. The impact on evapotranspiration is therefore expected to be negligible. Site clearing and grubbing is unlikely to materially affect the groundwater within the project area. However, care should be taken during the utilisation and storage of hydrocarbons and chemicals, which may have an impact on groundwater quality as a result of spillages and uncontrolled release.

Risk will be low to medium

Surface water

Various substances may result in the pollution of groundwater sources. Pollution from litter and general wastes may occur due to improper site management. Washing down of vehicles and equipment may result in the pollution of surface and groundwater, and pollution may occur from poor vehicle maintenance and improper storage of hazardous materials such as fuel, sludge etc.

The potential impacts on surface water during the construction phase of the proposed project are as follows:

- Accidental spillages of hazardous substances from construction vehicles used
- Contamination of runoff by poor materials/waste handling practices;
- Debris from poor handling of materials and/or waste blocking watercourses;
- Contaminated dirty water runoff to surrounding areas resulting in the impact on local surface water quality;
- Increase in turbidity of the local water streams as a result of runoff of cleared areas; and
- Increase of surface runoff and potentially contaminated water that needs to be controlled in the areas where site clearing occurred.

Some level of sedimentation is expected to occur in the watercourses that traverse the project area as runoff is naturally anticipated to pick up environmental debris as it crosses natural areas. Increased turbidity is reversible and surface water should return to pre-impact turbidity levels once sediment levels entering the watercourse are reduced. Settled sediments should naturally move downstream during periods of high flow flowing storm events.

Wetlands and Aquatic Ecosystems

There is watercourse about 300m from the proposed project.

Heritage and Archaeological Resources

It should be noted that none of the SAHR is listed sites present within the proposed project area will be touched. However, it is highly unlikely that sites will consist such phenomenon, due to the fact that approximately 90% of the site has been transformed from its natural state to agricultural land (livestock and farming), it is unlikely that any

artifacts of heritage value will be found on site. In the event that any heritage artifacts including graves and human remains are uncovered during excavation, this will immediately be reported to SAHRA as per National Legislation.

Flora

The project may result in the following impacts on the floral environment during the construction phase:

- Destruction of potential floral habitats for species as a result of site clearing, alien species, improper waste management and soil compaction;
- Vegetation clearance may lead to floral habitat loss of potential species of conservational concern; removal of vegetation involves cutting down of trees, removing stumps and roots of the trees but only after authorization/permit has been provided. However, there is no trees in the proposed area.

Fauna

The project may result in the following impacts on the faunal environment during the construction phase:

- Loss of faunal habitat and ecological structure as a result of site clearing, alien invasive species, erosion, and general construction activities;
- Loss of faunal species due to collisions with construction vehicles and machinery;
- Loss of faunal diversity and ecological integrity as a result of construction activities, erosion, poaching and faunal specie trapping;
- Impact on faunal species of conservational concern due to habitat loss and collision with construction vehicles, Failure to initiate a rehabilitation plan and alien control plan during the construction phase may lead to further impacts on faunal habitat during the operation phase.

Minimal vegetation disturbance is expected due to the transformed nature of the sites and the small size of the borehole diameter. The loss of biodiversity is expected be insignificant as it will be limited to the footprints of the required infrastructure. However, mitigation and management of species of conservational concern, if any, needs to be adhered to. The infrastructure that will have the significant impact on biodiversity is expected to the access roads.

As the vegetation within the excavation region has been identified as least concern in terms of their conservation status, the relatively small loss of vegetation within already degraded agricultural areas is regarded as negligible.

Environmental Impacts

Impacts of excavation activities: Increased dust and noise generation, noise impact on fauna in the immediate surrounds, increase in veld fire risk and loss of vegetation and stock/wild life, decrease visual quality and impact on land uses are potential impacts.

Noise

Noise is unlikely to be an impact during excavation, due to the majority of the activities occurring during the day, and far away from public roads or community nodes.

Soil

Impacts of topsoil removal for pitting: Topsoil removal could lead to short term dust creation (air pollution). These exposed surfaces will increase the chances of soil erosion and potential soil loss.

Impacts on soil are likely to be low negative impact, as excavation and coring may be required in the later phases of the excavation. Soil erosion and disturbance impacts should be incorporated into the landowner agreements prior to excavation.

Air Quality

The movement of construction vehicles and earth moving machinery as well as the stripping of vegetation will likely result in an increase in nuisance dust, PM10 and PM2.5. There is also potential for increase in carbon emissions and ambient air pollution due to the movement of vehicles and construction machinery. It is expected that the implementation of dust suppressing mitigation measures will result in the reduction in nuisance dust.

Visual

The following impacts on the visual character as a result of the proposed project are envisaged during the construction phase:

- Scaring of the landscape as a result of the clearance of vegetation;

- Visual intrusion as a result of the movement of machinery and the erection of contractor camps; and

Indirect visual impact due to dust generation as a result of the movement of vehicles and materials, to and from the site

Key findings of the environmental impact assessment include:

- All the identified impacts will be localized, short term and will have a medium and low significance. The significance of potential environmental impacts can be reduced to low and very low significance with implementation of mitigation measures and monitoring.
- Cumulative noise, visual and air quality (dust) impacts are deemed to not be significant when proper mitigation measures are implemented.
- Vegetation loss is unavoidable during the construction phase of the project. This will however be limited to the footprint of the infrastructure. Care must be taken to manage any species of special concern as well as the proliferation of alien invasive plant species.

3.1. Methodologies applied

The following section is focused on discussing the methods used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks.

The risk assessment was conducted using methodology outlined in DWS 2015 publication. This methodology has been utilised for the assessment of environmental impacts where the consequence (severity of impact, spatial scope of impact and duration of impact) and likelihood (frequency of activity and frequency of impact) have been considered in parallel to provide an impact rating and hence an interpretation in terms of the level of environmental management required for each impact. The risk ratings and significance are indicated in the table 7-15 below.

Table 7: Severity

How severe does the aspects impact on resource quality (flow regime, water quality, geomorphology, biota, habitat)?

Insignificant / non –harmful	1
Small / potentially harmful	2
Significant / slightly harmful	3
Great/ harmful	4
Disastrous / extremely harmful and /or wetland(s) involved	5
Where "or wetland(s) are involved" it means that the activity is located within the delineated boundary of any wetland. The score of 5 is only compulsory for the significance rating.	

Table 8: Spatial Scale

How big is the area that the aspect is impacting on?

Area specific (at impact site)	1
Whole site (entire surface right)	2
Regional / neighboring areas	3
National	4
Global (impacting beyond SA boundary)	5

Table 9: Duration

How long does the aspect impact on the environment and resource quality?

One day to one month, PES, EIS and /or REC not impacted	1
One month to one year, PES, EIS and /or REC impacted but no change in status	2
One year to 10 years, PES, EIS and /or REC impacted to a lower status but can be improved over this period through mitigation	3
Life of the activity, PES, EIS and /or REC permanently lowered	4
More than life of the organisation /facility, PES and EIS scores, a E or F	5
PES and EIS (sensitivity) must be considered.	

Table 10: Frequency of the activity

How often do you do the specific activity?

Annually or less	1
6 monthly	2
Monthly	3
Weekly	4

Daily	5

Table 11: Frequency of the incident/ impact

How often does the activity impact on the environment?

Almost never / almost impossible / >20%	1
Very seldom / highly unlikely / >40%	2
Infrequent / unlikely / seldom / >60%	3
Often / regularly/ likely / possible / >80%	4
Daily / highly likely / definitely / >100%	5

Table 12: Legal issues

How is the activity governed by legislation

No legislation	1
Fully covered by legislation	5
Located within the regulated areas	

Table: 13 Detection

How quickly can the impacts/risks of the activity be observed on the resource quality, people or property?

Immediately	1
Without much effort	2
Need some effort	3
Remote and difficult to observe	4
Covered	5

Table 14: Rating classes

Rating	Risk Class	Management Description
1-55	Low (L)	Acceptable as is or consider requirement for mitigation impact
56-169	Moderate (M)	Risk and impact on notably are required and mitigation measures on a higher level
170-300	High (H)	Impact on the environment has a long term impact.

A low risk class must be obtained for all activities to be considered for a GA

Table 15: Calculation

Consequence = Severity + Spatial Scale + Duration
Likelihood = Frequency of Activity + Frequency of Incident + Legal Issues + Detection
Significance \Risk = Consequence X Likelihood

ENVIRONMENTAL MANAGEMENT PLAN

SECTION 4: MITIGATION AND MANAGEMENT MEASURE OF IDENTIFIED POTENTIAL IMPACTS

The objectives of the EMPr will be to:

- Provide sufficient information to strategically plan the excavation activities as to avoid unnecessary social and environmental impacts;
- Provide sufficient information and guidance to plan the excavation activities in a mine that will reduce impacts (social, physical and biological) as far as is practically possible;
- Ensure an approach that will provide the necessary confidence in terms of environmental compliance; and
- Provide a management plan that is effective and practical for implementation.

The EMPr addresses the environmental impacts associated with the project during Construction, Operation, Decommissioning and Post Closure Phases of the proposed project.

- Alien plant monitoring should take place after construction, throughout the lifecycle of the mine, as well as post closure of the mine.
- Development planning must restrict the area of impact to a minimum and designated area only.
- Closely monitor the sand extraction volumes and sediment recruitment rates. The active channel dimensions should remain relatively unchanged as annual wet season sediment recruitment should replace the mined material.
- Monitor and prevent contamination, and undertake appropriate remedial actions.
- Limit the visual and noise impact on receptors.
- Avoid impact on possible heritage finds.
- Promote health and safety of workers.
- Limit dust and other emissions to within allowable limits.
- Manage soils to prevent erosion.

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

the impacts were assessed to have significance ranging between medium and low Without the implementation of mitigation measures. All the identified impacts will have a reduced significance of low when the mitigation measures have been implemented.

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

Please refer to Section below for the management and mitigation measures

Potential Impact	Significance Rating (before mitigation)	Proposed Mitigation	Significance Rating (after Mitigation)
Socio-Economic	Moderate	-A complaints register should be kept on site, with records of complaints received and manner in which the complaint was addressed. -Employment of local people, unless the skills and expertise required are not available locally. -Random and regular alcohol and drug testing shall be conducted on all personnel responsible for operating machinery and driving construction vehicles to ensure the safety of the public;	Low
	Moderate	-Security and safety should be emphasized; -No workers shall be allowed to access private properties without the owner's knowledge and consent; -Access to private property and areas outside the designated	Low

		operation areas shall be strictly prohibited. -The use of roads that are not specified in this report is strictly prohibited.	
	Moderate	-Local speed limits and traffic laws shall apply at all times to minimise the occurrences of accidents on public roads; -The transportation of materials and rubbish shall be undertaken outside traffic peak hours to minimise inconveniencing residents; -The number of vehicles on the roads shall be kept to a minimum; Materials transported on public roads must be covered.	Low
	Moderate	-Liaise with the SAPS and existing forums in order to implement effective crime prevention strategies; and -The applicant will ensure that as far as possible local businesses will be used for required services during the operation of the mining project. -Recruitment should not be undertaken on site. -Employees should by all times carry the identification cards	Low
Impact on health, and	Moderate	-Training of workers in the correct use of the machinery	Low

safety of workers.		and/or equipment so as to avoid incidents. - Workers to wear Personal Protective Equipment (PPE). - Hazardous material must be correctly labelled and handled in a safe manner.	
Flora (Biodiversity and alien vegetation).	Moderate	-Preconstruction walk through the facility in order to locate species of conservation concern that can be translocated as well as comply with permitting conditions. -No species of conservation importance was observed on the site, however if there is a need to remove them a permit must be obtained from the competent authority. -Prior to construction any critical and medicinally important floral specimens that may occur within the site layout should be collected and replanted in the surrounding areas. -An ecologist must be onsite before any virgin land can be touched.	Low
	Moderate	-Keep the footprint of the disturbed area to the minimum and designated areas only. -Vegetate and irrigate open areas to limit erosion, but take	Low

		care not to cause erosion by irrigating. -Removal of vegetation during coal mining activities will be minimised to reduce the risk of excessive open areas occurring. -Adhere to existing roads -Implement an alien and invasive plant management plan. The plan should include details of monitoring and removing or controlling the recruitment of alien and invasive species within the disturbed areas. -Plant native species on the borders of the mining area and road sideways to prevent erosion and air pollution. -Where practical possibly rehabilitation should be undertaken progressively.	
Air quality	Moderate	-Dust suppression must be conducted during the operational phase of the project. -Correct speed will be maintained at the proposed project site. -Vehicle maintenance must be conducted regularly to avoid excessive diesel fumes. -Exposed areas should be revegetated with locally indigenous flora. If the soil is compacted, it should be ripped,	Low

		and fertilised. Implement effective and environmentally-friendly dust control measures, such as mulching or periodic wetting of the entrance road. -Plant native species on the borders of the mining area and road sideways to prevent erosion and air pollution. -Where practical possibly rehabilitation should be undertaken progressively.	
Noise disturbances	Moderate	-Noise reduction measures will have to be implemented in compliance with Noise standards and Regulations. -No sound amplification equipment to be used on site, -Limit vehicles travelling to and from the site to minimise traffic noise to the surrounding environment. -Limit construction activities to day time hours. -Mining related machines and vehicles to be serviced on a regular basis to ensure noise suppression mechanisms are effective. -Activities that will generate the most noise should be limited to during the day, where viable, in order minimise disturbance.	

		Equipment that is not in use should be switched off.	
Visual alteration	Moderate	-Limit the footprint area of the construction where possible. Topsoil stockpilesshould be vegetatedand positioned to reduce visual disturbance where possible. -Re-slope and reinstate the bank topography correctly during decommissioning. -Use colors of infrastructure that blend with the natural environement.	Low
Generation of waste.	Moderate	-Any waste generated must be stored in such a manner that it prevents pollution and amenity impacts. -Bins must be provided for waste and removed regularly from the site. -Waste to be disposed of at a licensed landfill site. -Hazardous waste to be correctly stored and disposed of in terms of relevant legislation and guidelines.	Low
Groundwater and soil contamination.	Moderate	-Storm water design should limit any uncontrolled runoff through disturbed areas on the bank. -Design and implement sand erosion sediment control	Low

		management measures. -Prevent any spills from occurring; If a spill occurs it is to be cleaned up immediately and Reported to the appropriate authorities. - All vehicles are to be serviced in a correctly bounded area or at an off-site location. -Ensure that spillage control kits are available during transport and on storage sites in case of any accidental leakages of spillages, which can then be cleared immediately. -The temporary storage facilities of fuel, lubricants and explosives must be a hard park, roofed and bounded facility. This will prevent contamination of soils and the possibility of contamination of the surface water resources. -Machinery should be maintained properly. -Diesel and other chemicals should be handled appropriately. - -Refuelling protocols must be followed to ensure no diesel is spilled during filling. The temporary stockpile and Toilet area should be constructed on open areas or where there is a	

		presence of alien invasive plant species. -The Engineer or Contractor must ensure that only clean stormwater/runoff enters the environment.	
Heritage resources (Fossils)	Moderate	Should any features of heritage be identified on site, these should not be disturbed. They should be safeguarded, preferably in situ, and immediately reported to a Heritage specialist and/or SAHRA.	Low
Soils Land use and Land Capability	Moderate	-Ensure that topsoil is properly stored, away from the streams and drainage areas. -The soils must be used for the backfilling and rehabilitation -The rehabilitated sump must be seeded with recommended seed mix consisting of indigenous species -Tarpaulins will be placed on the ground to prevent oil, grease, hydraulic fluid and diesel spills during emergency repairs.	Low
Climate	Moderate	-The number of construction vehicles and trips shall be kept to a minimum. -All the vehicles shall undergo maintenance on a regular basis to	Low

		improve on the combustion engine vehicle efficiency.	
Traffic	Moderate	-Local speed limits and traffic laws shall apply at all times to minimise the occurrences of accidents on public roads -The transportation of construction materials and rubbish shall be undertaken outside traffic peak hours to minimize inconveniencing residents.	Low

4.2. Assessment of each identified potentially significant impact and risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties).

Table 17: Assessment of each identified potentially significant impact and risk

Name Of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance When mitigated are implemented
Site establishment						
General	Disturbance of surrounding areas	All	Site establishment phase	Low	• Fence the site indicated on the mine plan, prior to undertaking any activity on the site. • Treat all areas outside the fence as no-go areas. • Should any heritage features (e.g. artefacts, structures or human remains) be identified on site, all work should be ceased, and a heritage specialist should contacted to investigate the find.	Very Low

					• The heritage specialist will provide further management measures and recommendations in terms of notifying relevant heritage authorities, etc. • Failing implementation of the requirements listed in this table, a fine may be issued at the discretion of the ECO	
Vegetation clearance	Loss of ecological processes	Indigenous vegetation	Site establishment phase	Very Low	• Removal and disposal of alien vegetation • Stripping, mulching and stockpiling indigenous vegetation • Re-vegetation during rehabilitation	Very Low
Topsoil stripping	Dust Soil erosion Loss of topsoil	Natural vegetation and soil	Site establishment phase	Medium	• Control dust by wetting during dry, dusty conditions. • Prevent erosion by placing of berms • Follow correct topsoil stripping and stockpiling methods	Low

Subsoil and topsoil stockpiles	• Dust • Loss of topsoil and subsoil through inadequate management or erosion • Contamination of topsoil • Alien vegetation proliferation	• Natural vegetation • Top soil • Sub soil	Site establishment phase	Low	• Control dust by wetting during dry, dusty conditions. • Prevent erosion by placing of berms • Implement adequate subsoil and topsoil stockpiling methods And management • Prevent access of contaminants near topsoil stockpiles • Alien vegetation monitoring and management on topsoil stockpiles	Low
Site camp including ablution facilities, waste management facilities, material	• Soil erosion • Visual impacts for the landowners, surrounding land and road users	• Vegetation • Soil • Visual	Site establishment phase	Low	• Effective solid waste management • Sufficient housekeeping • Appropriate materials management • Locate site camp in disturbed area as far as possible	Very Low

and equipment storage						
Construction and Operational phase						
Vegetation clearance	Loss of ecological processes	Indigenous vegetation	Constructional phase	Low	• Removal and disposal of alien vegetation • Stripping, mulching and stockpiling indigenous vegetation • Re-vegetation during rehabilitation	Low
Soil stockpiles	• Dust • Loss of topsoil and subsoil through inadequate management or erosion • Contamination of topsoil • Alien vegetation proliferation	• Natural vegetation • Top soil Sub soil	Constructional and operational phase	Low	• Implement adequate subsoil and topsoil stockpiling methods and management • Prevent access of contaminants near topsoil stockpiles • Alien vegetation monitoring and management on topsoil stockpiles	Low

Site camp including. ablution facilities, waste management facilities, material and equipment storage, etc	• Soil erosion • Visual impacts for the landowners, surrounding land and road users	• Vegetation • Soil • Visual	Constructional phase	Low	• Effective solid waste management • Sufficient housekeeping • Appropriate materials management • Locate site camp in disturbed area as far as possible	Very Low
Material stockpiles	• Dust generation • Visual impacts on surrounding land and road users • Erosion	• Visual • Topsoil	Constructional and operational phase	Very Low	• Dust suppression measures • Erosion control measures • Screening of stockpiles behind existing vegetation • Stripping of topsoil before stockpiling materials	Very low

	• Topsoil sterilisation if topsoil is not stripped from affected area					
Blasting, Excavation, stockpiling of gravel, loading & haulage	• Noise • Dust • Traffic	Adjacent area to mining footprint	Operational phase	Very low	• Advise adjacent land users of expected blast at least 5 days prior. • Blasting should be according to the approved blasting plan to control vibration and fly-rock. • Control impact on roads by properly servicing the operating trucks • Speed limit should be 40 km per hr on gravel roads. • Control dust by wetting the ground during dry, dusty conditions. • Loads must be covered with tarpaulin.	Very low

					• Flag personnel to be on duty when trucks are running.	
Re-fuelling of plant	Contamination of environment	Soil environment	Operational phase	Low	• Prevent by not storing fuel on site and re-fuelling to be done from a mobile bowser with Dpc laid down to contain dripping	Low
Storm water control	Erosion	Soil environment	Operational phase	Low	Prevent erosion by placing of berms and temporary drains to reduce velocity of run-off water	Low
Site camp including: ablution facilities, waste management facilities, material and equipment	• Soil erosion • Visual impacts for the landowners, surrounding land and road users	• Vegetation • Soil • Visual	Construction and Operational phase	Low	• Effective solid waste management • Sufficient housekeeping • Appropriate materials management • Locate site camp in • disturbed area as far as possible	Very Low

storage, etc.						
Job creation	Job creation leading to improved socioeconomic conditions for community members and contractors	Community members	Construction and Operational phase	Medium positive	• Ensure that local community members and contractors are employed as part of the contract	Medium positive
Decommissioning Phase						
Decommissioning and rehabilitation	• Reinstatement of land use potential	Land Use	Decommissioning phase	Low positive	• Restoration of the landform and removal of infrastructure to reinstate land use potential	Low positive
	• Incorrect replacement of topsoil and subsoil leading to poor reinstatement of the area	Sub-soil and Top-soil	Decommissioning phase	Low	• Ensure rehabilitation plan is followed • Implement erosion control measures • Monitor erosion and remediate where necessary	Very low

	• Erosion					
	• Re-establishment of natural vegetation	Vegetation	Decommissioning phase	Low to very low positive	• Ensure adequate reseeding • Monitor reestablishment for two (2) years and remediate where necessary	Low positive
	• Alien vegetation proliferation	Alien Vegetation	Decommissioning phase	Low	• Monitoring and removal of alien vegetation for at least three (3) years after rehabilitation	Low to very low
	• Reinstatement of natural area (removing visual Impacts)	Visual	Decommissioning phase	Low positive	None	Low positive

4.4 Overall project risk rating

Risk rating	Confidence level	Control measures	Recommendation	Positive impact
Medium and with mitigation measures the risk will be insignificantly low risk	99.9%	Precautionary measures outlined in the EMP must be implemented. In addition an independent monitoring must be conducted by a competent environmentalist and DMR officials at regular intervals. Thus, be will be responsible for monitoring, reviewing, and verifying compliance with the Environmental Authorisation conditions and Rehabilitation plan.	After considering the activities involved in the mining phases, it deems necessary that these activities be carried out concurrently with the mitigation measure in order to minimise and eliminate the potential impacts.	The activity will enhance opportunities which will contribute towards the socio-economic development in the region. Thereafter, the development will be beneficial to the surrounding community and low impact to biodiversity.

4.4 Reasons for authorising or unauthorising the activities

Mining is important for economic development, to construct durable, modern structures, employment creation and revenue collection.

According to the impact assessment undertaken for the proposed project, the impacts of the project are considered to be of medium and low significance. The significance of the impacts can be reduced to low and very low when the mitigation measures are implemented.

The project will also have positive impacts due to the employment to be created although for a short term, as well as a short boost to local businesses.

The stakeholders were also requested for their comments. All comments received during Public Participation Process are included in the final BAR and EMPr. These comments are addressed as far as possible to the satisfaction of the interested and affected parties.

The management of the impacts identified in the impact assessment for all phases of the proposed project will be undertaken through a range of programmes and plans contained in the EMPr. In consideration of the layout plan and the management and mitigation measures contained within the EMPr compiled for the project, which are expected to be effectively implemented, there will be significant reduction in the significance of potential impacts.

SECTION 5: MOTIVATION AND ALTERNATIVES CONSIDERATIONS

5.1 The positive and negative impacts that the proposed activity

(This is in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected).

The impacts of the proposed site layout will be the same as those of the alternative sites that may be identified during the excavation exercise.

The positive impacts of the activities are the creation of employment, which is required in the region. This will result in job creation and support to local businesses is continued

The proposed site was selected because it is rich in coal and the coal is of good quality. The proposed site is located within a section of portion 61 & 62 of the Nootgedacht which is located at a flat gradient providing a large surface area suitable for excavation, with no permanent surface water and little vegetation. There are no wetlands on site. The aesthetic characteristics of the surrounding areas will be minimal to none.

The proposed activities have medium to low significance impacts, which will be short term activities in nature. The probability of occurrence of an impact was determined and most of the activities can be controlled and impacts can be reduced or avoided. The probability was also determined based on other excavation activities of similar nature. It was found that generally excavation activities have low impact on the environment.

5.2 Motivation where no alternatives sites were considered

The mining sector accounts for a quarter of all economic activity in the Mpumalanga province and is also the largest single sector, providing employment to 25 percent of the province's workforce. Mpumalanga contributes 83 percent of all coal produced in South Africa, making it the world's third largest coal- exporting region. Towns such as eMalahleni and Middleburg in the Nkangala District Municipality are the center of the coal mining industry. Mpumalanga coal mining industry is developing as a significant attractor of both foreign and local direct investment in the province. This is particularly important for the development and economic growth of the communities in eMalahleni.

As discussed previously, the proposed site was selected because it contains good quality coal and it is located in a convenient position close to the R104 and N4. The site is therefore regarded as the preferred site and alternatives sites

are not considered. There are no alternatives to be considered as the application has already been accepted. Only changes in the layout plan and access roads will be discussed and agreed on with the affected landowners.

The site layout was determined by considering both spatial and practical mining operation aspects. The location and extent of the mining activities will be based on the information derived from the desktop surveys as well as the specialist studies. Where practicable, the mining sites and location of infrastructure was selected on the basis to avoid sensitive environments such as wetlands, watercourses, biodiversity of conservation importance and heritage features.

5.3 Full description of the process undertaken to identify, assess and rank the impacts and risks

(*In respect of the final site layout plan) through the life of the activity*).

In order to identify the potential impacts associated with the proposed excavation activities, the following steps were undertaken:

- The stakeholder consultant process is currently being undertaken in a manner to be interactive, providing the landowners and identified stakeholders with an opportunity to provide input into the project. This is considered a key focus as the local residents have capabilities of providing site-specific information, which may not be available in desktop research material. Stakeholders were requested, as part of the notification letter, to provide their views on the project, and to state any potential concerns they may have. All comments and responses provide will be collated into the Comments and Responses Register, which will be attached to the final BAR, and will also be incorporated into the final impact assessment.
- A detailed desktop study was undertaken to determine the environmental setting in which the project is located. Based on the desktop investigations, various

resources were used to determine the significance and sensitivity of the various environmental considerations. The desktop investigation involved the use of:

- The South African National Biodiversity Institute (SANBI) Biodiversity Geographic Database LUDS System;
- The Department of Environmental Affairs 2015 Landcover and Landuse Mapping Database;
- Department of Water and Sanitation information documents such as the Internal Strategic Perspective (ISP) for the local rivers and Groundwater Vulnerability Reports
- Municipal Integrated Development Plans of the Municipality
- The Provincial Spatial Development Framework for the Mpumalanga Province.

The rating of the identified impacts was undertaken in a quantitative manner as provided in Section V (impact rating). The ratings were undertaken in a manner to calculate the significance of each of the impacts. The identification of management and mitigation measures was done based on the significance of the impacts and measures included are considered sufficient, appropriate and practical to protect the environment.

5.4 Summary of specialist reports

No specialist studies were conducted as part of this application. Site investigation by a qualified environmentalist and desktop information was used to compile the report and to conduct the impact assessment.

SECTION 6: LEGAL QUESTIONS

6.1 Aspects for inclusion as conditions of environmental Authorisation (EA)

The following conditions should be included in the Environmental Authorisation:

(a) The holder shall be responsible for ensuring compliance with the conditions contained in the EA. This includes any person acting on the holders' behalf, including but not limited to an agent, servant, contractor, subcontractor, employee, consultant or any person rendering a service to the holder of the EA.

(b) Any changes to, or deviation from the project description set out in the BAR must be approved in writing by this Department before such changes or deviation may be effected. In assessing whether to grant such approval or not, the Department may request such information as is deems necessary to evaluate the significance and impacts of such changes or deviations. It may be necessary for the holder of the EA to apply for further authorisations in terms of the EIA Regulations applicable at the time of the amendment.

(c) The activities, which are authorised, may only be carried out at the property indicated in the Reg 2.2 map.

(d) The holder of the EA must note that in terms of the National Forest Act (Act no.84 of 1998) protected plant species must not cut, disturbed, damaged, destroyed and their products must not be possessed, collected, removed, transported, exported, donated, purchased or sold unless permission in grated by the Department of Environment, Forestry and Fisheries.

(e) A minimum distance of 100m from any dwellings or infrastructure must be kept;

(f) No activities may be undertaken within 100m of watercourses.

(g) No activity should be taken within 100m from the important biodiversity area (threatened vegetation and animal species e.g. game farm).

(h) Landowners as well as land occupiers must be re-consulted at least 30 days prior to any prospecting activities undertaken on their properties; A map detailing the Mining locations should be submitted to the relevant landowners, prior to the commencement of the prospecting activities;

(i) Manmol Investments must ensure concurrent rehabilitation.

(j) The EA is only applicable to Mining permit permit application and associated activities only.

(k) Where any contacts details of the holder of the EA Changes, including the name of the responsible person, physical address/or telephonic details, the holder of the EA must notify the Department within 14 calendar days

(l) The EA does not negate the responsibility of the holder to comply with any other statutory requirements that may be applicable to the undertaking of such activities.

(m) The holder of the EA must ensure that any water uses listed in terms of the National Water Act be authorised by the Department of Human Settlement, Water and Sanitation prior to the commencement of such activities.

(n) The EA does not purport to absolve the holder of the EA from its common law obligations towards the owner of the surface land affected.

(o) The EA may be amended or withdrawn at any stage for non-compliance and provides no relief from the provisions of any other relevant statutory or contractual obligation.

(p) The holder of the EA must not that in terms of Section 30 of the National Environmental Management: Waste Act, 2008 (Act no 59 of 2008), no person may commence, undertake of conduct waste management activity, except in accordance, with the requirements of the norms and standards determined in terms of Section 19(3).

(q) The Department serves the right to Audit and/or inspect the activities without prior notification at any reasonable time and any frequency.

(r) The EA will only be effected in the event that a corresponding prospecting right is issues in terms of the MPRDA (as amended) and none of the activities listed in this EA may commence without the corresponding Mining permit.

(s) Should there be any conflicting conditions between this EA and approved granted by others authorities, the responsibility rests with the holder of EA to bring it to the attention of the Department for resolution.

(i) Non-compliance with any condition of this EA and approved EMP may result in the issuing of a directive in terms of section 28 and or a compliance notice in terms of section 31L of NEMA.

(j) The holder is reminded in terms of section 49(A)(1)(c) of NEMA, 1998, as amended, a person is guilty of an offence if that person fails to comply with or contravenes a condition of an EA.

(k) (v)A person convicted of an offence is liable to a fine not exceeding 10 million or to imprisonment for a period not exceeding 10 (ten) years, or to either such fines or such imprisonment.

6.2 Key factors to be considered by the Department (DMR) in making a decision

- The procedure that has been followed is in compliance with the provisions of the NEMA and the associated EIA Regulations as amended in 2017.
- The environmental Impacts associated with the proposed activity will be addressed by the proposed mitigation measures outlined in the Environmental Impact Assessment and Environmental Management programme.
- The baseline information contained in the BAR provided an adequate description of the site and impacts of the prospecting operation on the environment.
- An adequate Public Participation Process (PPP) was undertaken and the applicant satisfied the minimum requirements as prescribed in the NEMA:EIA Regulation 326 as amended in 2017 for public involvement.
- Comments, issues and objections raised have been adequately responded to.
- The national wide need to create economic and employment opportunities for previously disadvantages individuals.

6.3 Period for which the Environmental Authorisation is required

The mining permit has been applied for a period of five (5) years. Thereafter an extension will be applied when deemed necessary.

SECTION 7: FINANCIAL LIABILITY/REHABILITATION COSTS

7.1 Financial Provision

(States the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation)

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	14,05	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	195,76	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	288,49	1	1	0
3	Rehabilitation of access roads	m2	0,01	35,03	1	1	0,3503
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	340,01	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	185,46	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	391,53	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0,5	205242,16	1	1	102621,08
7	Sealing of shafts adits and inclines	m3	0	105,09	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0,1	136828,1	1	1	13682,81
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	170416,93	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	494971,55	1	1	0
9	Rehabilitation of subsided areas	ha	0	114572,93	1	1	0
10	General surface rehabilitation	ha	0,01	108390,94	1	1	1083,9094
11	River diversions	ha	0	108390,94	1	1	0
12	Fencing	m	10	123,64	1	1	1236,4
13	Water management	ha	0	41213,28	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0,2	14424,65	1	1	2884,93
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum				1	0
					Sub Total 1		121509,4797
1	Preliminary and General		14581,13756		**weighting factor 2** 1		14581,13756
2	Contingencies		12150,94797				12150,94797
					Subtotal 2		148241,57
					VAT (15%)		22236,23
					Grand Total		**170478**

7.1.1 How the aforesaid amount was derived

The financial provision for the environmental rehabilitation and closure of any mine/excavation and its associated operations forms an integral part of the MPRDA. Sections 41 (1) and, 41 (2), 41 (3) and 45 of the MPRDA deal with the financial provision for rehabilitation and closure. During 2012, the DMR made updated rate available for the calculation of the closure costs, where contractor's costs are not available, these apply.

The "Guideline Document for the Evaluation of Financial Provision made by the Mining Industry" was developed by the DMR in January 2005 in order to empower the personnel at Regional DMR offices to review the quantum determination for the rehabilitation and closure of mining sites. With the determination of the quantum for closure, it must be assumed that the infrastructure had no salvage value (clean closure). The closure cost estimate (clean closure) was determined in accordance with the DMR guidelines.

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

The amount required to cover the excavation operation is estimated to be R2 782 343.00, the rehabilitation and closure financial provision is estimated to be R 170 478.00 at this stage. Manmol Investments (Pty) Ltd will fund the operation and rehabilitation costs. The applicant hereby confirms that the amount is anticipated to be an operating cost and is provided for as such in the Excavation Work Programme.

SECTION 8: DECOMMISSIONING AND CLOSURE

8.1 Determination of closure objectives

In terms of Section 38(1)(d) of the MPRDA, Integrated Environmental Management and Responsibility to Remedy: "The holder of a mining permit must as far as it is reasonably practicable, rehabilitate the environment affected by the mining operations to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development".

In line with the above, it was agreed with the landowners that the land use would be restored to the pre-mining conditions.

The rehabilitation plan compiled by Basia Environmental Consultants was developed on the basis that the rehabilitated area will be made safe, stable as well as non-polluting and will be able to support self-sustaining ecosystems, similar to the surrounding natural ecosystems. To ensure that the rehabilitation plan is aligned with the closure objective, high-level risk assessment of the mining components was undertaken to establish the potential risks associated with the disturbed areas.

Closure of the mining site will entail rehabilitation of the disturbed areas to as close to the pre-mining condition or enhanced end-land use.

The closure objectives are to:

- To ensure that all areas that were impacted by the mining activities are physically stable and non-eroding after closure;
- Remove and/or rehabilitate all pollution and pollution sources such as waste materials and spills;
- To leave behind a rehabilitated site that is neat and tidy, giving an acceptable overall aesthetic appearance.
- To limit the possible adverse environmental consequences arising from the mining after closure and ensure that environmental functionality, where relevant, is reinstated;
- Restore disturbed areas and re-vegetate these areas with plant species naturally occurring in the area to restore the ecological function of the affected areas as far as practicable; and
- Eliminate all alien invasive plant species

Rehabilitation can be divided into two different streams, namely concurrent rehabilitation and final rehabilitation. Concurrent rehabilitation must be carried out along with the operations, and will decrease the final liability that the operation will carry at the time of closure. This concurrent rehabilitation will be carried out within the context of the EMPr. Final rehabilitation will be carried out once the operation goes into its closure phase. This final rehabilitation will be carried out within the context of the closure plan. The closure and rehabilitation plan should be modified and adapted as the project continues and more knowledge is generated about the environment and the impacts project.

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

The following have been highlighted as closure objectives:

- Minimising the area to be disturbed and to ensure that the areas disturbed during the mining activities are rehabilitated and stable, as per the commitments made in the EMP.
- Sustaining the pre-mining land use, and return the site to its near natural state as far as possible.
- This EMP will be made available to and discussed with each landowner before any mining activity commences on his/her property.
- Access to each property and placement of infrastructure will be done in consultation with the relevant landowner.

Proof of consultation is attached. Comments on the closure and rehabilitation will be expected from landowners and I&Aps after the review of the DBAR. All the issues raised by the I&Aps will be incorporated in the final BAR

8.3 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

After mining has been completed in one area, the site must be restored to its original state by implementing the measures listed in the table below.

Aspects/ Impact	Rehabilitation Measure	Monitoring Frequency and Responsibility
Removal of Structures	• Clear and completely remove from site all construction plant equipment, storage containers, signage, temporary fencing, temporary services, fixtures and any other temporary works; and • Ensure that all access roads utilised during construction (which are not earmarked for closure and rehabilitation) are returned (as far as possible) to their state prior to construction.	Once-off; Manmol Investments (Pty) Ltd (Applicant)
Vegetation clearing/ Replanting	• Remove any emerging alien and invasive vegetation to prevent further establishment; • All work is to be undertaken by suitably qualified personnel making use of the appropriate equipment; • Transplant will be done during the winter period (between April and September); and • Plant indigenous plants to minimise the spread of alien and invasive vegetation.	When revegetation is done and in blooming season

Aspects/ Impact	Rehabilitation Measure	Monitoring Frequency and Responsibility
Topsoil replacement	• Replace and redistribute stockpiled topsoil together with herbaceous vegetation, overlying grass and other fine organic matter in all disturbed areas of the mining site, including temporary access routes and roads. Replace topsoil to the original depth (i.e. as much as was removed prior to construction). • Prohibiting the use of topsoil suspected to be contaminated with the seed of alien vegetation. Alternatively, the soil is to be sprayed with specified herbicides. • Backfill planting holes with excavated material / approved topsoil, thoroughly mixed with weed free manure or compost (per volume about one quarter of the plant hole), one cup of 2:3:2 fertiliser and an approved ant and termite poison. • Where local soil has poor drainage, broken rock (Approx. 75 mm in diameter) must be placed to a depth of 150mm at the bottom of the planting hole prior to planting and backfilling with approved plant medium mixture.	Once-Off, Manmol Investments (Pty) Ltd (applicant)
Waste and Rubble Removal	• Clear the site of all inert waste and rubble, including surplus rock, foundations and batching plant aggregates.	Once-Off; Manmol Investments (Pty) Ltd

Aspects/ Impact	Rehabilitation Measure	Monitoring Frequency and Responsibility
	• Remove from site all domestic waste and dispose of in the approved manner at a registered waste disposal site	
Solid & Hazardous Waste	• Store hazardous waste as indicated on the approved Environmental Management Programme (EMPR). • Dispose of all hazardous waste not earmarked for reuse, recycling or resale at a registered hazardous waste disposal site. • Remove from site all temporary fuel stores, hazardous substance stores, hazardous waste stores and pollution control sumps. Dispose of hazardous waste in the approved manner. • Do not hose oil or fuel spills into a storm water drain or sewer, • Dispose of all visible remains of excess cement and concrete after the completion of tasks. Dispose of in the approved manner (solid waste concrete may be treated as inert construction rubble, but wet cement and liquid slurry, as well as cement powder must be treated as hazardous waste).	Once-Off, Manmol Investments (Pty) Ltd (applicant)
Erosion protection	• Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction site. • Retain shrubbery and grass species wherever possible.	After rainfall events

Aspects/ Impact	Rehabilitation Measure	Monitoring Frequency and Responsibility
	• Perform regular monitoring and maintenance of erosion control measures.	

8.4 Confirmation that the rehabilitation plan is compatible with the closure objectives.

Closure of the mining site will entail rehabilitation of the disturbed areas to as close to the pre-mining condition after removal of infrastructure and supporting vehicles.

The closure-related objectives are as follows:

- To ensure that all areas that were impacted by mining activities are physically stable and non-eroding after closure;
- Ripping, shaping, and vegetating of the remaining disturbed areas and integrating these into the surrounding surface topography.
- To limit the possible adverse environmental consequences arising from mining after closure and ensure that environmental functionality, is reinstated where relevant;
- Ensuring that the rehabilitated site is free-draining and run-off is routed to local/natural catchments, to sustain catchment yield;
- To eliminate potential latent safety threats to humans and animals through proper closure;
- To remove and properly dispose of all mining-related waste; and
- To re-instate pre-existing land uses/capabilities over the affected portions of the mining site.

If the Applicant fails to rehabilitate or manage any negative impact on the environment, the DMR may, upon written notice to the Applicant use all or part of the financial provision to rehabilitate or manage the negative environmental impact in question. The financial provision provides for the final checking of all sites before site clearance.

8.5 Calculations of the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline

The financial provision for the environmental rehabilitation and closure of any mine/prospecting and its associated operations forms an integral part of the MPRDA. Section 41 (1) and 41(3) and 45 of the MPRDA deals with the financial provision for rehabilitation and closure. During 2012, the DMR made updated rate available for the calculation of the closure costs, where contractor's costs are not available these apply

The Guideline document for the evaluation of financial provision made by the Mining Industry was developed by the DMR in January 2005 in order to empower the personnel at Regional DMR offices to review the quantum determination for the rehabilitation and closure for mining sites.

With the determination of the quantum closure, it must be assumed that the infrastructure had no salvage value (clean closure). The closure costs were calculated to be **R170 478.00.** The quantum of the financial provision required is **R170 478.00.** Manmol Investments (Pty) Ltd is required to update and review the quantum of the financial provision on an annual basis (as per Regulation 54 (2) of the MPRDA).

8.5.1 Confirm that the financial provision will be provided as determined

Please refer to Appendix E for more details on the financial provision for the proposed activity.

8.6 The frequency of the submission of the performance assessment/ environmental audit report

Environmental Performance Assessment (EPA) audits or reviews are a requirement of all MP holders, as stipulated in the MPRDA Regulations 54 and 55 (MPRDA Regulations, Government Notice (GN) 527, 2004, as amended. In compliance with these Regulations, the audit process is to be conducted on a biennial basis (i.e. every two years).

Environmental audits to ensure compliance with the EMPr and EA. The environmental audit reports must also include the provision. The reports must be submitted to the DMR.

8.7 Environmental Awareness Plan

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

It is a standard practice for Manmol Investments (Pty) Ltd to ensure that employees and the employees of contractors that will be working on a new project or at a new site attend an induction course where the nature and characteristics of the project and

the site are explained. The course includes key information abstracted from the EMPr pertaining to the potential environmental impacts, the mitigation measures that will be applied, the monitoring activities that will be undertaken and the roles and responsibilities of contractors' and Manmol Investments (Pty) Ltd personnel. The full EMPr document is also made available to attendees.

The environmental training courses will include, amongst others, aspects such as:

- Awareness training for contractors and employees
- Job specific training – training for personnel performing tasks which could cause potentially significant environmental impacts;
- Comprehensive training – on emergency response, spill management, etc;
- Specialised skills; and
- Training verification and record keeping.
- Environmental issues on site;
- Roles and responsibilities;
- The construction environmental management measures;
- Cultural awareness; and
- Heritage discovery procedures.

All attendees shall remain for the duration of the course and, on completion, sign an attendance register that clearly indicates participants' names. A copy of the register shall be kept on record by Manmol Investments (Pty) Ltd.

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

The Following Documents Will Be Used As Reference For Identifying And Managing Impacts:

- Approved Empr;
- Approved EA; And

All employees must be provided with environmental awareness training to inform them 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. This should be in conjunction with the implementation of the EMPr.

Manmol Investments (Pty) Ltd and contractors will be responsible for the implementation of section 28 of NEMA at all times "duty of care" to mitigate any impacts in order to avoid pollution or degradation of the environment. Appropriate implementation of the recommended mitigation measures specified in the EMPr will be monitored through monthly site audits by an EAP and annual EMP audits undertaken by a third party.

8.8 Specific information required by the competent authority

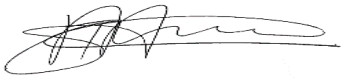
Basia Environmental Consultant will update and review the quantum of the financial provision on an annual basis (as per Regulation 54(2) of the MPRDA). In addition, formal monitoring and performance assessment reviews of compliance will be undertaken annually.

8.9 Undertaking

The EAP herewith confirms

a) The correctness of the information provided in the reports [X]
b) The inclusion of comments and inputs from stakeholders and I&APs [X]
c) The inclusion of inputs and recommendations from the specialist reports where relevant [X] 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 [X]



Signature of the environmental impact practitioner

BASIA ENVIRONMENTAL CONSULTING

Name of Company

2021/06/02

Date