DRAFT BASIC ASSESSMENT REPORT AND

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

PREPARED BY: BEYOND GREEN ENVIRONMENTAL SERVICES (PTY) LTD

Name of applicant: Malumbazo Holdins (Pty) Ltd

Contact Name: Nandi Malumbazo

Tel No: 0729117492

Email: nandi.malumbazo15@gmail.com

Postal Address: 13 T Street, Grahamstown, 6139

FILE REFERENCE: EC30/5/1/3/2/10748MP

NOV 2022

i. IMPORTANT NOTICE

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

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

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

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

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

ii. Objective of the basic assessment process

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

(a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context.

(b) identify the alternatives considered, including the activity, location, and technology alternatives.

(c) describe the need and desirability of the proposed alternatives,

(d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:

(i) The nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and

(ii) The degree to which these impacts—

(aa) can be reversed.

(bb) may cause irreplaceable loss of resources; and

(cc) can be managed, avoided, or mitigated.

(e) Through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—

(i) Identify and motivate a preferred site, activity and technology alternative.

(ii) Identify suitable measures to manage, avoid or mitigate identified impacts; and

(iii) Identify residual risks that need to be managed and monitored.

EXECUTIVE SUMMARY

Malumbazo Holdings (the applicant) appointed Beyond Green Environmental services Pty Ltd (referred to BGES here after) as the independent Environmental Assessment Practitioner (EAP) to facilitate the environmental authorisation process for its proposed aggregate opencast quarry mine. Malumbazo Holdings is in a process of applying for mining permit and an environmental authorization in terms of section 27 of the MPRDA (Act of 2002) and section 24 of the NEMA (Act 107 of 1998. The proposed project is located on Portion of Erven 741, 742, 755, 756, 763, 764, 765 & 958, Buffalo City Metropolitan Municipality: BUF. The applicant proposed to undertake excavation and extraction of aggregate stone which involve drill and blasting operations, should the permit/authorization be acquired.

BGES has submitted the application for environmental authorization to the Department of Mineral Resources and Energy (referred to DMRE here after) for the proposed aggregate mining. The Department of Mineral Resources and Energy subsequently accepted the application in October 2022. As such, Malumbazo Holdings must proceed with the Basic Assessment Report process (this report) in terms of the National Environmental Management Act, Act of 107 of 1998 (NEMA) and its Environmental Impact Assessment Regulations, 2014. In this regard, the requirements of the BA Process are noted in the EIA Regulations (2014, as amended), Listing Notice 1, Appendix 1 of GNR 326 and are consequently adhered to in this report.

Ultimately, the outcome of the BA Process is to provide the Competent Authority, the Department of Mineral Resources and Energy, with sufficient information to provide a decision on the Application in terms of Environmental Authorisation (EA), in order to avoid or mitigate any detrimental impacts that the activity may impose on the receiving environment.

Description of the project

The proposed mining activity is for a 5-year Mining Permit for the quarrying of Aggregates on a long-term to permanent basis. This will involve the blasting, excavation, crushing and processing of aggregate rock. Holes will be drilled into the aggregate rock and explosives will be dropped into the holes drilled. Blasting will then occur which will remove the rock from the quarry wall. The blasted rock will be moved from the blast pit with Wheel Loaders and fed into a Mobile Crushing machine. The crushing machines will then crush and screen the rock into various aggregate products.

Baseline environment

The proposed project falls within the Beaufort Group (Karoo Supergroup) geology and within immediate surrounding consist human settlements, surrounded by Hanover Kuwait, Tukayi and Peelton (eDrayini). Located outside protected areas, closest being approximately 3km of the site, King Williams Town. The project falls within the quaternary W42G and is close to the Kwagana River, a tributary to the Yellowwood River. The proposed development site is in a green field area, only degraded by livestock and agricultural activities is currently taking place. During the site animals were found on site (Animals are transient). Animals and plants species of conservation concern are unlikely to be found on the site.

Environmental sensitivities

The proposed project is located approximately 250m west from the Yellowwood river and 50 m away from the national road, R63. The mining site is approximately 2,19km south of the Peelton (eDrayini) community area and 2.45km north of SAPS Academy Bhisho and All Saints College. There are no houses in the immediate vicinity of the site. Bhisho is located approximately 7km southwest of the application.

Significant potential impacts

Impacts	Significance before mitigation	Significance after mitigation
Negative Impacts		
Loss of fauna (and protected species)	Medium	Low
Fauna disturbance (and displacement)	Medium	Low
Surface water (Yellowwood river) contamination	High	Low
Diminution/Depletion of surface water (surrounding water courses)	Medium	Low
Groundwater contamination/pollution	Medium	Low
Soil degradation	Medium	Low
Soil contamination	Medium	Low
Increase in noise	Medium	Low
Degradation of the air quality/Dust emission	Medium	Low
Health impact assessment	Medium	Low
Accident (work accident)	Medium	Low
Social issues (conflicts between communities)	Medium	Low
Crimes	Medium	Low
Visual degradation	Medium	Low
Positive impacts		
Job creation	Medium	Medium
Skill improvement	Medium	Medium
Improved technology	Medium	Medium

Recommendations

The following summarised EAP recommendations

- The disturbed area and footprint of the mine's operations must be kept as small as possible by mining strips.
- Appropriate waste and water management must be implemented. The client must ensure that the water leaving the mine is not polluted, avoid water, soil and groundwater contamination.
- Appropriate buffer zone must be implemented around the Yellowwood River.
- A water quality monitoring and biomonitoring programme must be implemented for the water resources within the area. Rehabilitation should run concurrently with operations. A

comprehensive rehabilitation plan must be developed and implemented so as to mitigate the further deterioration of the riparian habitat; and

- An environmental risk awareness training should be undertaken.
- Compensate farmers for loss of land where applicable
- Dust suppression must be regularly undertaken
- The mitigations measures included in this report should be implemented.
- Monitoring is critical to ensuring the fulfilment of all commitments made in this report.

Environmental statement

It is the opinion of the EAP that this option be authorised provided that recommendations indicated in this report potential positive impacts enhanced, and monitoring programme be executed.

This document will be sent out to the public; stakeholders; landowners and any other Interested & Affected Parties to get their issues and concerns and respond thereof.

TABLE OF CONTENTS

List of Figures

List of Tables

PART A: ACTIVITY INFORMATION

1. Contact Person and correspondence address

Table 1: Contact Person and correspondence address

	Environmental Assessment Practitioner (EAP)	**Holder**
Name	BGES Pty Ltd	Malumbazo Holdings (Pty) Ltd
Contact person	Mitrance Nana Nonkululeko Mbasane	S Mamani
Tel no.	0721728374/ 065 877 6771	072 421 8161
Fax	0865156638	
Address	P O Box 68832 Highveld 0169	13 T Street Tantyi Grahamstown 6139
Email	nonkululeko@beyondges.co.za nana@beyondges.co.za	nandi.malumbazo15@gmail.com

1.1 Expertise of the EAP

BGES Pty Ltd is contracted by Malumbazo Holdings (the developer) as the independent environmental consultants to undertake the Environmental Basic Assessment Process for the proposed project. BGES is not a subsidiary of or affiliated with the applicant. Furthermore, BGES does not have any interests in secondary developments that may arise out of the authorisation of the proposed project.

The EAP Team from BGES who is responsible for this project is Kudashwe Zandire, Mitrance Nana and Nonkululeko Mbasane.

Qualifications (Annexure A)

Ms Mitrance Nana holds master's degree (Environmental management) degree from the University of the Northwest (2020) and Master of Science Degree Ecology and Environmental science from the University of Dschang, Cameroon (2014).

MS Nana has over 3 years' experience in environmental management, compiling and managing environmental authorisation reports, including Environmental Management Programmes (EMPr), and environmental auditing and compiling GIS based maps. This includes fieldwork

Ms Nonkululeko Mbasane holds Bsc Honors degree (environmental monitoring) degree from the University of South Africa. She is trained as an Environmentalist and has wide experience and exposure in undertaking Environmental Impact Assessments, water resources management, environmental management audits as well as land use management and social sciences

Nonkululeko has 13+ years of environmental management experience acquired from different entities, inter alia, Department of Mineral Resources; Petroleum Agency SA; South African National Biodiversity Institute and Department of Water Affairs. She is experienced in public participation, presenting public meetings, managing specialists and general project management of environmental projects. She has outstanding and working knowledge of the relevant environmental legislation.

Zandire Kuda's qualification and CV is attached

2. Location of the overall Activity.

Table 2:Location of the overall Activity

Farm Name:	Portion of Erven 741, 742, 755, 756, 763, 764, 765 & 958
Application area (Ha)	5 Ha
Magisterial district:	Buffalo City Metropolitan Municipality, BUF
Distance and direction from nearest town	The site is located ±6km North of Bhisho and lies ±2km south of eDrayini and 7km North of Bhisho
21-digit Surveyor General Code for each farm portion	C03800270000097300000 C03800270000076400000 C03800270000076300000 C03800270000075500000 C03800270000095700000 C03800270000095800000
Locality map	Attach a locality map at a scale **not smaller than 1:250000 and attach as Appendix 2**
Description of the overall activity. (Indicate Mining Right, Mining Permit, Prospecting right, Bulk Sampling, Production Right, Exploration Right, Reconnaissance permit, Technical co-operation permit, Additional listed activity)	The proposed mining activity is quarrying of Aggregate; this will involve the blasting, excavation, crushing and excavation of sandstone. Holes will be drilled into the sandstone; explosives will be dropped into the holes drilled. Blasting will then occur. The blast will remove the stones from the quarry wall. The large pieces of sandstone will be moved with a pit loader and loaded onto trucks that will haul the large pieces of sandstone to the processing centre.

2.1 Locality map
(Show nearest town, scale not smaller than 1:250000).

A locality map showing the study site in relation to surrounding areas is provided as Figure 1 below. The location of the mine is within Quarter Degree Grid Square 2731DB at the following central GPS location 32°47'35.56"S and 27°28'24.70"E. The proponent intends to mine aggregate from an area located approximately 7 kilometres northeast of Bhishoi. The project is surrounded by the following towns Bhisho, Hanover, Peelton and Ethembeni

Locality Map

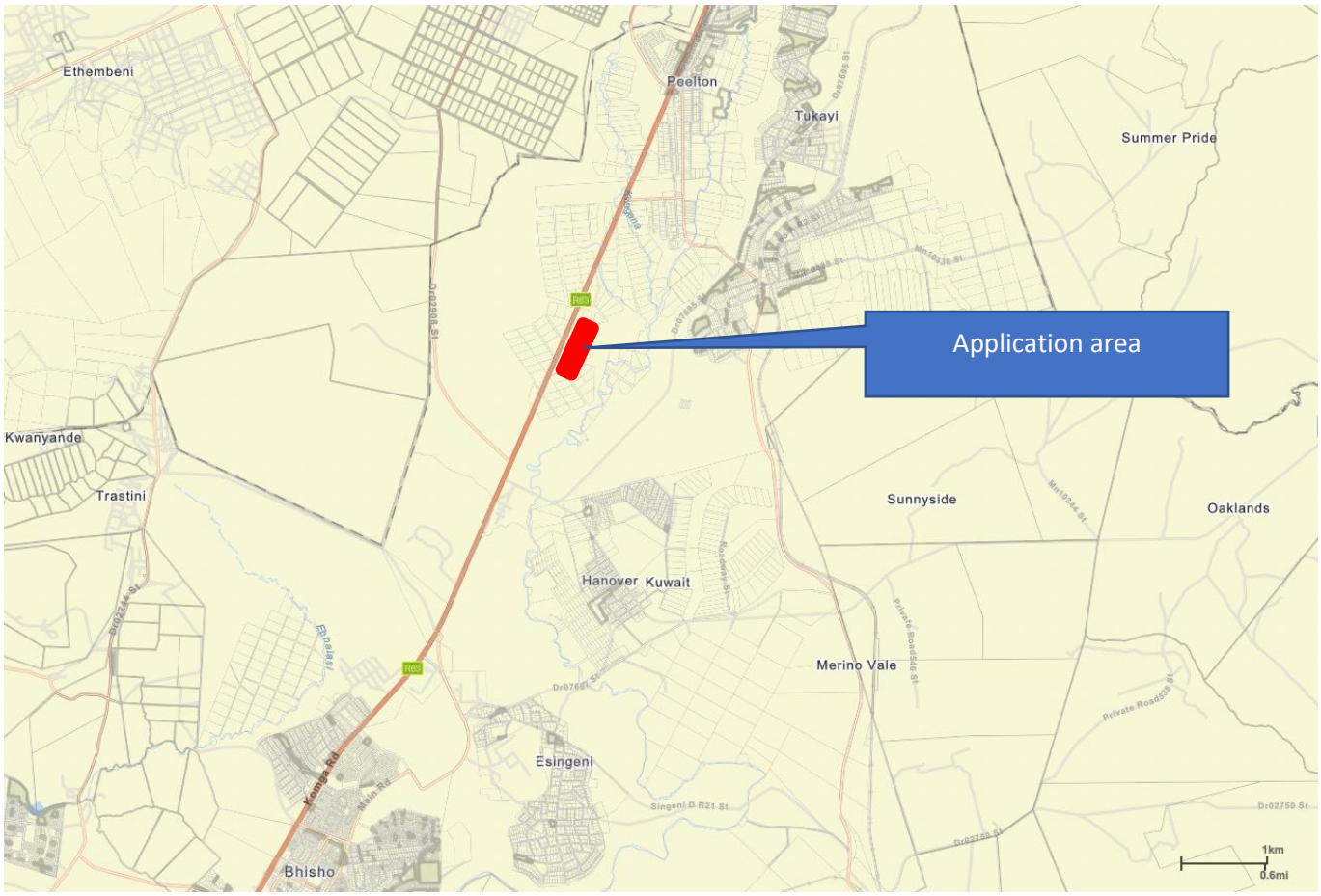


Figure 1: Site Locality Map

3. Description of the scope of the proposed overall activity

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

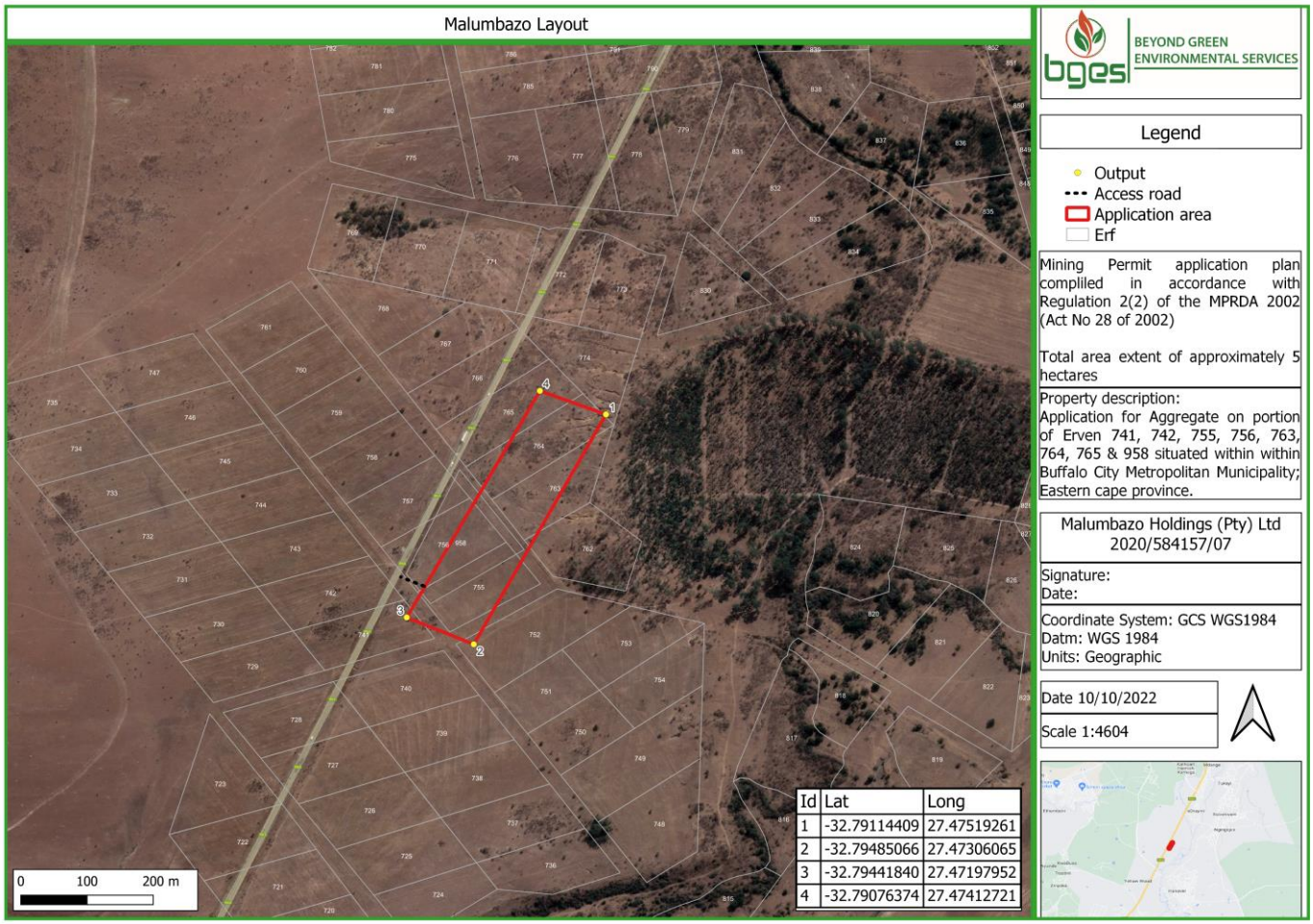


Figure 2: Layout Map of proposed site

4. Listed and specified activities

Table 3:Listed and specified activities

NAME OF ACTIVITY **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc.** **E.g. for mining**, - excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc.…etc.…etc.)	**Aerial extent of the Activity Ha or m²**	**LISTED ACTIVITY** (Mark with an **X** where applicable or affected).	**APPLICABLE LISTING NOTICE** ***(GNR 983, GNR 984 or GNR 985)***	**WASTE MANAGEMENT AUTHORISATION** (Indicate whether an authorization is required in terms of the Waste Management Act). **(Mark with an X)**
Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice or in Listing Notice 3 of 2014, required to exercise the mining permit.	5ha	X	GNR 983, activity 21	Not applicable
The widening of a road by more than 6 meters, or the lengthening of a road by more than 1 kilometer- (i) where the existing reserve is wider than 13,5 meters; or(ii) where no reserve exists, where the existing road is wider than 8 meters; excluding where widening or lengthening occur inside urban areas.	±30m long, 4m width	X	GNR 983 Activity 56	X

5. Description of the activities to be undertaken

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

The proponent intends to mine aggregate from a greenfield area located approximately 7 kilometres Southeast of the nearest town, Bhisho within the Buffalo City Metropolitan Municipality. The proposed area bears a habitat destruction due to anthropogenic pressures from farming activities has reduced the value of parts of the study area from a faunal point of view. Malumbazo Holdings is proposing the quarrying/ blasting of aggregate on 5 hectares of the Remainder of Portion of Erven 741, 742, 755, 756, 763, 764, 765 & 958. The proposed project includes the application for a mining permit which triggers a listed activity in terms of the Environmental Impact Assessment (EIA) Regulations, Government Notice Regulations (GNR) GNR 983, Activity 17, promulgated under the National Environmental Management Act (NEMA) (Act no 28 of 2002). The proposed Project will be developed in set phases, with each phase having a different combination of activities. For ease of reference, the proposed Project has been divided into the following phases.

5.1 Construction and set up

Setup is required to establish operating areas. Construction will include preparing the area for the mobile facilities (that is the toilet and office), establish offices, demarcate the mining area, haulage roads and to place the crusher plant, plus erecting mine signage and waste bins. services, etc.

Access Roads

Existing access road (road tracks) will be used on site. The road will need to be properly cleared. Access to the site is via R63, Maitland Regional road.

Security and Access Control

A permanent security house and boom gates will be constructed at the site for access control. The structures will comprise of brick and mortar and will be supplied with electricity from a diesel driven generator.

Ablution Facility

Ablution facility at the proposed project site will utilize a chemical portable toilet. A contractual agreement will be signed with Sanitech to collect waste sewage and dispose of at their nearest wastewater treatment works, all located within the Buffalo Metropolitan.

Office Complex

Project office complex will be established on site and will include the following:

- Vehicles and equipment area
- Ablution facility (chemical mobile toilet)
- Mobile office (mobile container)

Mine development Plan

A plan showing the typical mining sequence is to be drawn up for the site once the detailed survey is complete and approved by the technical personnel designated by the Mine Manager. All safety considerations are to be incorporated into the mine development plan. The short-term plans are to be drawn and evaluated once a semester and must show development within the annual mine plan.

Bench Design

The working bench widths are to be a minimum of 30m and depth heights to be between 10 and 12m for stability reasons as well as to enable the machines to work safely on the benches and provide ample turning space. A safety berm or line of boulders is to be erected around 3m from the crest. The strategy employed must be clear as much of the soft material (overburden) from the area above the blast using an excavator. The soft material is to be cut back at a batter no steeper than 1:1.5. this reduces the height of the suspended material and makes it manageable while working below. any wedges or other discontinuity defined structure is to be clearly identifiable in the face and all attempts must be made to drill and blast them before the area is declared safe to work. Any major change in the rock structure must be reported to the Site/Quarry Manager.

5.2 Operation

The operational phase will consist of excavating and undertaking controlled blasts to remove material. This will then be run through the crusher. Mined material may be stockpiled for a short period.

Mining Operation

Typically quarrying is a truck and shovel operation, the rock being blasted and stockpiled for the crushing and screening plant. The loading formats are primarily wheeled front end loaders and tracked backhoe excavators ranging from 30–50-ton machines. The dumper fleet typically will comprise vehicles up to a 30-ton carrying capacity.

All new benches must have a minimum bench height of 10m and maximum height of 12m. this bench height range is matched to the loading equipment and enables the machines to clear any loose rock relatively easily in the face. The loading format of the 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 application in dealing with hanging or tight blasts.

Production blasts

Blasts tonnage will vary in size dependent on production requirements but can be up to 5000 m^3 of material per month. Vertical holes will be drilled, and blast patterns tailored to the rock mass being blasted.

Plant operation

The earth moving machine will work Monday to Saturday. Plant maintenance must be carried out periodically or as per service book, during which time waste can be removed from the pit.

5.3 Decommissioning phase

On decommissioning, the plant and offices will need to be removed and the roads ripped and rehabilitated. Areas that have been cleared will need to be re-shaped, covered with topsoil and re-vegetated. Before the quarry is legally abandoned, DMRE requirements of long-term drainage, environmental and public access issues must be adequately implemented and monitored. The identified closure activities, which will be detailed further on the closure plan to be initiated three months prior to closure, seek to achieve:

- As far as practicable, rehabilitation must achieve a stable and functioning landform which is compatible with the surrounding landscape and other environmental values.
- The closure plan must ensure the physical and geochemical stability of the mining area in the post-closure stage, as well as meeting the required DMRE/NEMA environmental standards.
- The surface of stockpile areas must be scarified and leveled, graded evenly and the topsoil previously stored, returned to its original depth over the area.

5.4 Water supply and waste management

Water Supply

Process water supply for the operation will be sourced from an existing artificial dam within the study site or Buffalo Metropolitan and will be carted onto the site in a tanker. A 4000 litre water cart will be adequate for the size of this operation. The water will be used for dust suppression of access roads. Dust suppression will be conducted as and when necessary.

Portable Water Supply

Potable water required for the proposed operation is approximately 40 litres per day (ℓ/day). The water will be used for drinking purposes and will be sourced from local water vendors within Ingwe. The water will be supplied in cooled water dispensers.

Power supply

A generator will be used for the operation of the project.

Waste Management

The main types of waste that will be produced during the operation are general waste, oil and fuel (from possible leakage). It is recommended that adequate waste management be implemented. Waste hierarchy must be fully considered (avoid producing waste, waste segregation, waste recuperation). Waste must not be thrown in the river.

6. Policy and Legislative Context

Table 4: Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the	**REFERENCE WHERE APPLIED**	**HOW DOES THIS DEVELOPMENT COMPLIY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT?**
National Environmental Management Act (Act No. 107 of 1998)	EIA & EMPr	EA has been applied for
National Environmental Management: Biodiversity Act 2004 (Act No. 10 of 2004) (NEM: BA)	Impact assessment of vegetation	Did not trigger the requirement for any NEMBA licence
Mineral Petroleum Development Resources Act (Act 120 of 1977)	EIA &EMPr	Mining Permit has been lodged
National Water Act (Act No 36 of 1998)	Water use. The Act controls the pollution of water bodies (wetlands, underground water etc.)	The activity does not seem to be triggerring a Water use licence in terms of NWA. The applicant will have to consult with DWS In terms of Section 19, the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to prevent and remedy the effects of pollution to water resources from occurring, continuing or recurring.
National Heritage Resources Act (Act No. 25 of 1999) (NHRA)	Structures	Did not trigger the requirement for any NHRA licence
Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)	EMPr	This Act will be enforced during the construction and operational phases. It serves to mitigate any potentially negative impacts the proposed project may have on any of the labour force. Particular reference is made to this at given that the project entails the handling of a “dangerous good”. The Act

		controls the exposure of employees and the public to these dangerous and toxic substances or activities.
Section 26 of the National Environmental Management: Waste Management Act, 2008 (Act No. 59 of 2008), as amended.	The management of waste for all types of developments and activities which pose a threat to the environment in terms of the act. Waste is currently a very serious topic around the world and all efforts to minimise and recycle waste are currently being encouraged by government and international agencies. It is therefore important for any development to manage waste in a sensible way and in line with the waste hierarchy where the preference is always minimization.	In terms of GNR921, no waste license is required for the project. Waste handling, storage and disposal during construction and operation is required to be undertaken in accordance with the requirements of this Act, as detailed in the EMPr, as well as in Accordance with the relevant Norms and Standards.

7. Need and desirability of the proposed activities.

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

EIA regulations require that needs and desirability of the project are being considered in terms of the ecological sustainability, economic justifiability, and social development of the area.

Ecological sustainability

The proposed project is a small-scale mining operation located within the Buffalo City Metropolitan Municipality, Bhisho area. The area is facing major challenges in addressing a range of development issues, including the improvement of the living conditions for the poor, and promoting local economic development within its area. Also, according to the Buffalo City Metropolitan Municipality IDP 2020/21 this area is faced with a high rate of poverty. Achieving socio-economic development is one of the municipality's main priorities, aimed to provide job opportunities and reduce poverty levels. Malumbazo Holdings believes that their stone aggregate gravel mining has an important role to play in community upliftmant, job creation and poverty alleviation. Since this economy is built on sand and stone aggregate mining with sand accounting for over a third of the provinces economy mining, it is one of the primary sectors that provide employment opportunities for unskilled and semi-skilled people. This project will not only provide the community with income for few years, but it will also leave them with skills that they can use in the future to better their lives.

The South African mining industry has its origin in small-scale mining activities, with these operations offering much needed employment opportunities and entrepreneurship, as well as contributing to the local economy. Malumbazo Holdings intends to maximise the impact of small-scale mining with particular focus on poverty nodal points with mining potential, intended to contribute meaningfully towards the livelihood of the local communities, particularly the community members whose gardens are around the proposed mining area.

The proposed development would provide ploughing seed to the local subsistence farmers, employment opportunities for members of the local community during the construction and operational phases of the project, thereby providing local economic benefit for currently unemployed people. Malumbazo Holdings is one of the Black owned companies which seek to ensure that National Development Plan achieves its targets. The proposed mining operation will provide good quality gravel/aggregate to the local building industry for use in the construction of roads and buildings and rarely for the manufacture of stone tools, particularly scrapers, blades, and projectile points. It would ultimately contribute towards the wider socio-economic development of the area in the form of job opportunities and service delivery through promoting infrastructural development.

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

Mining activity areas include known mineral regions of the country such as aggregates. Aggregate mining is the most important development in the economic sector in the Eastern cape.

Preferred site: Malumbazo Holdings preferred to operate in the area due to a few projects that are undertaken in the area and the lack of access to the material required. Furthermore, the proposed location for the quarry is in a seclude area where illegal mining is currently taking place, few kilometers away. The proponent has signed an offtake agreement to provide the material from the site. BGES Pty Ltd undertook ecological and social site screening assessments, and considered the following environmental aspects:

Environmental

- Water resources
- Flora and fauna

Social

- Homesteads
- Houses
- Farming (subsistence gardens)

Technical

- Topography

9. 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.

9.1 Details of the development footprint alternatives considered

With reference to the site plan provided as Appendix 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.

The identification and assessment of alternatives is a key component to the success of any EIA process. Essentially, alternatives represent different means of meeting the general purpose and need of the proposed project through the identification of the most appropriate method of development.

(a) The property on which or location where it is proposed to undertake the activity

Site location

The identification and selection of alternative locations for the selection of the site was because the area has huge material loosened on the adjacent site where illegal mining is taking place. The proponent will easily have access to the reserves, depth of the reserve, quality of the reserve, location of sensitive environments, servitudes. As such there are no feasible site alternatives considered.

(b) The type of activity to be undertaken

Open cast mining alternative

The opencast mining activity was selected based on the type of mineral to be mined, depth of the reserve and access to these reserves. This was done based on the previous experience of the client working in other projects in the area. No typical study or analysis has been done, as this is a general knowledge that aggregate, and quarry mining can be easily mined through opencast than underground or any other type of mining. As such there are no feasible types of alternatives to the mining of Aggregate that have been considered; aggregate mining is a viable business opportunity for the applicant. It is of the applicant's opinion that the site possessed viable volumes of minable Aggregate.

(c) The design or layout of the activity

The site layout was determined by considering both spatial and practical mining operation aspects. The layout and temporary nature of the mining activity and associated infrastructure will be implemented with the aim to reduce substantial impacts on the area.

Access road alternatives:

One existing access road, joining R63 regional road have been identified on site. The figure below indicates access roads lines in pink and green. The pink line indicates an access road which is most preferred by the client, however due to proximity to regional road, the road may pose risk to roads users. The alternative back road indicated in green might be the safer option, however it is likely to have more detrimental impacts on the environment and water courses. This access road is not recommended for this operation as using this road can result to degradation of the *Yellowwood/Incemerha* river located 800m east of the application. The line coloured in pink is the preferred access road for this operation.

Figure 3:Alternative access roads to be used during mining

(d) The technology to be used in the activity

Mining methods

Various mining methods are used for mining. Typically quarrying is a truck and shovel operation, the rock being blasted and stockpiled for the crushing and screening plant. The loading formats are primarily wheeled front end loaders and tracked backhoe excavators ranging from 30–50-ton machines.

(e) The operational aspects of the activity

Processing onsite

When the applicant was asked to consider processing of the Aggregate material, there were two options for consideration:

• Develop processing plant on farm portion of Even 741, 742, 755, 756, 763,

764, 765 & 958

• Identify existing, legally authorized, and active mining operations with a processing plant to process the Aggregate material

The alternatives that informed the final decision are:

• Do not establish a processing plant on the site and process the Aggregate material off-site to reduce visual impact and pollution impact on road users.

• Establish the processing plant onsite due to lack of availability of mining operations closer to the site.

It was ultimately decided to establish the processing plant onsite due to the fact that there are no aggregate mines within the surrounding area.

(f) Option of not implementing the activity

If the proposed project should not take place, no additional socio-economic benefits will be created by the mining activities within the area, the mineral resource will be lost, and the additional GDP from the local supply of the mineral (aggregate) will be compromised.

Further implications of the No-Go alternative include failure to comply with the mandate of the Department of Mineral Resources and Energy, the loss of economic input into the area and a loss of regional socio-economic benefit. However, the potential impacts on biodiversity, habitat, impact due to noise and dust will not occur. This includes no clearing of any vegetation, no digging of pits, no Aggregate mining operations on site and no decommissioning at the end of the project life cycle. Therefore, the option of not implementing the activity will not be pursued at this stage. The option of not implementing the activity assumes that, should the proposed activity not proceed then the status quo would remain.

10. Details of the Public Participation Process Followed

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

The PPP for the proposed project will be undertaken in accordance with the requirements of the MPRDA, and NEMA in line with the principles of Integrated Environmental Management (IEM). A PPP has been implemented to engage with I&AP's and meet the requirements for Public Participation as stipulated by the relevant legislation.

In terms of the NEMA, I&AP's must be given the opportunity to comment on the proposed project. The Basic Assessment aims to describe the proposed project, the environment in which the project is located and the potential impacts that may result if the project goes ahead. The Draft Basic Assessment Report will be made available for public comment for a period of 30 days, excluding the period between 15 Dec to 5 Jan.

i. Identifying Regulatory Authorities:

The authorities for this project were identified from similar projects in the past. The authorities to be contacted with regards to this project include:

- the Department of Mineral Resources and Energy (DMRE);
- The Department of Water and Sanitation (DWS);
- Land Claims Commissioners Office.
- Buffalo City Metropolitan Municipality
- Department of Environmental Affairs (Eastern Cape)
- Department of Rural Development and Land Affairs (Eastern Cape)
- Department of Transport
- Eastern Cape Heritage:
- Department of agriculture
- Landowners in the area

Public participation activities that have been undertaken to inform the public, stakeholders and Organs of State of the applications and availability of the Basic Assessment Report are listed below.

i. Notices

Posters informing the public of the proposed activities, written in English, were erected and displayed on the nearest areas to the site (Portion of portion of Even 741, 742, 755, 756, 763,764, 765 & 958).

ii. Adverts

An advertisement informing people of the proposed activities and requesting readers to register as I&AP's are placed in the Imbewu News on the 05th of November 2022 advertiser, the local newspaper(s).

iii. Meeting with Municipal Representatives with Project Management

A meeting was held between the locals and the Malumbazo Holdings management with regards to the proposed project.

iv. Introductory Public Meeting

Further to this, a public open day meeting was held in an area near the proposed site. In the meeting, the proposed project were discussed as well as access to the site. Minutes of the meeting and a copy of the agenda are attached in this report (public participation section).

vi. Landowner consultation

The landowner(s) were consulted regarding the mining project. The purpose of the consultation were to receive comments and/or concerns from the landowners and whether or not they agree to the project taking place on the proposed land

Summary of issues raised by I&AP's

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

Interested and Affected Parties **List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.**		**Date Comments Received**	**Issues raised**	**EAPs response to issues as mandated by the applicant**	**Section and paragraph reference in this report where the issues and or response were incorporated.**
AFFECTED PARTIES					
Landowner/s	X				
Lawful occupier/s of the land					
Landowners or lawful occupiers on adjacent properties	X				
Municipal councillor	X				
Municipality	X				
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA	X				
Communities	X				
Dept. Land Affairs	X				
Traditional Leaders					
Dept. Environmental Affairs	X				
Dept. of Transport	X				
Other Authorities affected:	X				
OTHER AFFECTED PARTIES					
INTERESTED PARTIES					

10.Environmental attributes associated with the alternatives

(The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical, and biological aspects)

This section provides a description of the regional site of the project and the baseline Environment of the project i.e. the type of environment affected by the proposed activity; *Its current geographical, physical, biological, socio-economic, and cultural character).*

10.1 Regional site description

The area falls within Buffalo City metropolitan Municipality (BCMM) which consist of a major urbanised core. The main cities/towns in the BCMM are: Bisho, Dimbaza, East London, Kidd's Beach, King William's Town, Mdantsane, Phakamisa, Zwelitsha. The main economic sectors in BCMM are community services, finance, manufacturing, trade, and transport. The topography of BCMM area is sea level at the coastal belt to a plateau of 450 m and 850 m above sea level in the north-west. This plateau extends from northern town of Maclean and the centrally located town of Berlin through to Dimbaza in the western portion of BCCM. The most north-westerly region of the BCMM has the Amatole Mountains which reaches 2,100 m above sea level. The BCMM has a topography characterized by a number of incised river valleys that results in hilly tracts of flat land which impacts significantly on settlement patterns and the cost of provision of services within the region (Buffalo City Metropolitan Municipality, 2018).

The regional vegetation is known as Bhisho Thornveld, less threatened and not protected. The municipality covers an area of approximately 14 810 km², with approximately half of the area being under the jurisdiction of traditional authorities while the remainder comprises predominantly commercially-owned farms and conservation areas.

Below the biophysical and socioeconomic character of the project area are provided.

10.2 Climate

Varying climatic conditions prevail across the Buffalo City Metropolitan Municipality. The BCMM climate is moderate for most of the year. Hot summer spells occur from December to February especially in the inland areas. Due to the large geographical area (from coastline to mountainous), the temperature varies according to location with the coastline experiencing subtropical climate. The region primarily records summer rainfall region with the winter months of June and July generally being the driest in the year (Buffalo City Metropolitan Municipality, 2018). BCMM normally receives about 850 mm of rain per year (Eastern Cape Socio Economc Consultative Council, 2017). The rainfall is not evenly distributed in the region with the coastal belt and the north western portion experiencing

approximately 1,000 mm of rainfall per annum and rainfall gradually decreasing in a westerly direction to 500 mm per annum (Buffalo City Metropolitan Municipality, 2017)

10.2.1 Temperature

BCMM is characterised by warm summers and cool winters.

The proposed project is in Bhisho a warm temperate climate zone (RAW Gardner, 2007). The average monthly high temperatures in the area are between 19-25 degrees Celsius, the average low temperatures are between 12-15 degree Celsius (Figure **4**). The length of the day in Bhisho varies significantly over the course of the year. In 2022, the shortest day is *June 21*, with *9 hours, 59 minutes*of daylight; the longest day is *December 21*, with *14 hours, 19 minutes* of daylight. The *earliest sunrise* is at *4:54 AM* on *December 5*, and the *latest sunrise* is *2 hours, 19 minutes* later at *7:13 AM* on *June 30*. The *earliest sunset* is at *5:10 PM* on *June 11*, and the *latest sunset* is *2 hours, 12 minutes* later at *7:22 PM* on *January 7*. Daylight saving time (DST) is not observed in Bhisho during 2022.

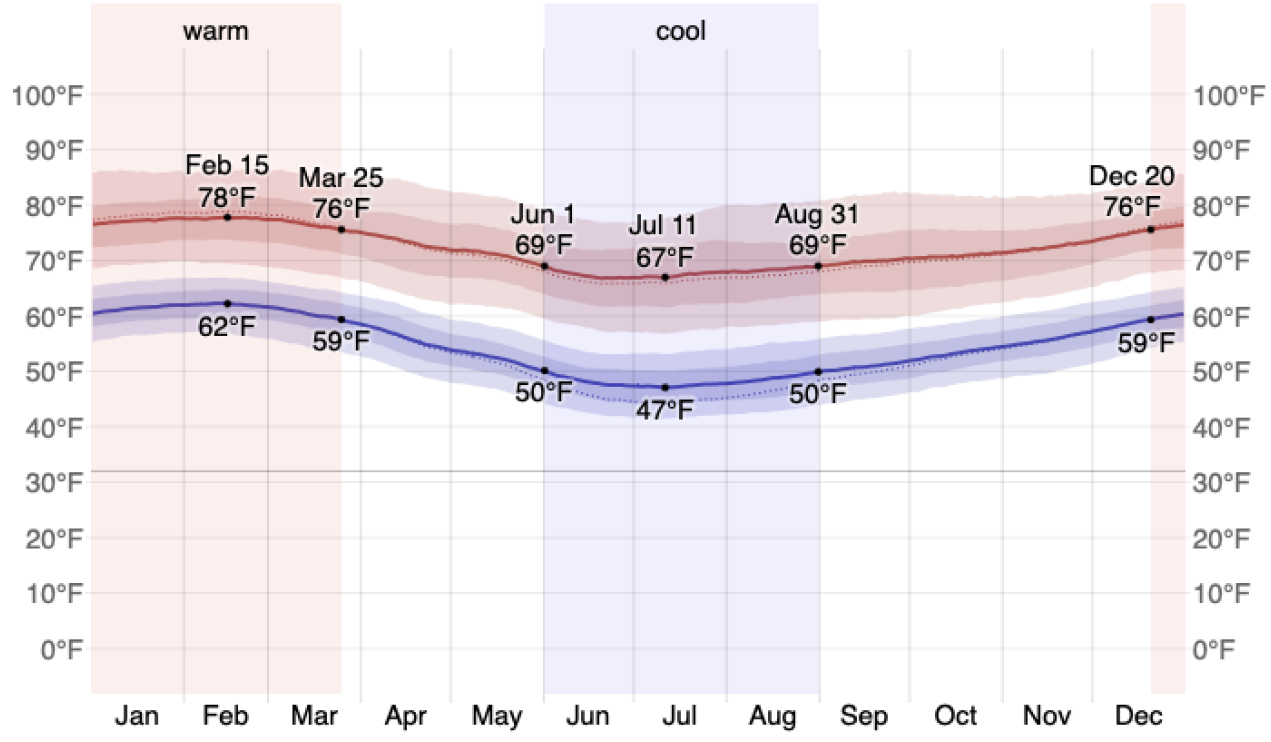


Figure 4:Average monthly temperature data (Bhisho, Station)

10.2.2 Precipitation

Rain falls throughout the year in . The month with the most rain in Bhisho is *November*, with an average rainfall of *5.5 inches*. The month with the least rain in Bhisho is *May*, with an average rainfall of *1.0 inches*.

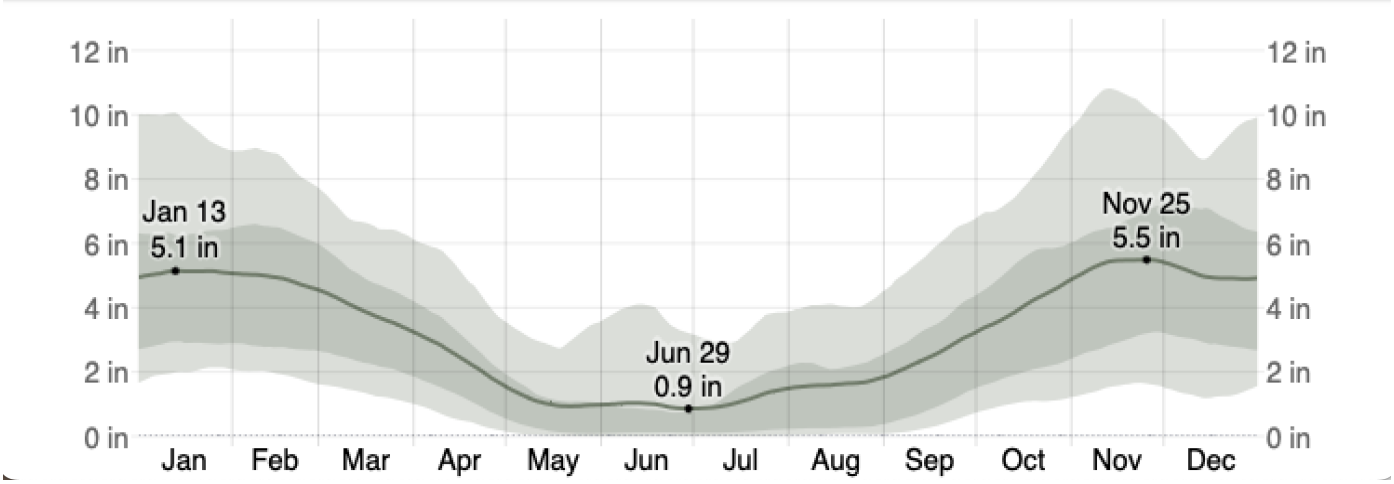


Figure 5: Average precipitation/rainfall data (Bhisho Station).

10.2.3 Wind

The average hourly wind speed in Bhisho experiences *mild* seasonal variation over the course of the year. The *windier* part of the year lasts for *7.2 months*, from *May 27* to *January 2*, with average wind speeds of more than *9.7 miles per hour*. The *windiest* month of the year in Bhisho is *October*, with an average hourly wind speed of *10.8 miles per hour*.

The *calmer* time of year lasts for *4.8 months*, from *January 2* to *May 27*. The *calmest* month of the year in Bhisho is *April*, with an average hourly wind speed of *8.7 miles per hour*. The predominant average hourly wind direction in Bhisho varies throughout the year.

The wind is most often from the west for *6.1 months*, from *April 1* to *October 4*, with a peak percentage of *52%* on *June 18*. The wind is most often from the east for *5.9 months*, from *October 4* to *April 1*, with a peak percentage of *37%* on *January 1*.

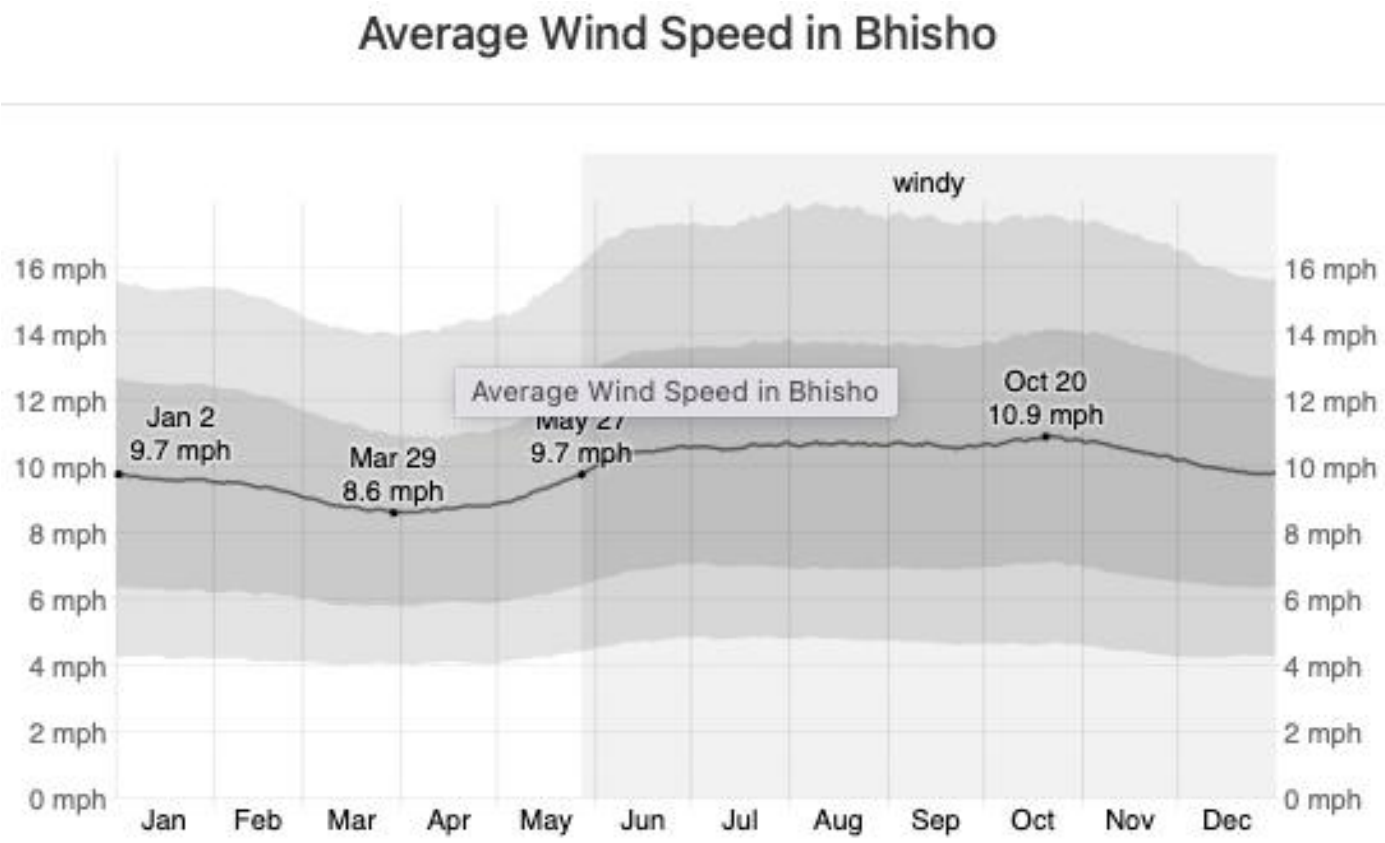


Figure 6: Wind speed in Bhisho

10.3 Topography

The topography of Bisho area is sea level at the coastal belt to a plateau of 360 m and 580 m above sea level. The most north-westerly region of the BCMM has the Amatole Mountains which reaches 2,100 m above sea level. The BCMM has a topography characterized by a few incised river valleys that results in hilly tracts of flat land which impacts significantly on settlement patterns and the cost of provision of services within the region (Buffalo City Metropolitan Municipality, 2018). The topography on the proposed site varies from 360m and 580m

The figure below provided

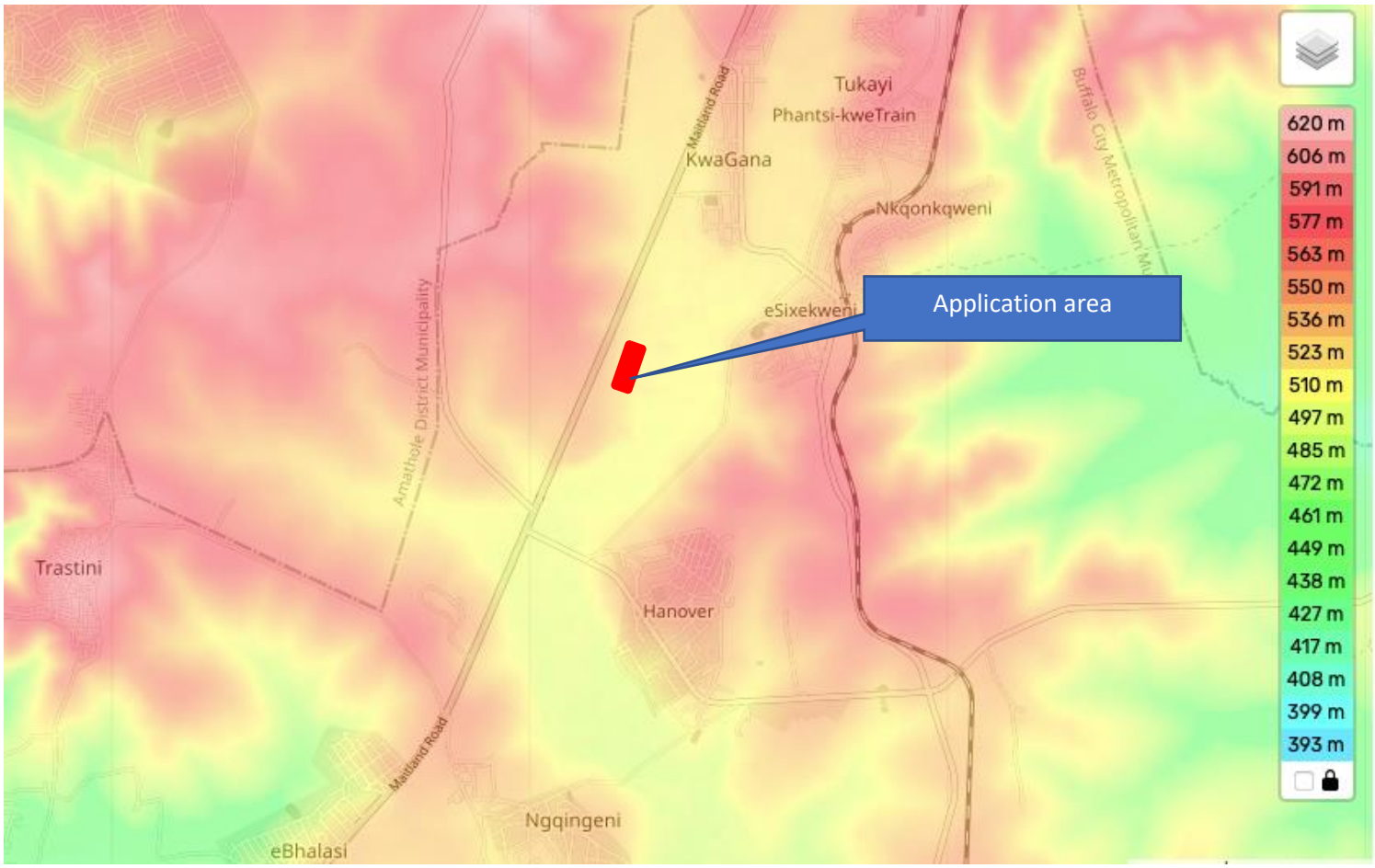


Figure 7: View of topography surrounding the proposed site

10.4 Air quality

According to BCMM Air quality management plan 2018, An emissions inventory for air pollution sources in the BCMM has been compiled, building on what was completed as part of the first AQMP (C&M Consulting Engineers, 2011) and the emissions inventory database (C&M Consulting Engineers, 2012). Potential air pollution sources in the BCMM have been identified as:

- — Industrial operations.
- — Domestic fuel burning.
- — Vehicle emissions.
- — Airport and Harbor.
- — Agricultural activities.
- — Biomass burning.
- — Waste treatment and disposal; and
- — Fugitive dust sources.

Particulate and gaseous emissions from industrial operations, domestic fuel burning, and vehicle tailpipe emissions were quantified due to the availability of information for these sources. Emissions were calculated using available international and local emission factors including the United States Environmental Protection Agency (USEPA) AP-42 emission factors. The emission calculations and resultant emission rates for the above-mentioned sources are discussed in the section below.

10.5 Geology

The King William's Town region primarily consists of steep slopes of river valleys in highly dissected hills and moderately undulating plains. It consists mainly of mudstones and sandstones intruded by dolerite dykes and sills. Soils are moderate to deep clayey loams. Erosion risk is recorded as being medium to low (Buffalo City Metropolitan Municipality, 2018).

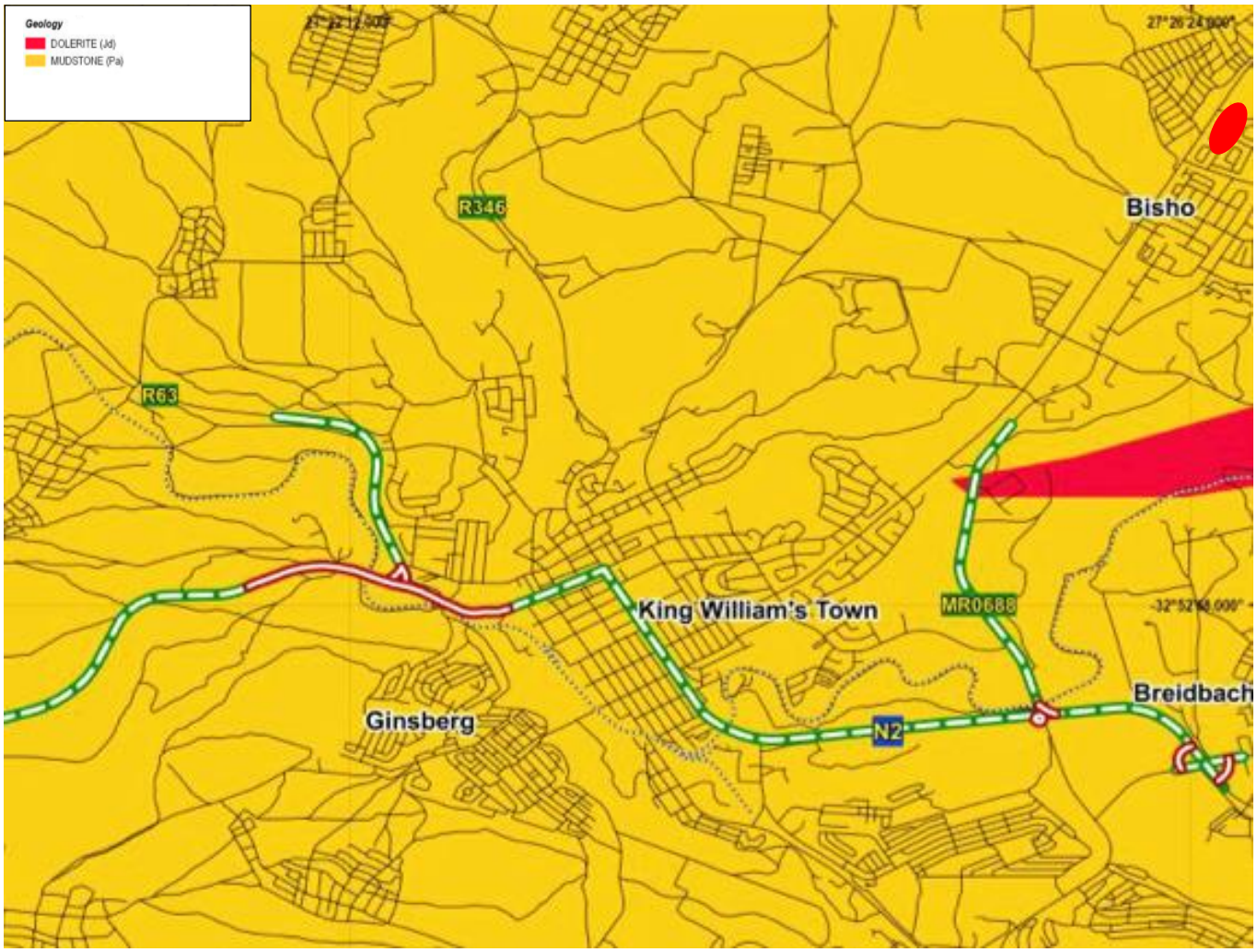


Figure 8: Geology of the project area

10.6 Soil

The study area constitutes a minor vocal point in the landscape but display currently low visual character due to the unrehabilitated excavation and alien infestation on the south of the application and north of Bhisho. The open area is mainly dolerite. The area will therefore be able to absorb some disturbance, but rehabilitation of the disturbed mine area is still important, and the best possible vegetation cover must be achieved. The coastal belt has coastal forest and thornveld vegetation, while the middle plateau is mainly covered by valley bushveld (Mountain, 1974). Over time the natural vegetation has been replaced by scrub and grassland, due to the removal of forest for agricultural purposes.

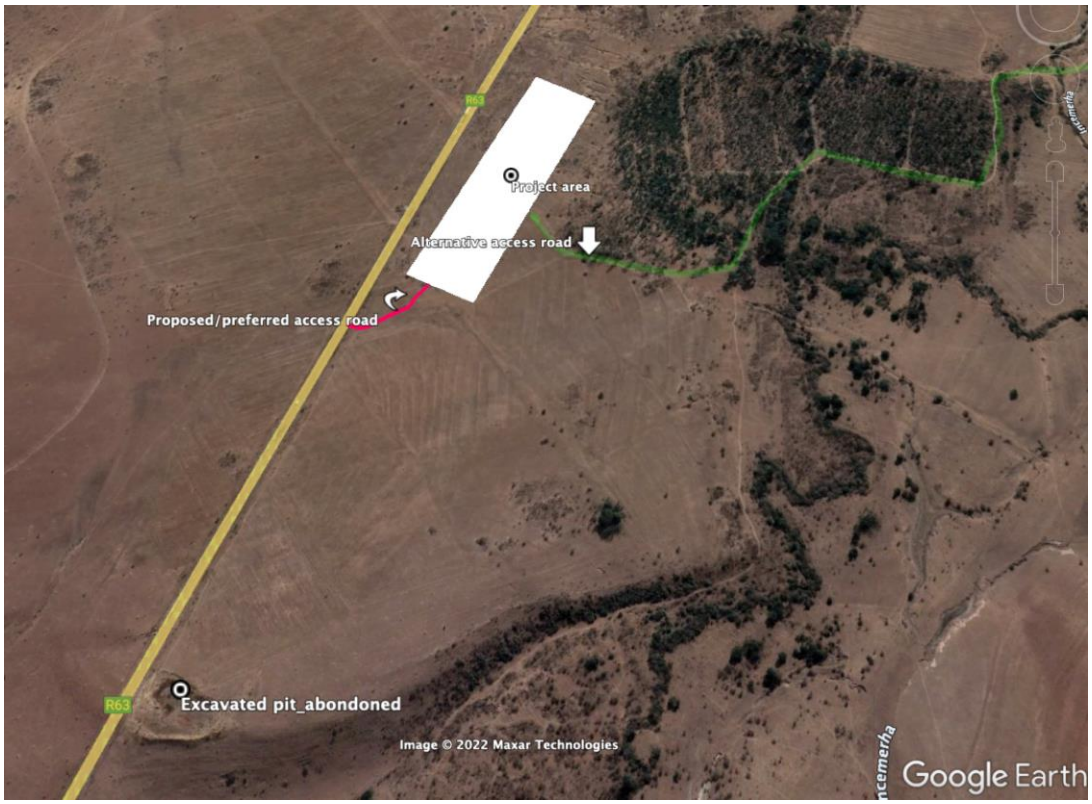


Figure 9: Dolerite outcropping in the excavated pit closer the project area

10.7 Surface hydrology and watercourses

Figure 10 below indicates the wetlands which occur along the proposed quarry mining, along R63 road as well as the 500m DWS regulated area, placement of a 50metre buffer around the wetlands/Yellowwood/Incemarha river. The activities which fall within 500 of the wetland and watercourse buffers require Water Use Licenses from the Department of Water and Sanitation (DWS).

This activity falls outside DWS regulated area. Yellowwood/Incemarha river has one tributary named as Kwagana river flowing from the Northeast of the application. The site is located in quaternary sub-catchment R30B within the Amatola Catchment area and is administered under the Water Management Area: Mzimvubu to Tsitsikamma.

Wetlands in South Africa have been mapped on a broad scale by various stakeholders and have been included in the National Freshwater Ecosystem Priority Assessment (NFEPA, 2011-2014). Due to the broad- scale nature of the NFEPA map it is not spatially accurate and therefore some error is expected.

The NFEPA wetland map identifies important or sensitive wetlands and wetland clusters. A wetland cluster is a group of wetlands all within 1 km of each other and which are surrounded by relatively natural vegetation. Figure 10 below indicates the NFEPA wetlands listed within 1km of the study area. There are no NFEPA wetlands located within 500 m of the proposed activity.

Figure 10: DWS regulated area and River Delineation (50m Buffer).

10.8 Groundwater

Groundwater quality in the proposed development area is generally good (IDP, 2021). There are no activities which pose risk to the underground water. It is of great concern that the proposed project ensures avoiding groundwater pollution.

10.9 Biodiversity

The two vegetation types that the project area passes through (Bhisho Thornveld and Buffels Thicket) are both classified by SANBI as 'least threatened', as indicated in Figure 11 & 12. Both these vegetation types in the study area have been transformed and are infested by a large amount of alien vegetation. The area of the study site classified as CBA 2 was found to be infested with numerous aliens and was therefore not considered pristine. The remainder of the study site was classified as CBA 3 or Functional Landscapes (as per ECBCP), this was ground truthed and so the area will be considered low sensitivity.

The area had no excessively steep slopes, however stormwater management will play a large role in ensuring the integrity of the area is maintained and that no long-term erosional issues arise in the future.

Although no animal species were observed onsite, there is still a possibility of some being present. This will especially be the case surrounding wetlands, streams, and rivers. This would be far enough from the activity area.

Figure 11: Type of vegetation onsite: Bhisho Thornveld and Buffels Thicket

Figure 12: Vegetation within the proposed development area

Figure 13: **Vegetation map:** Proposed site project with poor vegetation areas and other areas outside mining consist of good vegetation.

Fauna

As discussed under previous heading, neither the study nor the immediate surrounds represent a sensitive environment as a large portion of the study area has been previously disturbed and the grassland transformed, see Figure 12. Photos below indicate the type of vegetation cover

Figure 14:View of vegetation cover onsite, Acacia trees and alien species dominating the area.

10.10 Socio Economic Environment

Demography

The main cities/towns in the Buffalo City Metropolitan Municipality are: Bisho, Dimbaza, East London, Breidbach, litha Kidd's Beach, King William's Town, Mdantsane, Phakamisa, Zwelitsha. This application falls under Kind Williams Town. The King William's Town (KWT) area and surrounds is a spatially fragmented area with King William's Town being the main urban area. King William's Town serves as a secondary node in the Buffalo City region. King William's Town functions as a Regional Service Centre and together with Bhisho, is the Provincial Administrative Hub and contains the seat of the Provincial Government of the Eastern Cape Province.

The BCMM's land area is approximately 2,515 km2 with 68 km of coastline. Buffalo City is the key urban center of the eastern part of the Eastern Cape Province, South Africa. In the east of BCCM is the city of East London. Hart (2002) anticipated industrial growth due to stimulated efforts of the government in the East London area. The slow rate of economic growth is aggravated by rural-urban migration, the high rate of population increases amongst blacks and the resettlement policies (Daniel, 2002). The Buffalo River catchment was inhabited by some 200 000 people during 1967 (Thornton *et al*, 1967), and most of these people lived in or near King William's Town and East London. According to Watling *et al* (2003) and Pike (2008) approximately 0.9 million people now reside in the catchment,

of which 57% live in the urban areas. This shows a population increase of more than 100% since 2006. The average population density in the catchment was 400 per km during the study by Hart (2002). This high population density gave rise to high overall water demands. Hart (2002) foresaw an increase in the catchment utilization due to industrial development in the East London area by the Government. According to Smit (2007), Mdantsane is one of the biggest homeland towns and one with a rapid population growth and serious squatter problems.

Economy activities

The area is well-known for its auto industry manufacturing base with Daimler AG and its wholly owned subsidiary Mercedes-Benz South Africa having an assembly plant in close proximity to the port of East London (Buffalo City Metropolitan Municipality, 2018). From East London, there is an urban corridor to Mdantsane and Dimbaza to the west. There is a spatial fragmentation of urban areas within BCCM with 3 main identifiable land use and land need patterns identified:

o An urban corridor formed through the East London–Mdantsane–King Williams Town – Dimbaza urban development axis. This corridor is the source of population influx due to its industrial and service sectors and improved access to services and facilities. East London serves as the primary urban node. King William's Town functions as a Regional Service Centre and with Bhisho, serves as the Provincial Administrative Hub and the seat of the Provincial Government of the Eastern Cape Province.

o Rural and peri-urban settlements are mainly located in former homelands, Ciskei, and on the outskirts of East London in the form of Newlands. These areas are home to around 20% of the BCCM population.

o Commercial farming areas in the north-eastern and south-western (coastal) sectors (Buffalo City Metropolitan Municipality, 2018).

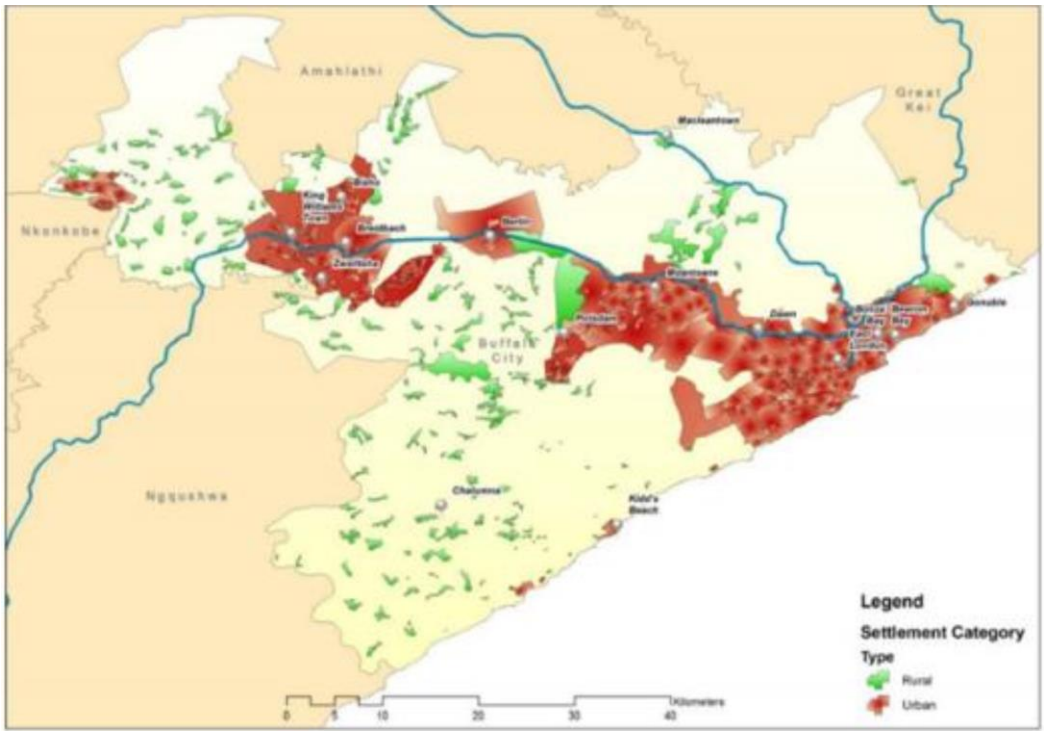


Figure 15:Settlement for BCMM- urban corridor from east to west

Employment

In Buffalo City Metropolitan Municipality, the economic sectors that recorded the largest number of employments in 2018 were the community services sector with a total of 64 600 employed people or 25.5% of total employment in the metropolitan municipality. The trade sector with a total of 60 000 (23.6%) employs the second highest number of people relative to the rest of the sectors. The mining sector with 188 (0.1%) is the sector that employs the least number of people in Buffalo City Metropolitan Municipality, followed by the electricity sector with 2 230 (0.9%) people employed. he number of formally employed people in Buffalo City Metropolitan Municipality counted 203 000 in 2018, which is about 79.98% of total employment, while the number of people employed in the informal sector counted 50 800 or 20.02% of the total employment. Informal employment in Buffalo City increased from 46 400 in 2008 to an estimated 50 800 in 2018.

Education and Skills profile

Within Buffalo City Metropolitan Municipality, the number of people without any schooling decreased from 2008 to 2018 with an average annual rate of -3.92%, while the number of people within the 'matric only' category, increased from 128,000 to 166,000. The number of people with 'matric and a certificate/diploma' increased with an average annual rate of 3.60%, with the number of people with a 'matric and a Bachelor's' degree increasing with an average annual rate of 5.74%. Overall improvement

in the level of education is visible with an increase in the number of people with 'matric' or higher education.

Health Profile

According to the South Africa Statistics, 2015 the main diseases and broad causes include: (i) injuries; (ii) noncommunicable diseases; (iii) HIV and TB; and (iv) communicable diseases together with maternal, perinatal, and nutritional conditions.

10.11 Heritage & Palaeontological Importance

There is no known natural heritage or cultural sites in or close to the study area. No areas of social, cultural, or historic value were identified onsite. The district is home to a rich cultural diversity and numerous sites of historical significance, specifically relating to the Xhosa and Coloured nation.

The BUF has historically been and is still the home of the Xhosa monarch. A screening study of the proposed area indicated the low sensitivity in terms of the importance of palaeontology, archaeology, and heritage of the proposed mining area. Based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the mined-out area from the Karoo Coastal formation during previous mining operations. There is an extremely small chance that fossils may have survived the mining operation and the natural weathering while exposed to sun, wind, and rain. If fossils are found the remining activities have commenced then they should be rescued and photographs sent to a palaeontologist called to assess their scientific value, and if deemed necessary to collect a representative sample.

10.12 Land use map

The current land use in the King William's Town region is portrayed in Figure 16 below, adapted from the National Geo-Spatial Information (2013) and the South African National Biodiversity Institute (SANBI) National Freshwater Ecosystem Priority Areas (NFEPA). King William's Town, Bhisho, Zwelitsha, Breidbach, Ginsberg, Mxhaxho, Schornville, KwaRayi and Tshatshu-Ezizeni are considered areas of high urban density (orange). The settlements which are classified as low urban density areas include Ngxwalane, Tolofiyeni, KwaLini and KwaMasingatha (light pink).

Figure 16 also indicates the hydrology of the area; including rivers, wetlands and drainage lines. Plantations (light purple), woodlands (dark green), golf courses (light green) and recreational areas (green) are also indicated on the map below.

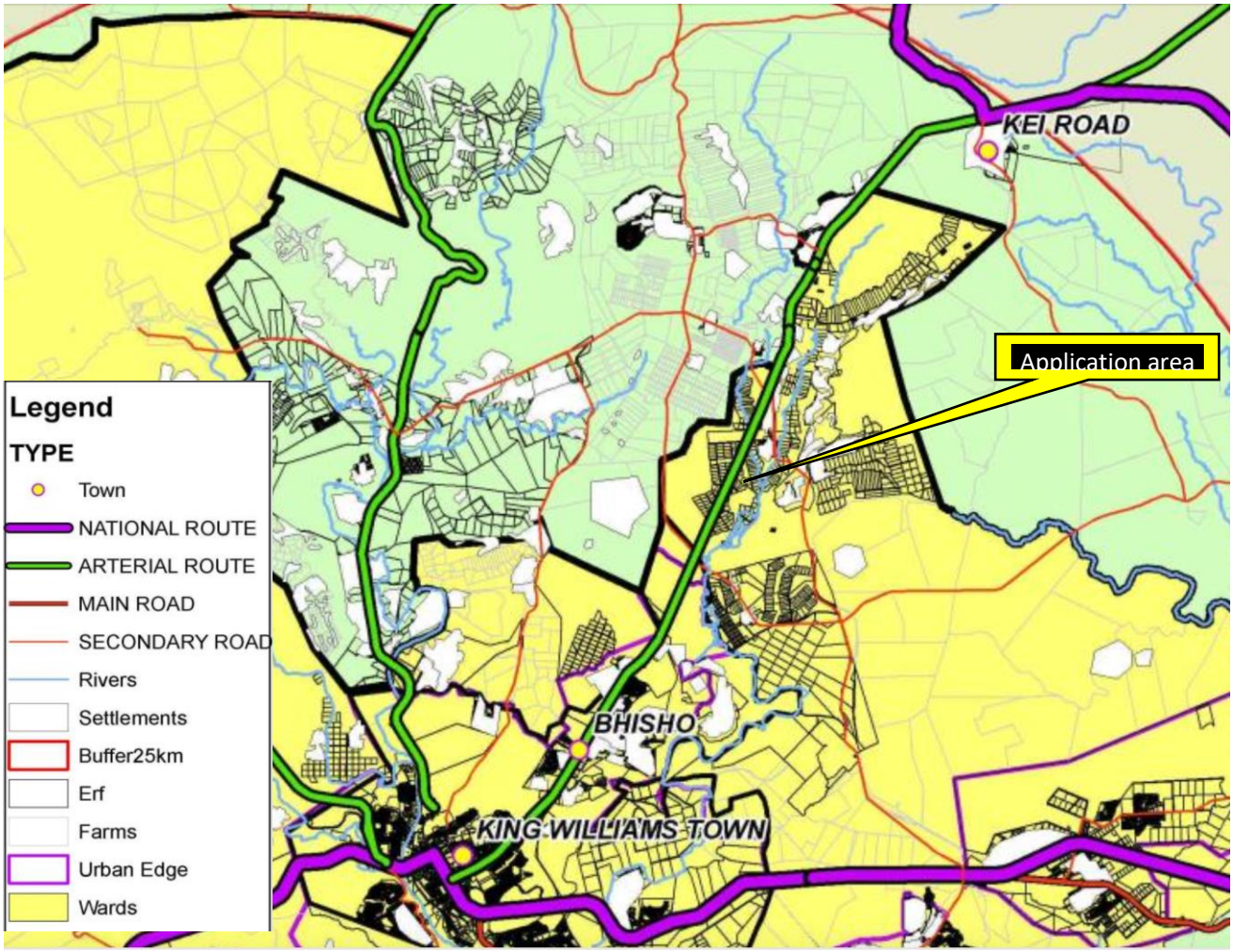


Figure 16: Landuse map

The vegetation ranges from pristine vegetation to degraded vegetation, although the majority of the natural vegetation which occurs on the periphery of King William's Town is no longer considered pristine vegetation due to degradation and alien vegetation. Cultivated areas are indicated in green on the map.

The red area on the map indicates the King William's Town Local Authority Nature Reserve. This nature reserve is a protected area.

10.12 Description of specific environmental features and infrastructure on the site
(Show all environmental and current land use features):

The proposed project is in a modified, unimproved grassland area. It located close to a river & road that is R63 road which is an important feature in the area, and the Yellowwood River.

There are illegal mining activities currently taking place few kilometres south of the proposed site (See Figure 17). The area is a rocky area Few vegetation is observed on site. Few residential areas, houses exist in the vicinity of the site. The figure below provides images of current land use on the proposed project area.

Figure 17: Images showing current land-use of the area

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

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

11.1 Identification of impacts

The major risk factors that were identified as being associated with the development of the site and which formed the basis of the assessment are as follows:

- Loss of vegetation; the proposed development will lead to the total destruction of the relevant local plant communities and ecosystems within the site boundaries.

- Fauna disturbance
- Dust emission: dust emission impacts will occur during the transport of excavated material and the whole operation of the project. They will include dust coating nearby vegetation and the enhanced spread of invasive alien plant species. The abstraction of the materials will lead to dust and scraps that will contaminate the surface of water, few people around and workers.
- Soil degradation
- Water degradation/ contamination due to spill contamination, poor waste management and sedimentation/siltation. A potential risk could be waste materials from the development that could spill into the nearby drainage lines and contaminate water resources.
- Sedimentation and eutrophication of the nearest watercourse
- Loss of soil as a result of clearance of vegetation and resultant erosion. This increases the threat of sedimentation to any lower lying riverine and wetland areas.
- Aesthetic degradation or visual impacts. The removal of the bedrock and materials on site will change the appearance of the study area. The rehabilitation of ecosystems back to their original state practically impossible.
- Changes to the topography of the landscape and stratigraphy of the geology. This will result in hydrological changes within and beyond the study area.
- Pressure on construction access roads
- Work / road accidents (during transport, transport of oversized loads or heavy load; general construction site safety (e.g., slip/trip, moving vehicles etc)
- Diseases (due to poor water and sanitation, and inadequate waste disposal)
- Increase in noise and vibration in the area
- Cracks in houses
- Social conflicts/ Insecurity
- Amelioration of quality of life (Job creation)
- The removal of bedrock from the study area will make rehabilitation of ecosystems back to their original state practically impossible.

The figure below provides the matrix which assist in the identification of potential impacts of the project. It illustrates the interaction between the project sand surrounding environmental components.

Table 5:Interrelation matrix for the identification of potentials impacts of the project

Interrelation Matrix : Identification of impacts																				
Légende Négative Impacts Positive Impacts			Components of the environments																	
			Biophysical						Acoustic	Aes-thetic	Biology		Socio-economic and cultural							
Activities/Aspects of the Project			Air	Soil	Mozane River	Ground water	Climat	Topography	Noise	Vi-sual	Végé-tation	Fauna	Health	Security/Safety	Traffic	Income	Social	Land	Culture
Activities sources of impacts	Site establishment and pre-construction	Upgrade selected road/Increase Road corridor																		
		Vegetation clearing and earthwork																		
		Provide office and toilets for staff																		
		Installation of road signs																		
		Construct haul road to Excavation																		
		Cast concrete footings for crushing plant																		
		Erect Crushing plant																		
		Construct weighbridge																		
	Op	Drilling																		

		Blasting																	
		Excavation and dumping of the overburden																	
		Load the stockpile materials																	
		Transports of materials																	
		Maintenance works (Vehicles and machinery)																	
		Use/operation and maintenance of the roads and haul road																	
		Presence of the project																	
	Closure/Decomis-sioning	Demolish all established structures (office, toilet, process plants, steel structures)																	
		Replace Topsoil and re-vegetate (where necessary																	
		Retain access roads for future use																	
	Post-	Maintain storm-water																	

		management system																	
		Maintenance of roads used																	
		Remove alien vegetations (if applicable)																	

11.2 Assessment of Potential Environmental Impacts of the proposed activity

The assessment of impacts will largely be based on DEATs' (1998) Guideline Document: NEMA 2014 EIA Regulations. Typically, an environmental impact assessment considers impacts which may arise from the construction, operation and decommissioning of a proposed activity and also assesses cumulative and residual impacts.

This assessment is also typically done before and after the implementation of appropriate mitigation measures. It is important to understand however that the situation being assessed prior to mitigation does not mean that no mitigation measures are in place at that time. The environmental assessor evaluates the project design, as presented for development. This is the "Before mitigation" scenario which may reflect well thought out measures to engineer out points of impact with the environment.

If, in the opinion of the environmental assessor, the resulting environmental impact will be of moderate to high environmental significance, the environmental assessor may recommend that additional mitigation be applied. The environmental assessor will then re-assess the environmental impact with the recommended mitigation in place. This second impact score would reflect the "after mitigation" scenario.

The environmental assessor then evaluates and clearly states whether there will be residual impacts remaining after mitigation has been applied. The environmental assessor must also evaluate whether the proposed development (or key components of the development) contributes to cumulative impacts on the environment (or components of the environment), considering other land uses and developments within the area.

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

(*Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision).*

This section describes the impact assessment methodology of the proposed mining activities. The impacts are rated according to nature, extent, duration, probability of occurring and significance.

Impact assessment methodology

The impact of a project (or of an activity associated with a project) on the environment may be positive, negative or neutral. Similarly, any impact may be reversible over time or irreversible. These aspects are described when assessing impacts. A scoring method is used to evaluate the extent over which an impact may be expressed, the duration of the impact, the magnitude of the impact and the probability of occurrence of the impact.

Nature of impact - this review the type of effect that a proposed activity will have on the environment and includes what will be affected and how.

Extent - this indicates whether the impact will be local and limited to the immediate area of development (the site); limited to within 5km of the development; or whether the impact may be realised regionally, nationally or even internationally.

Duration - this review the lifetime of the impact, as being short term (0 - 2 years), medium term (2 - 5 years), long term (5 - 15 years), but where the impacts will cease after the operation of the site, or permanent.

Intensity – here, it is established whether the impact is destructive or innocuous and it is described as either low (where no environmental functions and processes are affected), medium (where the environment continues to function but in a modified manner) or high (where environmental functions and processes are altered in such a way that they temporarily or permanently cease).

Probability - this considers the likelihood of the impact occurring and is described as improbable (low likelihood), probable (distinct possibility), highly probable (most likely) or definite (impact will occur regardless of prevention measures).

Reversibility - this considers the degree to which the adverse environmental impacts are reversible or irreversible. For example, an impact will be described to have low significance should the impact have little chance of being rectified to correct environmental impacts. On the other hand, an impact such as the nuisance factor caused by noise impacts from wind turbines can be considered to be highly reversible at the end of the project lifespan.

The status of the impacts and degree of confidence with respect to the assessment of the significance must be stated as follows:

Status of the impact: A description as to whether the impact will be positive (a benefit), negative (a cost), or neutral.

Degree of confidence in predictions: The degree of confidence in the predictions, based on the availability of information and EAP knowledge. This is assessed as high, medium or low.

Based on the above considerations, the EAP provided an overall evaluation of the significance of the potential impacts, which is described as follows:

Low*:* Where the impact will not have an influence on the decision nor require to be significantly accommodated in the project design

Medium: Where it could have an influence on the environment which will require modification of the project design or alternative mitigation.

High: Where it could have a "no-go" implication for the project unless mitigation or re-design is practically achievable.

This section describes the impact assessment methodology of the proposed mining activities.

The impact significance rating system is presented in the Table below and involves three parts:

Part A: Define impact consequence using the three primary impact characteristics of magnitude, spatial scale/population and duration.

Part B: Use the matrix to determine a rating for impact consequence based on the definitions identified in Part A; and

Part C: Use the matrix to determine the impact significance rating (S), which is a function of the impact consequence rating (from Part B) and the probability of occurrence.

Please note that the table below presents a high-level identification of potential impacts associated with the construction, operation and decommissioning of the mining and service road. The significance ratings provided are prior to the implementation of mitigation measures.

Part A: Defining consequence in terms of magnitude, duration and spatial scale/population **Use these definitions to define the consequence in part B**		
Impact Characteristics	Definition	Criteria
Magnitude	**Major = -5**	Substantial deterioration or harm to receptors; receiving environment has an inherent value to stakeholders; receptors of impact are of conservation importance; or identified threshold often exceeded
	Moderate = -3	Moderate/measurable deterioration or harm to receptors; receiving environment moderately sensitive; or identified threshold occasionally exceeded
	Minor = – 1	Minor deterioration (nuisance or minor deterioration) or harm to receptors; change to receiving environment not measurable; or identified threshold never exceeded
	Minor = + 1	Minor improvement; change not measurable; or threshold never exceeded
	Moderate = + 3	Moderate improvement; within or better than the threshold; or no observed reaction

	Major = + 5	Substantial improvement; within or better than the threshold; or favorable publicity
Spatial Scale or Population	**Site or local = 2**	Site specific or confined to the immediate project area i.e. ≤5ha
	Regional = 4	May be defined in various ways, e.g. cadastral, catchment, Topographic i.e. ≤50ha
	National = 5	Nationally or beyond i.e. ≥100ha
Duration	**Short term= 1**	Up to 24 months.
	Medium term= 3	24 months to 5 years
	Long term = 5	Longer than 5 years
Probability	**Definite = 5**	Impact will occur regardless of prevention measures i.e. ≥90% chances
	Possible = 3	There is a possibility that the impact will occur, depending on the circumstances i.e. ≥ 50% chances
	Unlikely = 1	There is low likelihood that the impact will occur i.e. ≤50% chances

PART B: DETERMINING CONSEQUENCE RATING
Rate consequence based on definition of magnitude, spatial extent and duration

			Spatial Scale/ Population		
			Site or Local	**Regional**	**National/ international**
Magnitude					
Minor	**Duration**	**Long term**	Medium	Medium	High
		Medium term	Low	Low	Medium
		Short term	Low	Low	Medium
Moderate	**Duration**	**Long term**	Medium	High	High
		Medium term	Medium	Medium	High
		Short term	Low	Medium	Medium
Major	**Duration**	**Long term**	High	High	High

		Medium term	Medium	Medium	High
		Short term	Medium	Medium	High

PART C: DETERMINING Environmental Risk (ER) ***Rate significance based on consequence and probability***				
		CONSEQUENCE		
		Low	**Medium**	**High**
PROBABILITY (of exposure to impacts)	**Definite**	Medium	Medium	High
	Possible	Low	Medium	High
	Unlikely	Low	Low	Medium

Once the Part B value has been determined the ER is determined in accordance with the standard risk assessment relationship by multiplying the Consequence and the Probability.

1.Determination of Environmental Risk

Environmental Risk = (Magnitude + Scale + Duration) * Probability

The outcome of the environmental risk assessment will result in a range of scores, ranging from 1 through to 100. These ER scores are then grouped into respective classes as described in the Table below.

Description	**Value**	**Symbol**
Low	≤30	
Medium	≥30; ≤60	
High	>60	

The Matrix table is attached

The impact evaluation took into consideration the cumulative effects associated with this and other facilities which are either developed or in the process of being developed in the region, if relevant. Management actions: Where negative impacts are identified, the EAP specified practical mitigation objectives (i.e. ways of avoiding or reducing negative impacts). Where no mitigation is feasible, this was stated, and the reasons given. Where positive impacts are identified, management actions to enhance the benefit were also recommended. The EAP set quantifiable standards for measuring the effectiveness of mitigation and enhancement.

11.3 The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.

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

Hint: The proposed mining site is in a disturbed area. The comparative impact assessment indicates however that opencast mining will have significant environmental impacts. An analysis of impacts significance (as provided below) indicated that impacts will be at medium significant and low significant after mitigation measures. The assessment also considers the scale of the operation which is 2ha and the area is already under considerable human interaction. Mining and its associated activities will have the greatest impact on the environment and is the least sustainable. But upon completion of mining and with proper rehabilitation, all the current land uses can be considered for the area. Most of the mining impacts will also be for a very limited time (not more than 5 years overall period if renewals are considered) and occurred in a very small area (5ha). In general, responsible mining and rehabilitation from the start of the operation can mitigate a lot of the residual impacts associated with mining. Mining will also have a great positive economic impact and should be considered a viable land use for the area, especially since the surrounding area has no major sensitive environmental features.

(b) Cumulative impacts

Cumulative impacts that may arise from the proposed project

Consideration must be given to the extent of any cumulative impact that may occur due to the proposed development. Such impacts are evaluated with an assessment of similar developments already in the environment. Such impacts will be either positive or negative, and will be graded as being of negligible, low, medium, or high impact. The Table below highlights how cumulative impacts manifest in the environment due to the impacts resulting from numerous developments on the given spatial scale.

Cumulative Impacts which could result from the proposed project, in addition to other projects in the area, are described below:

Table 6: CUMULATIVE IMPACTS: PROPOSED: Malumbazo Holdings

IMPACT	SIGNIFICANCE BEFORE MITIGATION	PROPOSED MITIGATION	SIGNIFICANCE AFTER MITIGATION
Pressure on road network due to increase in vehicles	Medium (negative)	• Improve roads, if required. • Implement traffic management plan and keep trucking to daylight hours.	Low (negative)

Increase job opportunities and boosting of local economy	Medium (positive)	• N/A	Medium (positive)
Contamination and sedimentation of the Yellowwood River	Medium	• Adequate buffer zone should be implemented (Maintain buffer zone of natural vegetation between mining operations and the seasonal stream). • Avoid fuel leakage from leakage from vehicles and machines • Implement a proper waste management on site • Monitor off site pollution. • Avoid using the back road closer to the water course. • Control soil erosion on site. • Better Management of stockpiles.	Low

The section below provided a summary of main activities associated with the project and environment to be affected.

11.4 Impact assessment of main activities of the project

Vegetation clearance

Environment to be affected: Soil, air quality, noise

Description: the clearance of the vegetation may contribute to soil erosion, dust emission and increase in noise in the area. The significance of each impact is assessed in the table below. Mitigation measures for those impacts are provided in the section below.

Phase Impact Occurs (C,O,D)	Affected Environment	Nature of Impact (Negative/Positive)	Spatial Scale	Duration	Intensity	Probability	Significance	Significance Rating (Pre-Mitigation)
C	Soil	N	2	2	4	4	32	Medium
C	Dust	N	2	2	4	3	15	Low
C,O,D	Noise	N	2	2	1	3	15	Low

Establishment of a fence

Environment to be affected: animals

Description: The main impact of the establishment of a fence surrounding the mining area will be the disturbance of animals (movement of animals) which are at the surrounding farms. This impact is rated low considering the present state/ land use of the area. The area is already fenced. Only grazing will be affected. The project site is not in a forest area.

Phase Impact Occurs (C,O)	Affected Environment	Nature of Impact (Negative/Positive)	Spatial Scale	Duration	Intensity	Probability	Significance	Significance Rating (Pre-Mitigation)
C,O	Animal Life	N	2	3	3	1	8	Low

Construction of site camp, office and toilets

Environment to be affected: Soil, air quality, noise, surface and groundwater

Description: Impact which can arise from this activity are noise creation (caused by construction activities and music from the staff), soil and air degradation and contamination of surface and

groundwater due to fuel spill from vehicles. The impact of noise is assessed medium due to the possible disturbance of surrounding animals. The effect on the noise on human is low due to the fact that there are few homesteads at a close proximity of the project site.

The operation of toilet (seepage) will not have impact on surrounding watercourses and groundwater since chemical portable toilet will be utilised. The impacts of this aspect will be low.

Phase Impact Occurs (C,O)	Affected Environment	Nature of Impact (Negative/Positive)	Spatial Scale	Duration	Intensity	Probability	Significance	Significance Rating (Pre-Mitigation)
C	Noise	N	2	1	4	5	35	Medium
C	Surface and groundwater	N	2	1	2	1	5	Low
C	Soil	N	1	2	2	1	5	Low
C	Air quality	N	1	2	2	2	5	Low
C	Job creation	P	1	2	2	2	10	Low

Removal of topsoil and overburden

Impacted environnent: Soil, air quality, noise

Description: Impacts associated with the removal of topsoil and overburden will be the degradation of soil, creation of dust and noise. The impacts are rating from medium to low.

Phase Impact Occurs (C, O, D)	Affected Environment	Nature of Impact (Negative/Positive)	Spatial Scale	Duration	Intensity	Probability	Significance	Significance Rating (Pre-Mitigation)
C	Soil	N	2	2	4	4	32	Medium
C	Dust	N	2	2	4	4	32	Medium
C, O, D	Noise	N	2	2	1	3	15	Low

Stripping and stockpiling of topsoil and overburden

Impacted environment: Soil, air (dust), noise, surface and groundwater.

Description: The impacts associated with the stripping and stockpiling of topsoil and overburden will be the degradation/disturbance of soil, creation of dust (caused by soil disturbance and effect of wind on the topsoil), noise caused by machinery stripping and stockpiling the topsoil., loss of topsoil due to incorrect storm water management, which can lead to surface water siltation, infestation of the topsoil heaps by weeds or invader plants, contamination of area with hydrocarbons or fuel from vehicles . The impacts from this activity are rated from medium to low.

Phase Impact Occurs (C, O, D)	Affected Environment	Nature of Impact (Negative/Positive)	Spatial Scale	Duration	Intensity	Probability	Significance	Significance Rating (Pre-Mitigation)
C	Soil	N	2	2	3	4	32	Medium
C	Dust	N	2	2	2	4	32	Medium
C	Topsoil (infestation by weeds)	N	2	3	2	1	7	Low
C,O	Noise	N	2	2	2	3	15	Low
C	Surface and groundwater	N	1	2	2	1	5	Low

Access road

The main effects and impacts associated with the utilisation of the road are the increase of road users, possible accidents, degradation of the road.

Phase Impact Occurs (C,O,D)	Affected Environment	Nature of Impact (Negative/Positive)	Spatial Scale	Duration	Severity	Conseque	Probability	Significance	Significance Rating (Pre-Mitigation)
C,O,D	Road	N	2	6	4	12	5	60	Medium
C,O,D	Safety	N	2	6	4	12	5	60	Medium

Blasting

Impacted environment : Soil, air quality (dust), noise, graves, houses, safety risk (accidents)

Description: The impacts associated with blasting activities include safety risk, dust nuisance, noise, vibration, gas emission, soil degradation and water contamination.

Noise

The impact of noise is assessed medium due to the possible disturbance of surrounding animals (terrestrial and aquatic animals). The effect on the noise on human is low due to the fact that there are few homes and a school at a close proximity of the project site.

Vibration

The impact of vibration on people and buildings will be medium to low. There are only few houses on the proposed project area. The negative impact from blasting vibration will be felt (medium) unless the following measures are in place:

-All overburden blasting that occurs closer than 1200 m from any house should be designed to reduce the charge mass per delay and thus limit vibration to below 7.0 mm/s in these areas where people live.

Water pollution

surface water contamination and Groundwater contamination may occur due to chemical from the explosives. Release or spillage of blasting chemicals has been occasionally associated with the detection of nitrate and nitrite (Brandon Kernen, 2010). Residual substances associated with blasting occurring on the face of blasted rockmaterials located at the blasting site, or when a stockpile of waste rock comes into contact with precipitation may result in the substances being leached into the groundwater.

Water pollution may also arise from dissolved explosives salts. To prevent this occurring, the following measures should be applied:

Gas Emissions from Blasting, dust and fumes: When explosives detonate, they generate nitrogen, carbon dioxide and water vapour. These gases are often non-poisonous and therefore do not have a significant impact. There are trace amounts of ammonia and nitrous fumes that produce the characteristic smell to blasting fumes just after a blast. These quickly dissipate and do not extend more than a few hundred metres from a blast. When explosives are not stoichiometrically balanced or poor blasting practices are applied, the amount of nitrous fumes can increase. These are visible as orange to deep red fumes. They are highly toxic and measures will be needed to prevent nitrous fumes should they occur. Should any nitrous oxide fumes be observed during a blast, blasting activity should be halted and the cause of the fumes identified and corrected. Causes include poor charging practices, incorrect explosives formulation or holes that are too close together in softer formations.

Dust; Residents living around the site may experience an increased level of black dust settling in their houses. The dust generated by blasting occurs for a short duration at blasting time as opposed to dust generated by dragline. Dust emissions increase with the wind speed. Wind speed increases with altitude. Since the project area is far from the communities, the impact of blasting on communities is medium.

Fly Rock: Fly rock (is rock that is ejected from the blast site in a controlled explosion in mining operations) in strip mining needs to be controlled by providing adequate quality stemming in each blasthole as outlined for air blast control. Strict control needs to be applied to prevent the occurrence of overcharged holes. Under-burdened holes in the front of a blast must be avoided, and control will be necessary if fly rock extends further than the dragline spoil piles.

For safety, it will be necessary to apply a safety distance from each blast during the blast. This distance must be defined by management based on fly rock history in blasts further away and using third party expert advice. All public roads that are close to any blasting must be closed to a safe minimum distance during the blast.

Phase Impact Occurs (C,O,D)	Affected Environment	Nature of Impact (Negative/Positive)	Spatial Scale	Duration	Intensity	Probability	Significance	Significance Rating (Pre-Mitigation)
O	Soil	N	2	3	4	5	45	Medium
O	Health and safety	N	2	3	3	5	40	Medium-Low
O	Surface Water	N	2	3	4	3	56	Medium
O	Ground Water	N	2	3	4	5	54	Medium
O	Noise	N	2	3	3	5	40	Medium

Crushing and screening

Environment affected: Noise, air, safety,dust

Description: The air movement through the crushers can generate high velocity dust moving through the process. Screening is the method to process particles into ranges by size. The major impacts that can be generated from those activities are dust, noise, contamination of surface and groundwater due dust, leakage from equipment, hydrocarbons and hazardous waste materials.

Phase Impact Occurs (C,O,D)	Affected Environment	Nature of Impact (Negative/Positive)	Spatial Scale	Duration	Intensity	Probability	Significance	Significance Rating (Pre-Mitigation)
O	Dust	N	2	3	4	5	45	Medium
O	Surface Water	N	2	3	4	3	56	Medium
O	Ground Water	N	2	3	4	5	54	Medium
O	Noise	N	2	3	3	5	40	Medium

Excavation: Impacts related to the excavation are visual intrusion, dust nuisance (due to excavation activities), noise nuisance generated by excavation equipment and unsafe working conditions for employees. The impacts of this activity will generally be low.

Phase Impact Occurs (C,O,D)	Affected Environment	Nature of Impact (Negative/Positive)	Spatial Scale	Duration	Intensity	Probability	Significance	significance Rating (Pre-Mitigation)
C,O	Dust	N	2	2	1	4	20	Low
C,O	Visual	N	1	2	2	5	25	Low
C,O	Noise	N	2	2	2	3	15	Low
C,O	Working condition for employees	N	1	3	3	5	35	Medium

Stockpiling/RoM

Environment affected: Air, surface water, groundwater, visual, soil

Description: Impacts associated with stockpiling of raw materials are:

- Visual intrusion associated with the stockpiled material and vehicles transporting material.
- Loss of material due to ineffective storm water handling
- Dust nuisance from stockpiled material
- Contamination of surrounding watercourses (due to ineffective storm water handling)

Most of the impact arising from the stockpiling of raw material will be contained (in the pit). Thus most the impacts from the stockpiling are assessed medium to low.

Phase Impact Occurs (C,O,D)	Affected Environment	Nature of Impact (Negative/Positive)	Spatial Scale	Duration	Intensity	Probability	Significance	significance Rating (Pre-Mitigation)
O	Dust	N	2	2	1	4	20	Low
O	Visual	N	1	2	2	5	25	Medium
C	Surface and groundwaterwater	N	1	3	3	5	35	Medium

Transporting

Environment affected: Air, Human, groundwater

Description: Impacts associated with transport are:

- Dust nuisance from vehicles transporting the material
- Degradation of access roads

- Road accidents
- Noise nuisance caused by vehicles
- Contamination of area (soil, groundwater) with hydrocarbons or hazardous waste materials

The significance of the impacts pre-mitigation are medium.

Phase Impact Occurs (C,O,D)	Affected Environment	Nature of Impact (Negative/Positive)	Spatial Scale	Duration	Intensity	Probability	Significance	significance Rating (Pre-Mitigation)
C,O,D	Accident	N	2	2	1	4	20	Low
C,O,D	Degradation of access	N	1	2	2	5	25	Low
C,O,D	Dust	N	1	2	2	4\5	25	Medium
C,O,D	Noise	N	2	2	2	3	15	Low
C,O,D	Surface and groundwaterwater	N	1	2	2	2	10	Low

Open Pit

Environment affected: Human, visual.

Description: Impacts associated with the open pit are:

- Visual degradation
- Possible accidents

Phase Impact Occurs (C,O,D)	Affected Environment	Nature of Impact (Negative/Positive)	Spatial Scale	Duration	Intensity	Probability	Significance	significance Rating (Pre-Mitigation)
O	Accident	N	2	3	3	5	40	Medium
O	Visual	N	2	3	3	5	425	Medium

Sloping and landscaping during rehabilitation

The main positive impact during rehabilitation are soil stabilization, positive natural revegetation and movement of animals. The likely negative impact of the rehabilitation on air quality/dust (nuisance caused during sloping and landscaping activities), noise (nuisance caused by machinery) and soil erosion will be low.

The potential significant negative impacts are:

- Health and safety risk posed by un-sloped areas, machinery and accidents.
- Surface and or groundwater contamination (Contamination of area with hydrocarbons or hazardous waste materials)

- Infestation of the area by weed and invader plants.

Phase Impact Occurs (C,O,D)	Affected Environment	Nature of Impact	Spatial Scale	Duration	Intensity	Probability	Significance	significance Rating (Pre-Mitigation)
D	Soil	N	2	3	2	1	7	Low
D	Soil stabilization	P	2	3	3	4	32	Medium (+)
D	Air quality /dust	N	2	3	2	1	7	Low
D	Noise	N	2	3	1	2	12	Low
D	Surface and groundwater	N	2	3	2	2	14	Low
D	Natural Vegetation and Animal life	P	2	3	3	4	32	Medium (+)
D	Natural vegetation/weed invader	N	2	3	3	4	32	Medium (-)
D	Health and safety	N	2	3	3	4	32	Medium (-)

Impact assessment for activities or developments associated with the proposed mining project.

Water/ power supply system/

Environment to be affected: Soil, surface and groundwater

Description: the utilisation/ demand of water may lead to the surface and groundwater depletion. The significance of the impact on the groundwater and surface quantity pre-mitigation will be high. The amount of water needed for this operation is less. Impact from the power supply will also be low.

Phase Impact Occurs (C,O,D)	Affected Environment	Nature of Impact (Negative/Positive)	Spatial Scale	Duration	Intensity	Probability	Significance	significance Rating (Pre-Mitigation)
C,O,D	Surface and ground water quantity	N	2	4	4	5	50	Low

The table below illustrates a general analysis, assessment of likely environmental impacts.

Table 7: Impact ranking

Impact	Activities sources of impacts	Phase			Characterisation						Assessment Criteria			Significance of the impact
		Site Establishment (SE)	Operational (Op)	Closure (Cl)	Nature	Interaction	Reversibility	Occurrence	Cumulatively	Value of the affected env.	Duration	Extent	Intensity	
Loss/Disturbance of flora and Destruction of important species	Vegetation clearing/ Mining operation, Blasting	SE/Op			-	D/I	R	De	Y	V	Mt	L	L	Low
Loss/Disturbance of fauna	Mining operation, Blasting	SE/Op			-	D/I	I	De	Y	V	Mt	L	Mo	Medium
Increase in noise	Mining operation, crushing, screening, drilling Blasting	SE/Op			-	D	I	De	Y	V	Mt	L	Mo	Medium
Surface Water pollution & Eutrophication, Sedimentation of the Yellowwood River.	Solid, organic waste management, Hazardous waste management	SE/Op			-	D/I	R	Po	Y	V	Mt	L	Mo	Medium
Diminution or reduction of the Yellowwood water quantity	Abstraction of water for mining operation	SE/Op			-	D	R	Po	Y	V	Mt	L	L	Minor

Groundwater contamination	Spill, vehicles, truck equipment maintenance, refuel	SE/ Op/Cl	-	D/I	R	De	Y	HV	Mt	R	H	High
Soil erosion/Loss of soil	Site clearing, Drilling, Top soil management	SE/Op	-	D/I	R	De	N	V	Mt	L	Mo	Medium
Surface water (local hydrology)	Waste management, water usage/	SE/Op /Cl	-	D	R	De	Y	V	Mt	R	Mo	Me
Change of topography	Excavation/ Open pit/ Bench	SE/Op /Cl	-	D	I	De	Y	V	Lt	L	H	Medium
Increased noise	Equipment movement Blasting,	SE/Op	-	D	R	De	Y	NV	M	L	Mo	Medium
Air Pollution, Dust emission /fumes	Blasting, Vehicle movement, Excavation, Closure	SE/Op	-	D	R	Po	Y	V	Mt	L	Mo	Medium
Work Accidents/fire	Transport, working at height, spill management	SE/0p /Cl	-	D	R	Un	N	V	S	L	Mo	Medium
Increase of disease, AIDS/	Presence of new people/labor force and staff	SE/Op /Cl	-	D/I	R	Un	Y	V	S	L	Mi	Minor
Social conflicts	Land use	Op	-	I	R	Un	Y	V	S	L	Mo	Minor
Increase of road users and traffic on R63	Transport of materials, Equipment movement	SE/Op /Cl	-	D	R	Un	Y	NV	Mt	L	S	Minor
Visual/Aesthetic degradation	Vegetation clearing, excavation and open pit	SE/Op	-	D	R	De	Y	NV	Lt	L	Mo	Medium
Spread of waterborne diseases, water pollution & loss of aquatic biodiversity	Poor sewage management, Poor waste management	SE/Op/Cl	-	D/I	R	Po	Y	V	Mt	L	Mo	Medium
Loss of crop	Vegetation clearing, Mining exploitation, land use	SE/Op	-	D	R	De	Y	V	S	L	Mi	Minor

Poor health of workers	Worked exposed to weather conditions, such as rain winter cold, summer	SE/Op /Cl	-	D	R	Un	N	V	S	L	Mi	Minor
Increase the development of the area	Upgraded road	SE/Op /Cl	+	I	R	Po	Y	V	S	L	Mi	Minor
Job creation	Staff /Labor force recruitment	SE/Op /Cl	+	D	R	De	Y	V	Me	L	Mo	Mediun

12. Possible mitigation measures that could be applied and the level of risk

Impact ranking and proposed mitigation measures: main impacts identified during each phase of the project

Construction Phase				
Potential Impact	**Mitigation**	**Significance**	**Probability**	**Duration**
Disturbance and loss of vegetation due to construction activities	Rehabilitation to original natural state after removal of bedrock material is not practically viable Keep vegetation clearance to a minimum, clearing only those sections that will be mined next in order to mitigate secondary impacts	Low Negative Mitigation measures will not make much difference (-)	Definite	Long term
Loss of soil as a result of clearance of vegetation and overburden	Rehabilitation to original natural state after removal of bedrock material is not practically viable Keep vegetation clearance to a minimum, clearing only those sections that will be mined next to mitigate secondary impacts Control storm water runoff from the onset of clearance and construction.	Low Negative Mitigation measures will not make much difference (-)	Definite	Long term
Sedimentation and contamination of the Yellowwood river	Maintain buffer zone of natural vegetation between mining operations and the seasonal stream. Keep vegetation clearance to a minimum. Store / dispose topsoil and overburden in such a way that it does not end up in the nearby seasonal stream as silt and sand Control storm water runoff. Control soil erosion. Control overgrazing and over browsing practices on and around the study area Control alien invasive plants	Medium Negative (-)	Definite	Long term
Increased grazing and browsing pressure on surrounding vegetation	Limit the amount of water supplied to what is normally available in this ecosystem. Do not create a perennial water	Medium (-) Current grazing and browsing pressures have resulted in degraded	Definite	Long term

due to perennial water supply from borehole	source at the nearby dam. This will encourage seasonal migration with livestock, providing the surrounding vegetation with respite from grazing and browsing pressures during the dry season. Follow and mimic natural ecosystem patterns and processes as far as possible.	vegetation. The proposed mining will only worsen the problem slightly		
Spillage of contaminants: Contamination of surface water from fuel spills and leakages	• Equipment used in the mining process must be adequately maintained, such that during operation they must not spill oil, diesel, fuel or hydraulic fluid. • Spills must be cleaned up immediately after occurrence by removing the spills, together with the polluted soil, and disposing thereof at a recognized facility. Oil and chemicals must not be stored on site.	Medium (-)	Definite	Short term
Increase of road users and traffic on R 63	Enforcement of speed limits to reduce the chances of impact with road users and animals • Fine road sign offenders employed by the Mine • Avoid transportation during busy hours of the day (that's 6:00-9:00am and 16:00-18:00pm).	Medium (-)	Definite	Short term
Dust and fumes from mine vehicles/machines and from exposed product stockpiles	The sensitive receptors in this case are such a distance away that the Dust Deposition resulting from the proposed operation on these receptors are negligible. According to the Australian NPI, dust generation from material transfer points can be reduced by 50% where water sprays are applied. Adding wind break can reduce the dust emissions with 30%. Enclosing	Medium Negative	Definite	Short term

	the operations, the emissions will become insignificant. The liberation of dust into the atmosphere must be controlled by: •Spraying water and limiting the speed of haul trucks •Regular maintenance of the access road •Reducing activities during windy days •Implementing a speed limit of 30km/h on unpaved surfaces •Minimizing exposed areas prone to wind erosion			
Cumulative impacts associated with the proposed development on the vegetation of the surrounding local areas will come from increased human and livestock activity in the area. Such impacts include an increased demand for firewood, grazing, browsing, water, access to electricity and sanitation, increased distribution of invasive alien plant species, increased dust pollution along the transport route, increased soil erosion along the transport route, increased sedimentation.	Keep vegetation clearance to a minimum. Control storm water runoff. Control soil erosion. Control alien invasive plants. Prevent illegal electrical connections from the power supply grid associated with the proposed development. Control dust pollution without causing sediment runoff into nearby drainage systems.	Medium Negative	Definite	Short to Long term
Operational Phase				
Potential Impact	**Mitigation**	**Significant**	**Probability**	**Duration**
Disturbance and loss of vegetation due to operational activities	Rehabilitation to original natural state after removal of bedrock material is not practically viable. Keep vegetation clearance to a minimum, clearing only those sections that will be mined next in order to mitigate secondary impacts.	Low Negative Mitigation measures will not make much difference	Definite	Long Term

Loss of soil as a result of clearance of vegetation and overburden	Rehabilitation to original natural state after removal of bedrock material is not practically viable Keep vegetation clearance to a minimum, clearing only those sections that will be mined next to mitigate secondary impacts. Control storm water runoff from the onset of clearance and construction	Low Negative Mitigation measures will not make much difference	Definite	Long Term
Contamination and Sedimentation of the Yellowwood River.	Maintain buffer zone of natural vegetation between mining operations and the seasonal stream. Keep vegetation clearance to a minimum. Store / dispose topsoil and overburden in such a way that it does not end up in the nearby seasonal stream as silt and sand. Control storm water runoff. Control soil erosion. Control overgrazing and over browsing practices on and around the study area. Control alien invasive plants.	High Negative	Definite	Long Term
Increased grazing and browsing pressure on surrounding vegetation due to perennial water.	Limit the amount of water supplied to what is normally available in this ecosystem. Do not create a perennial water source at the nearby dam. This will encourage seasonal migration with livestock, providing the surrounding vegetation with respite from grazing and browsing pressures during the dry season. Follow and mimic natural ecosystem patterns and processes as far as possible.	High Negative	Definite	Long Term
Spillage of contaminants: Contamination of surface water from fuel spills and leakages	• Equipment used in the mining process must be adequately maintained, such that during operation they must not spill oil, diesel, fuel or hydraulic fluid. • Spills must be cleaned up immediately after occurrence	Medium (-)	Definite	Short term

	by removing the spills, together with the polluted soil, and disposing thereof at a recognized facility. Oil and chemicals must not be stored on site.			
Increase of road users and traffic on R 63	Enforcement of speed limits to reduce the chances of impact with road users and animals • Fine road sign offenders employed by the Mine • Avoid transportation during busy hours of the day (that's 6:00-9:00am and 16:00-18:00pm)	Medium (-)	Definite	Short term
Dust and fumes from mine vehicles/ machines and from exposed product stockpiles	According to the Australian NPI, dust generation from material transfer points can be reduced by 50% where water sprays are applied. Adding wind break can reduce the dust emissions with 30%. Enclosing the operations, the emissions will become insignificant. The liberation of dust into the atmosphere must be controlled by: •Spraying water and limiting the speed of haul trucks •Regular maintenance of the access road •Reducing activities during windy days •Implementing a speed limit of 30km/h on unpaved surfaces •Minimizing exposed areas prone to wind erosion	Medium Negative	Definite	Short term
Increase in noise	- Fitting equipment with noise abatement measures (e.g. acoustical mufflers and white-noise generators)-Natural	Medium Negative	Definite	Medium term

	vegetation as barriers: Natural vegetation, such as a line of trees, does not represent an effective noise barrier. For vegetation to be used as a moderately effective barrier. - Limiting number of simultaneous noises emitting activities - Fitting equipment with noise abatement measures (e.g. acoustical mufflers and white-noise generators) - The area chosen for these purposes must be the minimum, reasonably required for the purpose, and which will involve the least disturbance to the vegetation and animals movement. - No blasting should take place early in the mornings, late in the afternoons, at night, during overcast conditions. The mine should schedule blasting at the same time in preferably around 3pm considering the fact that there are schools around the site. -All neighbours and interested and affected parties must be notified before blasting occurs.			
Cumulative impacts associated with the	Keep vegetation clearance to a minimum.	High Negative	Definite	Short to Long term

proposed development on the vegetation of the surrounding local areas will come from increased human and livestock activity in the area, agriculture and sedimentation of the watercourse	Control storm water runoff. Control soil erosion. Control alien invasive plants. Prevent illegal electrical connections from the power supply grid associated with the proposed development. Control dust pollution without causing sediment runoff into nearby drainage systems.			
Closure phase				
Potential Impact	**Mitigation**	**Significant**	**Probability**	**Duration**
Compaction of soil because of development infrastructure	Rehabilitate soil in places where original topography still remains intact to allow vegetation to grow in the substrate again	Medium Negative	Possible	Long term to Permanent
Hole left behind after mining	Reshape the hole to decrease danger to the local human community as well as decrease the negative affect on the surrounding natural environment.	High Negative	Definite	Long term to Permanent
Disturbance and loss of vegetation due to mining activities	Mitigation measures to restore topography and the original vegetation is impractical. Revegetate site with indigenous vegetation. Monitor increase of alien invasive species due to site disturbance.	Low Negative Mitigation measures will not make much difference	Definite	Permanent
Sedimentation and contamination of the Yellowwood river	Maintain buffer zone of natural vegetation between mining operations and the stream Keep vegetation clearance to a minimum. Store / dispose topsoil and overburden in such a way that it does not end up in the nearby seasonal stream as silt and sand. Control storm water runoff. Control soil erosion. Control overgrazing and over browsing practices on and around the study area. Control alien invasive plants.	High Negative	Definite	Long term

Increased grazing and browsing pressure on surrounding vegetation due to perennial water supply from borehole	Limit the amount of water supplied to what is normally available in this ecosystem. Do not create a perennial water source at the nearby dam. This will encourage seasonal migration with livestock, providing the surrounding vegetation with respite from grazing and browsing pressures during the dry season. Follow and mimic natural ecosystem patterns and processes as far as possible.	High, negative	Definite	Long term
Spillage of contaminants: Contamination of surface water from fuel spills and leakages	• Equipment used in the mining process must be adequately maintained, such that during operation they must not spill oil, diesel, fuel or hydraulic fluid. • Spills must be cleaned up immediately after occurrence by removing the spills, together with the polluted soil, and disposing thereof at a recognized facility. Oil and chemicals must not be stored on site.	Medium (-)	Definite	Short term
Increase of road users and traffic on R 63	Enforcement of speed limits to reduce the chances of impact with road users and animals • Fine road sign offenders employed by the Mine • Avoid transportation during busy hours of the day (that's 6:00-9:00am and 16:00-18:00pm)	Medium (-)	Definite	Short term
Dust and fumes from mine vehicles/ machines and from exposed product stockpiles	According to the Australian NPI, dust generation from material transfer points can be reduced by 50% where water sprays are applied. Adding wind break can reduce the dust emissions with 30%. Enclosing the operations, the emissions will become insignificant.	Low Negative	Definite	Short term

	The liberation of dust into the atmosphere must be controlled by: •Spraying water and limiting the speed of haul trucks •Regular maintenance of the access road •Reducing activities during windy days •Implementing a speed limit of 30km/h on unpaved surfaces •Minimizing exposed areas prone to wind erosion			
Cumulative impacts associated with the proposed development on the vegetation of the surrounding local areas will come from increased human and livestock activity in the area. Such impacts include an increased demand for firewood, grazing, browsing, water, access to electricity and sanitation, increased distribution of invasive alien plant species, increased dust pollution along the transport route, increased soil erosion along the transport route, increased sedimentation within drainage lines along the transport route and a reduction of ecosystem services.	Keep vegetation clearance to a minimum. Control storm water runoff. Control soil erosion. Control alien invasive plants. Prevent illegal electrical connections from the power supply grid associated with the proposed development	High, negative	Definite	Short to Long term

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

The following mitigation measures will be applied to ensure that the mining activity does abide, as discussed, with the interested and affected parties during consultation.

Activity	Potential Impact- Significance	Mitigation measures
Establishment of haul road/access road to the site; Demarcating mining area, erecting mobile toilet facilities & campsite. Designate stockpile area; Remove alien invasive species.	Disturbance and loss of vegetation due to construction activities	Rehabilitation to original natural state after removal of bedrock material is not practically viable Keep vegetation clearance to a minimum, clearing only those sections that will be mined next to mitigate secondary impacts
	Loss of soil as a result of clearance of vegetation and overburden	Rehabilitation to original natural state after removal of bedrock material is not practically viable. Keep vegetation clearance to a minimum, clearing only those sections that will be mined next to mitigate secondary impacts Control storm water runoff from the onset of clearance and construction.
	Sedimentation and contamination of the Yellowwood River	Maintain adequate buffer zone of natural vegetation between mining operations and the seasonal stream. Keep vegetation clearance to a minimum. Store / dispose topsoil and overburden in such a way that it does not end up in the nearby seasonal stream as silt and sand Control storm water runoff. Control soil erosion. Control overgrazing and over browsing practices on and around the study area Control alien invasive plants
	Increased grazing and browsing pressure on surrounding vegetation due to perennial water supply from borehole	Limit the amount of water supplied to what is normally available in this ecosystem. Do not create a perennial water source at the nearby dam. This will encourage seasonal migration with livestock, providing the surrounding vegetation with respite from grazing and browsing pressures during the dry season. Follow and mimic natural ecosystem patterns and processes as far as possible.

	Spillage of contaminants: Contamination of surface water from fuel spills and leakages	• Equipment used in the mining process must be adequately maintained, such that during operation they must not spill oil, diesel, fuel or hydraulic fluid. • Spills must be cleaned up immediately after occurrence by removing the spills, together with the polluted soil, and disposing thereof at a recognized facility. Oil and chemicals must not be stored on site.
	Increase of road users and traffic on R 63	Enforcement of speed limits to reduce the chances of impact with road users and animals • Fine road sign offenders employed by the Mine • Avoid transportation during busy hours of the day (that's 6:00-9:00am and 16:00-18:00pm) .
	Dust and fumes from mine vehicles/machines and from exposed product stockpiles	The sensitive receptors in this case are such a distance away that the Dust Deposition resulting from the proposed operation on these receptors are medium to negligible. According to the Australian NPI, dust generation from material transfer points can be reduced by 50% where water sprays are applied. Adding wind break can reduce the dust emissions with 30%. Enclosing the operations, the emissions will become insignificant. The liberation of dust into the atmosphere must be controlled by: •Spraying water and limiting the speed of haul trucks •Regular maintenance of the access road •Reducing activities during windy days •Implementing a speed limit of 30km/h on unpaved surfaces •Minimizing exposed areas prone to wind erosion
Social Impacts	Spontaneous settlement due to perceived employment opportunities Medium (-)	• Develop employment and recruitment policy that priorities local recruitment
	Increase pressure on social services due to influx of job seekers Low (-)	• Support local government capacity for integrated development planning • Identify and support community development programs
	Benefits resulting from employment and income opportunities created by the operation Medium (+)	• Support local government in skills development and training initiatives • Implement employment policy prioritizing local employment • Work together with the local municipality

Operational Phase		
Activity	**Potential Impact**	**Mitigation measures**
Extraction and removal of the minerals onsite; Stockpiling of product; Loading of product into transportation	Disturbance and loss of vegetation due to operational activities	Rehabilitation to original natural state after removal of bedrock material is not practically viable. Keep vegetation clearance to a minimum, clearing only those sections that will be mined next in order to mitigate secondary impacts.
	Loss of soil as a result of clearance of vegetation and overburden	Rehabilitation to original natural state after removal of bedrock material is not practically viable Keep vegetation clearance to a minimum, clearing only those sections that will be mined next to mitigate secondary impacts. Control storm water runoff from the onset of clearance and construction
	Sedimentation and contamination of the Yellowwood river	Maintain 50 m buffer zone of natural vegetation between mining operations and the seasonal stream. Keep vegetation clearance to a minimum. Store / dispose topsoil and overburden in such a way that it does not end up in the nearby seasonal stream as silt and sand. Storm water runoff should be controlled. Control soil erosion. Control alien invasive plants. Ensure proper waste management on site
	Increased grazing and browsing pressure on surrounding vegetation	Limit the amount of water supplied to what is normally available in this ecosystem. Do not create a perennial water source at the nearby dam and streams. This will encourage seasonal migration with livestock, providing the surrounding vegetation with respite from grazing and browsing pressures during the dry season. Follow and mimic natural ecosystem patterns and processes as far as possible.
	Spillage of contaminants: Contamination of surface water from fuel spills and leakages	• Equipment used in the mining process must be adequately maintained, such that during operation they must not spill oil, diesel, fuel or hydraulic fluid. • Spills must be cleaned up immediately after occurrence by removing the spills, together with the polluted soil, and disposing thereof at a recognized facility. Oil and chemicals must not be stored on site.
	Increase of road users and traffic on R 63	Enforcement of speed limits to reduce the chances of impact with road users and animals

		• Fine road sign offenders employed by the Mine • Avoid transportation during busy hours of the day (that's 6:00-9:00am and 16:00-18:00pm)
	Dust and fumes from mine vehicles/machines and from exposed product stockpiles	The sensitive receptors in this case are such a distance away that the Dust Deposition resulting from the proposed operation on these receptors are negligible. According to the Australian NPI, dust generation from material transfer points can be reduced by 50% where water sprays are applied. Adding wind break can reduce the dust emissions with 30%. Enclosing the operations, the emissions will become insignificant. The liberation of dust into the atmosphere must be controlled by: •Spraying water and limiting the speed of haul trucks •Regular maintenance of the access road •Reducing activities during windy days •Implementing a speed limit of 30km/h on unpaved surfaces •Minimizing exposed areas prone to wind erosion
	Increase in noise	- Fitting equipment with noise abatement measures (e.g. acoustical mufflers and white-noise generators)-Natural vegetation as barriers: Natural vegetation, such as a line of trees, does not represent an effective noise barrier. For vegetation to be used as a moderately effective barrier. - Limiting number of simultaneous noises emitting activities - Fitting equipment with noise abatement measures (e.g. acoustical mufflers and white-noise generators) - The area chosen for these purposes must be the minimum, reasonably required for the purpose, and which will involve the least disturbance to the vegetation and animals movement.

		- No blasting should take place early in the mornings, late in the afternoons, at night, during overcast conditions. The mine should schedule blasting at the same time in preferably around 3pm considering the fact that there are schools around the site. -All neighbours and interested and affected parties must be notified before blasting occurs.
	Cumulative impacts associated with the proposed development on the vegetation of the surrounding local areas will come from increased human and livestock activity in the area. Such impacts include an increased demand for firewood, grazing, browsing, water, access to electricity and sanitation, increased distribution of invasive alien plant species, increased dust pollution along the transport route, increased soil erosion along the transport route, increased sedimentation within drainage lines along the transport route and a reduction of ecosystem services.	Keep vegetation clearance to a minimum. Control storm water runoff. Control soil erosion. Control alien invasive plants. Prevent illegal electrical connections from the power supply grid associated with the proposed development. Control dust pollution without causing sediment runoff into nearby drainage systems.
Social Impacts	Spontaneous settlement due to perceived employment opportunities Low (-)	Develop employment and recruitment policy that prioritizes local recruitment
	Increase pressure on social services due to influx of job seekers Low (-)	Support local government capacity for integrated development planning Identify and support community development programs
	Benefits resulting from employment and income opportunities created by the operation	Support local government in skills development and training initiatives

	Medium (+)	Implement employment policy prioritizing local employment Working with the councilor of the area to ensure that locals get first preference when it comes to employment opportunities
Closure phase		
Activity	**Potential Environmental Impact**	**Mitigation measures**
Rehabilitation of haul roads; Removal of any site infrastructure; Reseeding/planting of disturbed areas; Eradication of alien invasive species	Compaction of soil as a result of development infrastructure	Rehabilitate soil in places where original topography still remains intact to allow vegetation to grow in the substrate again
	Hole left behind after mining	Reshape the hole to decrease danger to the local human community as well as decrease the negative affect on the surrounding natural environment.
	Disturbance and loss of vegetation due to mining activities	Mitigation measures to restore topography and the original vegetation is impractical. Revegetate site with indigenous vegetation. Monitor increase of alien invasive species due to site disturbance.
	Sedimentation and contamination of the Yellowwood river	Maintain buffer zone of natural vegetation between mining operations and the seasonal stream Keep vegetation clearance to a minimum. Store / dispose topsoil and overburden in such a way that it does not end up in the nearby seasonal stream as silt and sand. Control storm water runoff. Control soil erosion. Control overgrazing and over browsing practices on and around the study area. Control alien invasive plants.
	Increased grazing and browsing pressure on surrounding vegetation due to perennial water supply from borehole	Limit the amount of water supplied to what is normally available in this ecosystem. Do not create a perennial water source at the nearby dam. This will encourage seasonal migration with livestock, providing the surrounding vegetation with respite from grazing and browsing pressures during the dry season. Follow and mimic natural ecosystem patterns and processes as far as possible.

	Spillage of contaminants: Contamination of surface water from fuel spills and leakages	• Equipment used in the mining process must be adequately maintained, such that during operation they must not spill oil, diesel, fuel or hydraulic fluid. • Spills must be cleaned up immediately after occurrence by removing the spills, together with the polluted soil, and disposing thereof at a recognized facility. Oil and chemicals must not be stored on site.
	Increase of road users and traffic on R 63	Enforcement of speed limits to reduce the chances of impact with road users and animals • Fine road sign offenders employed by the Mine • Avoid transportation during busy hours of the day (that's 6:00-9:00am and 16:00-18:00pm)
	Dust and fumes from mine vehicles/machines and from exposed product stockpiles	The sensitive receptors in this case are such a distance away that the Dust Deposition resulting from the proposed operation on these receptors are negligible. According to the Australian NPI, dust generation from material transfer points can be reduced by 50% where water sprays are applied. Adding wind break can reduce the dust emissions with 30%. Enclosing the operations, the emissions will become insignificant. The liberation of dust into the atmosphere must be controlled by: •Spraying water and limiting the speed of haul trucks •Regular maintenance of the access road •Reducing activities during windy days •Implementing a speed limit of 30km/h on unpaved surfaces •Minimizing exposed areas prone to wind erosion
	Cumulative impacts associated with the proposed development on the vegetation of the surrounding local areas will come from increased human and livestock activity in the area. Such impacts include an increased demand for firewood, grazing, browsing, water, access to electricity and sanitation, increased distribution of invasive alien plant species, increased dust pollution	Keep vegetation clearance to a minimum. Control storm water runoff. Control soil erosion. Control alien invasive plants. Prevent illegal electrical connections from the power supply grid associated with the proposed development

	along the transport route, increased soil erosion along the transport route, increased sedimentation within drainage lines along the transport route and a reduction of ecosystem services.	

13 Motivation where no alternative sites were considered.

No Alternatives have been assessed and considered for this development.

Statement motivating the alternative development location within the overall site.

(Provide a statement motivating the final site layout that is proposed)

The final site layout/design was preferred due to adequate reserves for the proposed mining period and considering the illegal mining which is currently taking place in the area. Aggregate quality is good due to its grad ability, durability of concrete and ability to capture precipitation. Also, the site is on a low steep gradient thus reducing the risk of erosion under normal non-flood conditions. The removal of alien invasive species on the riparian and office sites will add to the improvement of this area.

BGES undertook ecological and social site screening assessments, and considered/took into account the following aspects/parameters when selecting the site for the mining activities included:

<u>Environmental health and safety; protection of environmentally sensitive areas; land use and pollution levels</u>

• Flora, fauna, and vegetation

<u>Social</u>

• Homesteads.

• Farming (subsistence gardens and grazing livestock).

<u>Technical</u>

• Topography

• Clear access road (eastern side of the proposed site)

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).

NAME OF ACTIVITY **(E.g. For prospecting** - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc…etc…etc **E.g. For mining, -** excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and	**POTENTIAL IMPACT** (Including the potential impacts for cumulative impacts) (E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc…. etc…)	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	**SIGNIFICANCE** if not mitigated	**MITIGATION TYPE** (modify, remedy, control, or stop) Through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation.	**SIGNIFICANCE** if mitigated
Establishment of haul road/access road to the site. Demarcating mining area, erecting toilet facilities & campsite,	Disturbance and loss of vegetation due to construction activities	Fauna and flora habitat	Pre-establishment	Medium (-)	Rehabilitation to original natural state after removal of bedrock material is not practically viable Keep vegetation clearance to a minimum, clearing only those sections that will be mined next in order to mitigate secondary impacts	Low significance

Designate stockpile area; Remove alien invasive species. Extraction	Loss of soil as a result of clearance of vegetation and overburden.	Habitat	Construction	Medium (-)	Rehabilitation to original natural state after removal of bedrock material is not practically viable Keep vegetation clearance to a minimum, clearing only those sections that will be mined next to mitigate secondary impacts Control storm water runoff from the onset of clearance and construction.	Low significance
	Sedimentation and contamination of the Yellowwood River.	Local residences	Construction / Operation	Medium (-)	Maintain 50 m buffer zone of natural vegetation between mining operations and the seasonal stream. Keep vegetation clearance to a minimum. Store / dispose topsoil and overburden in such a way that it does not end up in the nearby seasonal stream as silt and sand Control storm water runoff. Control soil erosion. Control overgrazing and over browsing practices on and around the study area Control alien invasive plants	Low significance
	Spillage of contaminants: Contamination of surface water from fuel spills and leakages	Water/soil pollution	Construction / operation	Medium (-)	• Equipment used in the mining process must be adequately maintained, such that during operation they must not spill oil, diesel, fuel or hydraulic fluid. • Spills must be cleaned up immediately after occurrence by removing the spills, together with the polluted soil, and disposing thereof at a recognized facility. Oil and chemicals must not be stored on site.	Medium significance
	Increase of road users and traffic on R 63	Public infrastructure and safety	Construction/ Operational/ Decommissioning	Medium (-)	Enforcement of speed limits to reduce the chances of impact with road users and animals • Fine road sign offenders employed by the Mine	Medium significance

					• Avoid transportation during busy hours of the day (that's 6:00-9:00am and 16:00-18:00pm)	
	Dust and fumes from mine vehicles/machines and from exposed product stockpiles	Water resources, soil and ecosystem environment	Construction/ operation	Medium (-)	The sensitive receptors in this case are such a distance away that the Dust According to the Australian NPI, dust generation from material transfer points can be reduced by 50% where water sprays are applied. Adding wind break can reduce the dust emissions with 30%. Enclosing the operations, the emissions will become insignificant. The liberation of dust into the atmosphere must be controlled by: •Spraying water and limiting the speed of haul trucks •Regular maintenance of the access road •Reducing activities during windy days •Implementing a speed limit of 30km/h on unpaved surfaces •Minimizing exposed areas prone to wind erosion - Fitting equipment with noise abatement measures (e.g. acoustical mufflers and white-noise generators)-Natural vegetation as barriers: Natural vegetation, such as a line of trees, does not represent an effective noise barrier. For vegetation to be used as a moderately effective barrier.	Low significance
	Increase in Noise	Surrounding communities, animals				

					- Limiting number of simultaneous noises emitting activities - Fitting equipment with noise abatement measures (e.g. acoustical mufflers and white-noise generators) - The area chosen for these purposes must be the minimum, reasonably required for the purpose, and which will involve the least disturbance to the vegetation and animals movement. - No blasting should take place early in the mornings, late in the afternoons, at night, during overcast conditions. The mine should schedule blasting at the same time in preferably around 3pm considering the fact that there are schools around the site. -All neighbours and interested and affected parties must be notified before blasting occurs.	
	Cumulative impacts associated with the proposed development on the vegetation of the surrounding local areas will come from increased human and livestock activity in the area. Such impacts include	Surface water	Operation	Medium (-)	Keep vegetation clearance to a minimum. Control storm water runoff. Control soil erosion. Control alien invasive plants. Control dust pollution without causing sediment runoff into nearby drainage systems.	Medium significance

	an increased demand for firewood, grazing, browsing, water, access to electricity and sanitation, increased distribution of invasive alien plant species, increased dust pollution along the transport route, increased soil erosion along the transport route, increased sedimentation within drainage lines along the transport route and a reduction of ecosystem services.					
	Benefits resulting from employment and income opportunities, created by the operation	Surrounding community	Construction/ Operational	Low (+)	Hire locals and support local government in skills development and training initiatives	Medium significance
NAME OF ACTIVITY	**POTENTIAL IMPACT**	**ASPECTS AFFECTED**	**PHASE**	**SIGNIFICANCE**	**MITIGATION TYPE**	**SIGNIFICANCE**
Decommissioning of roads; Removal of office structures and any site infrastructure; Reseeding/planting of disturbed areas	Compaction of soil because of development infrastructure	Ecosystem	Rehabilitation	Medium (-)	Rehabilitate soil in places where original topography remains intact to allow vegetation to grow in the substrate again	Low significance
	Hole left behind after mining	Surrounding community and habitat	Rehabilitation	Medium (-)	Reshape the hole to decrease danger to the local human community as well as decrease the negative affect on the surrounding natural environment.	Low significance

	Disturbance and loss of vegetation due to mining activities	Ecosystem environment	Rehabilitation	Medium (-)	Mitigation measures to restore topography and the original vegetation is impractical. Revegetate site with indigenous vegetation. Monitor increase of alien invasive species due to site disturbance.	Low significance
	Sedimentation of the Yellowwood river	Surrounding community and habitat	Rehabilitation	Medium (-)	Maintain 50 m buffer zone of natural vegetation between mining operations and the seasonal stream Keep vegetation clearance to a minimum. Store / dispose topsoil and overburden in such a way that it does not end up in the nearby seasonal stream as silt and sand. Control storm water runoff. Control soil erosion. Control overgrazing and over browsing practices on and around the study area. Control alien invasive plants.	
	Increased grazing and browsing pressure on surrounding vegetation due to perennial water supply from borehole	Surrounding community	Rehabilitation	High (-)	Limit the amount of water supplied to what is normally available in this ecosystem. Do not create a perennial water source at the nearby dam. This will encourage seasonal migration with livestock, providing the surrounding vegetation with respite from grazing and browsing pressures during the dry season. Follow and mimic natural ecosystem patterns and processes as far as possible.	

	Spillage of contaminants: Contamination of surface water from fuel spills and leakages	Surrounding community	Rehabilitation	High (-)	• Equipment used in the mining process must be adequately maintained, such that during operation they must not spill oil, diesel, fuel or hydraulic fluid. • Spills must be cleaned up immediately after occurrence by removing the spills, together with the polluted soil, and disposing thereof at a recognized facility. Oil and chemicals must not be stored on site.	
	Increase of road users and traffic on R 63	Surrounding community	Rehabilitation	High (-)	Enforcement of speed limits to reduce the chances of impact with road users and animals • Fine road sign offenders employed by the Mine • Avoid transportation during busy hours of the day (that's 6:00-9:00am and 16:00-18:00pm)	High significance
	Cumulative impacts associated with the proposed development on the vegetation of the surrounding local areas will come from increased human and livestock activity in the area, and sedimentation and degradation of the nearest watercourse.	Surrounding community	Rehabilitation	High (-)	The sensitive receptors in this case are such a distance away that the Dust Deposition resulting from the proposed operation on these receptors are negligible. According to the Australian NPI, dust generation from material transfer points can be reduced by 50% where water sprays are applied. Adding wind break can reduce the dust emissions with 30%. Enclosing the operations, the emissions will become insignificant. The liberation of dust into the atmosphere must be controlled by:	Low significance

					•Spraying water and limiting the speed of haul trucks • Avoid using road nearest to the watercourse Regular maintenance of the access road •Reducing activities during windy days •Control erosion and topsoil management •Implementing a speed limit of 30km/h on unpaved surfaces •Minimizing exposed areas prone to wind erosion .	

13 Summary of specialist reports

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form): -

LIST OF STUDIES UNDERTAKEN	**RECOMMENDATIONS OF SPECIALIST REPORTS**	**SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)**	**REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.**
No studies to undertaken	/		

14. DEA Screening Tool

Purpose of the Screening Tool

The Department of Environmental Affairs (DEA) Screening Tool allows to study the environmental sensitivities of a proposed development site, assist with the identification of specific zones, or plans such as industrial development zones or Environmental management Frameworks may be applicable to the proposed development site, and it acts as a guideline as to which specialist assessments may need to be undertaken as part of the environmental assessment process. The selection of the specialist investigations that were undertaken as part of this environmental assessment process was determined with the assistance of this tool as well as a desktop environmental assessment.

The DEA Screening Tool has identified the following environmental sensitivities for the development site:

Table 8:Environmental sensitivity areas for the development site according to the screening tool

Development Area Themes	**Environmental Sensitivity**
Agricultural Theme	Low sensitivity
Animal Species Theme	Medium sensitivity
Aquatic Biodiversity Theme	Medium sensitivity
Archaeological & Cultural	Low sensitivity
Civil Aviation Theme	Medium sensitivity
Defence theme	Low sensitivity
Palaeontology Theme	Low sensitivity
Plant Species Theme	Medium sensitivity
Terrestrial Biodiversity Theme	Low sensitivity

Specialist Investigations

The DEA Screening Tool has identified that the following specialist investigations are potentially to be included in the environmental impact assessment process:

Recommended Assessment	Status	Motivation for Inclusion/Exclusion of Assessments
Agricultural Impact Assessment	Excluded	Technical desktop investigation did not indicate the need for this assessment. The proposed area is in within rocky areas, ‘’decommissioned’’ historical mine. Illegal mining activities are currently taking place on site.
Archaeological and Cultural Heritage Impact Assessment	Excluded	Technical desktop investigation does not indicate the need for this assessment. The area indicates that there are no heritage resources that may occur.
Paleontological Impact Assessment	Excluded	As above. Fossil remains. Such resources are typically found in specific geographical areas, e.g., the Karoo and are embedded in ancient rock and limestone/calcrete formations.
Terrestrial Biodiversity Impact Assessment	Excluded	The project site is on a degraded environment
Aquatic Biodiversity Impact Assessment	Excluded	The key underlying impacts will be included assessed in the Ecological Impact Assessment
Hydrology Assessment	Included	The key underlying impacts on water courses will be assessed in the Ecological Impact Assessment.
Noise Impact Assessment	Excluded	The area is outside community area, operational noise during extraction of the Aggregate material will generate noise. However, the noise does not warrant for impact. The noise will not exceed 60 dB, the SANS noise levels.
Radioactivity Impact Assessment	Excluded	Technical desktop investigation does not indicate the need for this assessment.
Traffic Impact Assessment	Excluded	Technical desktop investigation does not indicate the need for this assessment. The nature and scope of the activity does not require the undertaking of such an assessment.
Geotechnical Assessment	Excluded	Technical desktop investigation does not indicate the need for this assessment.
Plant Species Assessment	Excluded	The key underlying impacts will be included assessed Ecological Impact Assessment.
Animal Species Assessment	Excluded	The key underlying impacts will be included assessed Ecological Impact Assessment.

15. Environmental impact statement

Summary of the key findings of the environmental impact assessment.

After the environmental assessment was undertaken, most activities triggered by the mining have shown to be medium to minor significance impact, however once mitigation measures are applied the impact ranged from minor to insignificant impact.

Key findings of the environmental impact assessment include:

• The significance of potential environmental impacts can be reduced to insignificant with implementation of mitigation measures and monitoring.

• Likewise, potential impacts on the socio-economic environment and livelihoods can be mitigated from minor-medium. This means locals will get preference and the method of recruitment would improve.

• Cumulative impacts are rated with insignificance after mitigated.

During construction and operation, the following aspects may be affected and result to medium potential impacts:

Ecological Environment

<u>Impacts on Fauna and Flora</u>

-The proposed project is located on a degraded site. However there are few three and vegetation on a part of the site. An investigation will be carried out to assess the importance/conservation concern of species on site, and appropriate measures provided thereto.

- A small number of invasive alien plant species were recorded within the study area. It is recommended that these species be controlled as soon as possible. Alien vegetation should be removed and disposed of. The impact on plant species is considered to have **medium to low significance** during both the construction phase and the operational stage, given the condition of the area as well as the type of vegetation observed around the proposed area. Due to the nature of open-cast mining of bulk geological material and the bulk consumption of the product, very little can be done to mitigate the direct losses of the associated ecosystems..

Waste/Refuse Impact

Solid waste (if any) and domestic refuse from the contractors on site will be minimal and temporary storage would be implemented before the waste is disposed of at a registered landfill site. The operational phase has the potential to generate potentially small amounts of hazardous waste (oils, spent solvents etc.) This has the potential to lead to soil and surface water contamination resulting in a deterioration of downstream water quality rendering it dangerous for ecological and human use. The adherence to measures outlined within the EMPr will ensure that the impacts associated with waste generation, use and disposal of hazardous substances, and general and hazardous waste will be appropriately mitigated. The impact was assessed and rated as **medium significance** without mitigation and **low significance** with mitigation**.**

Noise impact

Noise from the drilling activities, blasting, tipper trucks and the excavator will have any impact on residents around the area. The noise impact is expected to be of **Medium** to **Low** considering the natural state of the site and surrounding communities.

Air pollution Impacts

The proposed activity is not likely to generate a high level of nuisance dust as excavation activities will be conducted in a damp area using an excavator. Dust will also be created by trucks on the short gravel access road to the stockpiling area. Trucks coming in and out of site will only drive at 45km/hr to ensure that dust particulate is less. Provided that dust control measures are implemented, it is unlikely that there will be any significant impacts. The probability of dust impacts is **medium-low significance** and can be mitigated and reduced to decrease risks. Dust suppression measures will be always implemented in order to reduce the effects of windborne dust.

Traffic Impact

The proposed project will increase the number of slow moving, heavy vehicles on the local road network. These slow-moving vehicles could cause delays for other road users, however, the impact of this is not considered to be significant after mitigation measures. The probability of traffic impacts is **medium significance** and can be easily managed to decrease risks. Malumbazo Holdings must ensure that stock taking trucks only come in and out of site from 09h00 to 16h00.

Socio-Economic Impacts

Employment Opportunities

The operational activities phase will provide a positive impact by providing employment opportunities to contract workers over this period (proposed 8-10 job opportunities over a 24months period, with a chance to continue for further three years). This employment will have a positive impact on the socio-economic context of the local area for a short duration.

At least two (2) part time skilled/qualified personnel must be hired, i.e. Site manager and ECO/Ecologist. The day-to-day operational activities will necessitate the employment of truck drivers, excavator, and front-end loader drivers. The material extracted from the proposed Aggregate winning site will be used as building material for civil and construction industries in the greater Durban market, thus increasing the economic upliftment of the region and the province. The potential impacts on the socio-economic environment and livelihoods can be mitigated from **low-medium (+) significance**. This means locals will get preference, method of recruitment would improve

Closure phase

NEMA requires that the applicant develops a closure plan before a mine can be closed. A closure rehabilitation plan must be developed. A suitably qualified ecologist must be included in the closure rehabilitation planning. This has the potential to improve the condition of the area within the mined area, as well as prevent impacts to the nearby system that could potentially result from the mined area.

15.1 Final Site Map

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

Please see figure 11 above which include buffer. A detail map indicating associated infrastructures will be provided with the ecological specialist study.

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

Impact Description	**Significance before Mitigation**	**Significance after Mitigation**
Area/habitat disturbance		
Commodity excavation	Moderate	Insignificant
Site survey	Positive (insignificant)	Positive (insignificant)
Stockpile area preparations	Moderate	Insignificant
Upgrade selected access road	Minor	Insignificant
Possible oil/ fuel; leak from earthmoving equipment	Moderate	Insignificant
Noise impact		
Stockpile area preparations	Moderate	Insignificant
Upgrade selected access road	Minor	Insignificant
Commodity excavation	Moderate	Insignificant
Surface & ground water contamination		
Chemical toilets leakages	Moderate	Insignificant
Possible oil/ fuel; leak from earthmoving Equipment	Moderate	Insignificant
Dust/Air quality impact		
Stockpile area preps	Minor	Insignificant
Road users	Minor	Insignificant
Cumulative noise		
Mining/ service of the hauling road	Minor	Insignificant
Cumulative impact on landscape & biodiversity		
Socio-economic impacts		
Creation of Employment Opportunities	Minor (positive)	Medium (positive)
Risk on community Health and Safety	Moderate	Minor

16. Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr.

(*Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.)*

The EMPr addresses the environmental impacts associated with the project during Construction, Operation, Decommissioning and Post Closure Phases of the proposed project. The objectives of the EMPr will be to provide detailed information that will advise the planning design of Malumbazo Holdings ’s mining activities in order to avoid and/or reduce impacts that may be detrimental to the

environment. The following environmental management objectives are recommended for the proposed mining

development and associated infrastructure:

It is recommended that no activities be allowed in the study area that may have any negative impacts on the drainage line ecosystems adjacent to the study area. While the Subtropical Alluvial Vegetation (Aza 7) communities associated with the sea stream directly south of the study area are well conserved under the formal protection of nature reserves, the Lowveld Riverine Forests (FOa 1) types down-stream from the study area are considered Critically Endangered (Mucina & Rutherford 2006). These ecosystems are interlinked and highly dynamic. All possible efforts should be made to avoid secondary impacts on the riverine ecosystems adjacent to the study area

A small number of invasive alien plant species were recorded within the study area. It is recommended that these species be controlled as soon as possible.

-Development planning must restrict the area of impact to a minimum and designated area only.

- Monitor and prevent contamination and undertake appropriate remedial actions.
- Limit the visual and noise impact on receptors.
- Avoid impact on possible heritage finds.
- Promote health and safety of workers.
- Limit dust and other emissions to within allowable limits.
- Manage soils to prevent erosion.

i. Aspects for inclusion as conditions of Authorisation

Any aspects which must be made conditions of the Environmental Authorisation

- On-going consultation with the public to monitor and verify any noise complaints.
- Monitoring shall be ensured so that the following results are always attained:
  - No soil erosion is permitted to occur.
  - No discharge of contaminated water is permitted into any water course.
  - Concurrent rehabilitation is facilitated and not jeopardised.
  - Removal of alien vegetation, and
  - Rehabilitation shall ensure that surfaces are smooth and free-draining, and that no forms remain.
  - Only approved access routes are to be used.
  - Chemical toilet(s) must be erected; the facilities must not cause any water pollution or health hazard.
  - No domestic or any other solid waste shall be disposed of on site. All waste removed from the site must be disposed of at a permitted landfill site.
  - Vegetation shall not be harmed as far as possible.

- Vehicles shall as far as possibly stick to established access routes, so as to minimize the effects to surrounding vegetation.
- The Duty of Care and remediation of environmental damage contained in Section 28 of the National Environmental Act (Act No.107 of 1998) must be complied with.
- All requirements of the Local Authority shall be complied with.
- All requirements of the Mine Health and Safety Act (no. 29 of 1996) shall be complied with.
- Staff operating heavy machinery must wear proper PPE and the applicant must ensure that the requirements of the OHSA Act are met.
- All requirements shall be complied with relating to health matters.
- No landowner or authority may request the holder to carry out any activity that is not authorised in terms, conflict therewith.

ii. Description of any assumptions, uncertainties and gaps in knowledge
(Which relate to the assessment and mitigation measures proposed)

The position of the components of the proposed development was obtained from data provided by the client. The impacts and recommendations described in the Impact Assessment Report apply specifically to these data.

- The ecological assessment tools are qualitative, caution and experience are required in interpreting the figures produced.
- Given the size of the study area and the environmental status of the area, no specialist studies have been undertaken.

The social impact component of this report relied on the report compiled by the Ingwe Local Municipality (Integrated Development Plan). It is assumed that the information contained in that report was correct.

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

i. Reasons why the activity should be authorized.

Based on the detailed environmental impact assessment undertaken and the proposed management measures proposed, the EAP is of the opinion that the proposed mining project can be granted Environmental Authorisation (EA), provided that Malumbazo Holdings adheres to the management and mitigation measures proposed. Environmental Authorisation should include those conditions listed in Section (m) above.

ii. Conditions that must be included in the authorisation

- No soil erosion is permitted to occur
- No discharge of contaminated water is permitted into the Yellowwood river or any water course
- Adequate buffer zone to be maintained around the Yellowwood river.
- Concurrent rehabilitation is facilitated and not jeopardised
- Removal of alien vegetation
- Rehabilitation shall be concurrently with operation and shall ensure that surfaces are smooth and free-draining, and that no forms remain.
- Only approved access routes are to be used.
- Chemical toilet must be erected; the facilities must not cause any water pollution or health hazard.
- No domestic or any other solid waste shall be disposed of on site. All waste removed from the site must be disposed of at a permitted landfill site.
- Vegetation shall not be harmed as far as possible.
- Vehicles shall as far as possibly stick to established access routes, to minimize the effects to surrounding vegetation.
- The Duty of Care and remediation of environmental damage contained in Section 28 of the National Environmental Act (Act No.107 of 1998) must be complied with.
- All requirements of the Local Authority shall be complied with.
- All requirements of the Mine Health and Safety Act (no. 29 of 1996) shall be complied with.
- Staff operating heavy machinery must wear proper PPE and the applicant must ensure that the requirements of the OHSA Act are met.
- All requirements shall be complied with relating to health matters.
- No landowner or authority may request the holder to carry out any activity that is not authorised in terms, conflict therewith.
- Mining must be contained within the approved area extent.

Period for which the Environmental Authorisation is required.

2 years, with 3 consecutive annual renewals.

18. Undertaking

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

It can be confirmed that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic assessment report and the Environmental Management Programme report. Malumbazo Holdings have confirmed that the mitigation, management measures as well as the monitoring thereof can be undertaken by themselves for all phases (construction, operation, decommissioning and post-closure) of the general mining.

19. Financial Provision

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

R 184 380.00

Explain how the aforesaid amount was derived.

R184 380.0- The quantum for financial provision was calculated using the DMR's preferred methodology and guideline document titled "Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provision Provided by a Mine (2005)" and the Master Rates of 2014. Based on the current scope of the project, namely one (1) mining Aggregate associated infrastructure with a surface disturbance of approximately 2 hectares, the estimate of the rehabilitation costs is: R R184 380.00.

An amount of R184 380.0 will be provided for environmental costs. This amount will be reviewed annually based on the impact caused by mining on the environment Confirm that this amount can be provided for from operating expenditure.

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

It can be confirmed that the amount is anticipated to be an operating cost and is provided for as such in the Mining work programme, Financial and Technical Competence Report.

Should Environmental Authorisation be granted, Malumbazo Holdings will make provision for the estimated closure cost by means of a Bank Guarantee or via cash deposit or any other means available and accepted by the Competent Authority.

Specific Information required by the competent Authority

Compliance with the provisions of sections 24(4) (a) and (b), read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998).

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

(*Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as an* ***Appendix****.)*

Persons directly affected by the development and operation of the mining were identified as:

- residents of homesteads and settlements more than away of the mining footprints.
- Land users (grazing and farming) within the area.
- Owner of the area.

The potential socio-economic impacts of the mining activities on these directly affected persons includes:

- Creation of Employment Opportunities.
- Loss of Productive Land and Related Current and Future Income Opportunities.
- Reduced access to Natural Resources: firewood for fuel.
- Impact on Community Health and Safety.
- Increased pressure on social infrastructure i.e., road

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

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

N/A, no heritage resources were encountered within the proposed site

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

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

Section 24 (4) (b) (i) states that "[an] investigation of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity [must be included]". Alternative site locations for the mining activity have been discussed in Section G, of this Report. An investigation of the potential impacts of only the preferred alternative has been undertaken as the other alternatives were deemed not feasible. The option of not implementing the activity (i.e., no development of the commodity extraction) would mean that Malumbazo Holdings would not be able access and exploit the extensive Aggregate reserve, resulting in the mine not

commencing, which would mean that there would be no development of the area and also failure to meet the requirements of the National Development Plan.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

FOR

MALUMBAZO HOLDINGS Pty Ltd

REF: EC30/5/1/3/2/10748MP

Environmental Management Programme

1. Details of the EAP (Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required).

Confirmed

2. Description of the Aspects of the Activity (Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required).

Confirmed

3. Composite Map

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

Confirmed

4. Description of Impact management objectives including management statements

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

Once mining has been completed, all areas disturbed by mining activities will be fully rehabilitated. The areas disturbed by operational activities will be rehabilitated concurrent with the mining; rehabilitation will not be banked for the mining work to cease. This will be undertaken in accordance with the rehabilitation and closure plan to be developed.

It is noted that an application for environmental authorization must be submitted in accordance with Activity 21 GNR 982:

The decommissioning of any activity requiring –

i. a closure certificate in terms of Section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002); or

ii. A prospecting right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years.

The site will be rehabilitated back to its natural state/pre-mining land use

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

None. The operation may require a water use license.

5. Has an application been made for a water use licence?

Yes, the process has not commenced yet.

6. Impacts to be mitigated in their respective phases
(Measures to rehabilitate the environment affected by the undertaking of any listed activity)

ACTIVITIES **(E.g., For prospecting** - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc…etc…etc **E.g. For mining,** - excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling.	**PHASE** In which impact is anticipated e.g., Construction, commissioning, operational Decommissioning, closure, post-closure)	**SIZE AND SCALE of disturbance** **(**Volumes, tonnages and hectares or m²)	**MITIGATION TYPE** (Modify, remedy, control, or stop) Through (e.g., noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g., Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation.	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	**TIME PERIOD FOR IMPLEMENTATION** Describe the time when the measures in the environmental management programme must be implemented Measures must be implemented when required.
Establishment of haul road/access road to the site. Demarcating mining area, erecting toilet facilities & campsite,	Pre-establishment	0.3ha (0.3ha to be cleared for stockpile)	Rehabilitation to original natural state after removal of bedrock material is not practically viable Keep vegetation clearance to a minimum, clearing only those sections that will be mined next to mitigate secondary impacts	Manage & Control via Soil Management Measures	On-going, until mining is completed
Designate stockpile area. Remove alien invasive species. Extraction	Construction	±300m road	Rehabilitation to original natural state after removal of bedrock material is not practically viable. Keep vegetation clearance to a minimum, clearing only those sections that will be mined next to mitigate secondary impacts Control storm water runoff from the onset of clearance and construction.	Remedy through Rehabilitation Measures, Conservation Management Measures	On-going, until mining is completed

	Construction / Operation	Open	Maintain buffer zone of natural vegetation between mining operations and the Yellowwood river. Keep vegetation clearance to a minimum. Store / dispose topsoil and overburden in such a way that it does not end up in the nearby seasonal stream as silt and sand Storm water runoff must be controlled. Control soil erosion. Control alien invasive plants	Control through Alien Invasive Management Measures	On-going, until mining is completed
	Construction / operation	Open	Limit the amount of water supplied to what is normally available in this ecosystem. Do not create a perennial water source at the nearby dam. This will encourage seasonal migration with livestock, providing the surrounding vegetation with respite from grazing and browsing pressures during the dry season. Follow and mimic natural ecosystem patterns and processes as far as possible.	Monitor and remedy through Stormwater Management Measure	On-going, until mining is completed
	Construction / operation	5ha	Equipment used in the mining process must be adequately maintained, such that during operation they must not spill oil, diesel, fuel or hydraulic fluid. Spills must be cleaned up immediately after occurrence by removing the spills, together with the polluted soil, and disposing thereof at a recognized facility. Oil and chemicals must not be stored on site.	Monitor and remedy through Stormwater Management Measure	On-going, until mining is completed
	Construction / Operational	5ha	Enforcement of speed limits to reduce the chances of impact with road users and animals Fine road sign offenders employed by the Mine Avoid transportation during busy hours of the day (that's 6:00-9:00am and 16:00-18:00pm)	Monitor and Control through Traffic Management Measure	On-going, until mining is completed

	Construction / operation	5ha	According to the Australian NPI, dust generation from material transfer points can be reduced by 50% where water sprays are applied. Adding wind break can reduce the dust emissions with 30%. Enclosing the operations, the emissions will become insignificant. The liberation of dust into the atmosphere must be controlled by: •Spraying water and limiting the speed of haul trucks •Regular maintenance of the access road •Reducing activities during windy days •Implementing a speed limit of 30km/h on unpaved surfaces •Minimizing exposed areas prone to wind erosion	Monitor and Control through Traffic Management Measure	On-going, until mining is completed
	Operation	Open	Keep vegetation clearance to a minimum. Control storm water runoff. Control soil erosion. Control alien invasive plants. Control dust pollution without causing sediment runoff into nearby drainage systems.	Environmental - Ecological Procedure/Plan	On-going, until mining is completed
NAME OF ACTIVITY	**PHASE**	**SIZE AND SCALE**	**MITIGATION TYPE**	**COMPLIANCE WITH STANDARDS**	**On-going, until mining is completed**
Decommissioning of roads. Removal of office structures and any site infrastructure; Reseeding/planting of disturbed areas	Rehabilitation	5ha	Rehabilitate soil in places where original topography remains intact to allow vegetation to grow in the substrate again	Manage & Control via Soil Management Measures	On-going, until mining is completed
	Rehabilitation	2ha	Reshape the hole to decrease danger to the local human community as well as decrease the negative affect on the surrounding natural environment.	Remedy through Rehabilitation Measures, Conservation Management Measures	On-going, until mining is completed

	Rehabilitation		Mitigation measures to restore topography and the original vegetation is impractical. Revegetate site with indigenous vegetation. Monitor increase of alien invasive species due to site disturbance.	Remedy through Rehabilitation Measures, Conservation Management Measures	On-going, until mining is completed
		2ha	Maintain buffer zone of natural vegetation between mining operations and the seasonal stream Keep vegetation clearance to a minimum. Store / dispose topsoil and overburden in such a way that it does not end up in the nearby seasonal stream as silt and sand. Control storm water runoff. Control soil erosion. Control overgrazing and over browsing practices on and around the study area. Control alien invasive plants.	Remedy through Rehabilitation Measures, Conservation Management Measures	On-going, until mining is completed
	Rehabilitation	2ha	Limit the amount of water supplied to what is normally available in this ecosystem. Do not create a perennial water source at the nearby dam. This will encourage seasonal migration with livestock, providing the surrounding vegetation with respite from grazing and browsing pressures during the dry season. Follow and mimic natural ecosystem patterns and processes as far as possible.	Monitor and remedy through Stormwater Management Measure	On-going, until mining is completed

			Equipment used in the mining process must be adequately maintained, such that during operation they must not spill oil, diesel, fuel, or hydraulic fluid. Spills must be cleaned up immediately after occurrence by removing the spills, together with the polluted soil, and disposing thereof at a recognized facility. Oil and chemicals must not be stored on site.	Monitor and remedy through Stormwater Management Measure	On-going, until mining is completed
	Rehabilitation	5ha	Enforcement of speed limits to reduce the chances of impact with road users and animals Fine road sign offenders employed by the Mine Avoid transportation during busy hours of the day (that's 6:00-9:00am and 16:00-18:00pm).	Monitor and Control through Traffic Management Measure	On-going, until mining is completed
	Rehabilitation	5ha	The sensitive receptors in this case are such a distance away that the Dust Deposition resulting from the proposed operation on these receptors are negligible. According to the Australian NPI, dust generation from material transfer points can be reduced by 50% where water sprays are applied. Adding wind break can reduce the dust emissions with 30%. Enclosing the operations, the emissions will become insignificant. The liberation of dust into the atmosphere must be controlled by: •Spraying water and limiting the speed of haul trucks •Regular maintenance of the access road •Reducing activities during windy days•Implementing a speed limit of 30km/h on unpaved surfaces	Abide to ambient air quality standards and implement dust control measures	On-going, until mining is completed

7. Impact Management Outcomes

(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph.

Table 9:Impact Management Outcomes (Standard to be achieved)

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage,	**POTENTIAL IMPACT** (Including the potential impacts for cumulative impacts) (E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc…. etc…)	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	**MITIGATION TYPE** (modify, remedy, control, or stop) Through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation.	**STANDARD TO BE ACHIEVED** (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
Establishment of haul road/access road to the site. Demarcating mining area, erecting toilet facilities & campsite, Designate stockpile area; Remove alien invasive species. Extraction and removal of the minerals onsite; Stockpiling of	Disturbance and loss of vegetation due to construction activities	Fauna and flora habitat	Pre-establishment	Rehabilitation to original natural state after removal of bedrock material is not practically viable Keep vegetation clearance to a minimum, clearing only those sections that will be mined next in order to mitigate secondary impacts	Impact reduced on vegetation disturbance
	Loss of soil as a result of clearance of vegetation and overburden.	Habitat	Construction	Rehabilitation to original natural state after removal of bedrock material is not practically viable Keep vegetation clearance to a minimum, clearing only those sections that will be mined next to mitigate secondary impacts Control storm water runoff from the onset of clearance and construction.	Noise control – SANS 10328:2008 Minimal vegetation destruction
	Sedimentation and contamination of the Yellowood river	Natural System	Construction / Operation	Maintain 50 m buffer zone of natural vegetation between mining operations and the stream. Keep vegetation clearance to a minimum. Store / dispose topsoil and overburden in such a way that it does not end up in the nearby seasonal stream as silt and sand	Principles of NEMA Minimal vegetation destruction

product; Loading of product into transportation				Control storm water runoff. Control soil erosion. Control overgrazing and over browsing practices on and around the study area Control alien invasive plants	
	Increased erosion and siltation of nearby surface water bodies	Ecosystem, environment and the public	Construction / Operation	Soil erosion on site must be prevented at all times, i.e. pre-, during- and post- construction activities Having appropriate berms and bunds in place to prevent erosion and spills The road shall have an acceptable surface and be free from erosion damage, preventing the impounding/ponding of water on road sideways Where a depression in the ground in which water can gather has formed, attention must be given to the outflow of water to prevent concentration of the run-off and thus prevent erosion. Development of water management infrastructure as per the SWM.	Principles of NEMA Soil control
	Increased grazing and browsing pressure on surrounding vegetation due to perennial water supply from borehole	Ecosystem, environment and the public	Construction/ operation	Limit the amount of water supplied to what is normally available in this ecosystem. Do not create a perennial water source at the nearby dam. This will encourage seasonal migration with livestock, providing the surrounding vegetation with respite from grazing and browsing pressures during the dry season. Follow and mimic natural ecosystem patterns and processes as far as possible.	Principles of NEMA: waste disposed in a responsible manner
	Spillage of contaminants: Contamination of surface water from fuel spills and leakages	Water/soil pollution	Construction / operation	• Equipment used in the mining process must be adequately maintained, such that during operation they must not spill oil, diesel, fuel or hydraulic fluid. • Spills must be cleaned up immediately after occurrence by removing the spills, together with the polluted soil, and disposing thereof at a recognized facility.	Guidelines, Dept. Of Water Affairs &Forestry, 2nd Ed 1996. National Water Act, 36 of

				•Oil and chemicals must not be stored on site.	1998. Avoid water pollution
	Increase of road users and traffic on R 63	Public infrastructure and safety	Construction/ Operational/ Decommissioning	Enforcement of speed limits to reduce the chances of impact with road users and animals • Fine road sign offenders employed by the Mine • Avoid transportation during busy hours of the day (that's 6:00-9:00am and 16:00-18:00pm)	Principles of NEMA: minimise disturbance of ecosystem environment
	Dust and fumes from mine vehicles/machines and from exposed product stockpiles	Water resources, soil and ecosystem environment	Construction/ operation	The sensitive receptors in this case are such a distance away that the Dust Deposition resulting from the proposed operation on these receptors are negligible. According to the Australian NPI, dust generation from material transfer points can be reduced by 50% where water sprays are applied. Adding wind break can reduce the dust emissions with 30%. Enclosing the operations, the emissions will become insignificant. The liberation of dust into the atmosphere must be controlled by: •Spraying water and limiting the speed of haul trucks •Regular maintenance of the access road •Reducing activities during windy days •Implementing a speed limit of 30km/h on unpaved surfaces •Minimizing exposed areas prone to wind erosion	Guidelines, Dept. Of Water Affairs &Forestry, 2nd Ed 1996. National Water Act Principles NEMA Principles
	Cumulative impacts associated with the proposed development on the vegetation of the surrounding local areas will come from increased human and livestock activity in the area. Such impacts include an increased demand for	Surface water	Operation	Keep vegetation clearance to a minimum. Control storm water runoff. Control soil erosion. Control alien invasive plants. Prevent illegal electrical connections from the power supply grid associated with the proposed development. Control dust pollution without causing sediment runoff into nearby drainage systems.	NEMA Principles Biodiversity Act; protection of indigenous species

	firewood, grazing, browsing, water, access to electricity and sanitation, increased distribution of invasive alien plant species, increased dust pollution along the transport route, increased soil erosion along the transport route, increased sedimentation within drainage lines along the transport route and a reduction of ecosystem services.				
	Benefits resulting from employment and income opportunities, created by the operation	Surrounding community	Construction/ Operational	Hire locals and support local government in skills development and training initiatives	Community development Mining Charter Community development
Decommissioning of roads; Removal of office structures and any site infrastructure; Reseeding/planting of disturbed areas	Compaction of soil as a result of development infrastructure	Ecosystem	Rehabilitation	Rehabilitate soil in places where original topography still remains intact to allow vegetation to grow in the substrate again	Community development, job opportunities Mining Charter
	Hole left behind after mining	Surrounding community and habitat	Rehabilitation	• Reshape the hole to decrease danger to the local human community as well as decrease the negative affect on the surrounding natural environment.	Noise control – SANS 10328:2008 Minimal vegetation destruction
	Disturbance and loss of vegetation due to mining activities	Ecosystem environment	Rehabilitation	Mitigation measures to restore topography and the original vegetation is impractical. Revegetate site with indigenous vegetation.	NEMA Principles Biodiversity Act; protection of indigenous species

				• Monitor increase of alien invasive species due to site disturbance.	
	Sedimentation and contamination of the Yellowwood river			Maintain 50 m buffer zone of natural vegetation between mining operations and the seasonal stream Keep vegetation clearance to a minimum. Store / dispose topsoil and overburden in such a way that it does not end up in the nearby seasonal stream as silt and sand. Control storm water runoff. Control soil erosion. Control overgrazing and over browsing practices on and around the study area. Control alien invasive plants.	Road Traffic and Safety
	Increased grazing and browsing pressure on surrounding vegetation due to perennial water supply from borehole		Rehabilitation	• Limit the amount of water supplied to what is normally available in this ecosystem. Do not create a perennial water source at the nearby dam. This will encourage seasonal migration with livestock, providing the surrounding vegetation with respite from grazing and browsing pressures during the dry season. Follow and mimic natural ecosystem patterns and processes as far as possible.	Guidelines, Dept. Of Water Affairs & Forestry,2nd Ed 1996. National Water Act, 36 of 1998. No disturbance of water-flow
	Spillage of contaminants: Contamination of surface water from fuel spills and leakages			• Equipment used in the mining process must be adequately maintained, such that during operation they must not spill oil, diesel, fuel or hydraulic fluid. • Spills must be cleaned up immediately after occurrence by removing the spills, together with the polluted soil, and disposing thereof at a recognized facility. • Oil and chemicals must not be stored on site.	NEMA Principles Biodiversity Act; protection of indigenous species

	Increase of road users and traffic on R 63	Surrounding community	Rehabilitation	Enforcement of speed limits to reduce the chances of impact with road users and animals • Fine road sign offenders employed by the Mine • Avoid transportation during busy hours of the day (that's 6:00-9:00am and 16:00-18:00pm)	Dust control – National Ambient Air Quality Standard GNR No.263 (24
	Cumulative impacts associated with the proposed development on the vegetation of the surrounding local areas will come from increased human and livestock activity in the area, and sedimentation of the area		Rehabilitation	The sensitive receptors in this case are such a distance away that the Dust Deposition resulting from the proposed operation on these receptors are negligible. According to the Australian NPI, dust generation from material transfer points can be reduced by 50% where water sprays are applied. Adding wind break can reduce the dust emissions with 30%. Enclosing the operations, the emissions will become insignificant. The liberation of dust into the atmosphere must be controlled by: •Spraying water and limiting the speed of haul trucks •Regular maintenance of the access road •Reducing activities during windy days •Implementing a speed limit of 30km/h on unpaved surfaces •Control erosion and stockpile management •Avoid using or creating access roads nearest to watercourses. • Minimizing exposed areas prone to wind erosion	Principles of NEMA: waste disposed in a responsible manner

8. Impact Management Actions

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

Table 10:Impact Management Actions

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc…etc…etc E.g. For mining, - excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	**POTENTIAL IMPACT (Including the potential impacts for cumulative impacts) (E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc…. etc…)**	**MITIGATION TYPE (modify, remedy, control, or stop) Through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation.**	**TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. About Rehabilitation specifically this must take place at the earliest opportunity. Regarding Rehabilitation, therefore state either: - Upon cessation of the individual activity or upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.**	**COMPLIANCE WITH STANDARDS (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)**
	Habitat loss and disturbance	Demarcate the mining area Uphold 50 m buffer around the stream	On-going, until mining is completed	Vegetation management

Establishment of haul road/access road to the site. Demarcating mining area, erecting toilet facilities & campsite, Designate stockpile area; Remove alien invasive species. Extraction and removal of the minerals onsite; Stockpiling of product; Loading of product into transportation		Use of the existing road structures, there is no need for road construction. The area chosen for these purposes must be the minimum, reasonably required for the purpose, and which will involve the least disturbance to the vegetation. Conservation in situ is recommended if any animal species of conservation concern is found on site.		
	Disturbance due to noise/vibration	• Limiting number of simultaneous noises emitting activities • Fitting equipment with noise abatement measures (e.g. acoustical mufflers and white-noise generators) • The area chosen for these purposes must be the minimum, reasonably required for the purpose, and which will involve the least disturbance to the vegetation. • Compensate houses which may be impacted (cracks on houses due to vibrations and blasting). • Blasting must be carried out after 3pm. • Minimising the project footprint • All neighbours and interested and affected parties must be notified before blasting occurs. • Machines to be used must be adequately maintained and serviced regularly	On-going, until mining is completed	Noise reduction measures
	Dumping and waste/Poor waste management	Waste skips must be provided, collected, and disposed of at an appropriately landfill site once full.	On-going, until mining is completed	Hydrocarbon and Domestic and Industrial Waste Management Protocol

		Ensure adequate waste management (avoidance, reutilisation, segregation of waste and proper disposal).		
	Spillage of contaminants	Equipment used in the mining process, must be adequately maintained, such that during operation they do not spill any oil, diesel, fuel or hydraulic fluid Making sure all machinery is clean and in good working order so no fuel or oil spills enter the water Spills must be cleaned up immediately by removing the spills together with the polluted soil and disposing thereof at a recognized facility	On-going, until mining is completed	Hydrocarbon and Domestic and Industrial Waste Management Protocol
	Increased erosion and siltation of nearby surface water bodies	Soil erosion on site must be prevented at all times, i.e. pre-, during- and post- construction activities Having appropriate berms and bunds in place to prevent erosion and spills The road shall have an acceptable surface and be free from erosion damage, preventing the impounding/ponding of water on road sideways Where a depression in the ground in which water can gather has formed, attention must be given to the outflow of water to prevent concentration of the run-off and thus prevent erosion. Development of water management infrastructure as per the SWM.	On-going, until mining is completed	Storm-water and soil Management System
	Contamination of surface water from fuel spills and leakages	Equipment used in the mining process, must be adequately maintained, such that during operation they do not spill any oil, diesel, fuel or hydraulic fluid Making sure all machinery is clean and in good working order so that no fuel or oil spills enter the water	On-going, until mining is completed	Hydrocarbon and Domestic and Industrial Waste Management Protocol

		Spills must be cleaned up immediately by removing the spills together with the polluted soil and disposing thereof at a recognized facility		
	Eradication of invasive alien species	An appropriate alien invasive species management plan should be implemented Species should be cleared manually regularly depending on the invasion…	On-going, until mining is completed	Alien invasive eradication program
	Spontaneous settlement due to perceived employment opportunities	Develop employment and recruitment policy together with the community that prioritises local recruitment.	On-going, until mining is completed	Community development Mining Charter Community development
	Increase pressure on social services due to influx of job seekers	Support local government capacity for integrated development planning Identify and support community development programmes	On-going, until mining is completed	Community development Mining Charter Community development
	Benefits resulting from employment and income opportunities created by the operation	Hire locals and Support local government in skills development and training initiatives	On-going, until mining is completed	Community development, job opportunities Mining Charter
Extraction and removal of the minerals onsite, blasting Stockpiling of product Loading of product into transportation	Disturbance due to noise	Limiting number of simultaneous noise emitting activities Fitting equipment with noise abatement measures (e.g. acoustical mufflers and white-noise generators) The area chosen for these purposes must be the minimum, reasonably required for the purpose, and	On-going, until mining is completed	Noise reduction measures

		which will involve the least disturbance to the vegetation. All neighbours and interested and affected parties must be notified before blasting occurs.		
	Fauna and flora habitat loss; disturbances of species attached to the ground	The mining of aggregate must only take place within the approved demarcated mining area The area chosen for these purposes must be the minimum, reasonably required for the extraction purpose, and must involve the least disturbance to the vegetation Drill small sections at a time and allow sediment/dust to settle before continuing and rehabilitate the disturbed area. Conservation in situ is recommended if any animal species of conservation concern is found on site.	On-going, until mining is completed	Vegetation and soil management
	Dust and fumes from mine vehicles/machines and from exposed product stockpiles	The liberation of dust into the atmosphere must be controlled by: spraying water and limiting the speed of haul trucks Regular maintenance of the access road Reducing activities during windy days. Implementing a speed limit of 45km/h on unpaved surfaces Minimizing exposed areas prone to wind erosion	On-going, until mining is completed	Dust Reduction Processes
	Increase of road users and traffic on R 63	Enforcement of speed limits to reduce the chances of impact with road users and animals Fine road sign offenders employed by Malumbazo Holdings. Avoid transportation during busy hours of the day (that's 6:00-9:00am and 16:00-18:00pm)	On-going, until mining is completed	Road and Traffic Management

		Malumbazo Holdings must use the access road marked. No truck moving in & out of the site during pick hours		
	Contamination of surface water from fuel spills and leakages	Equipment used in the mining process, must be adequately maintained, such that during operation they do not spill any oil, diesel, fuel or hydraulic fluid. Spills must be cleaned up immediately after occurrence by removing the spills together with the polluted soil and disposing thereof at a recognized facility. Ensure proper waste management.	On-going, until mining is completed	Hydrocarbon and Domestic and Industrial Waste Management Protocol
	Dangerous areas that pose health risks and possible loss of life (e.g. pits, ponds, etc.)	Where a depression in the ground in which water can gather has formed, attention must be given to the outflow of water to prevent concentration of the run-off, and thus prevent erosion and any pond formation or damming. The mining of aggregate must only take place within the approved demarcated mining area Erect mine signage around the mining area	On-going, until mining is completed	Hydrocarbon and Domestic and Industrial Waste Management Protocol. Storm-water Management System
Decommissioning of roads Removal of office structures and any site infrastructure Reseeding/planting of disturbed areas	Loss of productive land for alternative uses	Roads must be ripped or ploughed and appropriately prepared to ensure the re-growth of vegetation The goal of rehabilitation, with respect to the area from which the aggregate has been extracted, is to leave the area level and even, containing no foreign debris or other materials Materials/infrastructure must be removed prior to rehabilitation and disposed of in an approved manner	On-going, until mining is completed	Rehabilitation method

		Removal of these materials must be on a continuous basis while the mine is operating and not only at the start of rehabilitation.		
	Fauna and flora habitat loss and Disturbance	The area must be appropriately prepared, to ensure the re-growth of indigenous vegetation An effective control programme for the eradication of invader species and other alien plants may be required.	On-going, until mining is completed	NEMA Principles Biodiversity Act; protection of indigenous species
	Windborne dust	The liberation of dust into the atmosphere must be controlled by: spraying water, limiting the speed of haul trucks Regular maintenance of the access road Reducing activities during windy days Implementing a speed limit of 45km/h on unpaved surfaces Minimizing exposed areas prone to wind erosion	On-going, until mining is completed	Dust control – National Ambient Air Quality Standard GNR No.263 (24 December 2009); National Ambient Air Quality Standard GNR No.486 (29 June 2012); National Ambient Air Quality Standards GNR No. 827 (1 November 2013).
	Dumping and waste	Precautions must be taken to prevent any refuse from spreading on and from the site.	On-going, until mining is completed	Principles of NEMA: waste disposed in a responsible manner
	Loss of employment and enterprise development opportunities	Nothing much to be done, however, education must be promoted along with promotion of skills transfer to ensure alternative livelihoods	On-going, until mining is completed	Mining Charter Community development

9. Financial Provision

i. Determination of the amount of Financial Provision.

The quantum for financial provision was calculated using the DMR's preferred methodology and guideline document titled "Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provision Provided by a Mine (2005)" and the Master Rates of 2014. Based on the current scope of the project, namely one (1) mining a quarry and associated infrastructure with a surface disturbance of approximately 5 hectares, the estimate of the rehabilitation costs is: R 185 380.00.

The estimate takes into consideration the following items which have been included in the (rough) costing:

- Access road maintenance and repair, and opencast rehabilitation
- General surface rehabilitation and vegetation
- Waste disposal at a registered waste disposal site; and
- Three (3) years of maintenance and aftercare

Explain how the aforesaid amount was derived.

The liability for closure of the aspects associated with the proposed project has been determined using the approach advocated in the Department of Minerals and Energy (DME) now the Department of Mineral Resources (DMR) Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provisions Provided by a Mine (2005).

A. Primary mineral mined

Granite Sand

B. Primary risk class for type of mineral mined/ processed or quarrying.

Mineral type	Primary risk class	
Aggregate	C	**X**
Soil	C	

C. Area sensitivity

Based on the criteria to determine the area sensitivity as outlined in the DMR guidelines "Table B.4" the proposed environmental sensitivity of the proposed operation site can be classed as **Medium** based on the following criteria:

Sensitivity	**Sensitivity criteria**		
	Biophysical	**Social**	**Economic**
Low	Largely disturbed from natural state. Limited natural fauna and flora	The local communities are not within sighting distance of the mining operation.	The area is insensitive to development.

	remains. Exotic plant species evident. Unplanned development. Water resources disturbed and impaired.	• Lightly inhabited area (rural).	• The area is not a major source of income to the local communities.
Medium	Mix of natural and exotic fauna and flora. Development is a mix of disturbed and undisturbed areas, within an overall planned framework. Water resources are well controlled.	The local communities are in the proximity of the mining operation (within sighting distance). Peri-urban area with density aligned with a development framework. Area developed with an established infrastructure.	The area has a balanced economic development where a degree of income for the local communities is derived from the area. The economic activity could be influenced by indiscriminate development
High	• Largely in natural state. • Vibrant fauna and flora, with species diversity and abundance matching the nature of the area. • Well planned development. • Area forms part of an overall ecological regime of conservation value. • Water resources emulate their original state.	• The local communities are in close proximity of the mining operation (on the boundary of the mine). • Densely inhabited area (urban/dense settlements). • Developed and well-established communities.	• The local communities derive the bulk of their income directly from the area. • The area is sensitive to development that could compromise the existing economic activity.

D. Quantum for financial provision

CALCULATION OF THE QUANTUM (REAL RATES)

Applicant: **Blue Print Mining** Ref No.:
Date: Oct-22

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	12,99	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0,2	180,92	1	1	36,184
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	266,68	1	1	0
3	Rehabilitation of access roads	m2	0	32,37	0,5	1	0
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	314,22	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	171,39	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	361,83	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	1,2	184152,8	0,5	0,5	55245,852
7	Sealing of shafts adits and inclines	m3	0	97,32	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0	166847,4	0,5	0,5	0
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	207805,5	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	603565,6	1	1	0
9	Rehabilitation of subsided areas	ha	0	139709,6	1	1	0
10	General surface rehabilitation	ha	2	132171,3	0,5	0,5	66085,655
11	River diversions	ha	0	132171,3	1	1	0
12	Fencing	m	0	150,77	1	1	0
13	Water management	ha	0,1	50255,25	0,5	0,5	1256,38125
14	2 to 3 years of maintenance and aftercare	ha	2	17589,34	0,5	0,5	8794,67
15 (A)	Specialist study	Sum	0	0	1	1	0
15 (B)	Specialist study	Sum	0	0	1	1	0
					Sub Total 1		131418,7423
1	Preliminary and General		15770,24907		weighting factor 2 1		15770,24907
2	Contingencies		13141,87423				13141,87423
					Subtotal 2		160330,87
					VAT (15%)		24049,63
					Grand Total		184380

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

Malumbazo Holdings intend to ensure that the area is left as it was before; the surface area is being scarified, levelled, and left resembling the surrounding area.

Approach to mine closure planning for rehabilitation and closure for this mining project has been initiated as a conceptual process and will be refined as the project progresses through detailed design and construction. The identified closure activities, seek to achieve:

- As far as practicable, rehabilitation will achieve a stable and functioning landform which is compatible with the surrounding landscape and other environmental values. The closure plan must ensure the physical and geochemical stability of the mining area in the post-closure stage, as well as meeting the required DMR/NEMA environmental standards. This will require services of ecological/horticulturalist specialist who has expertise in vegetation/landscape systems to assist in development of a final rehabilitation program before the cessation of the mine.
- Rehabilitate the site in accordance with a detailed closure plan, and implement an alien invasive management plan to ensure the establishment of indigenous vegetation.
- Rehabilitation of the disturbed areas to return the site to its similar visual state prior mining.
- Identify and attend to possible areas of erosion.
- Implement an effective waste management plan to contain waste on site, as well as any spills that may occur.
- Potential impacts to potable-water supplies, ecosystems, beneficial uses, environmental/cultural values or human health, associated with closure and rehabilitation of the project are identified, and must be adequately avoided, mitigated and/or minimised.
- The surface of stockpile areas to be scarified and levelled, graded evenly and the topsoil previously stored to be returned to its original depth over the area.

Rehabilitation of areas impacted by mining will ensure:

- Health risk to members of the public, including traditional owners, will be as low as is reasonably achievable. The mine closure activities must be carried out with care to ensure strict compliance with applicable legal standards to protect human health and to grant safety to people and third-party property.
- Social Objectives: Any access routes, especially if they are not beneficial to the local community would need to be scarified and levelled. Leave the area (from which the aggregate has been extracted) levelled and free of drainage or any foreign debris or materials.
- Prepare the area in such a way as to stimulate/ensure the re-growth of vegetation.

It is noted that an application for environmental authorization must be submitted in accordance with Activity 21 GNR 982:

The decommissioning of any activity requiring –

i. a closure certificate in terms of Section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002); or

ii. A prospecting right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years.

The site must be rehabilitated back to its natural state/pre-mining land use.

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

Landowner: Interested and affected parties will be consulted regarding environmental closure objectives.

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

The rehabilitation plan for the proposed Malumbazo Holdings operation aims to mitigate the negative impacts associated with the mining activities, and ultimately to return the affected land to its desired land use standard. The objectives of the plan are to ensure that the condition of the site post mining operation is suitable to and in agreement with the affected neighbouring community, tribunal council (landowners) and the competent authority, that there is minimal loss to the biodiversity of the area, and that rehabilitation restores the land use and capability of the area/site.

The rehabilitation process will commence during the mining operation throughout the life of mine; involving concurrent rehabilitation of pits when activities are completed, thereafter the final rehabilitation will be undertaken during the mine closure phase. A more detailed closure plan will be developed during the life of the mine, prior to the cessation of mining activities; adapted to the developed information and environmental impact status of the project in order to achieve a site-specific closure plan. In terms of the areal extent of the rehabilitation, Appendix B shows the site layout and aerial extent of the proposed mining activities, depicting the anticipated mining permit area at the time of closure. The entire 2.00 ha of the farm 7108 will be rehabilitated post closure. Once mining has been completed, all areas disturbed by mining activities will be fully rehabilitated. The areas disturbed by operational activities will be rehabilitated concurrent with the mining; rehabilitation will not be banked for the mining work to cease. This will be undertaken in accordance with the rehabilitation and closure plan to be developed.

It is noted that an application for environmental authorisation must be submitted in accordance with Activity 21 GNR 982:

The decommissioning of any activity requiring –

i. a closure certificate in terms of Section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002); or

ii. A prospecting right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5

The site will be rehabilitated back to its natural state/pre-mining land use

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

The Rehabilitation plan for this project will allow the proposed mining operation to achieve the following objectives:

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

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

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

R 184 380.00

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

Confirmed

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

Monitoring of Impact Management Actions

Monitoring and reporting frequency

Responsible persons

Time period for implementing impact management actions

Mechanism for monitoring compliance

Table 11:Mechanism for monitoring compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Demarcation: Area posts demarcating mining permit area in place	Demarcate the mining permit area throughout the mining period	Performance assessment requires the area to be demarcated	Site manager & Surveyor	Daily monitoring, Annual reporting
Earth moving machines, and blasting	Noise: Only if complaint received	Must not be more than 60 db. All surrounding communities must be informed of the blasting time. Blasting activity must be conducted after 3pm. If complaints received, then dust monitors to be placed at site of concern.	Site manager and all employees	Daily monitoring, annual reporting

Dust: Earth moving machines	Dust generation to be visually monitored on a daily basis. Dust monitoring to take place on a permanent basis	Dust to be permanently monitored by visual means and monitoring equipment. If complaints received, then dust monitors to be placed at site of concern.	Site manager / Dust Measurement Consultants	ECO or consultants to investigate and recommend additional measures
Oil / fuel leaks	Vehicles to be checked regularly	To be monitored constantly Must be cleaned immediately	Site manager and all employees	Daily monitoring, Annual reporting
Earth moving machines, blasting, waste handling	Surface water contamination and sedimentation (50 m Buffer zone around the Yellowwood river)	To be monitored constantly	Site manager and all employees	Daily monitoring, Report once
	Quality water monitoring	To be monitored monthly	Site manager	Monthly
Evidence of Erosion	Check for erosion on slopes	Soil erosion on site must be prevented at all times, i.e. pre-, during- and post- construction activities Having appropriate berms and bunds in place to prevent erosion and spills. The road shall have an acceptable surface and be free from erosion damage, preventing the	Site manager and all employees	Daily monitoring, Annual reporting

		impounding/ponding of water on road sideways. Where a depression in the ground in which water can gather has formed, attention must be given to the outflow of water to prevent concentration of the run-off and thus prevent erosion. Development of water management infrastructure as per the SWM.		
Topsoil removal & Stockpiling	Minimal topsoil is removed	Topsoil must be stockpiled and protected. Topsoil must not be more than 1,5 m	Site manager	Daily monitoring, Report once
Alien vegetation	Infestation of alien vegetation	Eradication of alien vegetation	Site Manager	Formally once every 6 months
Mining trucks	Traffic speeds on road	Calm traffic during commodity trafficking	Clients and Site Manager	Daily monitoring, report contractor to management

1

12. ROLES AND RESPONSIBILITIES

For the purposes of the EMPr, the generic roles that need to be defined are those of the:

• Project Developer.

• Environmental Control Officer.

• Environmental Health and Safety (EHS) Manager.

• Mine Manager

It is acknowledged that the specific titles for these functions will vary from project to project. The intent of this section is to give a generic outline of what these roles typically require. It is expected that this will be appropriately defined at a later stage.

Project Developer

The Project Developer (i.e. Malumbazo Holdings) is the 'owner' of the project and as such is responsible for ensuring that the conditions of the Environmental Authorisation issued in terms of NEMA (should the project receive such authorisation) are fully satisfied, as well as ensuring that any other necessary permits or licenses are obtained and complied with. It is expected that the Project Developer will appoint the Environmental Control Officer, EHS Manager and Construction Manager.

Environmental Control Officer

An independent Environmental Control Officer (ECO) must be appointed to monitor the compliance of the proposed project with the conditions of Environmental Authorisation (should such authorisation be granted by DMR) during the construction phase (and possibly the operational phase, depending on the requirements of DMR). The ECO must also monitor compliance of the proposed project with environmental legislation and recommendations of the EMPr.

The ECO will be responsible for preparing the Final EMPr based on the Draft EMPr, as well as updating the EMPr as and when necessary, and compiling a monitoring checklist based on the EMPr. The roles and responsibilities of the ECO should include the following:

- The ECO must undertake periodic environmental audits during the relevant phases of the proposed project, in order to monitor and record environmental impacts and non-conformances. It is recommended that weekly or bi-weekly environmental audits be undertaken by the ECO during the construction phase.
- Environmental compliance reports must be submitted by the ECO to the Competent Authority (i.e. DMR) on a regular basis (i.e. monthly during the construction phase or as stipulated by the DMR).

- The ECO must maintain a diary of site visits and audits, a copy of the Environmental Authorisation (should such authorisation be granted by DMR) and relevant permits for reference purposes, a non-conformance register, a public complaint register, and a copy of previous environmental audits undertaken.
- Prior to the commencement of construction, the ECO must meet on site with the Construction Manager to confirm the construction procedure and designated construction areas.

EHS Manager

It is important to note that the EHS Manager will be appointed to fulfil the roles of the Environmental Officer during the construction phase and the Environmental Manager during the operational phase. A generic term has therefore been assigned to this sector of roles and responsibilities. The responsibilities of the EHS Manager include overseeing the implementation of the EMPr during the construction and operational phases, monitoring environmental impacts, record-keeping and updating of the EMPr as and when necessary. The EHS Manager is also responsible for monitoring compliance with the conditions of the Environmental Authorisation that may be issued to Malumbazo Holdings.

During construction, the EHS Manager will be responsible for the following:

- Meeting on site with the Construction Manager prior to the commencement of construction activities to confirm the construction procedure and designated activity zones.
- Daily or weekly monitoring of site activities during construction to ensure adherence to the specifications contained in the EMPr and Environmental Authorisation (should such authorisation be granted by DMR), using a monitoring checklist that is to be prepared at the start of the construction phase.
  - Preparation of the monitoring report based on the daily or weekly site visit.
  - Reporting of any non-conformances within 48 hours of identification of such non-conformance to the relevant agents.
  - Conducting an environmental inspection on completion of the construction period and 'signing off' the construction process with the Construction Manager.

During operation, the EHS Manager will be responsible for:

- Overseeing the implementation of the EMPr and monitoring programmes for the operation phase.
- Reviewing the findings of the monitoring and highlight concerns to management.
- Ensuring compliance with the Environmental Authorisation conditions.
- Ensuring that the necessary environmental monitoring takes place as specified in the EMPr.

- Updating the EMPr and ensuring that records are kept of all monitoring activities and results.

During decommissioning, the EHS Manager will be responsible for:

- Overseeing the implementation of the EMPr for the decommissioning phase.
- Conducting an environmental inspection on completion of decommissioning and 'signing off' the site rehabilitation process.

At the time of preparing this EMPr, the EHS Manager appointment is still to be made by the proponent. The appointment is dependent upon the project proceeding to the construction phase.

Mine manager

The Mine Manager will be responsible for the following:

- Overall construction programme, project delivery and quality control for the construction of the facility.
- Overseeing compliance with the Health, Safety and Environmental Responsibilities specific to the project construction.
- Promoting total job safety and environmental awareness by employees, contractors and sub-contractors and stress to all employees and contractors and subcontractors the importance that the project proponent attaches to safety and the environment.
- Ensuring that each subcontractor employ an Environmental Officer (or have a designated Environmental Officer function) to monitor and report on the daily activities on-site during the construction period.
- Ensuring that safe, environmentally acceptable working methods and practices are implemented, and that sufficient plant and equipment is made available, is properly operated and maintained in order to facilitate proper access and enable any operation to be carried out safely.
- Meeting on site with the EHS Manager prior to the commencement of construction activities to confirm the construction procedure and designated activity zones.
- Ensuring that all appointed contractors and sub-contractors are aware of this EMPr and their responsibilities in relation to the programme.
- Ensuring that all appointed contractors and sub-contractors repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in the EMPr, to the satisfaction of the EHS Manager.

At the time of preparing this EMPr, the appointment of a Mine Manager has not been made and will depend on the project proceeding to the construction phase.

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

Once every year

13. Environmental Awareness Plan

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

Malumbazo Holdings has to appoint an independent Environmental Control Officer whose duty is to also implement an effective environmental awareness plan aimed to educate workers and contractors in terms of the biodiversity on site, environmental risks associated with the proposed development and land management of the site. Training and/or awareness should be raised and effectively communicated prior to the commencement of the construction phase. Training sessions should incorporate the management plans addressed in this EMP, as well as any new information and documentation provided by the ECO and Environmental Health & Safety Officer.

The ECO would be the most suitable person to conduct these training sessions - identifying sensitive environments, all the risks/impacts associated with the mining operation and the methods in which to deal with the impacts (in order to avoid environmental degradation). Training sessions can be monitored by providing an attendance register indicating the workers that received training as well as evidence of the training and/or awareness received. These sessions would also need to be carried out throughout the life of the mine, at least once a year, or as new information becomes available.

The training material should contain the following information:

- Statement of the applicant's commitment to environmental principles. This will include:

Site Induction – the purpose of the induction is to ensure that, as a minimum, all on-site personnel understand the EMPr in terms of:

- Key issues relating to the project.
- Relevant conditions of the EA.
- Location and protection of environmentally sensitive features.
- Waste management and minimization.

- Minimizing potential impacts to air, noise and water quality.
- Erosion and sediment control.
- Surface contamination.
- Spill control measures.
- Emergency Preparedness Plan.
- Incident reporting procedures.
- Best pollution prevention practices.
- Roles and responsibility relating to environmental management

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

Kindly refer to the table of possible mitigation measures that could be applied in section (viii) of Part A for an indication of the manner in which risks will be dealt with.

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

N/A. Please note that a request for comments on the Draft Basic Assessment Report will be sent to the Competent Authority prior to the close of the comment period.

15. 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 & affected parties and any responses by the EAP to comments or inputs made by interested & affected parties are correctly reflected herein. **X**

Signature of the environmental assessment practitioner:

BGES Pty Ltd

Name of company:

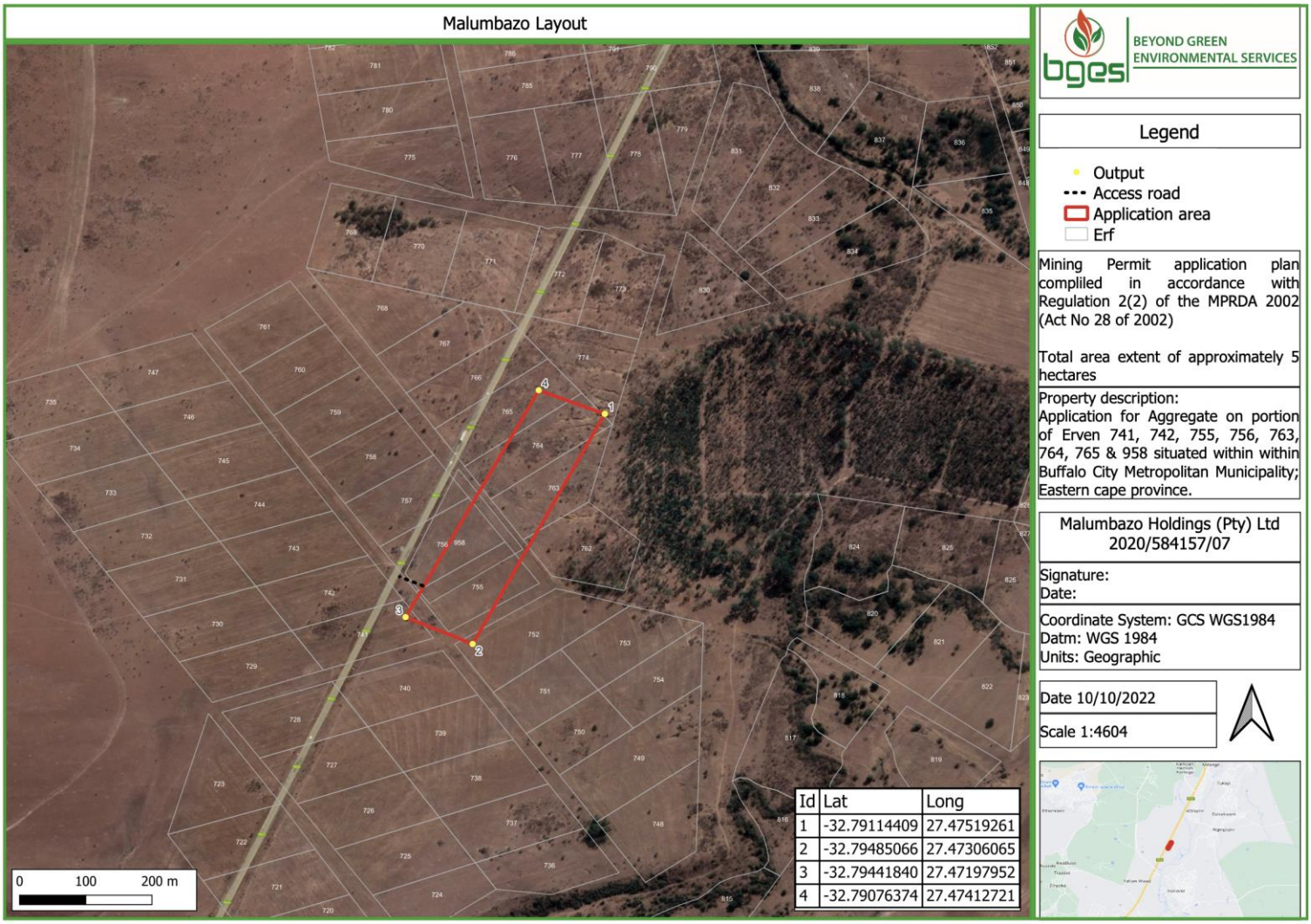
28/11/2022

Date:

-END

APPENDICES

APPENDIX A composite Map



Name of the Practitioner: Mitrance Nana

Professional affiliation: *Pr.Sci.Nat*

Tel No.: 0616148272

Fax No.: 0866756316

Email: nana@beyondges.co.za

Name of the Practitioner: Nonkululeko Mbasane (Reviewer)

Professional affiliation: *Pr.Sci.Nat*

Tel No.: 0721728374

Fax No.: 0866756316

Email: Nonkululeko@beyondges.co.za

Expertise of the EAP.
The qualifications of the EAP

Attached

- **Summary of the EAP's past experience**.

(In carrying out the Environmental Impact Assessment Procedure)

Work Experience:
Evaluate environmental authorizations as in accordance with NEMA and Mineral and Petroleum Resources Development Act;
Evaluate Environmental Impact Assessment, Scoping and Risk Report;
Evaluate Closure plans and compile Environmental reports;
Conduct mine environmental compliance monitoring and auditing;
Closure inspections to promote environmental management in the mining industry;
Respond to NEMA Section 30 emergency incidents in mining industry;
Respond to pollution and waste-incidents which do not constitute incidents in terms of section 30 of NEMA;
Evaluate financial provisions, handle and address complaints, enquiries and request related to Mine Environmental Management;
Consult with interested and affected parties and promote co-operative governance.
Development of Basic Assessment report in accordance with requirements of NEMA

+27 31 003 2900 / +27 12 003 6593
www.beyondges.co.za
info@beyondges.co.za

DECLARATION OF THE EAP WHO PREPARED THE REPORT

I, Mitrance Nana , declare that –

General declaration:

- I act as the independent environmental practitioner in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in regulation 8 of the Regulations when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a
- reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- I will keep a register of all interested and affected parties that participated in a public participation process; and
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- all the particulars furnished by me in this form are true and correct;
- will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I realise that a false declaration is an offence in terms of regulation 71 of the Regulations and is punishable in terms of section 24F of the Act.

Disclosure of Vested Interest (delete whichever is not applicable)

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;

- ~~I have a vested interest in the proposed activity proceeding, such vested interest being:~~

Signature of the environmental assessment practitioner:

BGES Pty Ltd

Name of company:

24/11/2022

Date:

Reference

IDP. 2021. Integrated Development Plan Final Review 2020-2021. Buffalo City Metropolitan Municipality.

PUBLIC PARTICIPATION REPORT

APPLICANT: MALUMBAZO HOLDINGS

EC 30/5/1/3/2/10748MP

INCLUDED IN THE REPORT:

1. DATABASE FOR I&AP
2. WRITTEN NOTICES- BID
3. PROOF OF SITE NOTICE
4. PROOF OF NEWSPAPER ADVERTISEMENT
5. LANDOWNER CONSULTATION
6. MINUTES OF MEETINGS
7. ATTENDANCE REGISTERS
8. COMMENTS AND RESPONSES REPORT

INTRODUCTION

The PPP for the proposed project has been undertaken in accordance with the requirements of NEMA (ACT 59 OF 1998) and in line with the principles of Integrated Environmental Management (IEM). IEM implies an open and transparent participatory process, whereby stakeholders and other I&AP's are afforded an opportunity to comment on the project. A PPP has been implemented to engage with I&AP's and meet the requirements for Public Participation as stipulated by the relevant legislation. The PPP provides stakeholders with information about the proposed project, and several opportunities to comment throughout the EIA/EMP process. This will ensure public involvement at each key step in the process and allow for comments, concerns, suggestions, and objections to the proposed project to be included in each of the submissions to the relevant Government Authorities.

In terms of the MPRDA and the NEMA, I&AP's must be given the opportunity to comment on the proposed project. The Basic Assessment Report aims to describe the proposed project, the environment in which the

project is located, and the potential impacts that may result if the project goes ahead. The Draft Basic Assessment Report will be made available for public/stakeholders' comment (a period of 30 days). The comments received from I&AP's will be captured in Issues and Responses Report (IRR) accompanying this Report or the Final BAR. A Final Basic Assessment Report, including an EMPR, has been compiled and will be presented to the Competent Authority. During the EIA phase for this project, the following steps were initiated, and all relevant documents are attached.

1. IDENTIFYING I&AP'S

The authorities for this project were identified from similar projects in the past. The authorities contacted with regards to this project include:

- The Kwa-Zulu Natal Department of Mineral Resources and Energy
- the Department of Transport:
- The Department of Water Affairs and Sanitation (DWS);
- EC Department of Agriculture
- Dept of Rural Develop & Land Reform
- Buffalo City Metropolitan Municipality

2. DATABASE & REGISTER FOR I&AP'S

3. WRITTEN NOTICES FOR BID and BAR

4. Fixing of Notices

Further to this, posters written in English were erected and displayed on the nearest areas to the site of the proposed site. These posters informed the public of the proposed activities, invited (I&AP's) to comment or object on the project.

Site 1

5. Proof of Newspaper Adverts

Advert was published on the local newspaper (Advertiser) informing the public of the application and registration as I&AP's.

6. Landowner Consultation

The landowner was a part of the public meeting which was held Wells (who were also present on the landowner's behalf at the meeting). However, he did not provide a consent letter form in this regard**.**

2.Closure

Meeting was adjourned

8.Attendance register