

**DRAFT**  
**Basic Assessment Report**  
**And**  
**Environmental Management Programme**

**Kgopong Mining (Pty) Ltd**

**Portion of Portion 12 & 13 of Harriets Wish 393 LR**

**LP 30/5/1/3/2/1/11955 MP**

**April 2023**

---



***Prepared by:***

Bateleur Environmental & Monitoring Services  
PO Box 70706  
Die Wilgers  
0041

Cell: 082 338 6607

E-mail: [gertenes@lantic.net](mailto:gertenes@lantic.net)

PART A: SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT	13
1. Project Applicant	13
1.1 Details of the applicant	13
1.2 Details of the EAP	13
1.3 Location of activity	14
2. Description of the scope of the proposed overall activity	16
2.1 Listed and specified activities	16
2.2 Description of the activities to be undertaken	17
2.3 Relevant policy and legislation	24
2.3.1 Environmental Authorisation Process	25
2.4 Need and desirability of project	32
2.5 Motivation for the overall preferred site, activities and technology alternative.	32
2.6 Full description of the process followed to reach the proposed preferred alternatives within the site.	33
2.6.1 Details of the development footprint alternatives considered	33
2.7 Details of the public participation process followed	34
2.7.1 Stakeholder identification	34
2.7.2 Project announcement	36
2.7.3 Stakeholder comments	36
2.8 Summary of issues raised by I&APs	36
2.9 Environmental attributes and associated alternatives	38
2.9.1 Baseline receiving environment	38
2.9.2 Environmental Aspects Which May Require Protection and/or Remediation	58
3. Methodology used in determining and ranking the nature, significance, consequence, extent, duration and probability of potential environmental impacts and risks	58
3.1 Methodology for assessing impact significance	58
4. Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts	60
4.1 Impact on Topography	60
4.2 Impacts on Soil	60
4.3 Impacts on Land Use	60
4.4 Impacts on Fauna and Flora	61
4.5 Impacts on Surface Water Resources	61
4.6 Pollution of Groundwater	61
4.7 Impacts of Environmental Pollution	61
4.8 Social Impacts	61
4.9 Impacts on Health and Safety	62
4.10 Impacts on Transportation, Infrastructure and Traffic	62
4.11 Visual Impact	63
4.12 Impacts on Air Quality	63
4.13 Noise Impact	63
4.14 Blasting and Vibration	63
5. 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	69
6. The possible mitigation measures that could be applied and the level of risk	69
7. Motivation where no alternatives sites were considered	69

8.	Statement motivating the alternative development location within the overall site	69
9.	Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity.	70
10.	Assessment of each identified potentially significant impact and risk.	71
11.	Summary of specialist reports.	77
12.	Environmental impact statement.	77
12.1	Final site map	78
12.2	Summary of key findings	78
13.	Proposed impact management objectives and the impact management outcomes for inclusion in the EMPR	80
13.1	Environmental Objectives and Goals	80
13.2	Socio-economic Objectives and Goals	83
13.3	Historical and Cultural Aspects	84
14.	Aspects for inclusion as conditions of authorisation	84
15.	Description of any assumptions, uncertainties and gaps in knowledge	85
15.1	Heritage	85
16.	Reasoned opinion as to whether the proposed activity should or should not be authorised	85
16.1	Reasons why the activity should be authorised or not	85
16.2	Conditions that must be included in the authorisation	86
17.	Period for which the environmental authorisation is required	86
18.	Undertaking	86
19.	Financial Provision	86
20.	Specific Information required by the competent Authority	86
20.1	Impact on the socio-economic conditions of any directly affected person	86
20.2	Impact on any national estate referred to in Section 3(2) of the National Heritage Resources Act.	87
21.	Other matters required in terms of Sections 24(4)(a) and (b) of the Act	87
Part B: Environmental Management Programme Report		88
1.	Details of the EAP	89
2.	Description of the aspects of the activity	89
3.	Composite Map	89
4.	Environmental Management Principles	89
4.1	Holistic Principle	89
4.2	Best Practicable Environmental Option	89
4.8	Duty of Care Responsibilities	91
4.9	Failure to Comply with Environmental Considerations	92
5.	Description of Impact management objectives including management statements	93
5.1	Determination of closure objectives	93
5.2	Volumes and rate of water use required for the operation	96
5.3	Has a water use licence has been applied for?	96
5.4	Impacts to be mitigated in their respective phases	96
6.	Impact management outcomes	109
7.	Impact Management Actions	109
8.	Financial Provision	109

9.	Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation	110
10.	Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties	111
11.	Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining permit area at the time of closure	111
11.2	Phase 1: Making Safe	111
11.3	Phase 2: Landform Design, Erosion Control and Revegetation	112
11.4	Phase 3: Monitoring and Maintenance	112
11.5	Post-Closure Monitoring and Maintenance	113
12.	Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives	114
13.	Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline	114
14.	Confirm that the financial provision will be provided as determined	114
15.	Monitoring compliance with and performance assessment	116
15.1	Monitoring of impact management actions	116
15.1.1	Air quality	116
15.1.2	Soil management	116
15.2	Monitoring and Reporting frequency	117
15.3	Responsible persons	117
15.4	Time period for implementing impact management actions	117
16.	Mechanism for monitoring compliance	117
16.1	Performance Assessments	117
16.2	Indicate the frequency of the submission of the performance assessment/environmental audit report	119
17.	Environmental Awareness Plan	121
17.1	Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work	121
17.2	Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment	122
17.2.1	Environmental response plan	122
18.	Specific information required by the Competent Authority	124
19.	Undertaking	125

## List of Figures

Figure 1: Locality map. ....	15
Figure 2: Operation plan of the proposed quarry. ....	16
Figure 3: Planned infrastructure plan. ....	22
Figure 4: Population statistics of the Project Area.....	39
Figure 5: Age structure of CDM and BLM (Source: StatsSA).....	40
Figure 6: Employment status by Gender, BLM.....	42
Figure 7: Main Economic sectors, CDM.....	43
Figure 8: Wind direction distribution.....	47
Figure 9: Local orientation of the study area within the regional vegetation units. ....	51
Figure 10: Geo-referenced images of the vegetation and soil profiles for the three plots within the area of burrow pit B2.....	52
Figure 11: Limpopo Conservation Plan.....	53
Figure 12: Quaternary catchments.....	56

## List of Tables

Table 1: Details of applicant.....	13
Table 2: Details of the EAP.....	13
Table 3: Details of location.....	14
Table 4: Relevant policies and legislation.....	24
Table 5: List of identified Interested and Affected Parties.....	35
Table 6: Comments raised by I&AP's.....	37
Table 7: Unemployment rates 2011 (Census) and 2016.....	41
Table 8: Average monthly precipitation.....	46
Table 9: Average maximum, average and minimum temperatures.....	47
Table 10: Annual maximum, minimum and average monthly evaporation.....	48
Table 11: Description of Roodeberg Bushveld vegetation unit.....	50
Table 12: Phases of the activity.....	58
Table 13: Criteria for EIA assessment.....	59
Table 14: Potential impacts and mitigation measures associated with the operational phase.....	64
Table 15: Assessment of each identified potentially significant impact and risk.....	71
Table 16: Possible environmental sensitivities.....	77
Table 17: Impact on socio-economic conditions.....	86
Table 18: Impacts to be mitigated in their respective phases.....	108
Table 19: Financial Provision.....	115
Table 20: Monitoring and Management of Environmental Impacts.....	120

## List of Appendices

Appendix 1:	Curriculum Vitae of EAP
Appendix 2:	Site photographs
Appendix 3:	Public Participation Report
Appendix 4:	Relevant Plans/Maps
Appendix 5:	Heritage Impact Assessment
Appendix 6:	Soil Scan and Protected Species Survey

## 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.

## OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

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

- 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;
- identify the alternatives considered, including the activity, location, and technology alternatives;
- describe the need and desirability of the proposed alternatives;
- 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:
  - the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
  - the degree to which these impacts—
    - can be reversed;
    - may cause irreplaceable loss of resources; and
    - can be managed, avoided or mitigated;
  - 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—
    - identify and motivate a preferred site, activity and technology alternative;
    - identify suitable measures to manage, avoid or mitigate identified impacts; and
    - identify residual risks that need to be managed and monitored.

## EXECUTIVE SUMMARY

### Introduction

This draft report is being provided in order for the public to have the opportunity to review and provide input into the application process, which will be used when finalising the report for submission to the authorities for a decision. Should you wish to submit comments on the contents of this report please refer to the Background Information Document (BID) available from the Public Participation Officer at Diphororo Developments (Pty) Ltd ([fransis@diphororo.com](mailto:fransis@diphororo.com)). Please ensure that your comments are submitted on or before the 17 April 2023.

Bateleur Environmental & Monitoring Services (Pty) Ltd (Bateleur) was appointed by Kgopong Mining (Pty) Ltd (Kgopong Mining), to compile and submit a Basic Assessment Report (BAR), pursuant to an application for a mining permit, in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) to the Limpopo Department of Mineral Resources and Energy (DMRE).

The Mining Permit Application (MPA) has been accepted by the Regional Manager, Limpopo Region, of the DMRE under Reference LP 30/5/1/2/3/3/1/11955 MP, instructing Kgopong Mining to prepare a BAR and conduct a Public Participation Process (PPP).

The Project is situated on portions of Portions 12 & 13 of the farm Harriets Wish 393LR in the Blouberg Local Municipality of the Capricorn District Municipality, Limpopo Province (Figure 1 - Local Setting).

### Project applicant

Details of the Project applicant are indicated in the table below:

Company name:	Kgopong Mining (Pty) Ltd
Contact person:	Mr Solomon Kgopong
Postal address:	PO Box 1959 Polokwane 0700
Tel nr:	082 455 4220
Cell nr:	082 455 4220
E-mail:	kgopongfarms@gmail.com

### Project overview

It is proposed that calcrete aggregate be mined at the operation. Mining at the Kgopong Mining Quarry will be conducted by means of opencast mining methods. Topsoil will be stripped and stockpiled separately to be used for rehabilitation purposes. The calcrete aggregate will be drilled and blasted. A front-end loader will load the blasted material on a dumper to transport the material to a mobile crusher, a front-end loader will also be used to load the crushed material onto trucks which will transport it to the stock piling area from where it will be distributed to where required. The mine will operate for a two (2) year permit period with an option to renew for three (3) periods, each of which may not exceed one (1) year if the mining programme is not completed.

The project infrastructure and activities will include the following:

- Site clearance.



- Removal of topsoil and overburden and stockpiling.
- Site establishment, including the establishment of an access route, mobilisation of equipment and preparation of area for mining.
- Excavation of an open pit.
- Blasting.
- Loading zone.
- Loading and dust control.
- Crushing and screening of aggregate.
- Hauling and transporting of aggregate.
- Ablution facilities and waste storage area.
- Rehabilitation of site.

### **Purpose of this Report**

The scope of work requires investigating all potential environmental and social impacts, for various activities, in terms of the National Environmental Management Act, Act 107 of 1998 (NEMA); and compiling a BAR and Environmental Management Programme Report (EMPR) in support of the Mining Permit application, in terms of the Mineral and Petroleum Resources Development Act, Act 28 of 2002 (MPRDA). This includes all relevant specialist studies required to identify the potential environmental impacts of the project and its related activities. This document will be submitted to the Limpopo DMRE in support of Kgopong Mining's Mining Permit Application (MPA).

The objectives of the BAR & EMPR for the Kgopong Mining Project are to:

- Comply with the legal requirements of the MPRDA and NEMA (Section 31, Regulation R543).
- Describe the proposed project's environmental and socio-economic context.
- Develop a detailed understanding of the baseline environment at the sites proposed for development.
- Determine and assess the impacts to receptors and resources as a result of the project activities.
- Introduce stakeholders to the additional activities of the project and provide information about the proposed project in a transparent way.
- Identify and engage with stakeholders to ensure that feedback on the results of the study is provided and that the assessment and management of impacts is identified, and concerns considered.
- Develop environmental and social management measures to mitigate negative impacts and enhance positive impacts.
- Consider and assess project alternatives in terms of environmental impacts; and
- Provide sufficient information to the authorities to inform the mining authorisation decision.

### **Environmental consultants**

Bateleur was appointed by Kgopong Mining as the independent environmental consultant to facilitate the environmental authorisation application process for the proposed Kgopong Mining Project.

Particulars of the EAP undertaking the EIA process are supplied in the table below:

EAP Name:	Mrs Yonanda Martin on behalf of Bateleur Environmental & Monitoring Services (Pty) Ltd
Contact person:	Gert Pretorius
Telephone nr:	082 338 6607
Fax nr:	086 619 3120
E-mail:	gertenes@lantic.net
Postal address:	PO Box 70706 Die Wilgers, 0041

### **Approach and methodology for the Public Participation Process**

The Public Participation Process (PPP) undertaken for this application included the requirements of the MPRDA and was designed to provide sufficient and accessible information regarding the proposed project to stakeholders in an objective manner. The process also provided opportunities to stakeholders to contribute actively to the environmental assessment. Refer to Sections 2.7 and 2.8 for details regarding the PPP.

A phased approach to the PPP was undertaken and relevant objectives to each of the phases are set out below.

During the Announcement Phase:

- Provide information about the proposed project.
- Raise issues of concern and suggestions for enhanced benefits; and
- Contribute relevant local and traditional knowledge to the environmental assessment.

During the BAR Phase:

- Verify that their issues have been considered in the environmental assessment; and
- Comment on the findings of the environmental assessment

### **Project alternatives**

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

Alternatives can typically be identified according to:

- Activity alternatives.
- Location alternatives.
- Design or layout alternatives.

- Technology alternatives.
- Operational alternatives.
- No-Go alternative.

For any alternative to be considered feasible, such an alternative must meet the need and purpose of the development proposal without presenting significantly high associated impacts. The geology is the primary driver in determining the location for mining. Historical mining operations and current data collected within the application area indicate that aggregate occurs in economically viable quantities. As such, no activity and location alternatives have been considered. Design, technology, operational as well as the No-Go alternatives have been considered and assessed in the report.

### **Environmental Impact Assessment**

This BA was undertaken in order to identify all of the potential risks and impacts associated with each phase of the project, namely (i) Pre-construction, (ii) Construction, (iii) Operation (iv) Closure and (v) Rehabilitation. Each of the identified risks and impacts were assessed following the impact methodology described in the body of this report. The assessment criteria include nature, extent, duration, magnitude/intensity, reversibility, probability, public response, cumulative impact, and irreplaceable loss of resources. Based on the impact assessment conducted by the Environmental Assessment Practitioner and the various specialists, the environmental impacts associated with this project are expected to be localised and of medium to low significance, provided all recommended mitigation measures are implemented correctly.

### **Environmental Management Programme Mitigation Measures**

The Environmental Management Programme (EMP) has identified appropriate mechanisms for avoidance and mitigation of negative impacts. These mitigation measures and monitoring programmes have been included as commitments in the EMP. It is anticipated that the implementation of the mitigation measures stipulated in the EMP will result in effective mitigation of the negative impacts. Conversely, the implementation of the mitigation measures is designed to maximise the positive aspects of the project and will result in a significant positive influence as a result of the mining operation.

### **Need and Desirability of the Project**

The possible increase in building, construction and road building material required by the adjacent Waterberg JV Resources platinum and palladium mine triggered the need of the Applicant to trade with the available aggregate from a permitted area. The proposed aggregate mining operation will entail the removal of aggregate, from an undisturbed area of the farm. The mining of the mineral was identified as a feasible business opportunity that will also bring about the diversification of activities on the property, extending it from dormant agricultural land to include small scale mining.

The project will contribute to the local economy, both directly and through the multiplier effect that its presence will create, as equipment and supplies are purchased locally, and wages are spent at local businesses, generating both jobs and income in the area.

### **Conclusions and recommendations**

Mitigation and management measures have been recommended to prevent, avoid and reduce the significance of the potential impacts of the project. Conversely, enhancement measures will be

implemented to increase the significance of the potential positive impacts for the project. Should the mitigation and management measures be correctly implemented, the potential impacts will be reduced in their significance. The proposed activities requiring Environmental Authorisation are critical for the mining activities and the prevention of pollution of the environment, as well as to ensure the efficient and successful operation of the project. With the implementation of the recommended mitigation measures to manage potential impacts, it is recommended that the proposed project be granted an Environmental Authorisation.

**PART A: SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT****1. Project Applicant**

This section of the report provides an overview of the applicant, details the Environmental Assessment Practitioner (EAP), who will oversee and facilitate the environmental process and details of the competent authorities.

This section also provides details on the property on which the mining permit area is located as well as adjacent properties, including surface right holders and land claims.

**1.1 Details of the applicant****Table 1: Details of applicant.**

Project applicant:	Kgopong Mining (Pty) Ltd		
Trading name (if any):	Kgopong Mining		
Contact person:	Mr Solomon Kgopong		
Physical address:	Portion 12 Harriets Wish 393 LR		
Postal address:	P.O. Box 1959 Polokwane		
Postal code:	0700	Cell:	082 455 4220
Telephone:	082 455 4220	Fax:	
E-mail:	kgopongfarms@gmail.com		

**1.2 Details of the EAP**

Bateleur was appointed by Kgopong Mining as the independent environmental consultant to facilitate the environmental authorisation application process for the proposed Kgopong Mining Project (Appendix 1).

**Table 2: Details of the EAP.**

Environmental Assessment Practitioner:	Yonanda Martin, on behalf of Bateleur Environmental & Monitoring Services		
Contact person:	Gert Pretorius		
Postal address:	PO Box 70706, Die Wilgers		
Postal code:	0041	Cell:	082 338 6607
Telephone:	082 409 0405	Fax:	086 619 3120
E-mail:	<a href="mailto:gertenes@lantic.net">gertenes@lantic.net</a>		
Qualifications:	MSc Environmental Science		
Professional affiliations (if any):	SACNASP: 400204/2009 EAPASA: 2019/1307		

### 1.3 Location of activity

The site is located 30 km west of Senwabarwana and 25 km east of Steilloop in the Blouberg Local Municipality of the Capricorn District Municipality, Limpopo Province. The project area spans approximately 5.0 hectares (Figure 1).

Photographs of the current site conditions are included in Appendix 2.

**Table 3: Details of location.**

Farm Name:	Harriets Wish 393 LR
Application Area (Ha):	5.0 ha
District Municipality:	Capricorn
Distance and direction from nearest town:	25 km west to Steilloop
21-digit Surveyor General Code for each farm portion:	Portion 3: TOLR00393000000300000

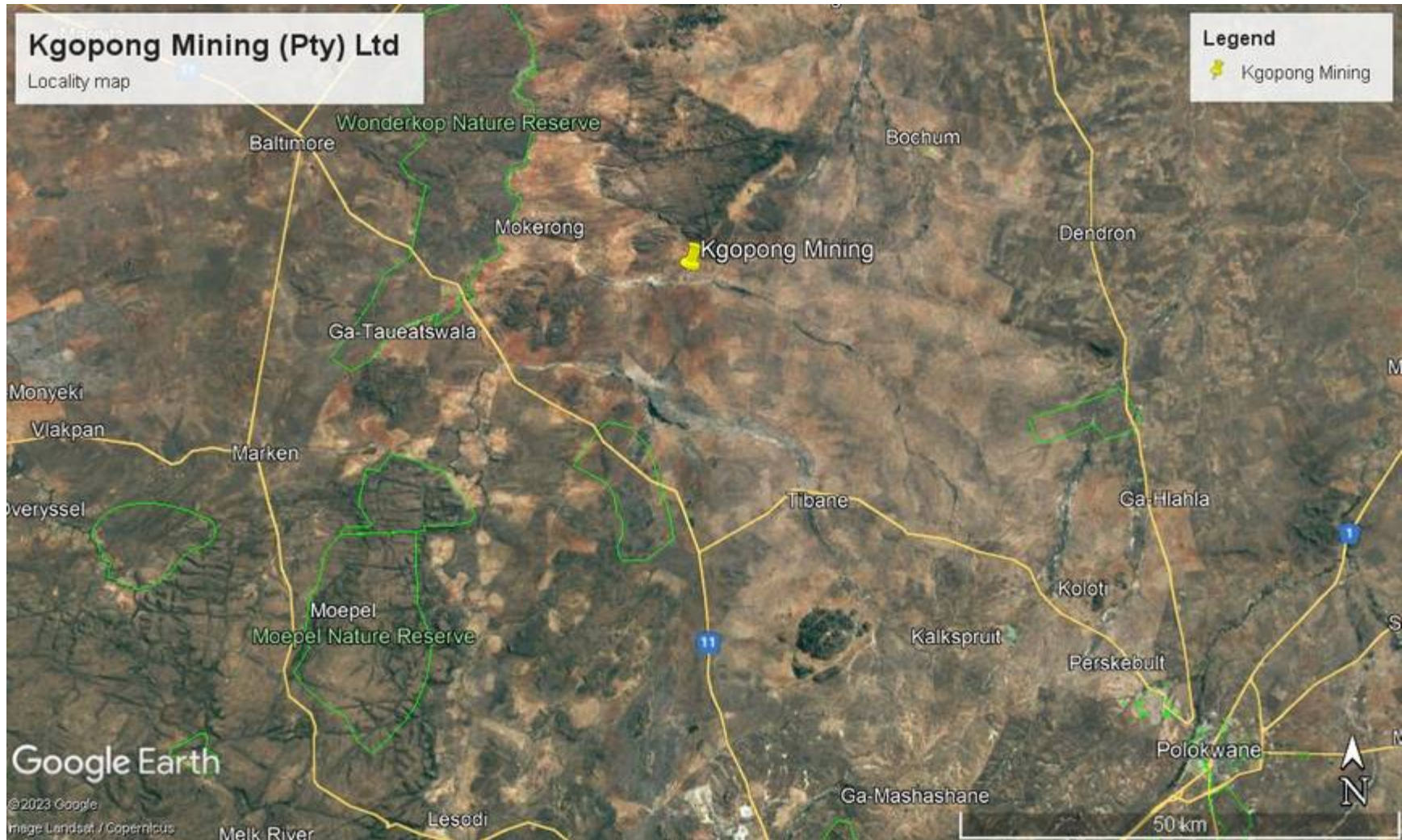
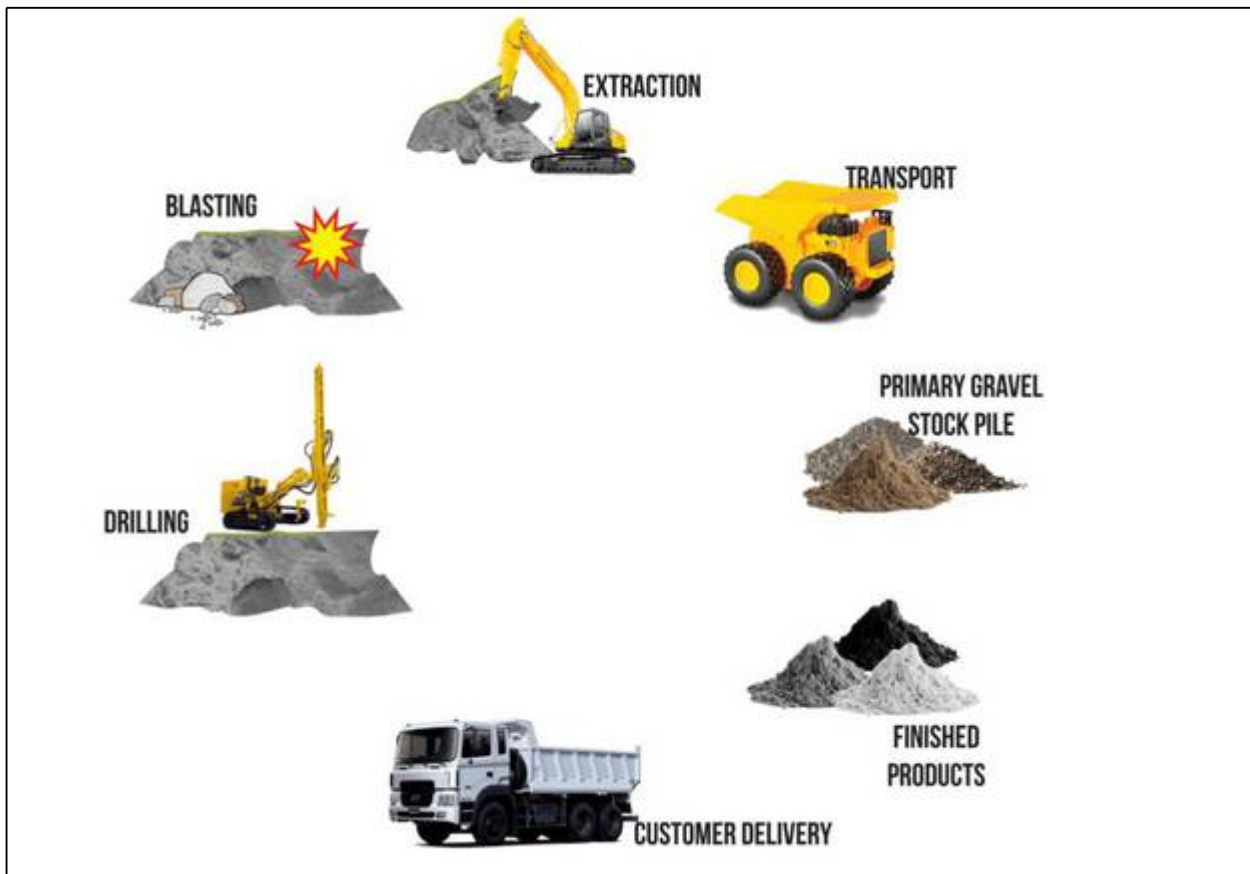


Figure 1: Locality map.

## 2. Description of the scope of the proposed overall activity

The method that will be employed is a very basic form of open pit mining, and a 5 ha area will be demarcated for mining activities. Mining at the Kgopong Mining quarry will be conducted by means of opencast mining methods. A simplified illustration of the mining method is indicated in Figure 2 below. Topsoil will be stripped and stockpiled separately to be used for rehabilitation purposes. The calccrete aggregate will be drilled and blasted. Limited blasting will be conducted as the permit area is situated close to a homestead. A safe distance of at least 50 meters will be applied. A front-end loader will load the blasted material on a dumper to transport the material to a primary crusher, a front-end loader will also be used to load the crushed material onto trucks which will transport it to the stock piling area from where it will be distributed to where required.

The mine will operate for a two (2) year permit period with an option to renew for three (3) periods, each of which may not exceed one (1) year if the mining programme is not completed. Planned infrastructure is indicated in Figure 3.



**Figure 2: Operation plan of the proposed quarry.**

### 2.1 Listed and specified activities

The legal requirement for Environmental Authorisation for a Mining Permit came into effect after the promulgation of the NEMA 2014 EIA Regulations on 8<sup>th</sup> December 2014. Prior to this, Mining Permits were subjected to the provisions of the MPRDA (2002). In this regard, a Mining Permit and Environmental



Authorisation are required in terms of the MPRDA (2002) and NEMA 2014 EIA Regulations (as amended), respectively. The applicable NEMA listed activities anticipated to be triggered by this project are outlined below.

- *GN R983 (as amended by R327): Activity no. 21 in Listing notice 1.*

Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002(Act No. 28 of 2002), including-

- a. associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource or including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
- b. the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing

- *GN R983 (as amended by R327): Activity no. 27 in Listing notice 1.*

The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-

- i. the undertaking of a linear activity or
- ii. maintenance purposes undertaken in accordance with a maintenance management plan

## **2.2 Description of the activities to be undertaken**

The type of mineral to be mined is aggregate. The method that will be employed is a conventional form of open pit mining, and a 5 ha area will be demarcated for the mining activities. The mining activities will consist out of the following:

- Stripping and stockpiling of topsoil;
- Blasting
- Excavating;
- Crushing & Screening;
- Stockpiling and transporting;
- Sloping and landscaping upon closure of the site; and
- Replacing the topsoil and vegetation the disturbed area.

The mining site will contain the following:

- Drilling equipment;
- Excavating equipment;
- Earth moving equipment;

- Mobile crushing and screening plants
- Access Roads;
- Site Office (Containers);
- Site vehicles;
- Parking area for visitors and site vehicles;
- Vehicle service area;
- Wash bay;
- Workshop (Containers);
- Salvage Yard;
- Bunded diesel and oil storage facilities;
- Generator on bunded area;
- Ablution Facilities (Chemical Toilets);

Should the MP be issued, and the mining of gravel be allowed, the proposed project will comprise of activities that can be divided into three key phases (discussed in more detail below) namely the:

- 1) Site establishment/construction phase which will involve the demarcation of the permitted mining area. Site establishment will also necessitate the clearing of vegetation, the stripping and stockpiling of topsoil, and the introduction of mining machinery and equipment.
- 2) Operational phase that will entail the mining of aggregate from the approved footprint area via conventional open cast mining methods. The mining method will make use of limited blasting in order to loosen the hard rock; upon which the loosened material will be transported to the crushing and screening processing plant where it will be screened to various sized stockpiles, before it is sold and transported from site to clients.
- 3) Decommissioning phase which entails the rehabilitation of the affected environment prior to the submission of a closure application to the DMRE. The permit holder will further be responsible for the seeding of all rehabilitated areas. Once the full mining area is rehabilitated, the mining permit holder will be required to submit a closure application to the DMRE in accordance with section 43(4) of the MPRDA, 2002. The Closure Application will be submitted in terms of Regulation 62 of the MPRDA, 2002, and Government Notice 940 of NEMA, 1998 (as amended).

- Rehabilitation of the surface area shall entail landscaping, levelling, top dressing, land preparation, seeding (if required), and weed / alien clearing.
- All infrastructures, equipment, and other items used during the mining period will be removed from the site (section 44 of the MPRDA).
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognised landfill facility. It will not be permitted to be buried or burned on the site.
- Weed / Alien clearing will be done in a sporadic manner during the life of the mining activities. Species categorised as weeds according to the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) [NEMBA] Alien and Invasive Species Regulation GNR 598 and 599 of 2014 Species regarded as need to be eradicated from the site on final closure.
- Final rehabilitation shall be completed within a period specified by the Regional Manager. Once the mining area was rehabilitated, the mining permit holder will submit a closure application to the

DMRE in accordance with section 43(4) of the MPRDA, 2002. The Closure Application will be submitted in terms of Regulation 62 of the MPRDA, 2002, and Government Notice 940 of NEMA, 1998 (as amended).

### **Phase 1: Construction Phase**

During the construction phase, the following activities, which may impact detrimentally on the health of people or the environment, will be conducted:

- Construction of mine infrastructure, i.e., haul roads, etc.
- Preparation of the topsoil area,
- Construction of the storm water diversion trenches;
- Excavation of initial box-cuts
- Formation of the topsoil stockpiles,

#### Construction of mine infrastructure:

Access to the proposed mining area will be via the gravel secondary road to the north of the mining site. Haul roads will be developed prior to mining activities and will be rehabilitated as part of the final reinstatement of the area. Trucks delivering the materials to the destinations will also make use of the gravel road. The haul roads will be 4 m wide and cover a distance of approximately 100 m. The topsoil stripped from the construction of these haul roads will be utilized to form berms alongside these roads. The haul roads will cover a total area of approximately 0.04 ha.

#### Construction of the Pollution control facilities.

Before a box-cut can be excavated the storm water berms and trenches must be constructed.

#### Construction of the Storm water diversion trenches:

The Storm water diversion trench will have a horizontal width of 1,0m, to a maximum depth of 1,0m. The upslope side of the trench will be sloped at 1:4 and the downslope side at 1:1. All material excavated during the construction of the trench will be used to construct a 1,0m high berm on the downslope side of the trench. This trench will divert all surface water runoff around the pit, infrastructure area and stockpiling area. The dirty water trench will be constructed with a 1,0m base to a depth of 1,0m. The upslope side of the trench will be sloped to 1:4 and the down slope side at 1:1. Material excavated from the trench will be used to construct a 1,0m high berm along the down slope side of the trench. This trench will divert surface runoff away from the opencast workings.

#### Excavation of the box-cuts:

An initial box-cut will be constructed on the southwestern section of the mining area. The box-cut will be approximately 10m wide and 10m long. Topsoil will be stripped to a depth of 200mm, thus approximately 20 m<sup>3</sup> will be removed to the topsoil stockpile.

Finally, all aggregate will be removed from the mining area.

#### Formation of the topsoil stockpiles

The position of the topsoil stockpile is indicated on the Mining Layout Plan. Note that topsoil will be removed from all stockpiling areas prior to formation of soft and hard overburden stockpiles.

The construction phase is expected to be completed within one month from the granting of the Mining Permit.

#### **Phase 2: Operational phase:**

Limited blasting of the aggregate reserves and the subsequent mining of the aggregate utilising a truck and shovel operation will be conducted. A rip and load mining method will be employed closer to the homestead to prevent possible damage caused by blasting. The mined aggregate will be crushed and screened utilising a mobile crushing and screening plant. A front-end loader will be used to load the material into haulage trucks.

#### **Phase 3: Rehabilitation phase:**

The decommissioning phase will entail the reinstatement of the proposed mining footprint.

The end objective is for the mining area to return to dormant agricultural use. No buildings/infrastructure, need to be demolished and the access road will remain intact.

The applicant will comply with the minimum closure objectives as prescribed DMRE and detailed below.

The decommissioning phase will entail the reinstatement of the processing area by removing the stockpiled material, and site infrastructure/equipment and landscaping the disturbed footprints. Due to the impracticality of importing large volumes of fill to restore the quarry area to its original topography, the quarry will need to be rehabilitated by shaping slopes and ensuring that there is no loose material or areas where slippage could occur. Topsoil will be re-laid over exposed areas and indigenous grassland species re-introduced.

The following key points must be followed to ensure appropriate closure:

- Rehabilitation will occur as soon as practically possible on completion of mining, following the cessation of the work in a specific section.
- A suitably qualified vegetation specialist is to provide input during the final rehabilitation to ensure the grassland is suitably rehabilitated in line with the condition of the adjacent grassland.
- No more than one month will pass between cessation of mining and rehabilitation.
- Any infrastructure erected for mining will be demolished and removed.
- All equipment, concrete footings, fencing, etc. will be removed from site.
- All waste will be removed from site and disposed of at an approved landfill.
- Soil contaminated with oil, grease, fuel may not be disposed of in the excavation but will be disposed at a permitted landfill.

- The floor of the quarry will be left level and ripped to allow re growth of vegetation. Topsoil removed at the beginning of the process can be used to cover this area.
- Before placing topsoil, all visible weeds will be removed.
- The topsoil will be spread evenly over the prepared surface to a depth of 75 to 150mm on slopes of 1:3 or steeper.
- Topsoil placement will occur in a phased manner, concurrent with the phased operation of the quarry. Topsoil will be placed in the same area from which it was stripped.
- Where amounts are inadequate to cover the entire area, slopes will receive priority treatment.
- Site access will be blocked to ensure that other operators or opportunists do not re-visit closed areas and continue to remove material.
- Re-vegetated areas will be protected until vegetation has become established. No vehicles or equipment will be allowed access to areas that have been vegetated.
- Any erosion channels that develop after re-vegetation will be backfilled and consolidated and the areas restored to a proper stable condition. The erosion will not be allowed to develop on a large scale before effecting repairs and all erosion damage should be repaired as soon as possible.
- The site will not be used further once it has been closed. The area will be shaped and re vegetated to ensure that it does not pose a safety or erosion and environmental hazard.

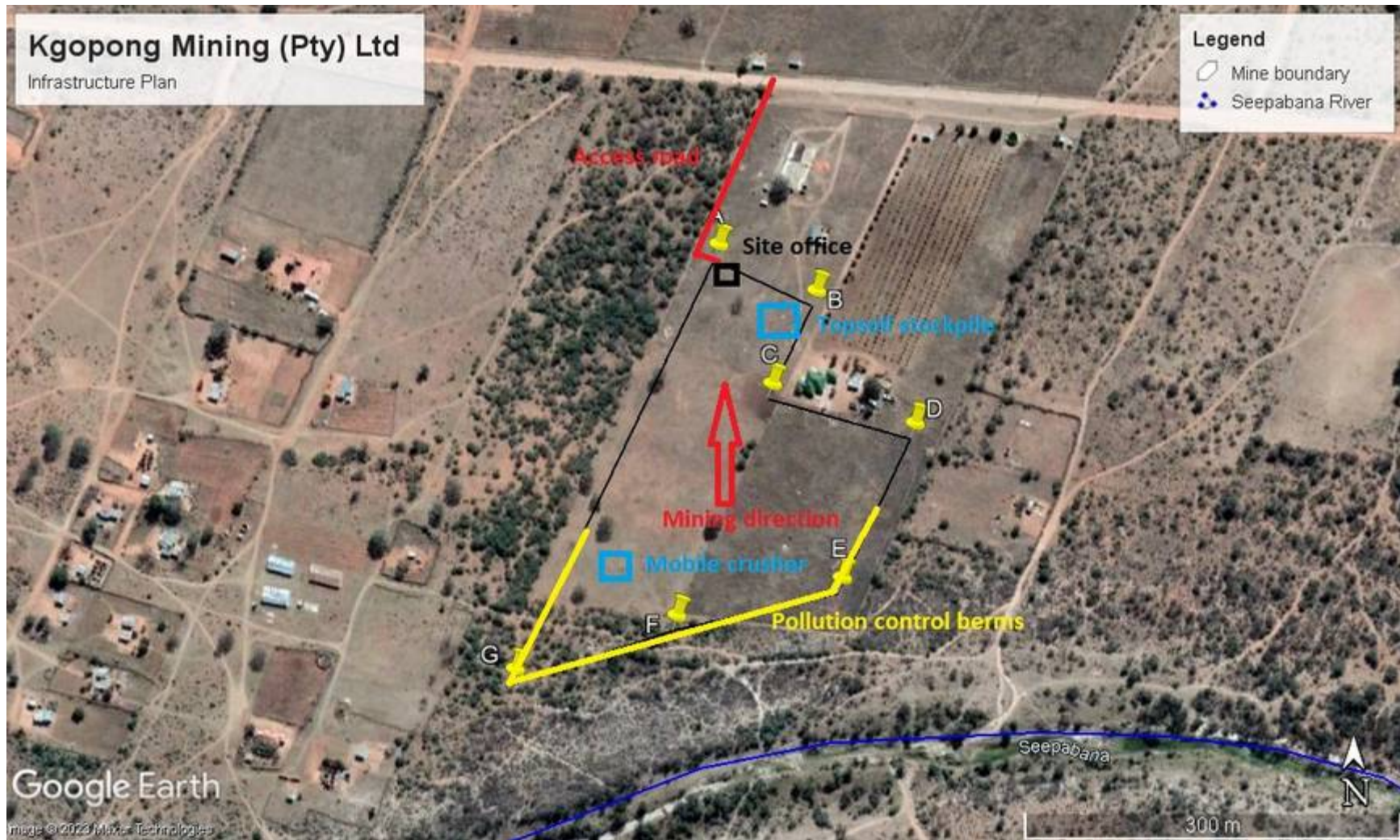


Figure 3: Planned infrastructure plan.

## **Description of Site Activities**

### *Access Roads*

Access will be from the north from a secondary gravel road. Any additional temporary roads created to gain access to site will be rehabilitated on completion of the Mining Permit operations, to the satisfaction of the relevant landowner.

### *Water Supply*

It is anticipated that water will be brought to site. The water will be sourced from local boreholes and it will be trucked in. An on-site water storage tank will be required for potable water supply to employees and workers. Additional water will also be required for dust suppression in order to prevent dust pollution on the untarred temporary roads.

### *Ablution*

Ablution facilities will be required on site. This may involve the installation of drum or tank type portable toilets. The toilets should be emptied twice every week through the services of a registered sewage waste service provider. The ablution facilities must be provided at a ratio of 15 : 1, i.e. 15 people per 1 toilet.

### *Temporary Office Area*

A temporary site office (container) will be erected on site. The office will be close to the entrance to the mining area.

### *Accommodation*

No accommodation will be provided on site. However, 24 hour security staff may be stationed on-site. No fires will be allowed on-site.

### *Storage of Dangerous Goods*

Limited quantities of diesel fuel, oil and lubricants may be stored on-site. A maximum amount of 60 m<sup>3</sup> may be stored in above ground diesel storage tanks with elevated bunded walls.

### *Waste*

Waste generated from the mining areas will include minimal construction and domestic waste, some hydrocarbon and explosive waste and sewage. These will be collected and disposed of as part of the waste management plan and/or will be managed by contractors. Waste will be recycled as far as possible. Portable toilets will be used at the mining areas.

### *Stockpiles*

Various stockpiles will be required on site. Long-term stockpiles will include topsoil, subsoil, soft overburden and hard overburden stockpiles, all of which will be erected as close as possible to the final void to aid in infilling and rehabilitation of final voids. In addition, the mine will have product and RoM stockpiles which will be temporary in nature.

### *Explosives*

During the mining operation blasting will be undertaken to break the hard overburden and the aggregate.

## **2.3 Relevant policy and legislation**

The Kgopong Mining Mining Permit application requires authorisation in terms of the following interlinked pieces of legislation:

- The Mineral and Petroleum Resources Development Act, 2002 (MPRDA, Act 28 of 2002), as amended.
- The National Environmental Management Act, 1998 (NEMA, Act 107 of 1998), as amended.

These pieces of core legislation stipulate the required studies, reports and legal processes to be conducted and the results thereof are to be submitted to the relevant authorities for approval prior to commencement. In addition to the above, there are various pieces of legislation which govern certain aspects of the mining operations, and these are summarised in Table 4, together with the main legislative requirements mentioned above.

**Table 4: Relevant policies and legislation.**

<b>Applicable legislation and guidelines used to compile the Report</b>	<b>Reference where applied.</b>	<b>How does this development comply with and respond to the policy and legislative context</b>
The Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).	This entire report is prepared as part of the Mining Permit Application under the MPRDA.	In terms of the Mineral and Petroleum Resources Development Act a Mining Permit Application has been applied for.
The National Environmental Management Act, 1998 (Act No. 107 of 1998)	This entire report is prepared as part of the Application for Environmental Authorisation under the NEMA.	In terms of the National Environmental Management Act an Application for Environmental Authorisation subject to a Basic Assessment Process has been applied for.



National Environmental Management Waste Act (Act 26 of 2014)	A framework for management of waste is presented in this report.	This report has been drafted in with due consideration to this Act.
National Environmental Management Biodiversity Act (Act 10 of 2004)	A framework for management of alien invasive species is presented in this report.	The management of alien invasive species is governed under the NEMBA. This report includes a framework for the management of alien and invasive species. The holder of a right will be required to develop a detailed alien invasive species management plan.
National Water Act (Act 36 of 1998) Section 21	Due to the nature of the proposed mining activities, no Section 21 water uses will be triggered, therefore there is no requirement to apply for Water Use authorisation in terms of the NWA.	A water use license is not required for this application. Water requirements for the proposed operation will be sourced legally and brought to site using a water truck or mobile container.
National Heritage Resources Act (Act 25 of 1999)	The framework for a Heritage Management Plan is provided in this EMPR.	A specialist heritage impact study has been undertaken in support of this Mining Permit application. No archaeologically significant artefacts or graves will be disturbed during this project therefore no permits will be required from the provincial heritage authority,

### 2.3.1 Environmental Authorisation Process

#### *Mineral and Petroleum Development Act*

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002), a Mining Permit must be issued prior to the commencement of any mining activities. As per Section 79(4)(a) and (b) of the MPRDA, the Applicant is required to conduct a Basic Assessment and submit an EMPR for approval as well as to notify in writing and consult with Interested and Affected Parties (I&APs) within 90 days of acceptance of the application. The MPRDA also requires adherence to related legislation, chief amongst them is the National Environmental Management Act (Act 107 of 1998, NEMA) and the National Water Act (Act 36 of 1998, NWA).

Several amendments have been made to the MPRDA. These include, but are not limited to, the amendment of Section 102, concerning amendment of rights, permits, programmes and plans, to requiring the written permission of the Minister for any amendment or alteration; and the Section 5A(c) requirement that

landowners or land occupiers receive twenty-one (21) days' written notice prior to any activities taking place on their properties.

One of the most recent amendments requires all mining related activities to follow the full NEMA process as per the 2014 EIA Regulations (as amended), which came into effect on 8th December 2014.

A Mining Permit is exclusive, transferable, valid for two (2) years and may be renewed for three periods of which may not exceed one year.

### *National Environmental Management Act*

The main aim of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) is to provide for co-operative governance by establishing decision-making principles on matters affecting the environment. In terms of the NEMA Environmental Impact Assessment (EIA) regulations, the proponent is required to appoint an environmental assessment practitioner (EAP) to undertake the EIA 9 as well as the public participation process. In South Africa, EIA became a legal requirement in 1997 with the promulgation of regulations under the Environmental Conservation Act (ECA). Subsequently, NEMA was passed in 1998. Section 24(2) of NEMA empowers the Minister and any MEC, with the concurrence of the Minister, to identify activities which must be considered, investigated, assessed and reported on to the competent authority responsible for granting the relevant environmental authorisation. On 21 April 2006 the Minister of Environmental Affairs and Tourism promulgated regulations in terms of Chapter 5 of the NEMA.

The objective of the Regulations is to establish the procedures that must be followed in the consideration, investigation, assessment and reporting of the activities that have been identified. The purpose of these procedures is to provide the competent authority with adequate information to make decisions which ensure that activities which may impact negatively on the environment to an unacceptable degree are not authorized, and that activities which are authorized are undertaken in such a manner that the environmental impacts are managed to acceptable levels.

The aim of the EIA process is to identify and assess the potential impacts associated with the proposed project and to develop measures through which potential negative biophysical and socio-economic impacts can be mitigated and positive benefits can be enhanced. The EIA will ensure that all issues are integrated into the lifecycle of the mining operation and its infrastructure. This will occur during the planning, construction, operation and decommissioning and site closure phases.

The Basic Assessment Report and the associated EMPR will indicate how the identified impacts will be avoided, mitigated and/or managed by setting environmental objectives and goals. The EMPR will further outline the implementation programme for the environmental objectives and goals. The EMPR is a legal requirement of the MPRDA and all mines, existing or new, are required to possess an approved EMPR prior to initiating any mining operations. The EMPR is legally binding, and the proponent is required to meet the requirements specified in the document.

The written decision called an Environmental Authorisation, is a legal document setting out the conditions of the authorisation and the actions required to protect human health and the environment. Any affected party may appeal against the decision contained in an Environmental Authorisation. Appeals must be lodged with the Minister who considers appeals in terms of the relevant provisions of NEMA and the Environmental Regulations.

An important amendment to the NEMA (December 2014) Regulations is that the Department of Mineral Resources has been the responsible authority for approving and issuing of the Environmental Authorisations under the NEMA for mining related activities. The Department of Environmental Affairs is the appeal authority for mining related Environmental Authorisations.

*National Environmental Management: Waste Amendment Act*

The Regulations pertaining to the NEMWA activities were published on 3rd July 2009 in Government Gazette 32368 under GN 718. These were amended in August 2013 in Government Notice Regulation 921. Regulations regarding the planning and management of residue stockpiles and residue deposits were published and commenced on 24 July 2015 in Government Notice Regulation 632 and the List of waste management activities that have or are likely to have a detrimental effect on the environment were amended on the same date by Government Notice Regulation 921. As per this list the following is of important to note:

- Category A: (15) The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining permit or mining permit, in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).
- Category B: (11) The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).

On 2<sup>nd</sup> June 2014 the National Environmental Management: Waste Amendment Act came into force. Of importance for mining activities is that according to this amendment, waste resulting from exploration, mining, quarrying, and physical and chemical treatment of minerals is classified as Hazardous Waste. Waste is accordingly no longer governed by the MPRDA but is subject to all the provisions of the National Environmental Management: Waste Act, 2008 (NEMWA). Section 16 of the NEMWA must also be considered which states as follows:

“A holder of waste must, within the holders’ power, take all reasonable measures to:

- Avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated.
- Reduce, re-use, recycle and recover waste.
- Where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner.
- Manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odor, or visual impacts.
- Prevent any employee or any person under his or her supervision from contravening the Act.
- Prevent the waste from being used for unauthorised purposes.

These general principles of responsible waste management are incorporated into the requirements in the EMPR to be implemented for this project.

Schedule 3: Defined Wastes have been broken down into two categories: Category A being hazardous wastes and category B being general wastes. Under Category A (hazardous wastes) the act makes allowance for “wastes resulting from exploration, mining, quarrying, and physical and chemical treatment of minerals”.

In order to attempt to understand the implications of this it is important to ensure that the definitions of all the relevant terminologies are defined:

- Hazardous waste: means “any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristic of that waste, have a detrimental impact on health and the environment and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles.
- Residue deposits: means “any residue stockpile remaining at the termination, cancellation or expiry of a prospecting right, mining right, mining permit, exploration right or production right.
- Residue stockpile: means “any debris, discard, tailings, slimes, screening, slurry, waste rock, foundry sand, mineral processing plant waste, ash or any other product derived from or incidental to a mining operation and which is stockpiled, stored or accumulated within the mining area for potential re-use, or which is disposed of, by the holder of a mining right, mining permit or, production right or an old order right, including historic mines and dumps created before the implementation of this Act.

Various regulations have been drafted in support of the NEMWA, as discussed below:

- Proposed Regulations regarding the planning and management of waste from a prospecting, mining, exploration or production operations (2014):
  - Chapter 2, Section 3 states the identification and assessment of any environmental impacts, including those on groundwater, arising from waste must be done as part of the Environmental Impact Assessment (EIA) conducted in terms of the National Environmental Management Act, 1998 (Act No.107 of 1998) (hereafter referred to as the NEMA). The pollution control barrier system shall be defined by the (a) Waste Classification and Management Regulations (2013); (b) National Norms and Standards for the Assessment of Wastes for Landfill Disposal (2013); and (c) National Norms and Standards for Disposal of Waste to Landfill (2013).
  - Waste Characterisation must be done in terms of physical and chemical composition as well as content. The classification must be done in terms of the health and safety classification and the environmental classification.
- Proposed Regulations to exclude a waste stream or a portion of a waste stream from the definition of a waste (2014):
  - This regulation will give the holder of the right the opportunity to exclude a waste stream, or a portion of a waste stream from the definition of a waste. Chapter 2, Section 4 of this Regulation, Sub-section (1) states that any portion of a waste generated from a source listed in Category A of Schedule 2 of the NEMWA, may be excluded from being defined as hazardous on demonstration that such portion of waste is non-hazardous in accordance with the Waste Management and Classification Regulations of 2013.
  - The application process will be in the form of a prescribed process and application must be made to the Minister.
  - This Regulation is however not yet in force.
- National Norms and Standards for the assessment of waste for landfill disposal (23 August 2013):
  - These norms and standards prescribe the requirements for the assessment of waste prior to disposal to landfill.

- The aim of the waste classification tests is to characterise the material to be deposited or stored in terms of the above-mentioned waste classification guidelines set by the Department of Environmental Affairs (DEA).
- The outcomes of the tests provide the necessary information in terms of:
  - Identification of chemical substances present in the waste.
  - Determination of the total concentrations (TC) and leachable concentrations (LC) of the elements and chemical substances that have been identified in the waste and that are specified in Section 6 of the above-mentioned Regulations. The obtained TC and LC values of the waste material will be compared to the threshold limits for total concentrations (TCT limits) and leachable concentrations (LCT limits) specified in Section 6 of the above-mentioned Regulations. Based on the TC and LC values of the elements and chemical substances in the waste exceeding the corresponding TCT and LCT limits respectively, the specific type of waste for disposal to landfill will be determined in terms of Section 7 of the Regulations.

#### *The National Environmental Management: Biodiversity Act*

The National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004, NEMBA), “provides for: the management and conservation of South Africa’s biodiversity within the framework of the NEMA; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute (SANBI); and for matters conducted therewith”.

- In terms of the Biodiversity Act, the applicant has a responsibility for: The conservation of endangered ecosystems and restriction of activities according to categorization of the area (not just by listed activity as specified in the EIA regulations):
  - Promote the application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all developments within the area are in line with ecological sustainable development and protection of biodiversity.
  - Limit further loss of biodiversity and conserve endangered ecosystems

Regulations published under the NEMBA also provide a list of protected species, according to the Act (GNR 151 dated 23 February 2007, as amended in GNR 1187 dated 14 December 2007). Section 57 of NEMBA identifies restricted activities involving threatened or protected species. Restricted activities include the gathering, collecting, cutting, uprooting, damaging or destroy a listed species.

#### *The National Environmental Management: Protected Areas Act*

The National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003) (NEMPAA) serves to: “provide for the protection and conservation of ecologically viable areas representative of South Africa’s biological biodiversity and its natural landscapes and seascape; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters

concerning protected areas; for the continued existence, governance and functions of South African National Parks; and for matters in connection therewith.

The objectives of this Act are –

- To provide, within the framework of the national legislation, including the National Environmental Management Act, for the declaration and management of protected areas.
- To provide for co-operation governance in the declaration and management of protected areas.
- To affect a national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity.
- To provide for a diverse and representative network of protected areas on state land, private land, communal land and marine water.
- To promote sustainable utilisation of protected areas for the benefit of people, in a manner that would preserve the ecological character of such areas.
- To promote participation of local communities in the management of protected areas, when appropriate
- To provide for the continued existence of South African National Parks.

#### *National Water Act*

The National Water Act, 1998 (Act 36 of 1998) (NWA) makes provision for two types of application for water use licences, namely individual applications and compulsory applications. The NWA also provides that the responsible authority may require an assessment by the Applicant of the likely effect of the proposed licence on the resource quality, and that such assessment be subject to the EIA regulations. A person may use water, if the use is-

- Permissible as a continuation of an existing lawful water use (ELWU).
- Permissible in terms of a general authorisation (GA).
- Permissible under Schedule 1.
- Authorised by a licence.

The NWA defines 11 water uses. A water use may only be undertaken if authorised. Water users are required to register certain water uses that actually took place on the date of registration, irrespective of whether the use was lawful or not.

Section 21 of the National Water Act 1998 lists the following 11 water uses which can only be legally undertaken through the water use authorisation issued by the Department of Water and Sanitation (DWS):

- a. Taking water from a water resource.
- b. Storing water.
- c. Impeding or diverting the flow of water in a watercourse.
- d. Engaging in a stream flow reduction activity contemplated in Section 36.
- e. Engaging in a controlled activity identified as such in Section 37(1) or declared under Section 38(1).
- f. Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduits.
- g. Disposing of waste in a manner which may detrimentally impact on a water resource.

- h. Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process.
- i. Altering the bed, banks, course or characteristics of a watercourse.
- j. Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.
- k. Using water for recreational purposes.

In terms of the National Water Act, no Water Use Licence has been applied for this project.

#### *National Heritage Resources Act*

The National Heritage Resources Act, 1999 (NHRA) stipulates that cultural heritage resources may not be disturbed without authorisation from the relevant heritage authority. Section 34(1) of the NHRA states that, “no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority...” The NHRA is utilised as the basis for the identification, evaluation and management of heritage resources and in the case of CRM those resources specifically impacted on by development as stipulated in Section 38 of NHRA, and those developments administered through NEMA, MPRDA and the DFA legislation. In the latter cases the feedback from the relevant heritage resources authority is required by the State and Provincial Departments managing these Acts before any authorisations are granted for development. The last few years have seen a significant change towards the inclusion of heritage assessments as a major component of Environmental Impacts processes required by NEMA and MPRDA. This change requires us to evaluate the Section of these Acts relevant to heritage.

The NEMA 23(2)(b) states that an integrated environmental management plan should, “...identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage”. A study of subsections (23)(2)(d), (29)(1)(d), (32)(2)(d) and (34)(b) and their requirements reveals the compulsory inclusion of the identification of cultural resources, the evaluation of the impacts of the proposed activity on these resources, the identification of alternatives and the management procedures for such cultural resources for each of the documents noted in the Environmental Regulations. A further important aspect to be taken account of in the Regulations under NEMA is the Specialist Report requirements laid down in Section 33.

MPRDA defines ‘environment’ as it is in the NEMA and therefore acknowledges cultural resources as part of the environment. Section 39(3)(b) of this Act specifically refers to the evaluation, assessment and identification of impacts on all heritage resources as identified in Section 3(2) of the National Heritage Resources Act that are to be impacted on by activities governed by the MPRDA. Section 40 of the same Act requires the consultation with any State Department administering any law that has relevance on such an application through Section 39 of the MPRDA. This implies the evaluation of Heritage Assessment Reports in Environmental Management Plans or Programmes by the relevant heritage authorities.

The NHRA identifies 5 activities that require a Heritage Impact Assessment (HIA). An HIA is the process to be followed in order to determine whether any heritage resources are located within the area to be developed as well as the possible impact of the proposed development thereon. An Archaeological Impact Assessment (AIA) only looks at archaeological resources.

An HIA must be done under the following circumstances:

1. The construction of a linear development (road, wall, power line, canal etc.) exceeding 300 m in length.
2. The construction of a bridge or similar structure exceeding 50 m in length.
3. Any development or other activity that will change the character of a site and exceed 5 000 m<sup>2</sup> or involve three or more existing erven or subdivisions thereof.
4. Re-zoning of a site exceeding 10 000 m<sup>2</sup>.
5. Any other category provided for in the regulations of SAHRA or a provincial heritage authority.

In accordance with the legislative requirements and EIA rating criteria, the regulations of the South African Heritage Resources Agency (SAHRA) and Association of Southern African Professional Archaeologists (ASAPA), an onsite heritage assessment has been included in this project.

#### **2.4 Need and desirability of project**

The possible increase in building, construction and road building material required by the adjacent Waterberg JV Resources platinum and palladium mine triggered the need of the Applicant to trade with the available aggregate from a permitted area. The proposed aggregate mining operation will entail the removal of aggregate, from an undisturbed area of the farm. The mining of the mineral was identified as a feasible business opportunity that will also bring about the diversification of activities on the property, extending it from dormant agricultural land to include small scale mining.

The project will contribute to the local economy, both directly and through the multiplier effect that its presence will create, as equipment and supplies are purchased locally, and wages are spent at local businesses, generating both jobs and income in the area.

#### **2.5 Motivation for the overall preferred site, activities and technology alternative.**

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

- Activity alternatives.
- Location alternatives.
- Design or layout alternatives.
- Technology alternatives.
- Operational alternatives.
- No-Go alternative.

For any alternative to be considered feasible, such an alternative must meet the need and purpose of the development proposal without presenting significantly high associated impacts. Alternatives are typically distinguished into discrete or incremental alternatives. Discrete alternatives are overall development options, which are typically identified during the pre-feasibility, feasibility and/or BA process. Incremental



alternatives typically arise during the BA process and are usually suggested as a means of addressing/mitigating identified impacts (drilling and trenching in low sensitivity areas). These alternatives are closely linked to the identification of mitigation measures and are therefore not specifically identified as distinct alternatives.

For the purpose of this project, the need and justification for alternatives was specifically guided by the relatively low sensitivity of the receiving socio-economic and biophysical environment as well as the geology. The types of alternatives considered are presented below.

## **2.6 Full description of the process followed to reach the proposed preferred alternatives within the site.**

The proposed project is located on portion of Portions 12 & 13 of Harriets Wish 393LR. The surrounding area is currently used for grazing purposes, housing and subsistence farming.

### **2.6.1 Details of the development footprint alternatives considered**

*the property on which or location where it is proposed to undertake the activity.*

The possible increase in building, construction and road building material required by the adjacent Waterberg JV Resources platinum and palladium mine triggered the need of the applicant to trade with the available aggregate from a permitted area. The proposed aggregate mining operation will entail the removal of aggregate, from an undisturbed area of the farm. The mining of the mineral was identified as a feasible business opportunity that will also bring about the diversification of activities on the property, extending it from dormant agricultural land to include small scale mining.

*the type of activity to be undertaken.*

No alternatives to the mining of aggregate have been considered.

*the design or layout of the activity.*

The site layout in terms of the position of the haul road, product dump and topsoil stockpile were determined by considering both spatial and practical mining operation aspects. These options would have been considered during the planning phase to derive an optimal layout.

*the technology to be used in the activity.*

No alternative in terms of the technology to be used have been considered.

*the operational aspects of the activity.*

The method that will be employed is a very basic form of open pit mining, and a 5 ha area will be demarcated for mining activities. Limited blasting will be conducted initially to establish a box cut. Rip and load will be

implemented as mining moves closer to the homestead. The mined aggregate will be crushed and screened utilising a mobile crushing and screening plant. A front-end loader will be utilised to load the material into haulage trucks. Should the proposed mining activities change, this will be indicated in the form of a Section 102 Amendment Application of the MPRDA.

*the option of not implementing the activity.*

The no-go alternative entails no change to the *status quo* and is therefore a real alternative that needs to be considered. The aggregate to be mined from the quarry will be sold to the building, road rehabilitation/maintenance and associated construction industry, if however, the no-go alternative is implemented:

- the applicant cannot utilise the mineral resource on this property;
- the proposed employment opportunities will be lost;
- the people/businesses of the area will not benefit from diversification of aggregate sources which will escalating product costs.

In light of this, the no-go alternative was no deemed to be the preferred alternative.

## **2.7 Details of the public participation process followed**

The Public Participation Process (PPP) undertaken was designed to allow for provisioning of information about the proposed project in a manner that will enable stakeholders to provide comments or to request further details. Full details of the PPP are set out in the Consultation Report included hereto as Appendix 3. Below is a summary of the key PPP activities.

### **2.7.1 Stakeholder identification**

An application specific IAP register was compiled and included the following parties:

- Landowners and/or occupiers of the affected properties;
- Landowners/occupiers of adjacent properties;
- The Municipal Ward Councilor of Blouberg Local Municipality;
- Blouberg Local Municipality;
- Capricorn District Municipality;
- Any organ of state with jurisdiction;
- Limpopo Department of Economic Development, Environment and Tourism;
- Eskom Holdings SOC Ltd;
- Department of Water and Sanitation;
- Department of Agriculture, Land Reform and Rural Development; and
- South African Heritage Resources Agency.

The identification and notification of potential stakeholders will be an ongoing process throughout the PPP, as more information is gathered and contact with people is established.

The identified Interested and Affected Parties are listed in Table 5 below.

**Table 5: List of identified Interested and Affected Parties.**

Category	Stakeholder	Organisation	Designation
Provincial Government	Mrs RJ Maisela	Department of Agriculture	HOD
Provincial Government	IM Rathumbu	Department of Economic Development, Environment & Tourism (LEDET)	HOD
Provincial Government	Mrs Tlouane Kele	Department of Economic Development, Environment & Tourism (LEDET)	DDG
Provincial Government	Mr V M Mongwe	Department of Economic Development, Environment & Tourism (LEDET)	Senior Manager – Environmental Impact Management
Provincial Government	Mr R Mthombeni	Department of Economic Development, Environment & Tourism (LEDET)	Manager Capricorn and Greater Sekhukhune
Provincial Government	Ms Emily Mulaudzi	Department of Mineral Resources and Energy (DMRE)	Mine Environmental Management
Provincial Government	Tebogo Mangaba	Department of Mineral Resources and Energy (DMRE)	Directorate Mineral Regulation: Limpopo
Provincial Government	Melton Tshililo	Department of Rural Development and Land Reform	Acting CD
Provincial Government		Department of Rural Development and Land Reform	Director: Waterberg District
Provincial Government	Mr T Maphoto	Department of Rural Development and Land Reform	HoD: Restitution
Provincial Government	David Nethengwe	Department of Water and Sanitation Limpopo	Senior Manager: Water Allocation
Provincial Government	Mr D Lithole	Limpopo Heritage Resource Agency (LIHRA)	Senior Manager
Provincial Government	Mrs Nokukhanya Khumalo	South African Heritage Resources Agency (SAHRA)	Case officer
Land Owner	Mr Solomon Kgopong	Kgopong Mining	RE of Ptn 12 and 13, Farm Harriets Wish 393 LR
Local Government	Stanford Moremi	Blouberg Local Municipality	Maphodi
Local Government	Mr KP Masebe	Blouberg Local Municipality	
Local Government	Cllr M Teffo	Capricorn District Municipality	Mafa
Affected Party	Camille Shah	Eskom Holding	Transmission Communication
Affected Party	Leslie Naidoo	Eskom Holding	Grid Planning
Affected Party	Dave Lucas	Eskom Holding	SOC Limited Corporate Specialist: Environmental Management
Affected Party	Sebenzile Vilakazi	Eskom Holding	Transmission Land and Rights Senior Advisor: Environmental
Affected Party	Mr Anton de Vos	Hacra Mining and Exploration Company (Pty) Ltd	
Direct Neighbour	Mr Johannes Kgopong		Ptn 10, Farm Harriets Wish 393 LR
Direct Neighbour	Lazarus Matlakala		Ptn 14, Farm Harriets Wish 393 LR
Neighbour	Isaiah Moreroa		Ptn 15, Farm Harriets Wish 393 LR
Neighbour	Johannes Maribe Mamabolo		Ptn 9, Farm Harriets Wish 393 LR
Community Member	Elisa Madimetja	Ga-Raweshi	

### **2.7.2 Project announcement**

The following notifications was done on 30 March 2023 at announcement of the Mining Permit Project:

- An Advertisement was placed in the Polokwane Observer;
- On-site notices were placed at the property boundaries; and
- A notification with information on the application was sent to IAPs.

Notifications was sent via E-mail (where email addresses exist), via Fax (where only a fax number exists), via SMS (where a cell phone number is available).

Appendix 3 have copies of the advertisement, on-site notices, and notifications sent.

Hardcopies of the Draft Basic Assessment Report will be submitted to the following organs of state:

- Limpopo Department of Economic Development, Environment and Tourism;
- Department of Water and Sanitation;
- Department of Agriculture, Land Reform and Rural Development;
- South African Heritage Resources Agency (Electronic Upload);
- Capricorn District Municipality; and
- Blouberg Local Municipality.

The commenting period will be for 30 calendar days.

A Comments and Responses Report (CRR) will be compiled from the comments received on the Draft Basic Assessment Report and included in the final Basic Assessment Report.

### **2.7.3 Stakeholder comments**

Comments received from any I&AP are included in Table 6 of this document.

### **2.8 Summary of issues raised by I&APs**

Limited comments were received from stakeholders. Table 6 is populated with the most prominent comments received from stakeholders.

Interested and Affected Parties		Date of 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 responses were incorporated.
Name of individual	Consulted				
<b>NO COMMENTS RECEIVED FROM INTERESTED AND AFFECTED PARTIES TO DATE.</b>					

**Table 6: Comments raised by I&AP's.**

## **2.9 Environmental attributes and associated alternatives**

This section describes the baseline receiving environment of the Mining Permit application area. Information in this section is based on specialist studies undertaken in support of this application, desktop studies and a site visit by the EAP as well as input from the public through the I&AP questionnaire. As such, the descriptions below of environmental features represent a consolidation of relevant information to the application area.

### **2.9.1 Baseline receiving environment**

#### **2.9.1.1 Socio economic**

##### **Blouberg Local Municipality**

The Blouberg Local Municipality (BLM), in which the Waterberg Extension Project is located, is part of the Capricorn District Municipality (CDM) of the Limpopo Province, bordering Zimbabwe and Botswana. At 9 540 km<sup>2</sup> it is the largest of four municipalities in the district, making up almost half of its geographical area (<https://municipalities.co.za/>; StatsSA, Census 2011). The CDM is predominantly rural and has the third-largest district economy in the Limpopo Province (<https://municipalities.co.za/>).

Half of the population of CDM resides in Polokwane Municipality, followed by Lepelle-Nkumpi, Blouberg, Aganang and Molemole with 18%, 13%, 10% and 9% respectively (CDM Final IDP/Budget 2016/17-2020/21). In August 2016 Aganang LM was de-established and amalgamated with Blouberg, Polokwane and Molemole, affecting this distribution slightly.

Roads R521 (P94/1 and P94/2) provide a north-south link between Blouberg and Molemole, Polokwane and the Makhado Municipalities. To the east the BLM is served by road R523 (D1200), which provides access to towns such as Mogwadi, Morebeng, Duiwelskloof, Tzaneen and Lephalale. The N11, which passes from Mokopane town to Botswana through the Blouberg LM, has the potential to stimulate the economy (Draft Blouberg LM IDP/Budget 2018/2019-2021). CDM has an international airport and is linked to Gauteng by the N1 freeway.

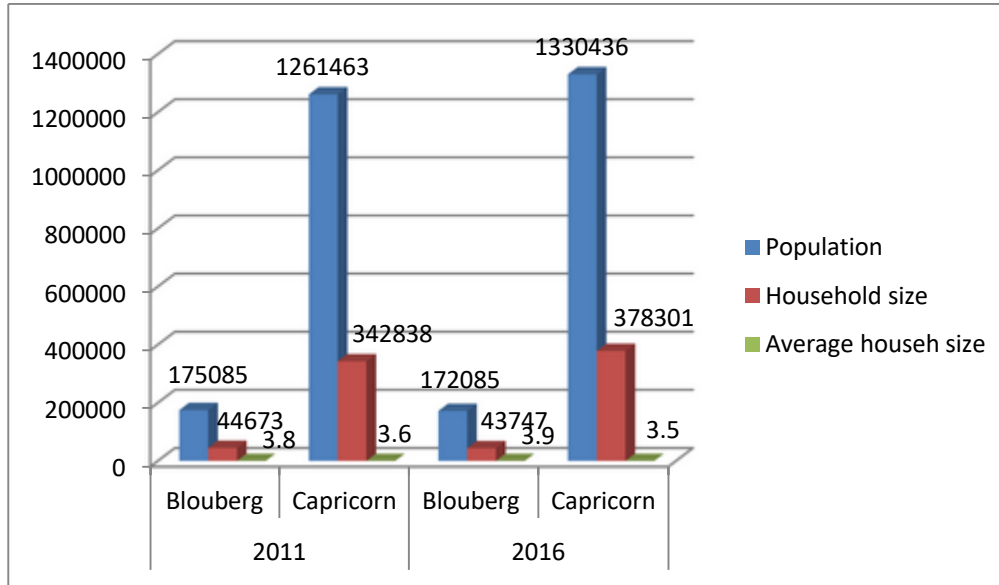
There are a number of rivers and tributaries in the BLM, which are used for agricultural purposes and various mountain ranges and heritage sites attract tourists. The BLM is home to some of the most spectacular rock-climbing locations in South Africa.

The major economic sectors are agriculture, mining and tourism. The BLM experiences challenges in the area of high levels of unemployment and high illiteracy rate. Most areas are not suitable for development. There is a huge infrastructure backlog in terms of water, roads, sanitation, education, health and recreational facilities (CDM Final IDP/Budget 2016/7-2020/21).

Currently the BLM consists of 25 wards and, prior to its amalgamation with a section of Aganang LM in 2016, consisted of 125 villages. The Waterberg Mining Area mainly affects wards 1 and 2.

### Key demographic information

The 2016 Community Survey (CS) estimated the total CDM population at 1 330 436. CDM had a population increase of 0.8% between 2001 and 2011 (with the largest growth in Polokwane Local Municipality of 2.13%) and then again with 1.21% per annum since 2011 up to 2016 (StatsSA). The average household size decreased slightly from 3.6 to 3.5 between 2011 and 2016.



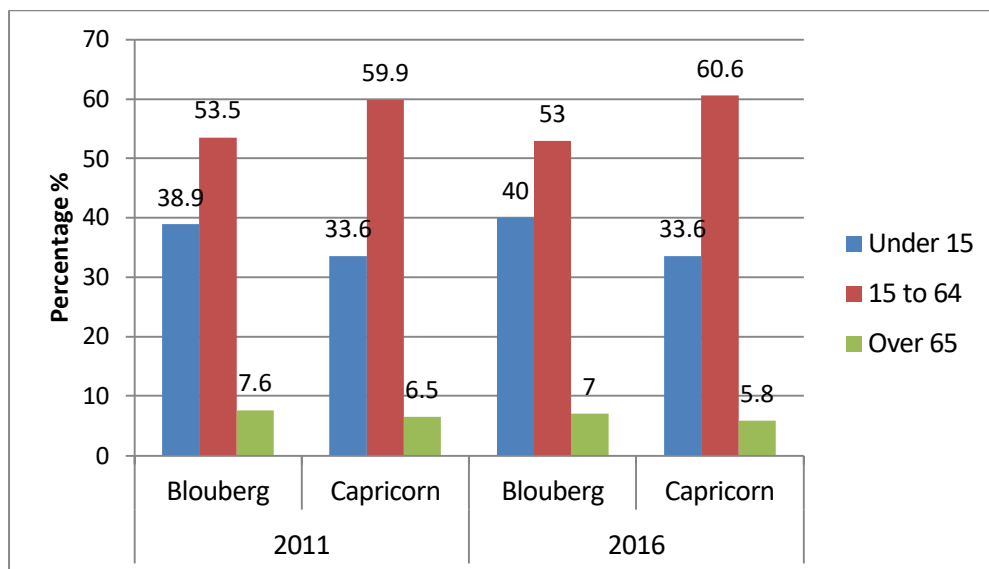
**Figure 4: Population statistics of the Project Area.**

The total BLM population is estimated at 172 601 (2016), with an average household size of 3.9 (StatsSA). In contrast to the CDM, the BLM revealed a negative population growth per annum of -0.32% between 2011 and 2016. This trend could most likely be attributed to a migration of people to urban areas looking for employment and improved service delivery (education and so forth) and, according to StatsSA, a large percentage people moved away to be closer to their spouses (marriage).

The age and gender structure of the population is a key determinant of population change and dynamics. The shape of the age distribution is an indication of both current and future needs regarding educational provision for younger children, health care for the whole population and vulnerable groups such as the elderly and children, employment opportunities for those in the economic age groups, and provision of social security services such as pension and assistance to those in need.

The age and sex structure of smaller geographic areas are even more important to understand, given the sensitivity of small areas to patterns of population dynamics such as migration and fertility. An increase in the young and economically active population of a municipality would thus mean the potential increase in income earnings, however the growth would place pressure on educational resources and job opportunities as there is the possibility for smaller and slower growing economies to provide work to the increasing population.

The predominant gender in the CDM and BLM is female, with an average of 53.2% females in the CDM and 54% in the BLM.



**Figure 5: Age structure of CDM and BLM (Source: StatsSA)**

The age structure in the CDM and BLM has remained fairly constant since 2011, although there has been a slight increase in the number of young people (0-4 years) in the BLM. The number of elderlies in the district has decreased slightly.

Out of the CDM's total population, 96.1% are Black African, of whom the majority stay in townships such as Seshego and rural tribal villages (CDM Final IDP/Budget 2016/7-2020/21). Similarly, most the population in BLM is Black African (161 075), followed by White (1 006), Indian (151), Coloured (65) and unspecified (332). Sepedi is the most widely spoken language.

#### *Economic background*

Employment status refers to whether a person is employed, unemployed or not economically active. The official unemployment rate therefore gives the number of unemployed as a percentage of the labour force. The labour force in turn is the part of the 15 - 64 year population that's ready to work and excludes persons not economically active (scholars, housewives, pensioners, disabled) and discouraged work-seekers. It is worth noting that, in South Africa, high unemployment coincides with low economic growth.

The overall official unemployment rate for South Africa during the first quarter of 2017 was 27.7%. Surprisingly the Limpopo Province, one of the poorer and smaller provinces in terms of economic size, has had the second lowest unemployment rate at 21.6% during this same period.

In line with the definition of official unemployment rate provided above, the unemployment and youth unemployment rates of the CDM and BLM are compared with the province and broader South Africa in the table below. South Africa experiences challenges with regards to youth unemployment. Amongst the unemployed (15-



64 years), the youth unemployment rates are almost double (2011). Youth unemployment in the CDM and BLM are also problematic.

Although youth unemployment improved since 2011, the youth remain vulnerable in the labour market with an unemployment rate of 37,1% which is 10,6 percentage points above the national average. Youth unemployment, however, registered a decline of 1,1 percentage points quarter-to-quarter. The latest figures for the CDM and BLM could not be obtained.

**Table 7: Unemployment rates 2011 (Census) and 2016**

	2011		2016	
	Unemployment rate %	Youth unemployment rate % (15-34)	Unemployment rate %	Youth unemployment rate % (15-34)
South Africa	29.8	52.5	27	37.1
Limpopo Province	38.9	42	19	-
CDM	37.2	47.4	-	-
BLM	39.2	47.2	-	-

Youth unemployment in South Africa is closely related to the inability of young people to obtain employment owing to their lack of experience, low education levels and various socio-economic factors, which are all too often compounded by a lack of skills. The result is a growing group of young people with severely limited access to formal sector employment, and limited means to do anything about this. The youth often drop out of school, have little work experience with poor literacy, numeracy and communication skills, making them undesirable for employers. In addition, these young people often lack resources enabling them to travel to areas where there are jobs. Those that do have the resources, family support and social networks, often display unrealistically high expectations for wages and salaries, resulting in prolonged periods of unemployment.

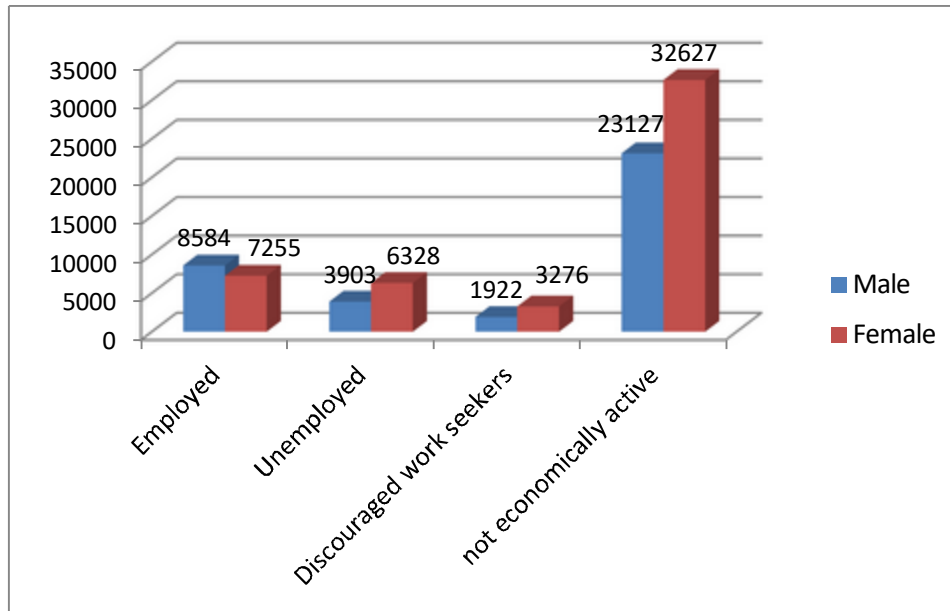
When young people are employed in the South African labour market, their employment intensity is the highest amongst the trade, agriculture, finance and other business services industries. Low and semi-skilled youth employment is concentrated in the trade industry, while high-skilled youth employment is in the community and social services, as well as finance and other business services industries ([www.statssa.gov.za](http://www.statssa.gov.za)).

Unemployment levels in the area are much higher than the local and district averages. More than 56% of the Early Dawn and 54% of the Old Langsine labour force is unemployed, and communities in both villages suffer very high rates of poverty. This is despite being in an area that attracts tourists and has an abundance of agricultural land. Many community members do not have required skills and prefer to be employed as general workers (Waterberg SLP).

The figure below depicts the employment status by gender of the population in the BLM.

Females are less likely to be employed, especially in jobs that are more labour and physically intensive. The unemployment amongst females in the BLM are almost double that of their male counterparts. Coupled with this is the high ratio of female headed households in the BLM (57.3%) (<https://municipalities.co.za>). Women are also often forced to become the main breadwinners, thereby placing tremendous economic strain on households. The

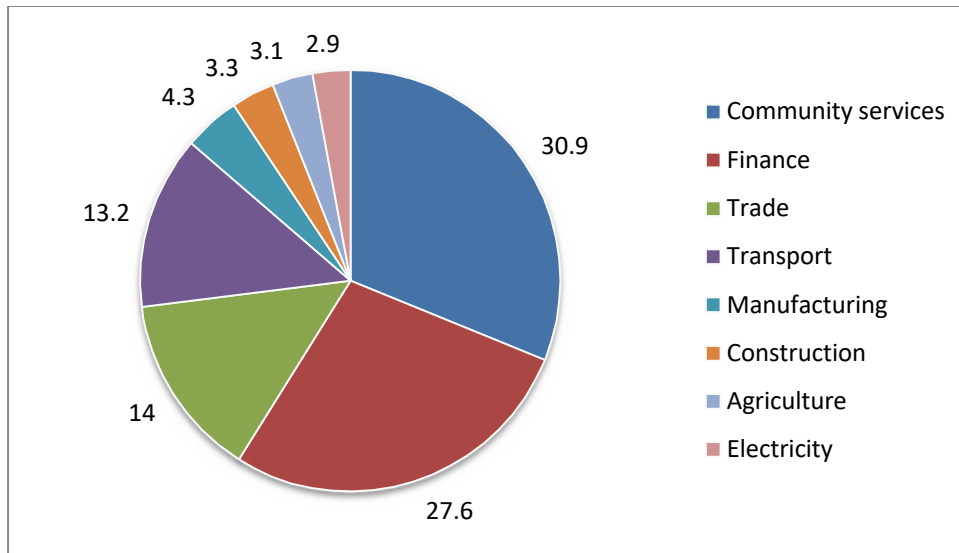
inclusion of women in the employment process should thus be addressed. In order to achieve and maintain the required Mining Charter objective of women participation in mining, Waterberg endeavours to eliminate any challenges faced through progressive strategies and action plans which will aim to encourage women to be developed in mining. Women will be given preference in filling certain positions and learnership opportunities. Amongst other, the identified women will be put on a mentoring programme to prepare them for the work in the various sections where they may be appointed upon completion of their programme (Waterberg SLP).



**Figure 6: Employment status by Gender, BLM**

### *Economic sectors*

The main economic sectors in the CDM are Community services, Finance, Trade and Transport. Manufacturing and Agriculture only make up 4.3 and 3.1% respectively. In the BLM Agriculture, Mining and Tourism are the main economic contributors and are elaborated on the sections below.



**Figure 7: Main Economic sectors, CDM**

There is abundant land in the BLM, which is mainly used for agricultural development in the commercial sector and to a lesser extent for the less established subsistence farming sector. The sweet veld and mixed grasses make the BLM especially suitable for livestock farming, particularly for Nguni and Bonsmara breeds. In communal areas, where land is scarce, most farmers are practicing farming at subsistence level.

Game farming has been identified as one of the pillars of the agricultural sector, especially surrounding Alldays, Vivo, Tolwe, Maastroom and the Baltimore areas. Private game farms are prevalent in such areas and this has attracted massive tourist influx, especially during the winter hunting season. Unfortunately, the prospect of extermination through poaching has the potential to negatively impact this industry.

In terms of crop and vegetable production, the area is known for tomato and potato products that are mainly sold to national and international markets. The area is also suitable for tobacco cultivation and pumpkins.

Subsistence farming is seen as a way to subsidize low incomes. Slightly more than one quarter of the households (27%) subsidised their low income over the years through subsistence farming, such as small vegetable gardens, followed by livestock farming of chicken and cows for family consumption and selling to their communities. Due to a lack of entrepreneurial and production skills, this is done on only a very small scale.

The BLM LED strategy identifies tourism as one of the key economic drivers. The geographical location of the BLM between the Waterberg wetlands and the Dongola Trans-frontier Park, which encompasses the Mapungubwe area, is of great tourist significance. The BLM is rich with cultural heritage and boasts two nature reserves, namely Maleboho and Blouberg. There are German missions in Senwabarwana and Leipzig that are seen as heritage sites and also the 1903 prison in the Blouberg Mountain. Rock paintings and Iron Age sites are prevalent in the Makgabeng Mountains. There are a number of popular rock-climbing spots and hunting farms boast tourism, especially during the winter months. The Glen Alpine Dam provides the BLM with the opportunity to enhance tourism, if developed to an acceptable standard. Tourists traverse through the BLM to access Botswana and Zimbabwe and the development of further overnight accommodation would be beneficial.

There are mining deposits, which have a potential of growing the economy and creating sustainable jobs, if explored and mined to the fullest. Potential of mineral deposits are found in areas such as Harris (platinum) and Arrie (pencil and coal, gold and other minerals) and huge potential for sand mining at Indermark and Eussorinca.

### *Local Economic Development*

The aim of a LED implemented by local Government is to achieve economic growth, alleviate poverty, and inclusively improve the quality of life of all community members to redress socio-economic imbalances. It is not an isolated function, and the output should be the result of co-operation between Government and private partnerships.

In order to address unemployment, CDM's LED function has established job creation targets and created permanent, temporary and internships through projects and programmes that create short and long-term employment, to meet the social and economic needs of communities. CDM is focusing on more labour-intensive methods during construction projects, resulting in skills development, income generation and poverty alleviation for locals. It has also implemented a School Entrepreneurial Support Project.

The CDM IDP further states that more emphasis needs to be placed on:

- Partnerships with private sector, to accelerate development initiatives in mining, tourism, agriculture and agro-processing; and
- SMME development which has the potential to accelerate job creation.

CDM has identified activity corridors and nodes (nodal development points) that are adjacent to or that link the main growth centres where future settlement and economic development opportunities should be channelled, and infrastructure investment should support localities that will become major growth nodes in South Africa and the SADC region. Twenty three per cent of the district population resides in these thirteen growth points, which include Senwabarwana, Alldays, Avon, and Eldorado in the BLM.

Key LED objectives for the BLM are listed as:

- Promotion of job creation in the municipality by 6% annually;
- Creation and promotion of LED initiatives in the SMME sector;
- Broadening of the skills base of the communities; and
- To acquire strategically located land for economic development.

A number of projects have been identified and funds have been allocated towards implementation including projects by Departments of Agriculture, Health, Housing and RAL. The importance of SMMEs should not be dismissed.

The BLED Strategy recognizes the need for job creation through SMMEs and retails as pillars of growing the economy and job creation. The Strategy notes that the local retail sector has not been doing well in sustaining itself and recommends that the BLM be proactive in coordinating the retail and business sector and further come up with ways of supporting their sustainability. The Strategy identifies nodal points such as Eldorado, Alldays and Senwabarwana as areas where major retail should be encouraged. Three retail centers have been established

in Senwabarwana and there is massive retail expansion in the town. A state-of-the-art retail center is currently under construction in Alldays, while Eldorado retail development is under the processes of surveying and environmental studies and finalization of land disposal and acquisition processes (Draft BLM IDP/Budget 2018/2019-2021).

Amongst some of the key private partners in development which the BLM has forged are Venetia Mine, MTN, Coal of Africa and Sanparks (Mapungubwe world heritage site). The partnership with Venetia Mine resulted in the implementation of infrastructure development projects, such as electrification of settlements; construction of schools; and community development initiatives on educational development. The BLM also partnered with the “UN Women” and Venetia Mine to capacitate female entrepreneurs known as AWOME (“Acceleration of Women Owned Micro Enterprises”). An NGO known as “Hand in Hand SA” was appointed and trained thirty (30) women from the BLM thus far, with the aim of training 250 women between 2018 and 2020.

Other avenues of corporate social investments (CSI) need to be clinched with McCormick Property Development (owners of Senwabarwana plaza), Coal of Africa and Sanparks. Recent partnerships are with Anglo-American/De Beers, where more emphasis is on building institutional capacity, Waterberg and Haccra mining houses (Draft BLM IDP/Budget 2018/2019-2021).

### *Economic challenges*

The BLM area, as a predominantly rural municipality, encounters economic challenges, such as high unemployment levels - especially amongst the youth; high illiteracy levels; skills mismatch; and insufficient infrastructure to support job creation initiatives. Local businesses have also not done well in sustaining themselves. Either most of them have collapsed or are being rented out to traders from India and North Africa. One of the factors that might have contributed to such collapse of local businesses is the failure of the business community to work as a team with a local chamber of business taking the lead. Another contributing factor may be the level of business acumen and training available at the disposal of local business practitioners and the age of such practitioners that hamper them to adapt to a changing business environment for their sustainability (Draft BLM IDP/Budget 2018/2019-2021).

## 2.9.1.2 Climate

### *Regional Climate*

The Limpopo Province falls in the summer rainfall region, with the western part semi-arid and the eastern part largely sub-tropical. The western and far northern parts experience frequent droughts. Winter throughout the Limpopo Province is mild and mostly frost-free. The climatic conditions vary within the Limpopo WMA, which ranges from the Waterberg Mountains in the south, northwards to the hot, dry Limpopo River valley on the border with Zimbabwe and Botswana. The mean annual temperature ranges between 16°C in the south to more than 22°C in the north, with an average of 20°C for the catchment as a whole. Maximum temperatures are usually experienced in January and minimum temperatures occur on average in July.

### *Rainfall*

The largest portion of the Limpopo Province has a mean annual rainfall of between 300 and 500 mm. The south-western part has an annual rainfall of up to 700 mm and in the Lowveld the rainfall can exceed 1 000 mm a year in places.

The BLM, in which the proposed project is located, is a hot area, with annual rainfall varying between 380 and 550mm. Most rainfall is experienced during the summer months.

During the rainy season a maximum of 8 to 12 rain days per month is typically expected, whilst in the dry season a maximum of 1 rain day may be expected per month. The rainfall is mainly in the form of thunderstorms. Hail, which is often associated with thunderstorms, does occur during the hot summer months.

In accordance with the rainfall patterns the relative humidity is higher in summer than in winter. Humidity is generally highest in February (the daily mean ranges from 64% in the west to above 70% in the east).

The average monthly precipitation is indicated in the table below:

**Table 8: Average monthly precipitation**

Precipitation (mm)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Monthly max	202	81	65	36	33	1	5	45	43	57	133	304	84
Monthly min	175	71	20	1	8	0	0	0	3	41	103	113	45
Monthly ave	186	75	18	19	18	0	2	18	20	49	115	185	59

### *Temperature*

The average maximum, average and minimum temperatures for Mokopane are given in the table below. Annual average temperatures for the area are given as 18.3°C.

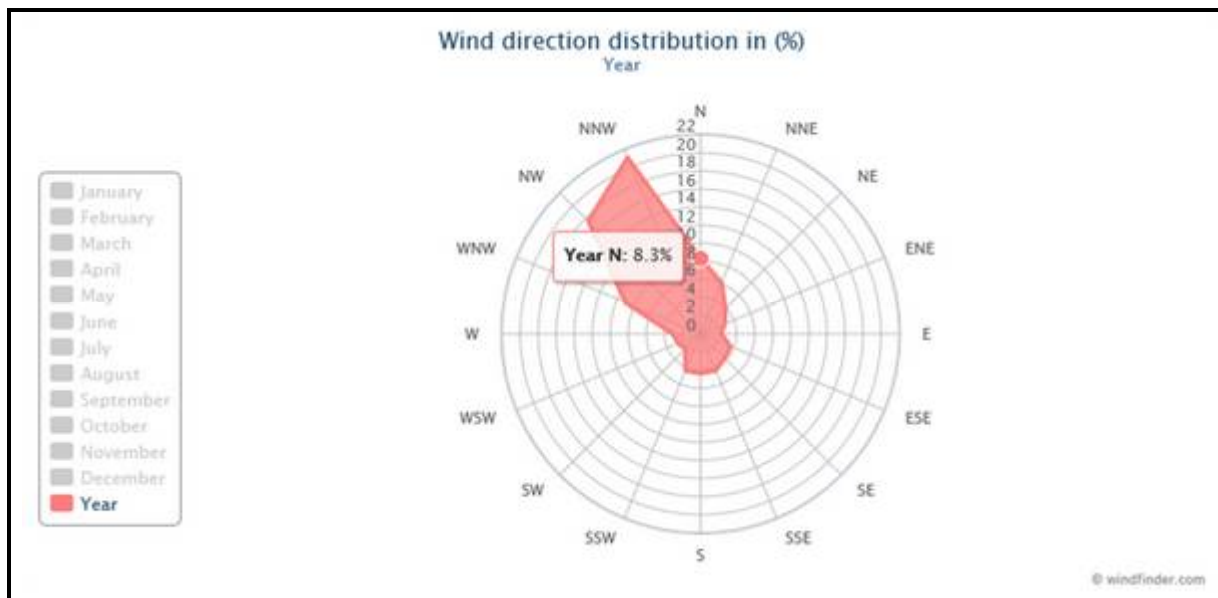
The average daily maximum temperatures range from 22.9°C in December to 8.1°C in July, with daily minima ranging from 21.5°C in December to 7.1°C in July. Annual average temperature for the Mining Area is given as 16.8°C.

**Table 9: Average maximum, average and minimum temperatures**

Temperature (°C)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Monthly max	23.5	22.3	21.6	18.8	16.0	13.0	10.7	14.1	18.8	20.6	22.0	23.3	18.7
Monthly min	21.9	20.9	20.3	17.5	15.0	11.1	10.3	13.3	17.2	19.5	21.1	22.2	17.5
Monthly ave	22.8	21.7	15.5	17.9	15.5	11.8	10.5	13.6	18.0	20.1	21.7	22.6	17.6

### Wind

The predominant wind direction is from north-northwest, with the secondary component from the northwest and west northwest. Contributions from the north and northeast quadrant are observed. Wind speeds vary between 6 – 11 kilometres per hour.



**Figure 8: Wind direction distribution**

### Evaporation

As shown in the table below, the annual maximum, minimum and average monthly evaporation rates for the Potgietersrus (Mokopane) area for the period 1957-1987 are 244 mm, 130 mm and 178 mm, respectively.

(Potgietersrus is the closest weather station that measures evaporation). It appears that this has also closed, hence the data being outdated.

The highest monthly maximum evaporation (322 mm) occurs for October. The rate decreases significantly down to 109 mm in June. The monthly minimum evaporation ranges between 180 mm in October and 68 mm in April.

**Table 10: Annual maximum, minimum and average monthly evaporation**

Evaporation (mm)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Monthly max	289	262	224	190	223	244	257	261	288	322	277	320	289
Monthly min	88	120	93	68	79	70	85	111	155	180	178	128	88
Monthly ave	206	177	171	141	124	109	126	170	224	253	224	212	206

#### *Extreme weather conditions*

Thunderstorms occur frequently in summer and are usually accompanied by lightning, heavy rain, strong winds and occasional hail.

Periods of extreme heat during summer months occur frequently. This can be accompanied by drought conditions.

#### **2.9.1.3 Noise**

The proposed project area may be described as a rural district, interspersed with typical African rural villages. In the absence of any nearby mining activities and with little traffic on the nearest public roads, ambient noise levels are still relatively low.

Inside villages ambient levels are bound to be elevated above the residual level by community activity and local traffic noises. In small rural villages, the level rises to typically 50 dBA (daytime) and 40 dBA (night-time), which corresponds to the SANS 10103 category Suburban Districts with little road traffic. With growing population density and commercial activities, the corresponding levels eventually rise to typically 55 dBA and 45 dBA in rural towns, which correspond to the nominal ratings for Urban Districts.

In an area covered with dense vegetation, thriving with insect, bird and amphibian life, the residual ambient noise floor seldom drops below 35 dBA and could well exceed that level, especially at night. Contrary to the characteristic pattern in developed and populated urban areas where, in response to traffic flow patterns, the night-time ambient noise level is characteristically 10 dB lower than the corresponding daytime level, it is not uncommon in remote rural or wilderness areas for the daytime level to be the same as, or even lower than, the night-time level. This is the reason why the lowest ambient noise category in SANS 10103 is assigned a night-time rating of 35 dBA, with a corresponding daytime level of 45 dBA.



The level of ambient noise in any area, whether purely residual, or elevated by intrusive noise, is bound to fluctuate perpetually. Although a rating has to be assigned for purposes of assessment, the actual measured level in any area will never be constant. Hence, in an area rated at 35 dBA for example, the actual level will from one day to the next, characteristically vary by several decibels around this value, even during the course of a single night.

#### **2.9.1.4 Fauna**

The proposed burrow pit areas are located in a Microphyllous Woodland habitat dominated by *Vachellia* spp, *Senegalia* spp and *Dichrostachys cinerea* dense shrubland/woodland. Each of the proposed sites is too small to consider faunal assemblages on an individual basis.

##### *Avifauna*

*Dominant species:* The bird composition consists primarily of typical "thornveld" species such as Marico flycatcher *Melaenornis mariquensis*, black-chested prinia *Prinia flavicans*, chestnut-vented warbler *Sylvia subcoerulea*, crimson-breasted shrike *Laniarius atrococcineus*, scaly-feathered finch *Sporopipes squamifrons*, green-winged pytilia *Pytilia melba*, white-browed sparrow weaver *Plocepasser mahali*, laughing dove *Spilopelia senegalensis*, blue waxbill *Uraeginthus angolensis* and Acacia pied barbet *Tricholaema leucomelas*.

*Indicator species* (species largely restricted to this habitat) include Kalahari scrub-robin *Cercotrichas paena*, ashy tit *Melaniparus cinerascens*, burned-necked eremomela *Eremomela usticollis*, Sabota lark *Calendulauda sabota*, great sparrow *Passer motitensis*, violet-eared waxbill *Uraeginthus granatina*, rattling cisticola *Cisticola cheniana*, barred wren-warbler *Calamonastes fasciolatus* and Gabar goshawk *Micronisus gabar*.

The proposed mining area does not fall within an Important Bird Area as defined by the South African National Biodiversity Institute (SANBI).

##### *Invertebrates*

A walk through survey is insufficient to get adequate data on the invertebrate assemblage of the area. The timing of the survey, in the dry season, also contributes to low numbers of invertebrates present. Prominent Orders seen were represented by the Coleoptera (beetles) and Hymenoptera (bees and wasps), while prominent families included the Scarabaeidae (scarab beetles such as dung beetles and miniature dung chafers represented by the Aphodinae) and Tenebrionidae (darkling beetles) as well as Muscid flies (various species). Active scorpion burrows were observed. As *Uroplectes planimanus* is known to be the most abundant scorpion in the area is it accepted that the majority of burrows belong to this species. No sign of Theraphosid spiders (Baboon Spiders) were observed, however, there are four theraphosid spider taxa that are likely to occur on the study area. These include:

- *Augacephalus junodi* (Junodi's golden baboon spider);
- *Brachionopus pretoriae*;
- *Ceratogyrus darlingi* (South African horned baboon spider); and
- *Idiothele nigrofulva*.

## Herpetofauna

Previous biodiversity surveys recorded 30 species, 20 lizards & 10 snake species, in the area during the dry season. Several gecko species including *Chondrodactylus turneri* (Turber's gecko), *Hemidactylus mabouia* (common tropical house gecko) and *Lygodactylus c. capensis* (common dwarf gecko) were positively identified as well as the common desert lizard *Meroles squamulosus* and the spotted sand lizard *Pedioplanis l. lineocellata*.

## Mammals

Tracks, sign and faeces of the following species were recorded on the proposed burrow pit site - the yellow mongoose *Cynictis penicillata*, banded mongoose *Mungos mungos*, scrub hare *Lepus saxatilis* as well as small rodent species.

The presence of carnivorous meso-predators such as the black-backed jackal *Canis mesomelas*, brown hyena *Parahyaena brunnea* and small-spotted genet *Genetta genetta* is confirmed on burrow pits A1 and B2.

### 2.9.1.5 Flora

Nyengere Wildlife & Environmental Solutions was appointed to conduct an assessment of the proposed quarry sites. The assessment's focus was the verification of the presence or absence of wetland soils and national protected trees as well as protected faunal species within the proposed burrow pit areas. The report is attached as Appendix 6.

The proposed quarry is located within the Roodeberg Bushveld (Mucina & Rutherford 2006), described in Table 11 below.

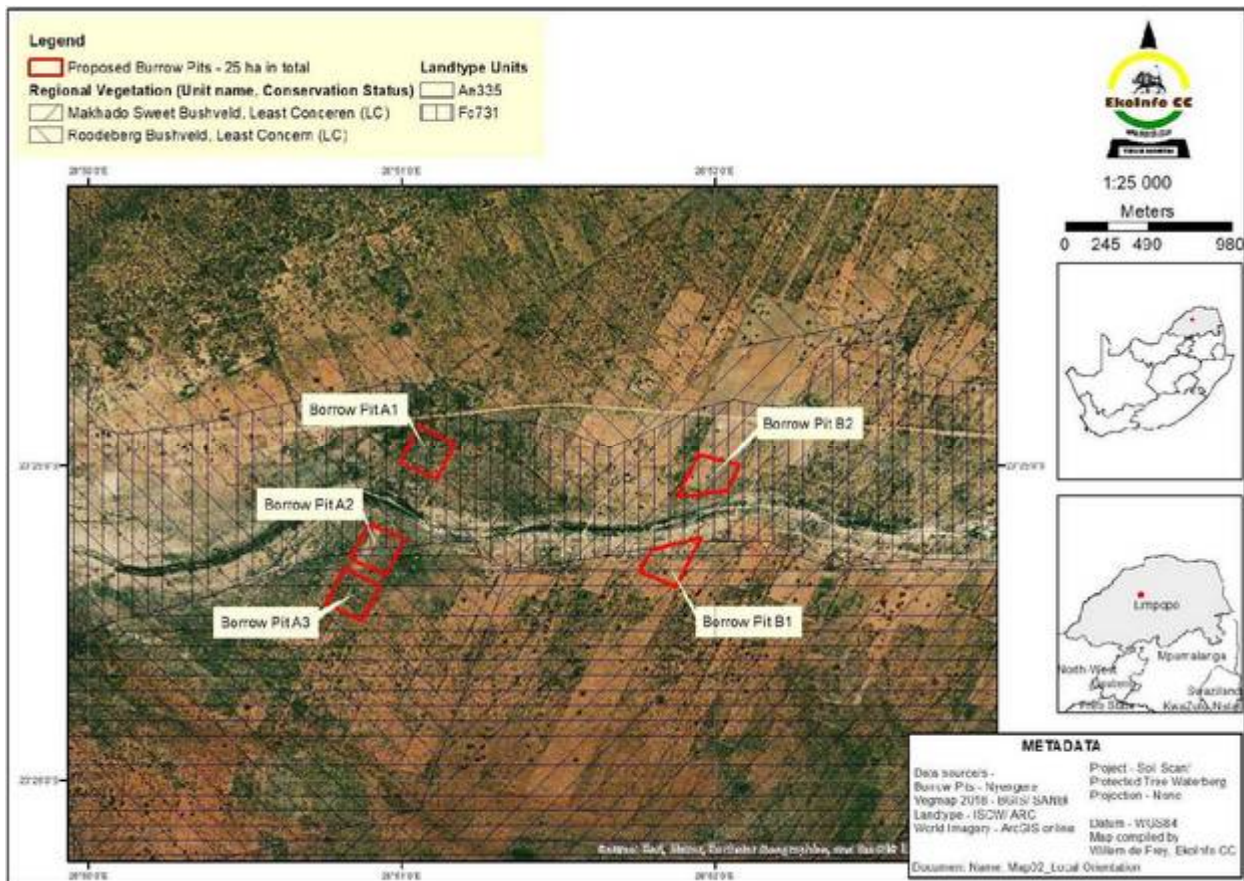
**Table 11: Description of Roodeberg Bushveld vegetation unit.**

Vegetation Unit	Roodeberg Bushveld (Svcb 18)
Vegetation & Landscape Features	Plains and slightly undulating plains, including some low hills, with short, closed woodland to tall open woodland and poorly developed grass layer. <i>Kirkia acuminata</i> trees not limited to hills.
Biogeographically Important Taxa	No
Endemic Taxa	No
Conservation status	Least threatened. Target 19%. Almost 6% statutorily conserved, mainly in the Wonderkop and Blouberg (Malebocho) Nature Reserves. An additional 3% conserved in other reserves, mainly in areas adjacent to the Wonderkop Nature Reserve. About 18% transformed
Transformation level	About 18% transformed, mainly by cultivation, with very little urban and built-up areas. Erosion is low to high
Utilisation	The area is mostly used for game ranching

*Roodeberg Bushveld (SVcb 18)*

This vegetation type straddles the Tropic of Capricorn, at an altitude of approximately 850 – 1100 metres above sea level (masl). The vegetation occurs on slightly undulating plains, including some low hills, and comprised of short, shrubby bushveld with a poorly developed grass layer. The area is transitional between the higher lying Polokwane Plateau and the lower lying vegetation units of the Limpopo River Valley. This vegetation type occurs on slightly undulating plains and low hills, with short, closed woodland to tall open woodland with a poorly developed grass layer.

Rainfall occurs in summer with very dry winters. Mean annual rainfall is about 400 – 550mm. This vegetation type is regarded to be vulnerable. This is due to the south-western half of the unit being densely populated with rural communities. This vegetation type is not regarded to be threatened.



**Figure 9: Local orientation of the study area within the regional vegetation units.**

*National Protected Trees*

Two national protected trees were recorded within this site namely *Vachellia erioloba* and *Sclerocarya birrea*. Of the two species *Vachellia erioloba* is the most abundant in the area. The mean density of this species is 282 individuals per ha, while the mean density for *Sclerocarya birrea* is 4/ha.

Two other national protected tree species were observed within the vicinity of the site, but was not within the footprint of the site, namely *Combretum imberbe* and *Boscia albitrunca*.



**Figure 10: Geo-referenced images of the vegetation and soil profiles for the three plots within the area of burrow pit B2.**

### Limpopo Conservation Plan

The purpose of the Limpopo Conservation Plan (LCP) is to develop the spatial component of a bioregional plan (i.e. map of Critical Biodiversity Areas and associated land-use guidelines).

Bioregional plans are one of a range of tools provided for in the Biodiversity Act that can be used to facilitate biodiversity conservation in priority areas outside the protected area network. The purpose of a bioregional plan is to inform land-use planning, environmental assessment and authorisations, and natural resource management, by a range of sectors whose policies and decisions impact on biodiversity.

This is done by providing a map of biodiversity priority areas or Critical Biodiversity Areas (CBA) together with accompanying land-use planning and decision-making guidelines. The conservation plan applies a target driven systematic spatial biodiversity planning methodology to develop this map and it is based on the best available biodiversity and context data, and an explicit set of biodiversity conservation targets. The resultant map represents the minimum area necessary to maintain biodiversity pattern and ecological processes in the landscape, i.e. ecologically functional landscapes.

CBA's are terrestrial (land) and aquatic (water) areas which must be safeguarded in their natural or near-natural state because they are critical for conserving biodiversity and maintaining ecosystem functioning. These areas include:

- a. natural areas identified as requiring safeguarding in order to meet national biodiversity thresholds;

- b. areas required to ensure the continued existence and functioning of species and ecosystems, including the delivery of ecosystem services; and/or
- c. important locations for biodiversity features or rare species.

Associated with the CBA's are areas known as Ecological Support Areas (ESA). The ESA are supporting zones or areas which must be safeguarded as they are needed to prevent degradation of Critical Biodiversity Areas and formal Protected Areas.

The project area falls within Ecological Support Area 1.



**Figure 11: Limpopo Conservation Plan.**

#### ***2.9.1.6 Topography and landscape character***

The general topography of the surrounding area is flat. The surface elevation across the mining area is 960 meters above mean sea level. The general slope is towards the south to the Sepabana River. Site photographs in Appendix 2 clearly depicts the landscape character.

#### ***2.9.1.7 Soils***

The assessment of the present (pre-mining) soil environment is an integral part of the compilation of an Environmental Management Programme Report (EMP) for the development of mining activities.

Plots were placed within the wetland categories present within the proposed burrow pit areas. At the plot location, the soil was augured and classified according to the South African Soil Classification System (Soil Classification Workgroup 1991). The soils observed were then compared against the national wetland guideline document (DWAF 2005). According to the guideline document, the following soils qualify as wetland soils:

1. Permanent wet areas – Champagne, Katspruit, Willowbrook or Rensburg soil forms
2. Seasonal and temporary wet areas: –
  - a. Form level: Kroonstad, Longlands, Wasbank, Lamotte, Estcourt, Klappmuts, Vilafontes, Kinkelbos, Cartref, Fernwood, Westleigh, Dresden, Avalon, Glencoe, Pinedene, Bainsvlei, Bloemdal, Witfontein, Sepane, Tukulu, Montagu
  - b. Family level: Inhoek, Tsitsikamma, Houwhoek, Molopo, Kimberley, Jonkersberg, Groenkop, Etosha, Addo, Brandvlei, Glenrosa, Dundee

Based on the wetness index, plot 14 within this site had a high probability to be wetland, however the soil profile was classified as Coega, which is not one of the soil forms associated with wetland conditions. Plot 13 was in a low wetland probability area, and Plot 15 in a very low probability area, the soil form at Plot 13 was also Coega, but Plot 15 was Askam. The overall soil depth ranged from 100 mm to 600 mm, with the mean soil depth being 367 mm. Therefore, it is concluded that no wetland conditions are present within this site.

The overall soil depth ranged from 500 mm to 1 200 mm, with the mean soil depth being 816 mm. Therefore, it is concluded that no wetland conditions are present within this site.

#### **2.9.1.8 Land capability and use**

The area surrounding the Kgopong Mining mining area is used predominantly for subsistence crop cultivation, grazing and rural residential purposes. A large portion of the local area has already been transformed for crop cultivation and residential use. The current land cover in the region indicates that extensive transformation and land degradation have occurred. There is widespread evidence of poor soil conservation practices, which have resulted in rapid soil erosion in some areas.

#### **2.9.1.9 Surface water**

The proposed mining area is situated within the Seepabana Sub-Basin, which is a tributary of the Mogalakwena River, a tributary of the Limpopo River. The Seepabana River originates in the east and drains in a westerly direction to the confluence with the Mogalakwena River, at the outlet of quaternary catchment A62H.

The proposed project area is situated 2 km north of the Seepabana River with only one small tributary on the eastern side (flowing from north to south) that will contribute to the run-off of the Seepabana River during high intensity rainfall events.

There are no DWS registered dams in the Seepabana River quaternary catchment A62H.

There is no surface water use in the Project Area and its immediate surrounds. The water use in this area is supplied from groundwater via boreholes.

#### *Surface water quality*

There is no published surface water quality data for the Seepabana River.

Water quality sampling cannot be done as part of the surface water assessment for the Project. Due to the arid nature of the area, streams and the rivers are mostly dry and surface flow only occurs after significant downpours. The surface water run-off accumulated during such events does however not represent the true surface water quality because the river only flows over a short distance, whereafter it seeps into the deep sands. It is thus recommended to refer to the groundwater report for an assessment of the water quality.

### **2.9.1.10      *Groundwater***

#### *Groundwater Levels*

The water table in the proposed mining area is unknown. The expected groundwater flow is expected to be in a northern direction mimicking the surface water flow.

#### *Borehole Yields*

No borehole yields are known.

#### *Groundwater Use*

Groundwater is expected to be used for domestic and livestock drinking purposes.

#### *Groundwater quality*

The groundwater quality of the area is not known.



Figure 12: Quaternary catchments.



### **2.9.1.12 Heritage**

Archaetnos cc was requested by Bateleur to conduct a cultural heritage impact assessment (HIA) for the proposed aggregate quarries. The HIA was done on portions 12 and 13 of the farm Harriet's Wish 393 LR. Report attached as Appendix 5.

The field survey for the project was conducted according to generally accepted HIA practices and was aimed at locating possible objects, sites and features of cultural significance in the area of proposed development.

The entire surveyed area has been disturbed in the recent past by farming activities (grazing of livestock) and dirt roads and thus the general environmental characteristics of these are more or less the same. Most of the land is used for livestock and has been overgrazed. This results in areas with little plant growth, showing trees but little grass cover and areas with pioneer species such as acacias, sickle bush and candelabra trees. Although the under footing of the surveyed area therefore is mostly open, there are areas with dense vegetation with the accordingly negative effect on horizontal and vertical archaeological visibility.

No evidence of sites of cultural or historical importance was discovered on site.

### **2.9.1.13 Air quality**

#### Regional air quality

South Africa is located in the sub-tropics, where high pressures and subsidence dominate. However, the southern part of the continent can serve as a source of hot air that intrudes sub-tropics, and that sometimes lead to convective movement of air masses. On average, a low pressure will develop over the southern part of the continent, while the normal high pressures will remain over the surrounding oceans. These high pressures are known as Indian high-pressure cells and Atlantic high-pressure cells. The intrusion of continents will allow for the development of circulation patterns that draw moisture (rain) from either tropics (hot air masses over equator) or from the mid-latitude and temperate latitudes.

Southern Africa is influenced by two major high-pressure cells, in addition to various circulation systems prevailing in the adjacent tropical and temperate latitudes. The mean circulation of the atmosphere over Southern Africa is anticyclonic throughout the year (except near the surface) due to the dominance of the three high pressure cells, namely the: South Atlantic High Pressure, off the west coast; South Indian High Pressure off the east coast and Continental High Pressure over the interior.

It is these climatic conditions and circulation movements that are responsible for the distribution and dispersion of air pollutants within the Mining Area and between neighbouring provinces and countries bordering South Africa.

#### Summary of ambient air quality

Ambient air quality monitoring has not been implemented at the proposed mining area, and no historical reliable local or district municipal Ambient Air Quality Monitoring Stations (AQMS) is in close vicinity to the enterprise. The DEA is however operating two AQMS in the Greater Limpopo region.

The Mokopane AQMS forms part of the Waterberg/Bojanala priority area and is approximately 100 km from the proposed Extension Area, whilst the Lephalale AQMS is approximately 120 km from the proposed Extension Area. The data quality of both these AQMS is unknown.

**2.9.2 Environmental aspects which may require protection and/or remediation**

The proposed project area is identified as an Ecological Support Area according to the Limpopo Conservation Plan (CPLAN). The proposed project area is regarded to have medium to low sensitivity. The application area does not fall within a Threatened Ecosystem as described in NEMBA (2011).

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

This part of this BAR describes and evaluates the potential impact of the proposed Kgopong Mining mining activity on the surrounding environment. It is the purpose of this part of the document to indicate the impacts on the various aspects of the environment that are anticipated to be associated with the proposed activity.

**3.1 Methodology for assessing impact significance**

The impact assessment has been compiled in terms of the following life cycle phases of the project:

**Table 12: Phases of the activity**

<b>Phase</b>	<b>Activity</b>	<b>Impact</b>
1. Construction phase	This Phase starts when the surface of the site is disturbed (including removal of vegetation) for the first time for the construction of infrastructure.	BAR and EMPr
2. Operational phase	This Phase comprises the longest period associated with the project and starts when the first load of aggregate is removed from the site, until the last load of aggregate is removed.	BAR and EMPr
3. Decommissioning phase.	This phase starts when the last load of aggregate is removed and consists mostly of decommissioning and rehabilitation activities. Decommissioning includes the complete removal of all infrastructure, levelling, filling in and shaping of the landscape and the rehabilitation of the landscape to resemble the pre-construction environment.	BAR and EMPr

The evaluation of impacts was conducted in terms of the following criteria.

**Table 13: Criteria for EIA assessment.**

<b>Magnitude</b>		
Minor	1	Environment remains unaffected.
Low	2	Environment might be negligibly affected.
Moderate	3	Environment might be notably affected.
High	4	Environment might be considerably affected.
Very High	5	Environment might be severely and irreversibly affected.
<b>Extent</b>		
Site only	1	Effect limited to the site and its immediate surroundings.
Local	2	Effect limited to within 3 – 5 km of the site.
Regional	3	Activity will have an impact on a regional scale.
National	4	Activity will have an impact on a national scale.
International	5	Activity will have an impact on an international scale.
<b>Duration of impact</b>		
Immediate	1	Effect occurs periodically throughout the life of the activity and is short lived.
Short term	2	Effect lasts for up to a year.
Medium term	3	Effect continues for a period between 1 and 5 years.
Long term	4	Effect will cease after the operational life of the activity either because of natural process or by human intervention.
Permanent	5	Effect is permanent and will last even after the decommissioning.
<b>Probability of occurrence</b>		
Improbable	1	Less than 25% chance of occurring.
Low	2	Between 25 and 50% chance of occurring.
Medium	3	Between 50 and 75% chance of occurring.
High	4	Greater than 75% chance of occurring.
Definite	5	Will occur regardless of any preventative measures.

The significance of the impacts was determined using the following formula:

<b>Significance = (Magnitude + Duration + Extent) x Probability</b>
---

<b>Significance of predicted impact</b>		
Low	0 – 25	Where the impact will have a relatively small effect on the environment and will require minimum or no mitigation.
Medium	26– 50	Where the impact can have an influence on the environment and should be mitigated.
High	51 - 75	Where the impact will definitely influence the environment and must be mitigated, where possible.

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

The potential impacts are discussed according to each phase of the proposed project: The Construction, Operational and Decommissioning Phase.

This section also rates the significance of the potential impacts pre-mitigation and post mitigation. The impacts below are a result of both, the environment in which the activity takes place, as well activity itself. The impacts associated with the proposed project include the NEMA EIA Regulations Listed Activities, as well as the mining activities to take place at the Kgopong Mining mining operation. The methodology utilised to assess the significance of the potential impacts is described in Section 3.

The impacts for the Construction and Operational phases will be considered together for this document as construction phase impacts will continue into the operational phase.

##### **4.1 Impact on Topography**

Topography refers to the surface shape and features of an area. Opencast operations will remove surface material to access and mine an orebody and this can alter the natural topography of the site. Resultant changes to the topography can in turn impact on groundwater, surface water drainage, visual character and the safety of both people and animals if not properly mitigated. If mining extraction techniques are not carried out correctly, lack of support from underlying layers could cause the surface soil profile to vertically subside to a greater or lesser degree. This could result in limitations to the viability of potential post mining land uses.

##### **4.2 Impacts on Soil**

Mining operations have the potential to damage soil resources through physical loss of soil and/or the contamination of soils, thereby impacting on the soils ability to sustain natural vegetation and altering land capability. Due to the increased activity of trucks and heavy machinery the possibility of soil contamination by leaking oils and fuels is increased. The contamination of soils may contribute to the contamination of surface and groundwater resources. Increased soil erosion can be caused by a loss in vegetative cover resulting in increased water runoff. This is especially likely to occur on sloping terrain. Impacts on soil structure can result in changes to soil drainage, increasing runoff and erosion, and may also result in further potential knock on effects impacting on surface and underground water resources. Loss of the topsoil resource reduces chances of successful rehabilitation and restoration.

##### **4.3 Impacts on Land Use**

The predominant land use in the surrounding area is shrubland. Mining activities have the potential to affect land uses within the application area and in the surrounding areas. This can be caused by physical transformation of land through direct or indirect impacts. Impacts may be related to factors such as loss of soil, loss of biodiversity, pollution of water, dewatering, air pollution, noise pollution, and damage/destruction from blasting. The nature of opencast mining is such that it is unlikely that mining and other land uses can coexist. This means that any area utilised for opencast mining will be unavailable for other land uses.

#### **4.4 Impacts on Fauna and Flora**

The mining activities and the establishment of the supporting infrastructure have the potential to result in loss of vegetation, habitat disruption, loss of ecosystem functionality, habitat transformation, spread of alien invasive species, a reduction in overall biodiversity, increased hunting of animals, the introduction of new species to the site and disruption of migration routes.

Mining and associated activities may result in the removal and destruction of primary vegetation communities. These communities may be in threat categories according to NEMBA or important according to the Limpopo C-Plan. According to the flora specialist two protected trees occur within the application area.

Disturbances to the site may result in an increase of invasive species on site and on downstream and adjacent properties. Increased erosion may alter the drivers that affect wetland vegetation. Several pollutants associated with mining activities including oil, concrete and dust have the potential to inhibit plant growth and germination and could potentially result in plant mortality. Mining alters the movement of water through the landscape, potentially affecting the hydrological flow regime which is the main driver of natural vegetation.

#### **4.5 Impacts on Surface Water Resources**

Mining activities have the potential to alter surface water features through actual mining methods employed as well as the placement of infrastructure. Hydrocarbon spills from diesel machinery also pose threats to local water resources. Surface infrastructure can result in the diversion of surface runoff to storm water dams resulting in a decrease in the quantity of water entering local resources. Should surface water become contaminated it could have impacts on downstream users, resulting in affected livelihoods and supply problems.

#### **4.6 Pollution of Groundwater**

Mining activities have the potential to impact on groundwater resources through potential pollution and/or contamination as a result of activities such as the actual mining method employed and resultant geological exposure of oxidising materials, seepage, spillages and both mineralised and non-mineralised waste streams.

#### **4.7 Impacts of Environmental Pollution**

Environmental pollution refers to any contamination of the environment resulting from mining activities. The types of impacts related to environmental pollution include hydrocarbon spills, sewage spills, and decant from underground workings. Environmental pollution can affect surface water, groundwater, wetlands, soil resources, and air quality. Poorly designed wash bays, accidental spillages, related water facilities on site, hydrocarbon spills from heavy machinery and vehicles onsite, the removal or capping of waste products from the site, the intentional washing and rinsing of equipment, storage and use of hydrocarbons and other hazardous materials including cement, and improper waste handling, storage and disposal can all be sources of environmental pollution.

#### **4.8 Social Impacts**

It is important to understand the difference between a social change process and a social impact. Social change processes are set in motion by project activities or policies. Social change processes can be

measured objectively, independent of the local context. Examples of a social change process are increase in the population, relocation or presence of temporary workers. Under certain circumstances these processes may result in social impacts, but if managed properly these changes may not create impacts. Whether impacts are caused will depend on the characteristics and history of the host community, and the extent of mitigation measures that are put in place. A social impact is something that is experienced or felt by humans. It can be positive or negative. Social impacts can be experienced in a physical or perceptual sense. Social impacts can be either objective or subjective. Objective social impacts can be quantified and verified by independent observers in the local context, such as changes in employment patterns, in standard of living or in health and safety. Subjective social impacts occur “in the heads” or emotions of people, such as negative public attitudes, psychological stress or reduced quality of life. It is very likely that a number of social changes processes will be set in motion by the project. Whether these processes result in social impacts will depend on the successful implementation of the suggested mitigation measures.

#### **4.9 Impacts on Health and Safety**

It is important to recognise that mining activities, equipment, and infrastructure can increase community exposure to risks and impacts. The mining activities can result in a possible increase in crime due to the increased number of strangers in the community. Hazardous structures and excavations may pose a threat to community safety if not correctly located, properly designed and correctly managed. By way of example, excavations may pose a risk to animals and people if not properly managed to prevent unauthorised access. The use of hazardous materials on the mine may result in a community health and safety risk if these materials are not stored, handled and disposed of in an appropriate manner. For example, the storage and use of explosives may represent a safety risk if appropriate controls and procedures are not followed.

Fly rock in particular may pose a risk to people, animals and infrastructure within close proximity to the mine. The use of public roads for hauling of the aggregate will result in increased safety risks for members of the community and public utilising these roads. Mining activities have the potential to increase the risk of accidental fires. Impacts on ecosystem services can impact on communities, particularly where these communities rely on these ecosystem services (e.g. water from watercourses) for their livelihoods. The contamination or degradation of natural resources, such as adverse impacts on the quality, quantity, and availability of freshwater, may result in health-related risks and impacts. Land use changes may result in the loss of natural buffer areas such as wetlands and impacts to natural vegetation areas that mitigate the effects of natural hazards such as flooding, landslides, and fire, may result in increased vulnerability and community safety-related risks and impacts. An influx of people to the mining area seeking employment may increase the risk for community exposure to waterborne, water based, water-related, and vector borne and communicable diseases.

#### **4.10 Impacts on Transportation, Infrastructure and Traffic**

In terms of potential impacts, the mine will result in increased use of the local road network which may result in the deterioration of road surfacing, damage to bridges and culverts in the area, and safety risks to surrounding communities. This will be predominantly due to the increase in transport of heavy machinery, and vehicles carrying Aggregate and labour for mining activities. Increased traffic may have repercussions on safety for other road users, predominantly by increasing the potential for road accidents in nearby communities.

#### **4.11 Visual Impact**

Considering the rural setting of the application area and the mountain backdrop, it is anticipated that the introduction of mining structures and related activities would create strong contrast with the existing landscape characteristics. During mining, it is expected that there will be haul trucks and other mine vehicles on the roads. This, along with the removal of vegetation, dust generation and preparation of opencast mining areas will result in a negative impact on the visual aspect. Operational areas may require lighting at night for safety reasons. It must however be kept in mind that there are already a significant amount of mining activities taking place in the area which will negate the potential impact.

#### **4.12 Impacts on Air Quality**

Existing sources of emissions in the region and the characterisation of existing ambient pollution concentrations is fundamental to the assessment of cumulative air impacts. A change in the ambient air quality can result in a variety of impacts which in turn may cause a disturbance to and/or health impacts on nearby receptors. Sensitive receptor sites include residential areas, communities, and natural environments. Mining activities have the potential to result in increased levels of atmospheric dust, increased concentrations of PM10 (Particulate Matter with an aerodynamic diameter of less than 10µm) and increased concentrations of PM2.5 (Particulate Matter with an aerodynamic diameter of less than 2.5µm). Historical evidence indicates that the pollutant of concern associated with open-cast mining operations is particulate matter creating a dust source and resulting in human health concerns and nuisance.

#### **4.13 Noise Impact**

Certain noise generating activities associated with mining operations can cause an increase in ambient noise levels in and around the site. Significant noise is associated with opencast and plant (including workshops) activities. A source of noise during the operational phase will be traffic to and from the site, traffic around the facility, RoM and product transport and activities associated with waste management. In some cases, mining and related activities may result in an increase in noise levels above the allowable thresholds. Whilst studies show that the response differs greatly between species, noise typically disturbs animals and results in them moving away from the source of noise or becoming adapted to the noise. Some of the typical effects that disturbing noise may have on sensitive receptors include interference with daily activities (work, leisure and sleeping), hindered speech communication, impeded thinking process and interference with concentration. Mine workers in very close proximity to noisy activities would be at risk to hearing damage if the proper precautions (e.g. use of personal protective equipment) are not taken.

#### **4.14 Blasting and Vibration**

The application of explosives for breaking rock will always have an effect on the surrounding environment. These effects can manifest in the form of ground vibration, air blast, fumes, fly rock and noxious fumes. These short duration events may be noticeable by communities and individuals living in the immediate environment. These events tend to cause nuisance and elicit an emotive response because of resonance because they are easily recognised as being related to blasting.

**Table 14: Potential impacts and mitigation measures associated with the operational phase.**

Potential Impact		Potential Impact Rating					Mitigation	Mitigated Impact Rating				
		Magnitude	Extent	Duration	Probability	Significance		Magnitude	Extent	Duration	Probability	Significance
Soil	Removal of vegetation will expose soils to erosion forces such as wind and water.	3	1	3	4	28	The extent of the soil disturbance will be limited to the areas indicated on the project plan and will be rehabilitated. Excising access roads will be used.	2	1	2	4	20
	Potential soil pollution due to Hydrocarbon spillage from vehicles or equipment.	3	2	3	4	32	Vehicles will be maintained in good working order. Hydrocarbon spillage will be treated according to the EMPr.	2	1	2	2	10
	Physical degradation such as compaction, surface crusting and hard setting of soils may occur due to movement of vehicles and removal of vegetation.	3	1	3	4	28	Prevent compaction of soils by limiting movement of vehicles to designated roads and areas. Ripping and rehabilitation according to EMPr.	2	1	2	3	15
	Loss of topsoil	3	1	5	4	36	Topsoil will be stored on site and used later for backfilling.	2	1	2	2	10
Land use	Degradation of land due to litter	3	1	5	4	36	Bins will be provided, and rubbish removed on a daily basis by contractors. Hazardous waste will be removed by the contractor and disposed of at a registered hazardous waste site.	2	1	1	1	4
	Degradation of land due to fire	5	2	3	5	50	No open fires will be allowed.	1	2	1	1	4
Topography	Alteration of topography	3	1	5	4	36	Control through site planning and design. Control through proper soil management procedures. Avoidance through mine design and planning (depth of mining, safety factors,	2	1	2	2	10



Potential Impact		Potential Impact Rating					Mitigation	Mitigated Impact Rating				
		Magnitude	Extent	Duration	Probability	Significance		Magnitude	Extent	Duration	Probability	Significance
	Altered drainage patterns	3	1	5	4	36	overburden and rock qualities).	2	1	2	2	10
Flora	Removal of vegetation will cause a loss in biodiversity and habitat for animal life currently occupying the site.	3	1	4	4	32	Areas to be disturbed will be limited to the areas indicated on the project plan. Sensitive areas will be avoided, i.e. wetlands, river beds etc. Any endangered species will be avoided or	2	1	3	3	18
Fauna	Increased human presence in the area will cause a disturbance to animal life occurring on the site.	3	1	4	4	32	No mitigation is possible against the increased presence of humans in the areas. It is anticipated that these animals will migrate to adjacent habitats due to lack of suitable habitat and nesting sites. Fauna encountered that could be moved will be relocated to an appropriate new habitat on the farm.	2	1	3	3	18
Air quality	Dust and emissions associated with the movement of vehicles will increase along the access routes and on site.	3	2	1	5	30	Dust suppression will be conducted regularly on site. The frequency of dust suppression will depend on on-site conditions to avoid excessive runoff. Vehicles will be maintained in good working order to minimize emissions.	2	1	1	3	12
Surface water	Potential pollution of water resources resulting from contaminated runoff due to incorrect handling or disposal of waste materials or oil leaks from vehicles or equipment.	3	2	3	3	24	Waste to be treated according to the EMPr Hydrocarbon spillage will be treated according to the EMPr.	2	1	1	1	4
	Ponding of clean surface water due to excavation of sumps.	3	1	4	3	24	Backfilling, surface rehabilitation and monitoring of sumps. Follow up if needed.	2	1	3	2	12

Potential Impact		Potential Impact Rating					Mitigation	Mitigated Impact Rating				
		Magnitude	Extent	Duration	Probability	Significance		Magnitude	Extent	Duration	Probability	Significance
Noise	The movement of vehicles, blasting and drilling activities will create noise that could cause a nuisance to people living close to the transport routes and the site.	4	2	1	5	35	Vehicles and equipment will be maintained in a good working to minimize noise. Operations will be limited to daylight hours on weekdays to minimize the impact on surrounding areas.	2	2	1	3	15
Visual	The mining activities will result in a visual impact on the surrounding landscape.	3	2	1	5	30	A berm will be placed along the boundaries of the mining area to shield the operations from nearby homesteads and roads.	2	2	1	3	15
Socio-Economic	Disruption to farming activities.	4	1	1	3	18	The impact will be minimised and managed by: <ul style="list-style-type: none"> <li>Conduct dust suppression on a regular basis.</li> <li>The excavator used will be in good working order.</li> <li>Excavation will be conducted in normal</li> </ul>	2	1	1	1	4
Environmental pollution	General environmental pollution	4	2	2	3	24	Avoid through implementation of suitable progressive rehabilitation and soil management. Control/remedy through interception of decant and treatment of polluted water where required. Avoid and control through implementation of EMPR mitigation measures (e.g. spill prevention, hydrocarbon storage).	2	2	1	3	15
	Hydrocarbon spills/contamination	3	2	2	3	21	Avoid through preventative measures (e.g. bunding, spill kits). Remedy through clean-up and waste disposal. Modify	2	2	1	2	10

Potential Impact		Potential Impact Rating					Mitigation	Mitigated Impact Rating				
		Magnitude	Extent	Duration	Probability	Significance		Magnitude	Extent	Duration	Probability	Significance
	Sewage spills/contamination	2	1	1	1	4	through soil treatment if required. Avoid and control through implementation of preventative measures (e.g. location of toilets, spill prevention, waste management).	1	1	1	1	3
Social impacts	Crime and violence	3	3	2	3	24	Avoidance and control through preventative measures (e.g. site security, code of conduct). Avoidance and control through mitigation measures (e.g. recruitment procedure, grievance mechanism, code of conduct).	2	2	1	2	10
	Influx of migrant workers	2	3	3	3	24		2	1	2	2	10
	Loss of sense of place	2	2	3	2	14		1	1	2	1	4
Health and safety	Fire and explosion hazard	3	2	2	3	21	Avoidance and control through preventative measures (e.g. HIV/AIDS awareness). Remedy through application of mitigation measures in EMPR.	2	1	1	1	4

Potential Impact		Potential Impact Rating					Mitigation	Mitigated Impact Rating				
		Magnitude	Extent	Duration	Probability	Significance		Magnitude	Extent	Duration	Probability	Significance
Blasting and vibration	Fly rock	3	1	2	2	12	Avoid and control through implementation of preventative measures (e.g. fire breaks, blasting procedures, hazardous substances management). Avoid and control through implementation of preventative measures (e.g. blast procedures, monitoring, communication with landowners, emergency response procedures).	2	1	1	1	4
	Health impacts	3	3	2	3	24		2	1	1	2	8
	Air blast	3	2	1	4	28		2	1	1	2	8
	Air blast and human perception	3	2	1	4	28		2	1	1	2	8
	Impacts on infrastructure (roads, communications infrastructure, services, houses, boreholes)	3	2	1	4	28		2	1	1	2	8

Potential Impact		Potential Impact Rating					Mitigation	Mitigated Impact Rating				
		Magnitude	Extent	Duration	Probability	Significance		Magnitude	Extent	Duration	Probability	Significance
	Noxious fumes	3	2	1	4		2	1	1	2	8	

**5. 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**

For the reasons provided above, no alternatives have been considered for this project. No concerns pertaining to the location or layout of the site have been raised, however in siting the quarry, the EAP has taken into account the location and distance from watercourses, quality and type of vegetation, existing infrastructure, as well as the location and proximity to adjacent communities while factoring in the nature of the mining that will take place.

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

The identification of risks and the mitigation measures that could be applied have been discussed above in Section 4.

**7. Motivation where no alternatives sites were considered**

The was considered suitable as it falls within an area that has already been disturbed (habitation and clearing) and there is easy access to the material. The site is located within close proximity to a road, thereby reducing the cost of transporting the aggregate that is to be mined. Due to the applicant owning the property, and the site-specific material found at this site, no alternative locations have been considered for this application.

**8. Statement motivating the alternative development location within the overall site**

For the reasons discussed in this document, no alternative development locations have been considered for this project.

**9. Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity.**

As the site layout was informed by environmental and technical input, as well as the location of the aggregate reserves, the initial layout has not changed during the PPP or impact ranking. The impacts and risks identified in Section 4 are therefore applicable to the final site layout plan.

**10. Assessment of each identified potentially significant impact and risk.**

The following assessment is the proposed potentially significant impacts based on current knowledge. Should further information be provided by I&AP's that requires inclusion / amendment to the assessment below, this will be updated after the consultation process has been completed.

**Table 15: Assessment of each identified potentially significant impact and risk.**

Activity	Potential Impact	Aspects Affected	Phase	Significance Pre-Mitigation	Mitigation Type	Significance Post-Mitigation
<b>Construction and Operational Phase</b>						
<b>Employment of workers</b>	Population influx - Pressure on resources	Socio-economic	Construction Phase Operational Phase	Minor negative	Very small operation.	Minor negative
	Population Influx – Social Pathologies	Socio-economic	Construction Phase Operational Phase	Minor Negative	Very small operation.	Minor Negative
	Health and Safety	Socio-economic	Construction Phase Operational Phase	Moderate Negative	Prevent through: Awareness Campaigns and Maintenance Programme Grievance Mechanism.	Minor Negative
	Job Creation and Skills Training	Socio-economic	Socio-economic	Minor Positive	Enhance through: Employment Strategy and recruitment policy.	Moderate Positive
	Job Creation (Multiplier Effect) and Population Influx	Socio-economic	Socio-economic	Minor Positive	Enhance through: Development Plan & SMME register.	Moderate Positive
	Hydrocarbon contamination	Soils	LoM	Moderate negative	Remedy and manage through:	Minor negative

Activity	Potential Impact	Aspects Affected	Phase	Significance Pre-Mitigation	Mitigation Type	Significance Post-Mitigation
<b>Storage of fuel and lubricants in temporary facilities.</b>					Emergency Response Plan, Stormwater Management Plan, Aquatic Monitoring Programme	
		Wetlands and aquatic ecology	LoM	Minor Negative		Negligible negative
		Surface water	LoM	Minor Negative		Negligible negative
		Groundwater	LoM	Minor Negative		Negligible negative
<b>Topsoil removal and stockpiling; and extraction and transportation of aggregate.</b>	Fugitive dust generation.	Air Quality	Operational Phase	Minor Negative	Monitor and manage through: Dust Management Plan & Dust Monitoring Programme.	Minor Negative
	Alteration in the topography and visual environment.	Topography and Visual Environment	Operational Phase	Moderate Negative	Avoid and minimise through: Mine Plan	Moderate Negative
<b>Vehicular activity on haul roads; and operation of mining equipment.</b>	Contamination of water resources and alteration of drainage patterns.	Surface Water	Operational Phase	Minor Negative	Prevent through: Stormwater Management Plan	Minor Negative
<b>Screening of aggregate in mobile plant</b>	Noise generation	Noise	Construction Phase Operational Phase	Negligible Negative	Control through: Quality control procedures.	Negligible Negative
	Fugitive dust generation	Air quality	Operational Phase	Minor Negative	Monitor and manage through: Dust Management	Minor Negative



Activity	Potential Impact	Aspects Affected	Phase	Significance Pre-Mitigation	Mitigation Type	Significance Post-Mitigation
					Plan & Dust Monitoring Programme.	
		Visual environment	Operational Phase	Minor Negative	Monitor and manage through: Dust Management Plan & Dust Monitoring Programme.	Minor Negative
	Hydrocarbon contamination	Soils	LoM	Moderate negative	Remedy through: Emergency response plan.	Minor Negative
	Sedimentation and siltation of water resources	Surface water	Operational phase	Minor negative	Prevent through: Stormwater management plan.	Negligible negative
	Noise generation	Noise	Construction Phase Operational Phase	Negligible Negative	Prevent and manage through: Vehicle Maintenance Plan.	Negligible Negative
<b>Stockpiling material</b>	Fugitive dust generation.	Air Quality	Operational Phase	Moderate Negative	Monitor and manage through: Dust Management Plan & Dust Monitoring Programme.	Minor Negative
	Alteration to the topography and visual environment.	Topography and Visual Environment	Operational Phase	Moderate Negative	Minimise through: Mine Plan & Vegetation Monitoring	Minor Negative

Activity	Potential Impact	Aspects Affected	Phase	Significance Pre-Mitigation	Mitigation Type	Significance Post-Mitigation
	Loss of topsoil resources due to erosion.	Soils	Operational Phase	Moderate Negative	Manage and prevent through: Stormwater Management Plan	Negligible Negative
<b>Water management</b>	Contamination of water resources	Surface water	Operational Phase	Minor Negative	Prevent through: Stormwater management plan.	Negligible Negative
		Groundwater	Operational Phase	Negligible Negative	Prevent through: Stormwater management plan.	Negligible Negative
<b>Waste generation and disposal</b>	Waste material contamination	Soils	Operational phase	Moderate negative	Prevent and avoid through: Emergency response plan.	Minor negative
		Surface water	Operational phase	Moderate negative	Prevent and avoid through: Emergency response plan.	Minor negative
	Contamination of water resources	Surface water	Operational phase	Minor negative	Prevent and manage through: Stormwater management plan.	Negligible Negative
		Groundwater	Operational phase	Minor negative	Prevent and manage through: Stormwater management plan.	Negligible Negative
<b>Decommissioning Phase</b>						
<b>Demolition / removal of portable and related infrastructure</b>	Fugitive dust generation	Air quality	Decommissioning Phase	Minor negative	Monitor and manage through: Dust Management Plan & Dust	Negligible Negative

Activity	Potential Impact	Aspects Affected	Phase	Significance Pre-Mitigation	Mitigation Type	Significance Post-Mitigation
					Monitoring Programme.	
	Alteration of the topography and visual environment	Topography and Visual Environment	Decommissioning Phase	Minor negative	Remedy through: Rehabilitation Plan & Closure Plan	N/A
	Hydrocarbon and waste material contamination	Soils	Decommissioning Phase	Moderate negative	Manage through: Emergency Responses Plan	Minor negative
	Alien Invasive Vegetation establishment	Fauna and Flora	Decommissioning Phase	Negligible Negative	Manage through: Alien Invasive Management Programme	Negligible Negative
	Sedimentation and contamination of water resources	Surface water	Decommissioning Phase	Minor negative	Monitor and remedy through: Emergency Response Plan	Negligible Negative
	Noise generation	Noise	Decommissioning Phase	Negligible Negative	Monitor and remedy through: Emergency Response Plan	Negligible Negative
<b>Vehicular activity: removal of mobile plant / equipment and vehicles</b>	Hydrocarbon contamination	Soils	Decommissioning Phase	Moderate negligible	Monitor and remedy through: Emergency Response Plan	Minor negative
		Surface water	Decommissioning Phase	Minor negative	Monitor and remedy through: Emergency Response Plan	Negligible Negative
		Groundwater	Decommissioning Phase	Negligible Negative	Monitor and remedy through: Emergency Response Plan	Negligible Negative
<b>Rehabilitation of the site</b>	Fugitive dust generation	Air quality	Decommissioning Phase	Minor negative	Monitor and manage through:	Minor Negative

Activity	Potential Impact	Aspects Affected	Phase	Significance Pre-Mitigation	Mitigation Type	Significance Post-Mitigation
					Dust Management Plan & Dust Monitoring Programme.	
	Alteration of the topography and visual environment	Topography and Visual Environment	Decommissioning Phase	Minor negative	Remedy through: Rehabilitation Plan & Closure Plan	N/A
	Hydrocarbon contamination	Soils	Decommissioning Phase	Moderate negligible	Monitor and remedy through: Emergency Response Plan.	Minor negative
	Reduction in land capability	Soils	Decommissioning Phase Post Closure	Moderate Negative	Prevent through: Rehabilitation Plan, Closure Plan, Vegetation Monitoring.	Minor Negative
	Vegetation and habitat establishment	Fauna and Flora	Operational Phase Decommissioning Phase	Negligible Negative	Remedy and enhance through: Rehabilitation Plan, Vegetation Monitoring & Alien Invasive Management Programme.	Minor Positive
	Noise generation	Noise	Operational Phase Decommissioning Phase	Negligible Negative	Manage and prevent through: Vehicle Maintenance Plan.	Negligible Negative

## 11. Summary of specialist reports.

The National Environmental Screening Tool (2017) identified the following possible environmental sensitivities:

**Table 16: Possible environmental sensitivities.**

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agricultural		X		
Animal species			X	
Aquatic biodiversity	X			
Archaeological, Cultural Heritage				X
Civil aviation				X
Defence			X	
Palaeontology			X	
Plant species				X
Terrestrial biodiversity	X			

A site inspection by the EAP confirmed that the site is already mostly transformed from its natural state due to intensive bush clearance and overgrazing by livestock. This coupled with the low/medium sensitivity for most aspects identified during the screening assessment above suggests that specialists' studies are unlikely to be required.

Due to previous experience working in the area it was decided to conduct the following assessment nevertheless:

- Cultural Heritage Impact Assessment (Appendix 5)
- Soil Scan and Protected Species Survey (Appendix 6)

Should discussions with the local communities and other I&AP reveal concerns related to cultural heritage aspects over the application area, a specialist may be consulted to confirm the sensitivity of the area.

## 12. Environmental impact statement.

In accordance with the EIA Regulations GN R543 31 (2) (n), the EAP must provide an opinion as to whether the activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation must be stated.

An impact assessment has been undertaken, which has incorporated extensive consultation with and participation of I&APs. It is the EAP's opinion that due process has been followed. Where impacts have been found to be potentially significant, various mitigation measures to manage and monitor the impacts of the project have been proposed.

In Bateleur's professional opinion, there are no anticipated impacts that constitute a fatal flaw for the proposed project. Nevertheless, the recommended mitigation measures must be implemented to minimise the impacts and ensuring compliance with current legislative requirements.

It is recommended that the proposed project be allowed to proceed on the assumption that the environmental and social management commitments are adhered to, the project description remains as per the description provided in this document and considering the positive social impacts associated with the project.

### **12.1 Final site map**

The site map attached in Appendix 3. There are no identified environmental sensitivities to be avoided within the proposed site boundary.

### **12.2 Summary of key findings**

The Environmental Impact Statement is utilised to summarise all the potential environmental impacts identified during each phase of the proposed project.

#### ***Air quality***

- Fugitive dust generation from augmenting existing roads;
- Fugitive dust generation from transport of construction material, mobile plant and equipment to site;
- Evaporation of diesel fuel and heavy fuel from temporary tanks and possible spills during loading of fuel from tanks on site that are used for re-fuelling of heavy machinery and trucks;
- Fugitive dust generation from site clearing and topsoil removal and construction;
- Fugitive dust generation from preparing for portable plant, infrastructure and stock piling;
- Fugitive dust generation from topsoil removal and stockpiling; and extraction and transportation of materials; vehicular activity on haul roads; and operation of mining equipment; and crushing and screening of aggregate in mobile plant;
- Fugitive dust generation from the operation and maintenance of the stockpiles, including waste and ROM stockpiles;
- Fugitive dust generation from the demolition of infrastructure;
- Fugitive dust generation from site rehabilitation.

#### ***Biodiversity***

- Loss of suitable habitats from the removal of vegetation; the disturbance of the soil; and vehicle operation;
- Loss of fauna and flora species from the removal of vegetation; increased human presence; machinery and vehicle operation;
- Loss of suitable habitats through the establishment of alien plant species in disturbed areas as well as roadkill from increased vehicle movement.

### ***Surface water***

- Sedimentation and contamination of surface water resources;
- Construction of infrastructure exposes the surface water to the following impacts: stockpiles may cause sedimentation; concrete and other impervious surfaces prevent surface water from infiltrating the soil and will increase runoff;
- Potential spillages during transport of construction material, hazardous substances and hydrocarbon containing fuels and lubricants to site;
- Mobilization of leaked/spilled contaminants (hazardous and hydrocarbon containing material) from surface to the surrounding surface water resources;
- Siltation of the surrounding surface water resources through erosion;
- Contamination of surface water resources resulting from temporary storage of waste material before collection for disposal may result in leakages;
- Rehabilitation will have a positive impact on the water quantity and quality of the disturbed site.

### ***Soils, Land Capability and Land Use***

- Loss of topsoil resources as a resource;
- Soil erosion and degradation;
- Hydrocarbon pollution;
- Loss of land capability.

### ***Noise***

Noise generation through mining machinery and vehicles may increase ambient noise levels at surrounding urban and rural noise sensitive receptors.

### ***Visual***

- Alteration of visual environment through vehicular activity and the resulting dust;
- Alteration of visual environment through the temporary storage of material / diesel;
- Alteration of visual environment through the removal of vegetation and topsoil for site clearing;
- Alteration of visual environment through the erection of surface infrastructure;
- Alteration of visual environment through the stockpiling topsoil and extraction of material and
- Alteration of visual environment through the vehicular activity on the haul roads.

### ***Positive impacts***

- Aggregate supply for the market.
- Economic growth.
- Employment opportunities.

### **13. Proposed impact management objectives and the impact management outcomes for inclusion in the EMPR**

The EMPR seeks to achieve a required end state and describes how activities that have, or could have, an adverse impact on the environment will be mitigated, controlled and monitored.

This EMPR addresses the environmental impacts during the Operational, Decommissioning and Post-Closure Phases of the project. Due regard must be given to environmental protection during the entire project. Several environmental recommendations are therefore made to achieve environmental protection. The environmental and social objectives are set to allow the mining of the aggregate in an environmental and socially responsible fashion while ensuring that sustainable closure can be achieved. To achieve closure the correct decisions, need to be taken during the planning phase of the project.

#### **13.1 Environmental Objectives and Goals**

##### ***Topography***

The following objectives should be attained during the planning, construction, operation, and decommissioning phases of the mining operations:

- Maintain the integrity of the landscape as far as possible by reinstating the topography to match the surroundings.
- Reinstatement of vegetation cover to match the surroundings.
- Monitor the reinstated areas to ensure that erosion does not occur.
- Ensure drainage lines are not disturbed as far as possible.
- Create pollution control structures to ensure pollution on site is minimised.

##### ***Soils***

The following objectives should be attained during the planning, construction, operation, and decommissioning phases of the mining operations:

- Only clear areas needed and keep footprints as small as possible.
- Vegetate topsoil stockpiles as soon as possible. Implement storm water management infrastructures
- Keep active pit area as small as possible and implement continual rehabilitation.
- Conduct waste classification of overburden material.
- Backfill opencast as soon as possible to reduce volume of overburden stored on site.

##### ***Land Use***

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:



- Preserve soil so that land capability class can be re-established post mining (as far as this is possible).

### ***Surface Water***

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:

- Ensure minimal impact to the surface water resources.
- Ensure that the construction activities are carried out to aid rehabilitation during decommissioning.

### ***Groundwater***

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:

- Prevent construction material becoming a source for pollution to the local aquifers.
- Ensure effective management of any accidental spills.

### ***Flora***

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:

- Ensure awareness amongst all staff, contractors and visitors to site to not needlessly damage flora.
- A management plan for the control of invasive alien species needs to be implemented. Specialist advice should be used in this regard. This plan should include pre-treatment, initial treatment and follow-up treatment and should be planned and budgeted for in advance. The cleared areas after removal should be re-vegetated with indigenous naturally occurring species to decrease large patches of bare soil. The best mitigation measure in this regard is avoiding invasive and/or exotic species from being established. It is vital that the control of alien invasive species is ongoing.
- No foraging, food and wood collecting within the veld should be allowed.
- Eliminate alien invasive and exotic plants.
- Minimise and limit the destruction or disturbance of vegetation of the proposed mining areas and mine infrastructure. The vegetation removal should be controlled and should be very specific.
- Prevent the destruction of natural and/or pasture vegetation of the surrounding areas that will not be mined.
- Prevent heavy machinery and light vehicles driving through natural vegetation that will not be disturbed by the proposed activities.
- Prevent the destruction of vegetation in areas prone to soil erosion.
- Remove and relocate any rare and endangered species within the areas where the natural vegetation will be destroyed.
- Prevent any pollution of natural vegetation, wetlands and red data species.

## ***Fauna***

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:

- Fauna (wildlife and domestic animals) may under no circumstances be handled, removed, killed or interfered with by the Contractor, his employees, his Sub-Contractors or his Sub-Contractors' employees. Activities on site must comply with the regulations of the Animal Protection Act, 1962 (Act 71 of 1962). Workers should also be advised on the penalties associated with the needless destruction of wildlife, as set out in this act.
- Appoint an ECO to oversee the activities and ensure that ecological aspects are kept in mind.
- Priority species, specifically nests if encountered, should be identified first and a management plan should be established for each of the priority species.
- Continuous rehabilitation and clean-up of the area should be implemented during the operational phase.
- Limit activities (transport etc.) to the smallest area possible. This is to prevent fragmentation that may have irreversible changes to faunal communities. It also increases the invasion of alien/foreign species.
- A management plan for the control of invasive and exotic plant species needs to be implemented (if required).
- Restrict movement to the proposed footprint of the activities. Control of access should be implemented for all other natural areas to prevent unnecessary destruction of habitats or disturbance of species. Human and vehicles movement should stay out of the natural areas associated with the proximity of the Pilanesberg Game Reserve. It is also vital that no additional fragmentation occur and that all roads are clearly demarcated and kept to a minimum without any exceptions. No vehicles or personnel are permitted outside of these demarcated roads.
- No camping activities or other contractor camps should be allowed on the mining area and this practice will be a good investment in preventing more impacts, noise and waste or possibly the spread of fires to the Pilanesberg Game Reserve.

## ***Air Quality***

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:

- Implement dust suppression in and around site as needed.
- Vehicles must be regularly serviced.
- Vehicles utilising public gravel roads must adhere to the speed limits.
- By minimising the removal of vegetation and topsoil in affected area, this will minimise the potential for dusty conditions.

### **Noise**

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:

- All vehicles and machinery must be maintained in good working order.
- When working or traveling past noise sensitive receptors, no unnecessary hooting or noise should occur.

### **Visual**

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:

- To limit the visual impact of mining and related infrastructure as far as possible during mining.
- To enhance the visual aspect and maintain the aesthetics of the region post mining.

### **Health and Safety**

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:

- Undertake mining and ancillary activities in safe and responsible manner so as to protect the safety of people and the environment.
- Manage hazardous materials and explosives in a safe and responsible manner so as to protect the safety of people and the environment.

### **Environmental Pollution**

The following objective should be attained during the construction, operation, and decommissioning phases of the mining operations:

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

### **13.2 Socio-economic Objectives and Goals**

The following socio-economic objectives should be attained during the construction, operation, and decommissioning phases of the Kgopong Mining mining operations:

- Always adhere to an open and transparent communication procedure with stakeholders.
- Ensure that accurate and regular information is communicated to I&APs in a manner which is understandable and accessible.
- Mitigate negative impacts.
- Enhance project benefits and minimise negative impacts through intensive consultation with stakeholders.
- Assemble adequate, accurate, appropriate, and relevant socio-economic information relating to the context of the operation.
- Ensure that recruitment strategies for the mine, prioritise the sourcing of local labour, and share in gender equality.
- Ensure an atmosphere of equality and non-discrimination among the workforce.
- Contribute to the development of functional literacy and numeracy among employees.
- Empower the workforce to develop skills that will equip them to obtain employment in other sectors of the economy.
- Contribute to the development of a self-reliant (not dependent on the mine) community surrounding the area of operation.
- Ensure that decommissioning and retrenchments take place in a legally compliant and humane manner.

### **13.3 Historical and Cultural Aspects**

No sites of cultural or historic importance exist in close proximity to the mining area.

## **14. Aspects for inclusion as conditions of authorisation**

The authorisation should be subject to the following conditions:

- It is proposed that as this authorization be granted for two years and that an environmental audit of the implementation of the EMP be undertaken annually.
- The financial provision calculation must be updated annually in line with prevailing legislation and any shortfall provided to the authority.
- The relevant landowners must agree on the success of rehabilitation and achievement of the closure objectives when the operation is decommissioned.
- The project should remain in full compliance with the requirements of the EMP and with all regulatory requirements.
- The EMP should be implemented by one or more senior and qualified environmental practitioners who have competence and credibility to interpret the requirements of the BAR and the EMP, and who must be issued with a written mandate by Kgopong Mining to provide guidance and instructions to the contractors.
- Stakeholder engagement must be maintained during the construction, operational and closure/ rehabilitation phases of the project, with the emphasis on on-going provision of information

pertaining to the project, and with the goal of maintaining constructive and mutually respectful stakeholder relations.

- A detailed record of all activities related to environmental and social management, as well as stakeholder engagement, should be retained for review and audit by independent parties for all phases of the project. The audit findings should be made available to the relevant environmental and local authorities; and
- Any substantive changes to the project configuration should be the subject of environmental assessments and should result in amendments to the EMP. Information related to any such changes should be made available to the authorities as well as for public review in the spirit of full disclosure.

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

When considering the uncertainties in this assessment it is important to note that EIA/EMP processes are not an exact science and impacts can only be evaluated on the information that is currently available and through past experience. Due to the fact that the land is already transformed through heavy grazing and adjacent historical mining, the physical impacts are anticipated to be restricted and the majority of impacts and appropriate mitigations measures are known.

### **15.1 Heritage**

Although all efforts were made to locate, identify and record all possible cultural heritage sites and features (including archaeological remains) there is always a possibility that some might have been missed as a result of grass cover and other factors. The subterranean nature of these resources (including low stone-packed or unmarked graves) should also be taken into consideration. Should any previously unknown or invisible sites, features or material be uncovered during any development actions then an expert should be contacted to investigate and provide recommendations on the way forward. From a cultural heritage point of view the development can therefore continue, taking cognisance of the recommendations.

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

### **16.1 Reasons why the activity should be authorised or not**

This BAR and EMPR has assessed the potential impacts associated with the proposed mining activities and mitigation measures have been developed to address the impacts identified. Furthermore, this BAR and EMPR has been compiled in accordance with the most recent guidelines and legislation. The draft BAR and EMPR was also be made available to I&APs review and comments, and appropriate changes have been made to this final BAR and EMPR as a result of the I&APs consultation process. Appropriate measures are included in the BAR and EMPR wherever possible, to ensure I&APs concerns are addressed. As such, the EAP is of the opinion that the activity should be authorised.

## 16.2 Conditions that must be included in the authorisation

These conditions have been listed in Section 14 above.

### 17. Period for which the environmental authorisation is required

The mining permit is required for a period of 2 years.

### 18. Undertaking

The undertaking required to meet the requirements of this section is provided at the end of the EMP Report in Part B, Section 12.

### 19. Financial Provision

The Regulations pertaining to the Financial Provision for Prospecting, Mining and Production Operations promulgated under Section 44(A) (e), (f), (g), (h) read with sections 24(5)(b)(ix), 24(5)(d), 24N, 24P and 24R of the National Environmental Management Act, 1998 (Act 107 of 1998) (20 November 2015) have been considered and this is anticipated to result in an increase in the rehabilitation costs estimated using the above-mentioned quantum. The amount that is required to both manage and rehabilitate the environment in respect of rehabilitation is reflected in the quantum of financial provision in Section 35 (Part B) of the report.

### 20. Specific Information required by the competent Authority

#### 20.1 Impact on the socio-economic conditions of any directly affected person

A summary of potential impacts is tabled below:

**Table 17: Impact on socio-economic conditions.**

Cause of Impact	Aspects	Impact
Effects on the local economy	Positive impacts	Sustained employment during construction and operation. Short-term growth of the local economy.
	Negative impacts	Dependency on the mine to provide extensive local economic development.
Effects from impacts to the physical environment	Positive impacts	Improvements to local infrastructure.

	Negative impacts	Physical Intrusion impacts. Land acquisition and loss of grazing land.
Effects of Population influx	Negative impacts	Community opposition – arising from unmanaged expectations.
		Increased social pathologies.
		Increased pressure on local services/ resources.

**20.2 Impact on any national estate referred to in Section 3(2) of the National Heritage Resources Act.**

No sites of cultural significance have been identified in or around the mining site.

**21. Other matters required in terms of Sections 24(4)(a) and (b) of the Act**

With reference to Section 24(4)(b)(i), the proposed mining operation would occur on land that is heavily impacted by grazing. The proposed site is therefore transformed from its natural state, does not present any highly environmentally sensitive aspects and is unlikely to have much conservation value. The site has a known resource. Therefore, no alternative site location was considered.

Due to the simplistic nature of the proposed operation, there are also no operational or technological alternatives identified that would be viable.