

**Application for Amendment of
the Approved Environmental
Management Programme in
Respect of the Portion 1 of Farm
Gams 60, Namaqualand,
Northern Cape**

DMR Ref: NC-00085-MR/102

**Basic Assessment
Report and
Environmental
Management Plan**

Gamsberg East & South
Prospecting

On behalf of: Black Mountain Mining



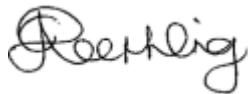
September 2017

Declaration of Consultant Independence

This report has been prepared by EndemicVision Environmental Services (Pty) Limited, with all reasonable skill, care and diligence within the terms of the contract with the client. EndemicVision Environmental Services is a multidisciplinary environmental management and consulting company with more than 20 years of experience in field. The technical appointments for this project are detailed below.

Team Member	Qualifications	Experience	Project Role
Chrizette Neethling Prof Nat Sci #400104/17	MSc BSc Honors BA – EM ND Conservation NC Business Management	Over 20 years of broad based environmental experience with more than 35 projects completed in mining, biodiversity and development industries.	Project Manager and Ecologist
Elsche Cronje	BSc Honors	8 months' experience infield	Environmental Technician
Annalien De Ath	BA Geography and Environmental Management	Two years' experience infield.	Environmental Technician

The author of this report, EndemicVision Environmental Services, does hereby declare that it is an independent consultant and has no business, financial, personal or other interest in the activity, application or appeal in respect of which it was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of the persons performing such work. All opinions expressed in this report are its own.



Signed: **C.D. Neethling**

Dated: **18 September 2017**

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Project Summary

Scope of Environmental Impact Assessment	
This impact assessment identifies and evaluates the actual and potential environmental consequences associated with the proposed activity. Furthermore, the potential for mitigation of negative impacts and enhancement of positive impacts (DEAT, 2014) are described.	
Project Name	Gamsberg East & South Prospecting: Amendment of existing Mining Right
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Applicant Details	Black Mountain Mining (Pty) Ltd CONTACT: Pieter David Venter TEL NO: +27 (0) 54 983 9802 / +27 (0) 82 851 3091 E-MAIL: Pventer@vedantaresources.co.za POSTAL ADDRESS: Private Bag X01, Aggeneys, 8893 PHYSICAL ADDRESS: 1 Penge Road, Aggeneys, 8893
Landowner	Black Mountain Mining (Pty) Ltd
Landowner Details	Black Mountain Mining (Pty) Ltd TEL NO: +27 (0) 54 983 9802 / +27 (0) 82 851 3091 E-MAIL: Pventer@vedantaresources.co.za POSTAL ADDRESS: Private Bag X01, Aggeneys, 8893 PHYSICAL ADDRESS: 1 Penge Road, Aggeneys, 8893
Property reference	Farm Gams No 60 - Portion 1
Surveyor General Property Code	Gams 60, Portion 1: C0530000000006000001
Local Municipality	Khâi-Ma Local Municipality
Magisterial district	Namakwa District Municipality
District Municipality	Namakwa District Municipality
Province	Northern Cape

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List of Abbreviations

AIA	Archaeological Impact Assessment
ABP	Area Based Plans
DAFF	Department of Agriculture, Forestry & Fisheries
DMR	Department of Mineral Resources
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IUCN	International Union of Conservation of Nature
LRAD	Land Redistribution for Agricultural Development
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM-AQA	National Environmental Management Air Quality Act, 2004 (Act No. 39 of 2004)
NEMPAA	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)
NEMBA	The National Environmental Management: Biodiversity Act, 2004 (Act No.10 of 2004)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
PIA	Palaeontological Impact Assessment
PPP	Public Participation Process
SAHRA	South African Heritage Resource Agency
SAHRIS	South African Heritage Resource Information System
SANBI	South African National Biodiversity Institute
SANBIS	South African National Biodiversity Information System



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT and ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (Act No. 107 of 1998) IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (Act No. 28 of 2002) (MPRDA) (AS AMENDED).

NAME OF APPLICANT: Black Mountain Mining (Pty) Ltd

CONTACT PERSON: Pieter David Venter

TEL NO: +27 (0) 54 983 9802 / +27 (0) 82 851 3091

FAX NO: +27 (0) 54 983 9353

POSTAL ADDRESS: Private Bag X01, Aggeneys, 8893

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FILE REFERENCE NUMBER SAMRAD: NC-00085-MR/102

1. Important notice

In terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 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, 1998 (Act No. 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 (EAP) must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

2. Objective of the basic assessment process

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

- (a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- (b) identify the alternatives considered, including the activity, location, and technology alternatives;
- (c) describe the need and desirability of the proposed alternatives;
- (d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:
 - (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to;
and
 - (ii) the degree to which these impacts—
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources; and
 - (cc) can be managed, avoided or mitigated;
- (e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
 - (i) identify and motivate a preferred site, activity and technology alternative;
 - (ii) identify suitable measures to manage, avoid or mitigate identified impacts; and
 - (iii) identify residual risks that need to be managed and monitored.

PART A: SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

3. Contact person and correspondence address

a) Details of EAP

i) Details of the EAP

Name of the Practitioner: EndemicVision Environmental Services (Pty) Ltd
Chrizette Neethling

Tel No.: +27 (0) 53 723 1379

Fax No.: +27 (86) 590 7261

E-mail address: cdn@endemicvision.co.za

ii) Expertise of the EAP

Please refer to the Appendix A for the Curriculum Vitae of Chrizette Neethling

1. The qualifications of the EAP

Please refer to the Appendix A for the Curriculum Vitae of Chrizette Neethling

2. Summary of the EAP's past experience

Please refer to the Appendix A for the Curriculum Vitae of Chrizette Neethling

b) Location of the overall Activity

The following table presents the location and associated cadastral details associated with the proposed project area.

Table 1: Project Locality Details

Farm Name:	Farm Gams No 60 Portion 1
Application area (Ha)	9.8 ha
Magisterial district:	Namaqualand [C053]
Distance and direction from nearest town	The prospecting expansion area of interest is located on BMM property, Portion 1 of Farm Gams 60 within the Khâi-Ma Local Municipality and Namakwa District Municipality, Northern Cape Province. The areas are situated approximately 11 km East from the Aggeneys town.
21-digit Surveyor General Code for each farm portion	Gams 60, Portion 1: C05300000000006000001

c) Locality map

.....
Show nearest town; scale not smaller than 1:250 000

The following figure illustrates the farm associated with the proposed Prospecting Area, as well as the Regional Setting.

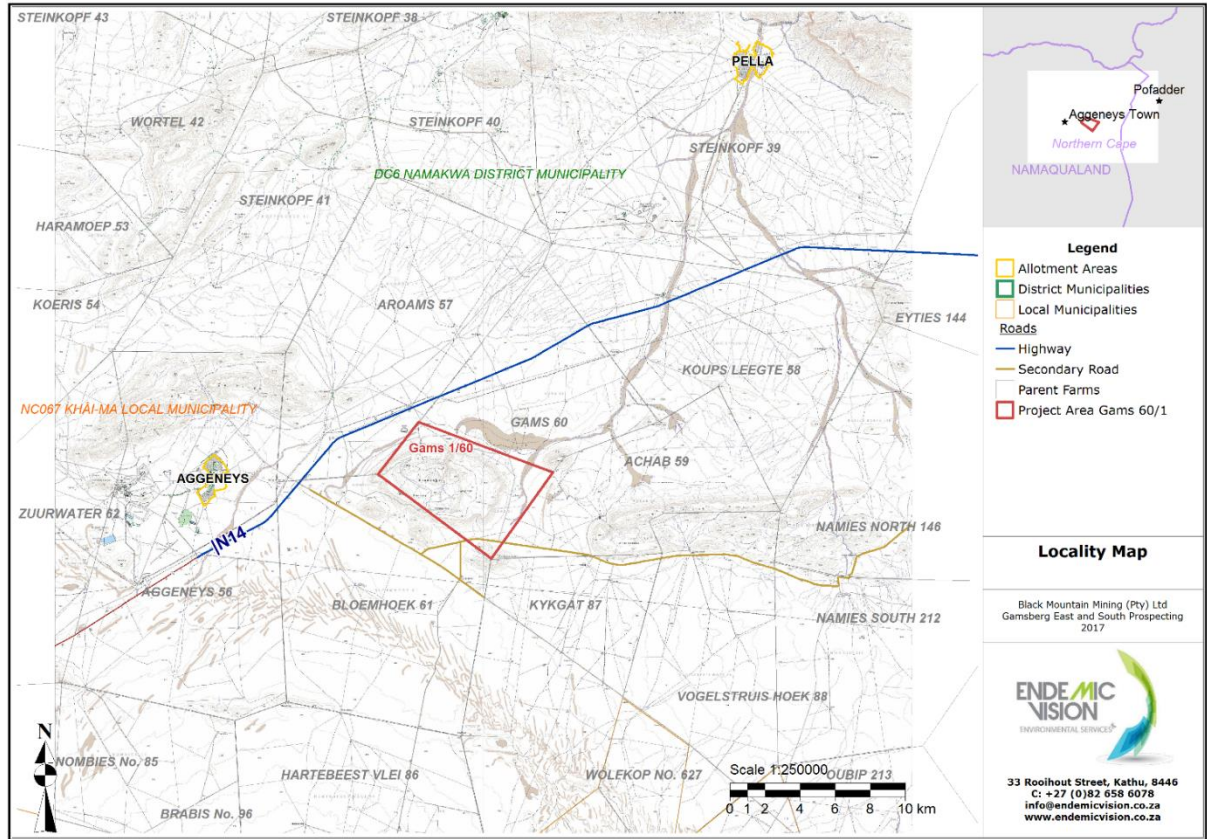


Figure 1: Regional Location of the Prospecting Right Application Area

The prospecting expansion area of interest is located on BMM property, Portion 1 of Farm Gams 60 within the Khâi-Ma Local Municipality and Namakwa District Municipality, Northern Cape Province.

The area is situated approximately 11 km East of the Aggeneys town.

The following figure illustrates the setting of the proposed Prospecting Area within the borders of the Khai-Ma Local Municipality.

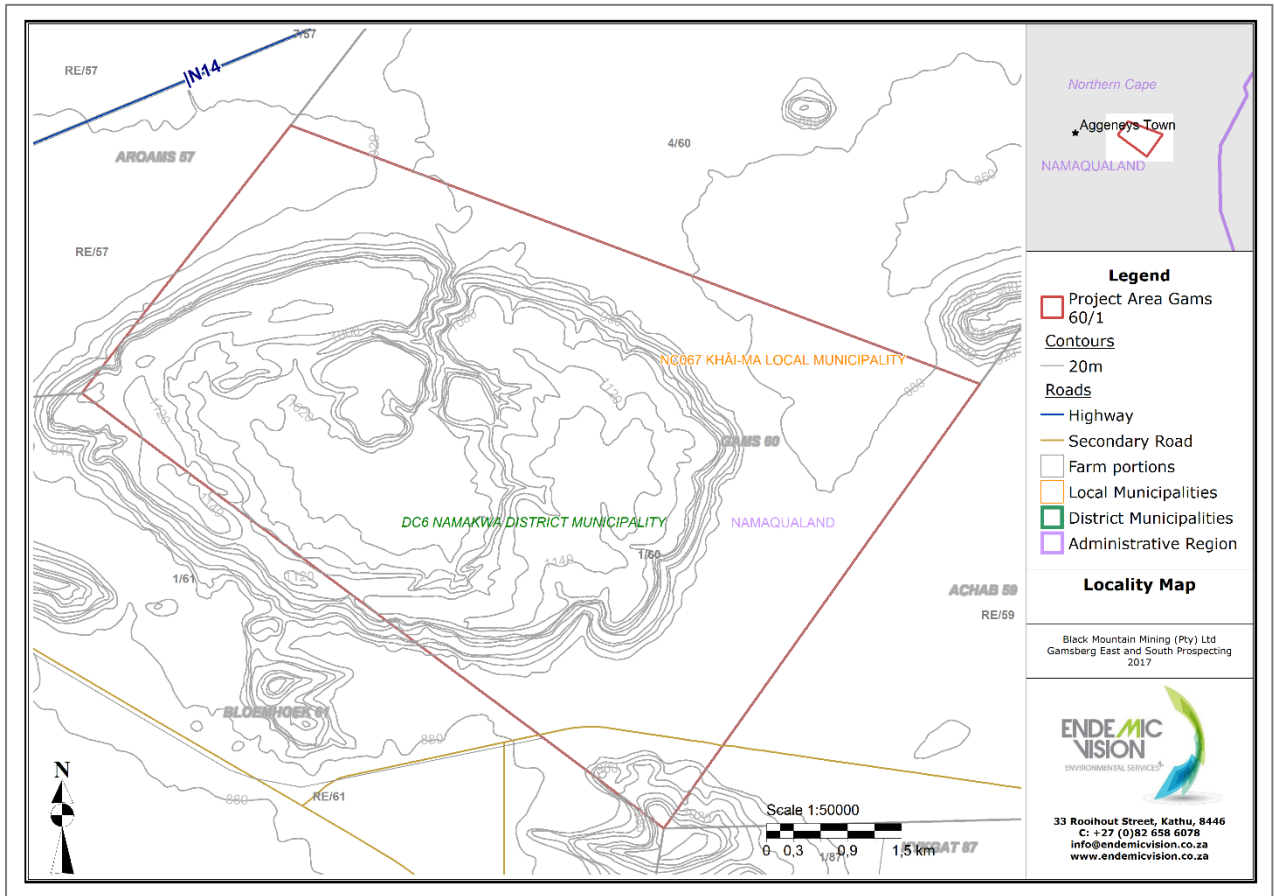


Figure 2: Local Setting of the Prospecting Right Area within the Namaqualand Administrative Region

The scope of the proposed Prospecting area is provided in the table below:

Table 2: Property Scope

Property scope	Gamsberg East & South Prospecting
Total landholding size (Ha)	3 858
Application area (Ha)	9.8
Project footprint as percentage of total landholding	0,25%
Project location description	The prospecting expansion area of interest is located on BMM property, Portion 1 of farm Gams 60 within the Khai-Ma Local Municipality and Namakwa District Municipality, Northern Cape Province. The area is situated approximately 11 km east from Aggeneys.
Distance from nearest town boundary (km)	10.69km east from Aggeneys
Distance from nearest residential settlement (km)	10.69km
Distance from nearest neighbour (km)	1.29km
Project Central Location Coordinates (Decimal Degrees) South	Project Central Location Coordinates (Decimal Degrees) East
29,2473118	18,9884616

Project Corner Coordinates (Decimal Degrees) South	Project Corner Coordinates (Decimal Degrees) East
29,2153591	18,9624986
29,241068	19,0407131
29,2851811	19,0048354
29,2419363	18,9387229

d) Description of the scope of the proposed overall activity

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

The project can be described as the expansion of the exploration prospecting for base minerals on the property of Black Mountain Mine (Farm Gams 60 Portion 1 East and South) which is part of the existing mining right area in order to identify further potential sources of future resources and reserves to ensure sustainability of the BMM projects.

Currently there are two high priority areas where BMM will focus the prospecting activities from 2018 to 2021 which include Gamsberg South and Gamsberg East. The areas are situated approximately 11 km East of the Aggeneys town.

The objective of the prospecting works is to determine the possibility of accessing ore bodies for the purpose of future underground mining. Activities will include the reopening and utilisation of previously existing access tracks / prepared roadways, passing & turning areas and demarcated laydown areas, access or clearance and drilling on drill sites on Gamsberg East and South. Existing old boreholes and access roads will be utilised again and the additional boreholes and access road constructed to complete the drilling program.

The proposed prospecting programme involves both non-invasive and invasive prospecting methods. Initially, prospecting activities will be non-invasive and restricted to a desktop study which will include historical and records and existing data, geophysical surveys, interpretation and modelling of data. Subsequent phases will be of the invasive type, and entails the re-drilling of historical drill sites and drilling of additional boreholes to confirm continuity of mineralisation and potential deposit size.

Standard NQ or HQ size diamond drilling will be used. Down-hole gyroscopic surveys will be done every 50m in each hole to ensure holes intersect the desired targets. The applicant's sampling and logging procedure standards will be applied to mark, log, photograph and sample the core. Percussion Rotary Air Blast (RAB) or Reverse Circulation (RC) drilling may be carried out for pre-collaring of diamond drill boreholes or for sampling if significant depth of cover is encountered over particular targets. Advanced directional and wedge drilling techniques will be applied to drill several holes per site.

The drilling takes place by tracked diamond drill rigs and use existing roads as far as possible. In locations where, historic drill pads and roads are not available, new access roads and drill pads will be constructed. Drill sites are prepared by constructing a gravel single track to access the sites, the construction of a drill site cleared and levelled for this purpose of approximately 10 meters x 10 meters.

Scope of works applied for

Both non-invasive and invasive phases will be implemented to identify further potential sources of future resources and reserves to ensure sustainability of BMM projects. Two main priority areas, Gamsberg East and Gamsberg South, were identified where prospecting activities will be focused. Two additional prospecting areas, Gamsberg North and Gamsberg Far East, will also be investigated. The location, extent and depth of the boreholes to be drilled will be determined by the preceding non-invasive phases. Any change in drill planning resulting from the initial testing will not exceed the scope, provision and impact outlined in this document. The prospecting program will include the use of existing access tracks and boreholes and the construction of new access tracks and boreholes to complete the drilling program. No drill camps will be constructed for this project. Life of project is anticipated to be 3 years with a total footprint of 9.8 ha (hectares).

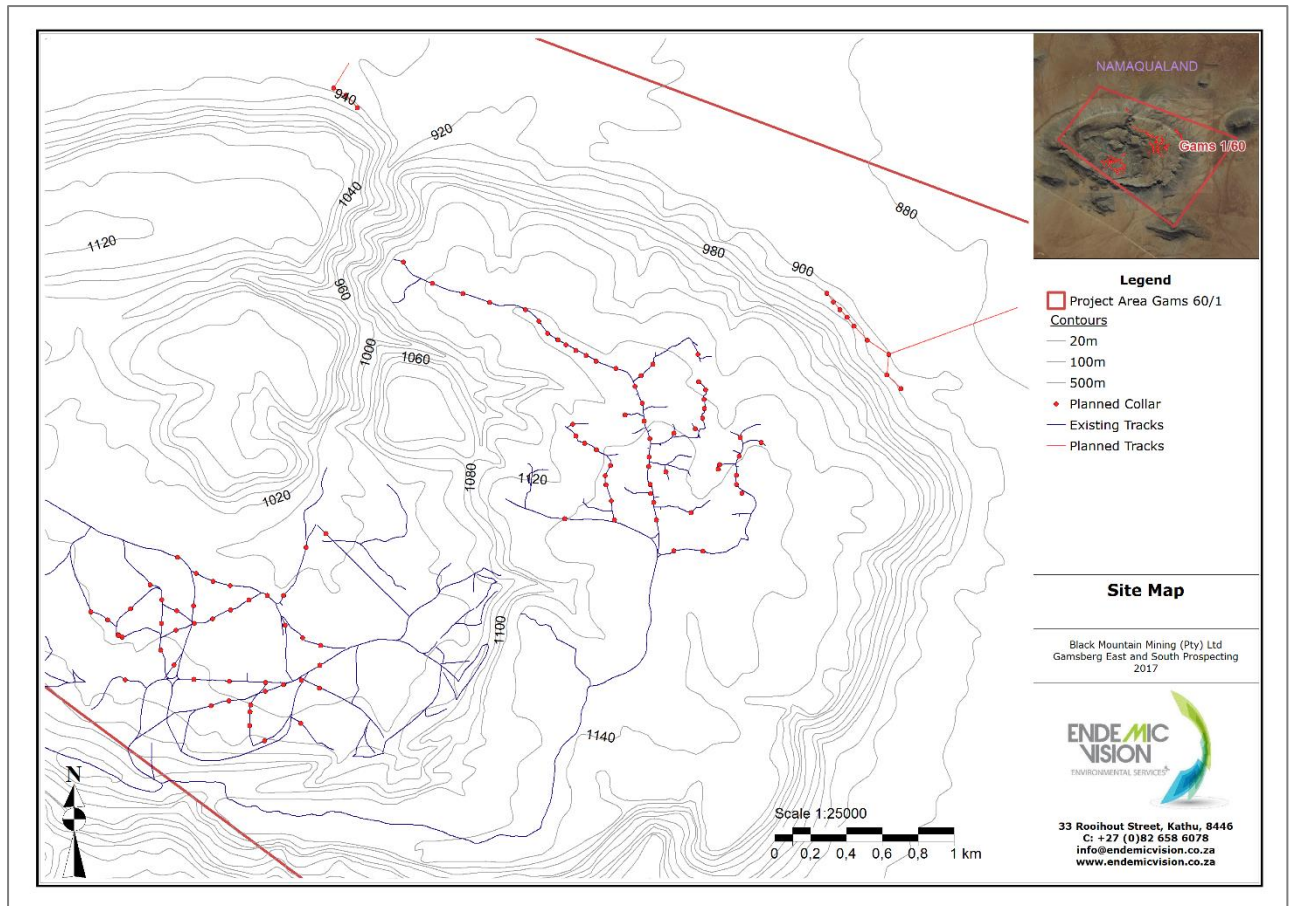


Figure 3: Final Site Layout Plan

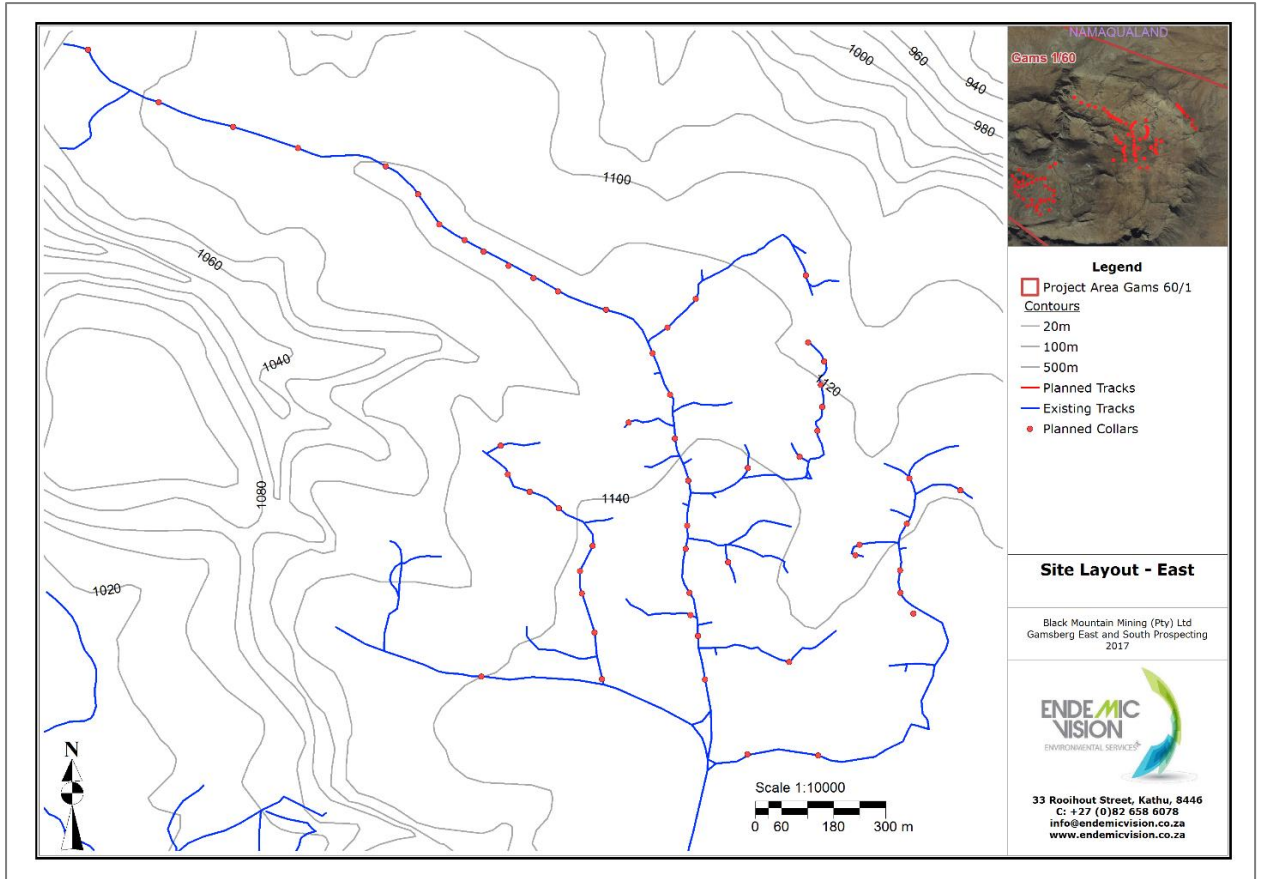


Figure 4: Final Site Layout on the East side

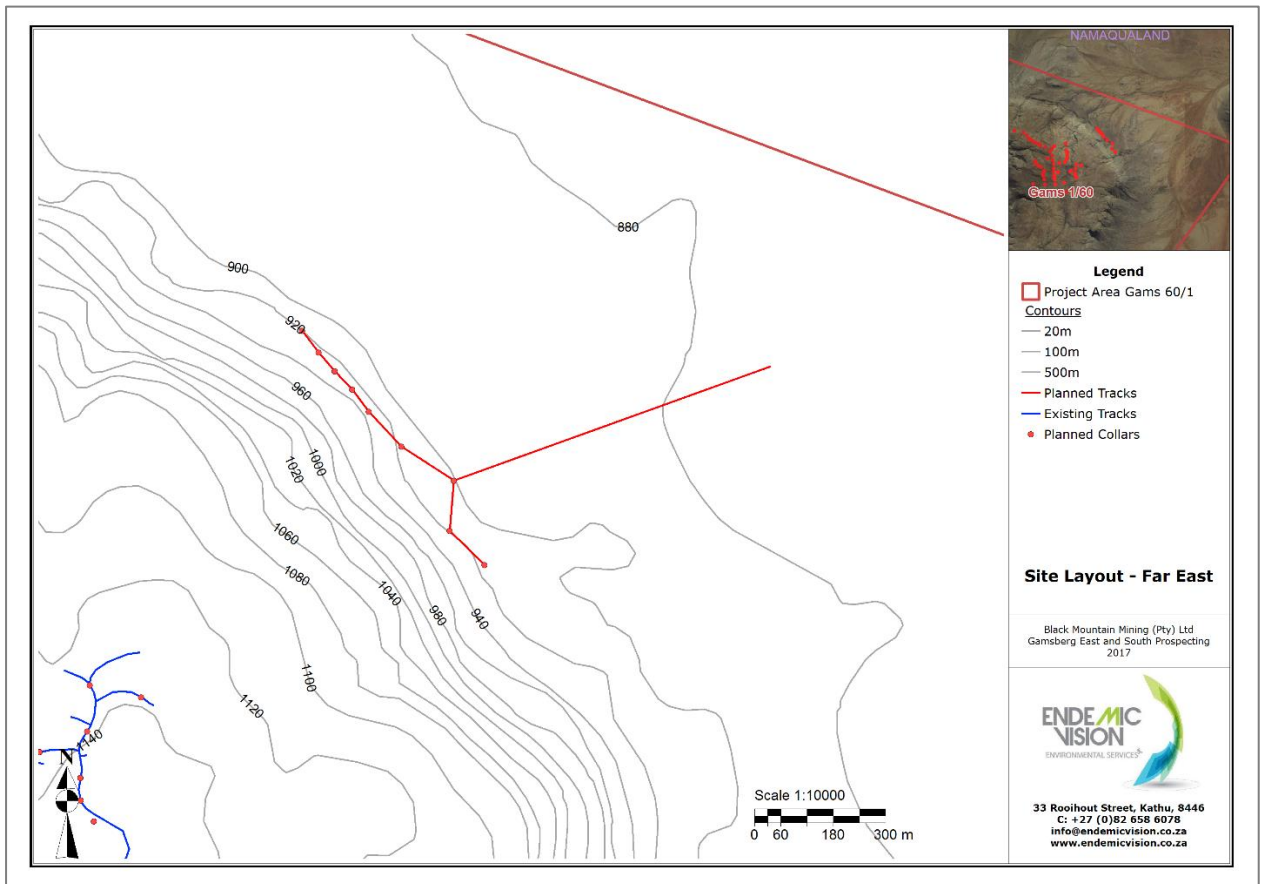


Figure 5: Final Site Layout on the Far East side

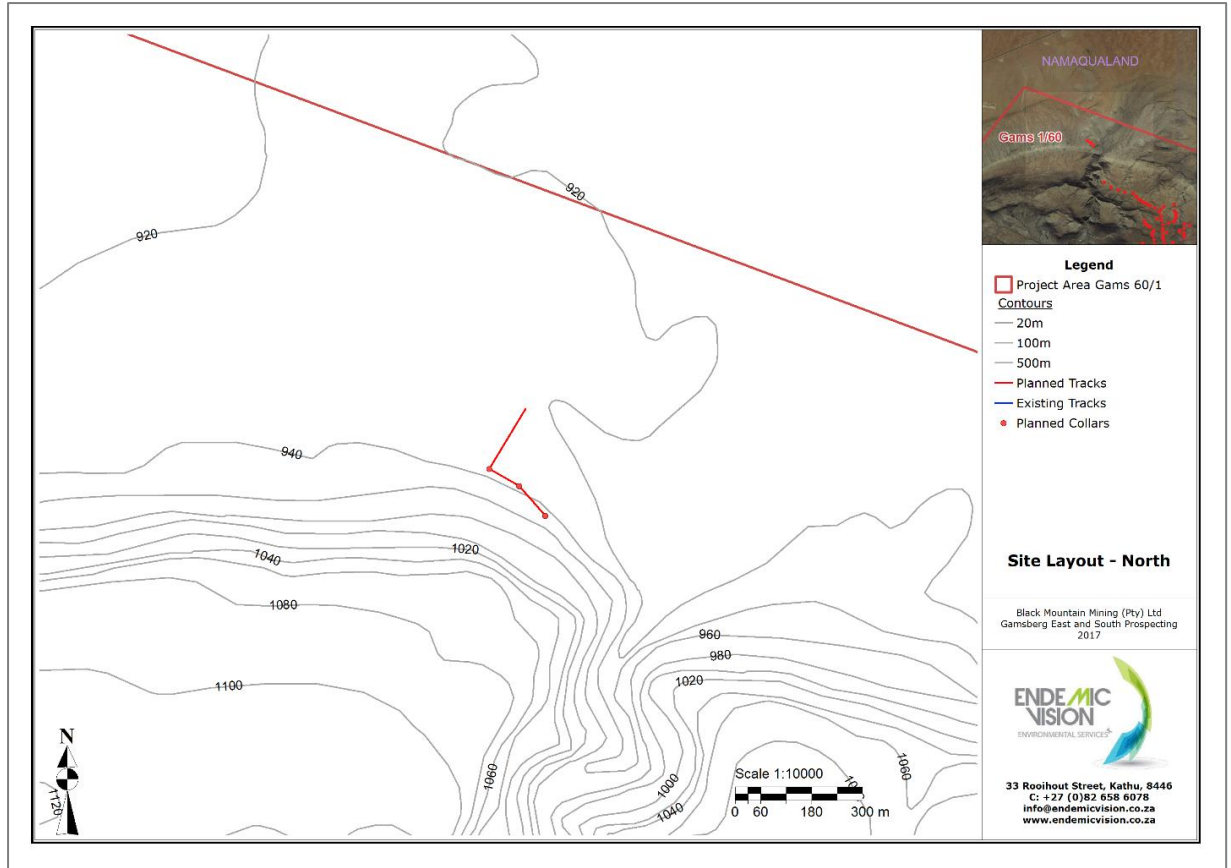


Figure 6: Final Site Layout on the North side

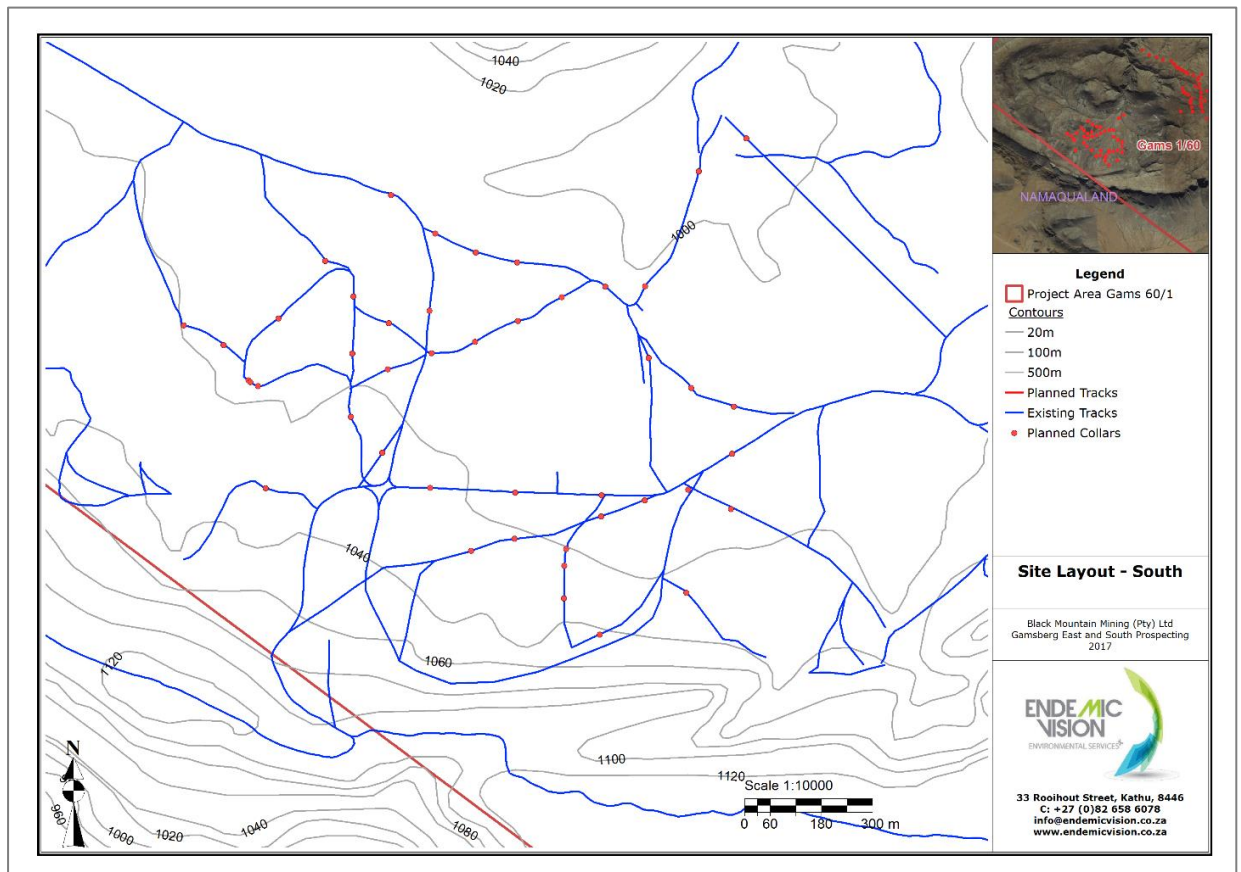


Figure 7: Final Site Layout on the South side

Table 3: Final Footprint of Development Activities

Access tracks totals				
Target Area	Infrastructure type	Width	Length (m)	Area (m ²)
Gamsberg East	Existing Access Tracks	4	7000	28000
Gamsberg South	Existing Access Tracks	4	8000	32000
Other (prospecting)	New Access Tracks	4	5000	20000
			20000	80000

Drill pad totals (includes contingency)				
Target Area	Infrastructure type	Area (m ²) per site	Planned number of drill sites (including contingency)	Total Area (m ²)
Gamsberg East	Drill Pad	100	100	10000
Gamsberg South	Drill Pad	100	50	5000
Other (prospecting)	Drill Pad	100	30	3000
			180	18000
			Total Footprint Area	98000

Drilling totals (actually planned)		
Target Area	Actual Meters planned	Actual No. Planned BH's
Gamsberg East	114000	71
Gamsberg South	54000	50
Other (prospecting)	50000	27
	218000	148

Table 4: Activity Schedule

Access tracks by work phase			
	Phase 1 / Year 1	Phase 2 / Year 2	Phase 3 / Year 3
Reinstating Existing Tracks (Length)	5000m	5000m	5000m
New Track (Length)	2500m	1000m	1500m

Gamsberg total drilling by work phase (includes contingency)			
	Phase 1 / Year 1	Phase 2 / Year 2	Phase 3 / Year 3
Drill pads	60	60	60
Meters of drilling	75000	75000	75000

Table 5: Final Scope of Works

Gamsberg total drilling per area				
Area	Existing	New	In existing road footprint	Total
Gamsberg East Main	30	0	41	71
Gamsberg East Prospecting	0	0	15	15
Gamsberg Far East Prospecting	0	9	0	9
Gamsberg North Prospecting	0	3	0	3
Gamsberg South Main	4	0	46	50
Total	34	12	102	148

A summary of the development scope is provided in the table below:

Table 6: Development Scope of the Project

Development scope	
Development objective	Expansion of the exploration prospecting for base minerals (zinc and lead) on the property of Black Mountain Complex as part of the existing mining right.
Type of impact (industry)	Prospecting
Mineral Type	Zinc and lead ore
Impact Description	The proposed prospecting programme involves both non-invasive and invasive prospecting methods. Initially, prospecting activities will be non-invasive and restricted to a desktop study which will include a literature survey, aerial photograph and satellite image interpretation, ground validation of targets, geophysical surveys, interpretation and modelling of data. Subsequent phases will be of the invasive type, and entails the re-drilling of historical drill sites and drilling of additional boreholes to confirm continuity of mineralisation and potential deposit size.
Impact Period	2018 - 2021
Total impact footprint	9.8 ha
Existing infrastructure	Historical drill sites, access roads and laydown areas.
Planned infrastructure	Access Roads: Existing single-track gravel roads transecting the mine area will be used as far as possible. Where roads do not exist, a single-track road will be planned. Drill sites: Cleared and demarcated area for drilling.
Affected Vegetation Types	SKr 18 - Bushmanland Inselberg Shrubland SKr 19 - Aggeneys Gravel Vygieveld Washes
Affected Water Resources	Non-perennial rivers
Affected Sensitive Habitats	Biodiversity no-go zone
Affected Heritage Resources	No-go areas (SG1, SG4 and SG7)
Main Activities and Infrastructure	
1	Construction of Roads
2	Non-invasive Prospecting
3	Invasive Prospecting: Drilling
4	Rehabilitation
Project Life Cycle Phases Applicable	
1	Plan & Design
2	Site Clearance
3	Operational
4	Closure

The scope of the properties and zone of influence of the project is limited to the property as held by Black Mountain Mine Pty (Ltd). The property scope in this regard is detailed below:

Figure 8: Project overview - zone of influence

Project Overview - Zone of Influence	
Formal land use zonation	Mining
Current land use	Mining
Existing Land Users	Black Mountain Mining (Pty) Ltd / Vedanta Plc
Adjacent land users	Farm Gams 60, Portion 4: Black Mountain Mine Farm Achab 59: Black Mountain Mine Farm Bloemhoek 61, Remaining extend: Albertus Roux Farm Kykgat 87, Portion 1: Tertius Visser Farm Bloemhoek 61, Portion 1: Black Mountain Mine Farm Aroams 57, Remaining extend: Black Mountain Mine
Main stakeholder groups	Adjacent landowners Local and District Municipalities Authorities: DWS, DENC, SAHRA, Land Affairs, DMR
Main organised forums	Farmers Union Succulent Society of South Africa (SSSA) Succulent Karoo Ecosystem Programme (SKEP)
Significant receptors	Aggeneys community & adjacent landowners
Main Government commenting authorities	
1	Department of Environmental Affairs
2	Department of Water Affairs
3	Department of Land Affairs
Authorising and competent authorities	
1	Department of Mineral Resources
2	South African Heritage Resources Association

(i) Listed and specified activities

Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) requires, upon request by the Minister that an Environmental Management Plan be submitted and that the applicant must notify and consult with Interested and Affected Parties (I&APs). Section 24 of the NEMA requires that activities, which may impact on the environment, must obtain an environmental authorisation from a relevant authority before commencing with the activities. Such activities are listed under Regulations Listing Notice 1 Government Notice (GN) 327 and Listing Notice 3 GN 324 (2017) of NEMA. The activities (listed and not listed) that require environmental authorisation in terms of the EIA Regulations of April 2017 are indicated in the table below.

Table 7: Applicable Listed Activities for the Project

Listed Activities	
Applicable Listing Notice	Activity referenced in listing notice
NEMA LISTING NOTICE 01 (GNR983)	<p>20. Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including—</p> <p>(a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or</p> <p>(b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing;</p> <p>but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies.</p>
NEMA LISTING NOTICE 01 (GNR983)	<p>22. The decommissioning of any activity requiring –</p> <p>(i) a closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002); or</p> <p>(ii) a prospecting right, mining right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years excluding where the competent authority has in writing agreed that such reduction in throughput does not constitute closure.</p> <p>but excluding the decommissioning of an activity relating to the secondary processing of a –</p> <p>(a) mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource; or</p> <p>(b) petroleum resource, including the refining of gas, beneficiation, oil or petroleum products; –</p> <p>in which case activity 31 in this Notice applies.</p>

<p>NEMA LISTING NOTICE 01 (GNR983)</p>	<p>27. The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-</p> <p>(i) the undertaking of a linear activity; or</p> <p>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p>
<p>NEMA LISTING NOTICE 03 (GNR985)</p>	<p>12. The clearance of an area of 300 square meters or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p>g. Northern Cape-</p> <p>(i) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</p> <p>(ii) Within critical biodiversity areas identified in bioregional plans;</p> <p>(iii) Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or</p> <p>(iv) On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.</p>

(ii) Description of the activities to be undertaken

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

The following section presents a detailed description of all the activities associated with the proposed Prospecting Application. The application is for a prospecting right for zinc and lead. It is planned to determine the mineral resource and distribution for this project by means of non-invasive as well as invasive prospecting methods.

The non-intrusive phase is expected to cover the whole area while drilling will take place according to the different prospecting areas and phases as outlined below. Timeline for exploration is a projection and completely dependent on zinc prices and budget availability for exploration activities.

Table 8: Project Activities and life cycle

<p>The following activities according to the project cycle is applicable to this application</p>	
<p>Non-invasive Prospecting</p>	<p>Initially, prospecting activities will be non-invasive and restricted to a desktop study which will include a literature survey, plus aerial photograph and satellite image interpretation, ground validation of targets, geophysical surveys, interpretation and modelling of data.</p>

Clearing Indigenous Vegetation	Concurrent search and rescue transplantation of protected species will take place.
Construction of Roads	Vehicles will use existing gravel roads transecting the mine as far as possible. Where roads do not exist, 4-meter-wide single-track gravel road with T turning points and in identified areas widening for vehicles to pass will be brush cut.
Clearing Soils	Topsoil will be cleared and stock piled for rehabilitation for the drill sites before invasive prospecting phases takes place.
Invasive Prospecting: Drilling	Subsequent phases will be of the invasive type, and entails the drilling of boreholes to confirm continuity of mineralisation and potential deposit size. It is not possible to give details of the drilling program (specific locations of drill holes) before the surveys and surface work phase 1 is completed. The location of the drill sites will be GPS located and pegged. These sites are inspected and photographed prior to any disturbance.
Resource Use: water	At its peak the prospecting programme could require up to 100 000 litres of water per day. Water supply will be from the Pella water drift Orange River pump station to Gams mountain and then delivered to the drill site via JoJo tank and pipes or watercarts. The Pella water borehole has a valid water use licence and limits will not be exceeded.
Generation of hydrocarbon spills	Strong control will be exercised over oil usage. Impervious sheeting (plastic lining) will be laid underneath the rig to catch any spills and the contaminated soil removed to an authorised disposal site. The excavation of a sump will not be required. A 3m ³ drill sludge containment and water recycling unit will be used. A diesel bowser will be used for rig refuelling. Spillage will be prevented as far as possible and cleaned up in the event that it occurs. Vehicle maintenance will occur off-site. Commercial oil spill kits will be kept at each site to be used in the event of any spillages.
Generation of Dust	The main source of air pollution in the area is dust generated on access roads.
Disturbance: Noise	Noise produced by current operations is limited to noise emanating from the mining activities and traffic noise. The effect of this industrial noise on any dwelling place in the region, is negligible.
Rehabilitation	Decommissioning will take place concurrently, as each drill site is closed. Concurrent rehabilitation will take place with direct transplantation of plant specimens to already impacted areas.
Monitoring	It is proposed that aerial photos (drone footage) at 5, 10 and 15 meters above the drill site be taken as fixed photo monitoring before, during and after rehabilitation. Three years of post-rehabilitation monitoring is required before final sign off can be considered.

e) Policy and Legislative Context

The applicable policy and legislation context are indicated in the table below.

Table 9: Policy and Legislative Context

Policy & Legislative Context		
Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the legislation and policy context
Minerals and Petroleum Resources Development Act, 2002	Application for amendment of section 102 mining right	Amendment application has been submitted to the DMR by the Applicant. The application was accepted by the DMR and draft BAR compiled for submission and approval.
National Environmental Management Act, 1998 and relevant EIA Regulations (2017)	The Basic Assessment Report and Environmental Management Programme for Environmental authorizations in terms of the National Environmental Management Act, 1998 in respect of listed activities that have been triggered by applications in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002, as amended) (MPRDA)	An Application for Environmental Authorisation was submitted to the DMR. The application was accepted by the DMR and requested the submission of the Basic BAR and EMP within 90 days of the letter. The Basic Assessment Report, Environmental Management Programme and the Stakeholder Consultation Process has been conducted with consideration of the EIA regulations.
National Water Act, 1998 (Act No. 36 of 1998)	Groundwater abstraction as part of drilling activities	Black Mountain Mine has an existing water use license. Licence number 14/D82C/ABCGIJ/2654 issued on 2016/04/14 Water extraction will be limited to between 1000 and 10 000 ℓ per day. The water must not exceed the general authorisation volume for the area.
National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)	Presence of nationally protected trees and other flora	The EMP will regulate the applicant to apply for Tree Removal Permit from the DAFF and a Flora Permit from DENC prior to the potential removal of any sensitive and/or protected species.
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	The activity may trigger the requirements under Section 38 of the NHRA. However, the requirements for permits are not known at this stage.	The South African Heritage Resources Agency (SAHRA) was contacted as part of the stakeholder engagement process.

f) Need and desirability of the proposed activities

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

The need for the project is primarily to secure an extension of the Black Mountain Complex life of mine and to ensure that all possible mineral resources in the area has been sourced and utilized.

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

The proposed prospecting area is targeted due to existing and historical mining activities that are known from within the Gamsberg inselberg and it is anticipated that similar conditions will prevail for this project.

The need for the project is primarily to secure an extension of the Black Mountain Complex life of mine and to ensure that all possible mineral resources in the area has been sourced and utilized.

The aim for the project is to ensure the long-term viability of the company. The economic desirability of whether or not this is the most suitable area for prospecting can only be confirmed after initial non-intrusive geological surveys. No alternative other than drilling is possible to determine the presence and quality of the specific minerals in the area.

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

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

No alternatives were raised by interested and/or affected parties. The evaluation of alternatives evaluated for the project are detailed below.

i. Details of the development footprint alternatives considered

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

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

Table 10: Alternatives considered

Evaluation Criteria	sumps	drill pads	roads	laydown areas	water supply
Description of infrastructure	Drill sludge containment and water recycling unit (3m ³)	100m ² level area	4-meter-wide single-track gravel road not bulldozed with T turning points and in	Existing previously impacted areas	Supply from Pella water drift orange river pump station to Gamsberg

			identified areas widening for vehicles to pass		then delivered via JoJo tank and pipes or watercarts
(a) the property on which, or location where, it is proposed to undertake the activity;	n/a	Alternative locations considered: Old drill sites will be used wherever possible	Use of existing roads and creating new roads. 90% of all roads will be existing roads	Use of existing previously impacted areas and creating new laydown areas. 90% of all laydown areas will be existing impacted areas.	Use of existing roads instead of creating new roads.
(b) the type of activity to be undertaken;	n/a	n/a	Driving or flying. Flying is not financially feasible.	n/a	n/a
(c) the design or layout of the activity;	Excavated sumps vs above ground sumps. Above ground sumps will be used. Concurrent sludge drying and removal, wet sludge immediate removal or sludge left till rehab. Concurrent sludge removal will be used	Multiple boreholes per drill pad vs single borehole per drill pad. Multiple fan drills from one drill pad will be used.	Instead of building roads as the crow flies to the drill sites roads are constructed to avoid sensitive biodiversity areas	n/a	n/a
(d) the technology to be used in the activity;	Hydrocarbon management. Environmental friendly solvents used.	Tracked drill rigs instead of trackless drill rigs. New technology drill rigs (smaller) instead of standard drill rigs (larger). Utilization of advanced directional and wedge drilling techniques to drill several holes per site instead of moving the rig slightly off the previous hole.	Brush cutting and driving single track instead of bulldozing tracks.	Standard acceptable technology will be used.	Standard acceptable technology will be used.

		SQUID geophysics for more focused drilling.			
(e) the operational aspects of the activity; and	Concurrent removal of sludge instead of removal post drilling.	Drilling and concurrent rehab instead of drilling and post drilling rehab. Night and day drilling instead of just day drilling to minimise amount of equipment and people on site at any given time	Standard acceptable operating procedures will be applied.	Standard acceptable operating procedures will be applied.	Standard acceptable operating procedures will be applied.
(f) The option of not implementing the activity	The no-go options applicable is the no-go biodiversity and heritage areas for any new roads or drill sites. Any new drill sites are considered no go unless a biodiversity offset is considered.				

ii. Details of the Public Participation Process Followed

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

The diagram below sets out the approach for the engagement process for the proposed project. The detailed stakeholder engagement report is attached as Appendix E of this report.

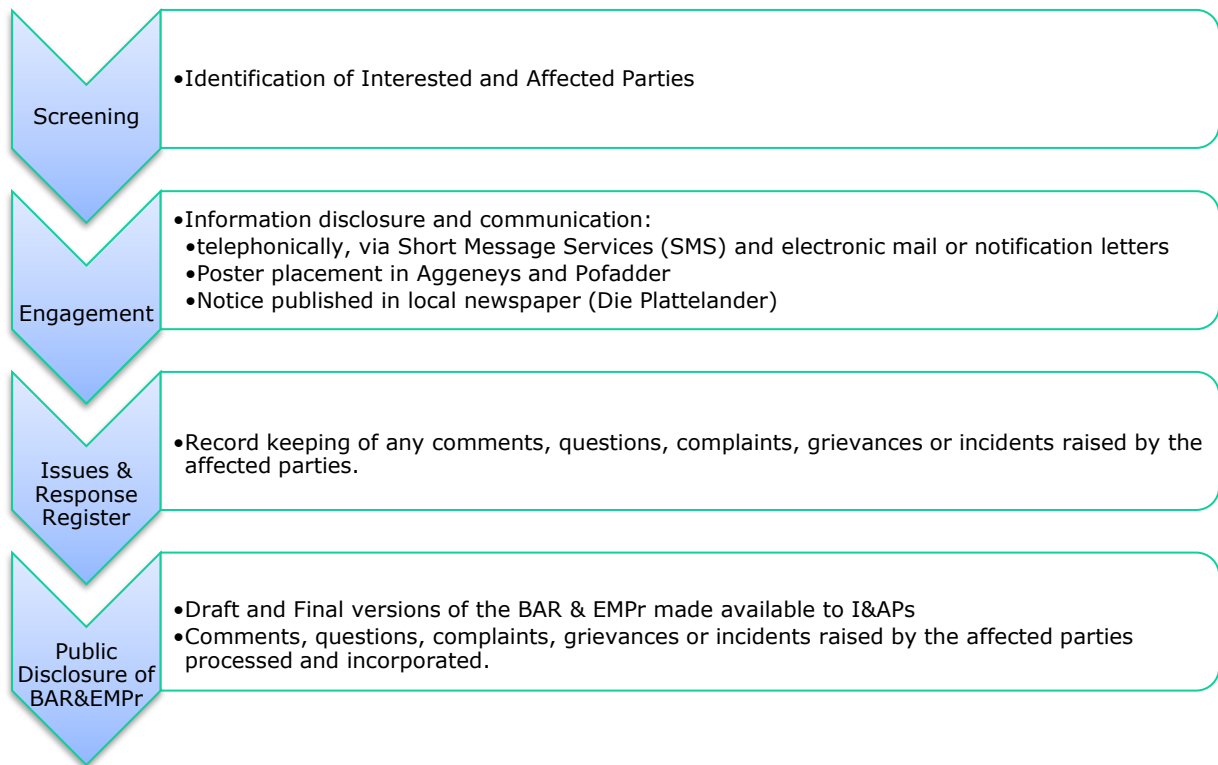


Figure 9: Public Participation Approach

iii. Summary of issues raised by I&As

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

Comments and issues received from Interested and Affected Parties are provided in the table below.
 This far no issues have been raised by interested and Affected Parties.

Table 11: Issues Raised by Stakeholders

Interested and Affected Parties	Consulted	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status
Birdlife South Africa	22/08/2017	21/08/2017	Request for Background Information and draft reports	Background Information Document and process sent	Continuous as project develops
Tania Anderson	22/08/2017	21/08/2017	Threatened plant species loss and biodiversity loss. Should prospecting lead to mining, the loss of biodiversity in the region will impact on the socio-economic conditions of the next generation. Information about the Biodiversity offset agreement for Gamsberg and whether it has been implemented yet.	Concerns addressed and process explained.	Continuous as project develops
Endangered Wildlife Trust	09/10/2017	09/10/2017	Request to be registered as an interested or affected party	Background Information Document and process sent	Continuous as project develops

1. Baseline Environment

a) Type of environment affected by the proposed activity

.....
Its current geographical, physical, biological, socio-economic, and cultural character
.....

Regional Context

Climatic Context

The Gamsberg study area falls within the NW region of Bushmanland. This area is marginal to the winter and summer rainfall zones in the NW Cape Province. Namaqualand to the west is a winter rainfall area where Gordonia to the east is a summer rainfall area. Gamsberg gets more rain in the summer months but gets very little rainfall overall, resulting in desert condition. Extended droughts are common in the area. Some parts of Bushmanland did not have any rain for a period of 10 years. Rainfall data are collected in Pofadder, approximately 60 km East of Gamsberg, which receives more summer rain and thunderstorms. The average rainfall from 1933 to 1984 was 105 mm with 278 mm being the highest recorded for one year. Moisture from cold fronts in the winter is captured on the southern side of the inselberg.

The temperatures in the Gamsberg area range between -2°C and 45°C, with the mean maximum temperature being 31.4°C in the summer and 17.6°C in the winter and the mean minimum temperature being 20.2°C in the summer and 10.8°C in the winter.

In the summer months, the prevailing wind direction is southerly and in the winter the direction is northerly. A north-westerly wind direction, which precedes rain in the summer months, is least common in the area. Wind velocities of up to 110 km/hr have been recorded (Gamsberg Zinc Project EIA & EMP Amendment, 2008).

Topography and Geology

Gamsberg is an oval shaped inselberg about 5km wide and 7km long. Its elevation is approximately 220m above ground level and 1150m above mean sea level. The basin in the interior is about 65 m below the rim and drains through a ravine on the eastern side.

Incompetent schists and amphibolites of the Nouses mafic gneiss formation occur on the floor of the basin which Pella Quartzites form the vertical cliffs, flat top and exterior sides of the inselberg. The mineralized layer which hosts sulphides of iron, zinc and lead with a diagnostic capping of gossan striking along a length of 5.3 km along the inner periphery of the basin are contained by the B member of the Gams formation.

Soils, Land Capability and Land Use

The soils of the inselberg are mainly shallow and stony and of the Mispah soil form on the top and slopes of the Mispah, Augrabies and Plooyberg soil forms in the basin. The land capability is indicated as "wilderness" due to the shallow soil and rock in the area according to the Chamber of Mines guidelines. This area has not been used for agriculture and is rather left wild due to the hostile topography.

Vegetation Context

The project falls within the Nama Karoo Biome which is a large, landlocked region within the central plateau of the western half of South Africa, extending into south-eastern Namibia.

The Nama Karoo Biome predominately consists of extensive plains dominated by dwarf shrubs mixed with grasses, succulents, geophytes and annual forbs. Due to unpredictable rainfall seasonality and frequency and low winter temperatures, leaf succulents are not able to dominate the area. Dominance of perennial grasses are prevented by very dry summer months and dominance of trees are prevented by shallow soils in the area.

The project area falls within SKr 18 Bushmanland Inselberg Shrubland, SKr 19 Aggeney's Gravel Vygiveld and washes (Appendix D3). The Bushmanland lies between the Orange River in the north, Namaqualand in the west, Loeriesfontein in

the south and Van Wyksvlei, Verneukpan and the Hartbees River in the east. It is dominated by a sea of sandy plains out of which rise steep, quartzite-capped hills. These ancient, rocky outcrops are known as inselbergs.

On the gravel plains and within the grasslands there are gravel patches with unique micro flora, including species such as *Lithops Conophytum*, *Titanopsis*, *Lapidaria*, *Dinteranthus* and *Avonia*. But it is the flat-topped inselbergs that are covered by a particularly rich variety of succulents and geophytes. The isolation of populations has led to species diversification within the dwarf succulent shrub lands. The inselbergs are thus important refuge for plants and animals and act as stepping-stones for rock loving species migrating east - west across the sand covered plains of Bushmanland.

Succulents (*Aizoaceae*, *Asphodelaceae*, *Crassulaceae*, *Didiereaceae*, *Euphorbiaceae* and *Zygophyllaceae*), nonsucculents (mainly *Asteraceae*) and sparse grassy undergrowth (*Aristida*, *Eragrostis* and *Stipagrostis*) are found on the steep slopes of the inselbergs.

More detailed mapping was undertaken by Desmet (Appendix D3) of fine-grained quartz-patch habitat in result of the proposed exploration which appears to be linked to the presence of a geological anomaly within the quartzite bedrock rock indicating a possible contact zone manifested in a higher degree of fracturing in the parent material. This anomaly resulted in the high density of small quartz pebbles that defines the habitat.

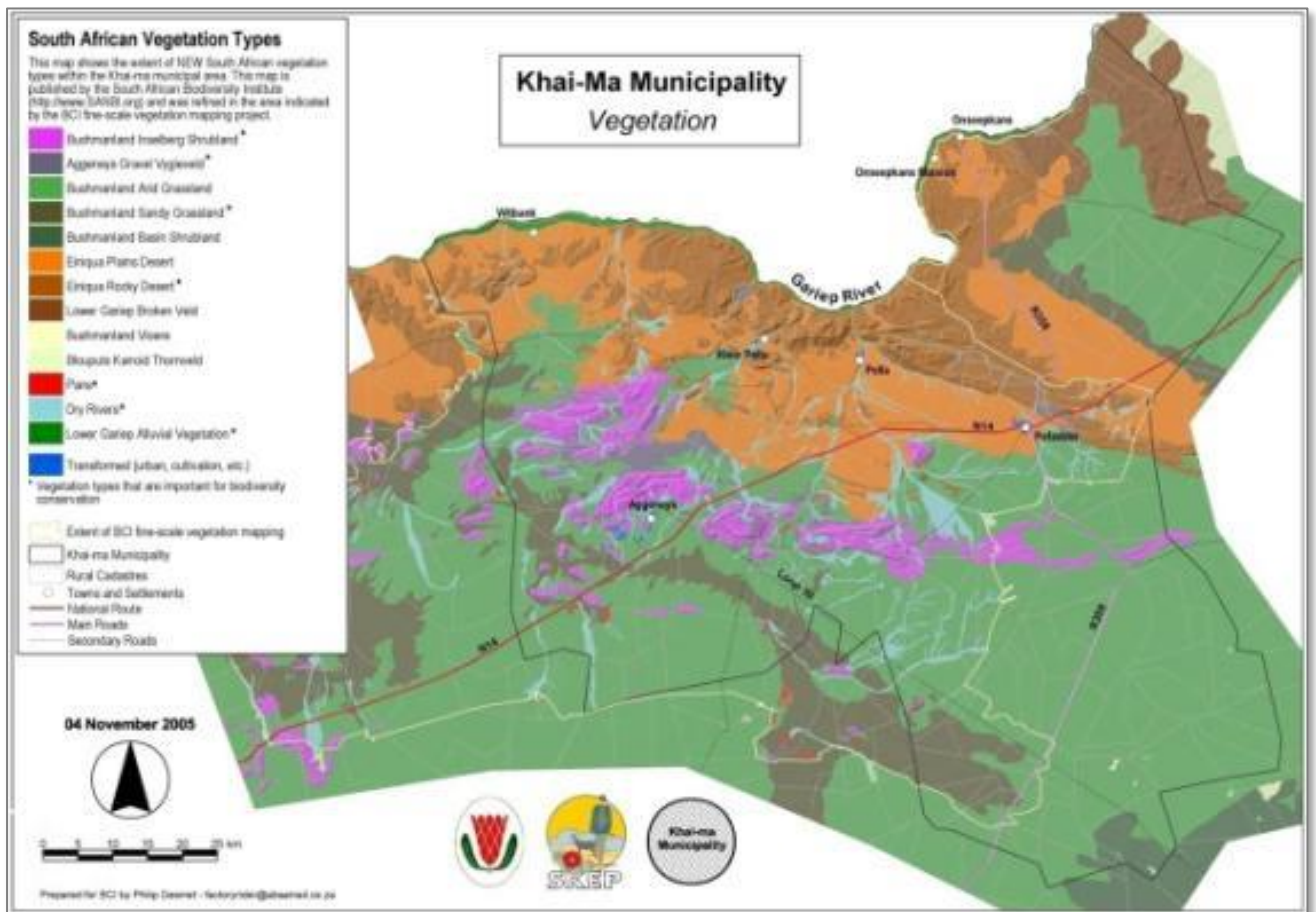


Figure 10: Vegetation: Topographical Map in municipal context

The study area is in a unique position as a considerable amount of botanical work has previously been done in the study area and regionally. The previous EIA and the Bushmanland Conservation Initiative (BCI) generated amongst other products that are available to this project (Referenced in Appendix D3):

- A regional context study quantifying the floristic relationships in the region (Desmet, 2000);
- Regions of Floristic Endemism in Southern Africa (van Wyk, A. and Smith, G. 2001);

- The succulents of Northern Bushmanland: their distribution and implications for conservation (Desmet 2000);
- A fine-scale vegetation map of the whole Bushmanland Inselberg Region(BIR) mapping habitat features found on the Gamsberg at a regional scale (Desmet *et al.*, 2005)
- Floral specialist study (Desmet, 2010).

Site specific Context

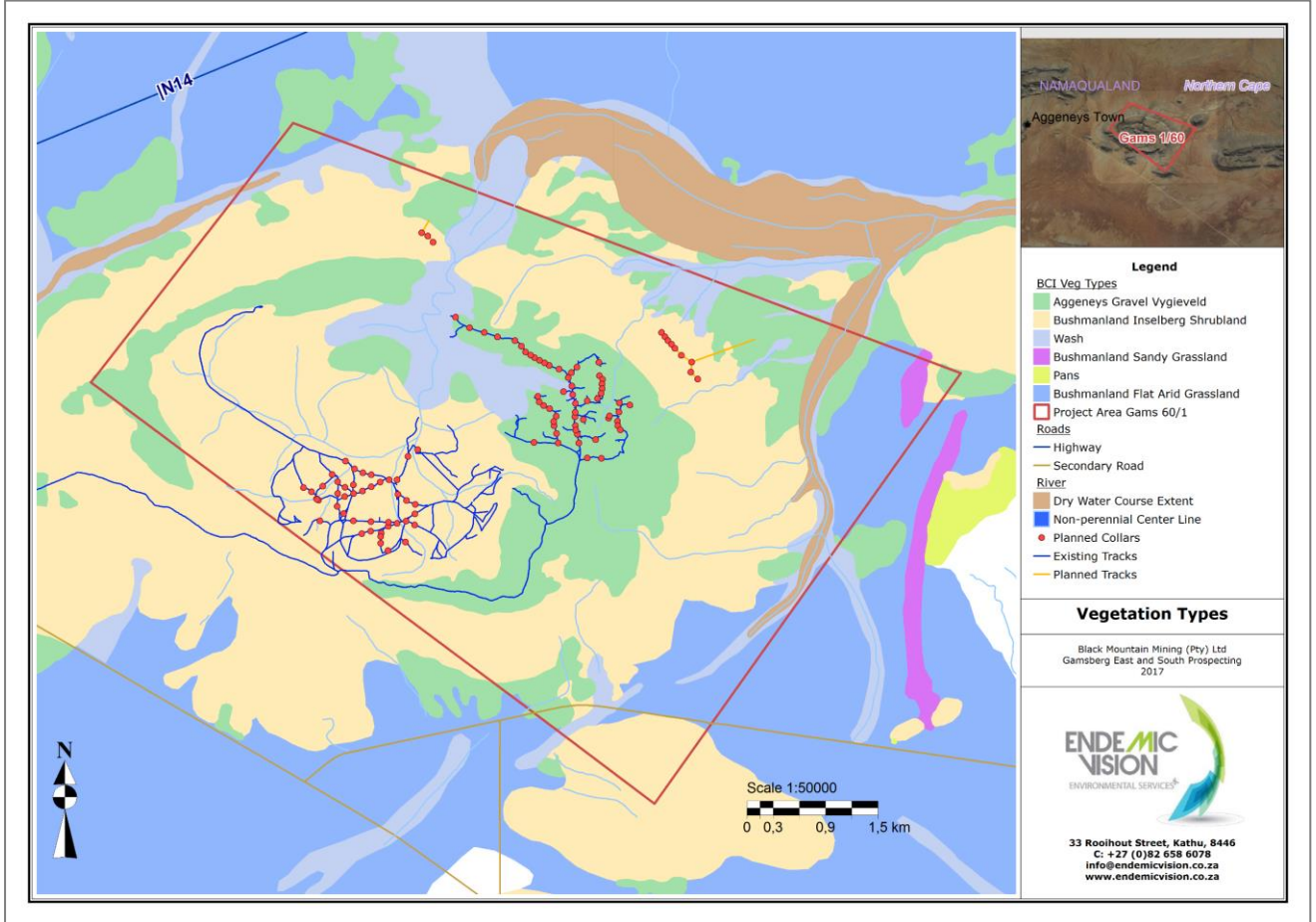


Figure 11: Fine Scale Biodiversity Areas Map for Gamsberg (BCI)



Figure 12: Avonia papyracea found in the project area



Figure 13: *Aloidendron dichotoma* stands in good condition - Gamsberg South project area

Fauna Context

Gamsberg does not support a unique reptile or mammalian fauna. A unique ecosystem is however supported by the drainage through the ravine. The Rubber Frog (*Phrynomantis annectens*), Springbok Stream Frog (*Strongylopus springbokensis*) and Paradise Toad (*Bufo robinsoni*) requires spatial protection. Threatened raptor species may also nest on the mountain which will result in these sites to also be protected. Threatened raptor species include the Martial Eagle (*Polemaetus bellicosus*) and Lanner Falcon (*Falco biarmicus*)

Hydrology

The depths of groundwater range from 100m below surface on the inselberg to 60m below surface on the plains. This results in the flow being towards the plains since the inselberg has a higher water table than the surrounding plains. A number of springs are found at the base of the inselberg. The groundwater is a sodium chloride type with high levels of Fluoride F. The water from the springs are only used by the wildlife in the area.

The rainfall patterns, driving the hydrological cycles, indicate a relatively low rainfall of between 100mm and 200mm per year. The rainfall events are erratic and annual rainfall seldom results in river systems flowing. Extreme rain events or a good rainfall year with sufficient follow-up rain could result in the Aggeneys berge catchment flowing out towards the lower lying plains.

Freshwater and wetland information was extracted from the National Freshwater Ecosystem Priority Areas assessment, NFEPA.

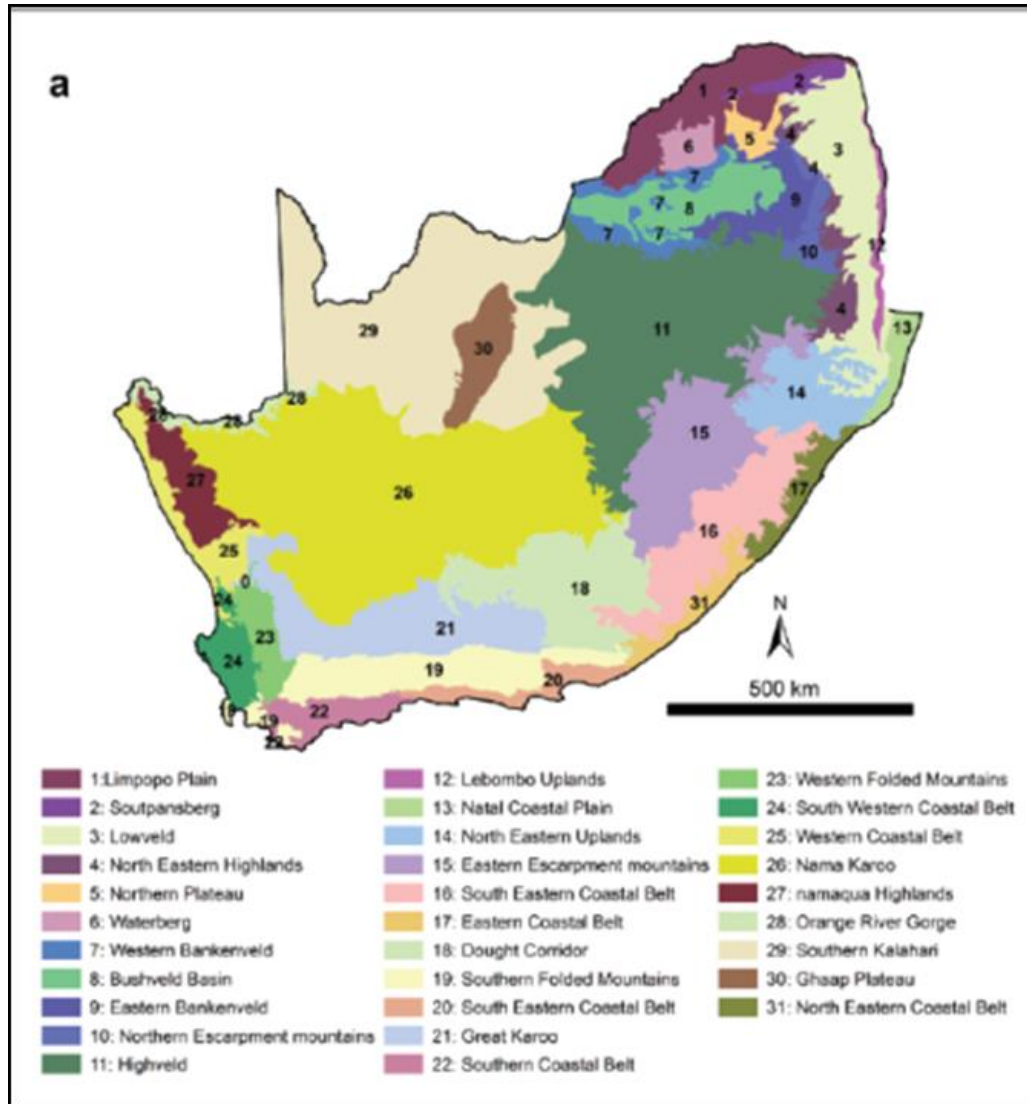


Figure 14: National Freshwater Priority Areas

In terms of surface hydrology categories by the Department of Water and Sanitation South Africa is divided into a number of drainage regions.

Table 12: Water Balance for the Pella Meteorological Station

Month	Precipitation (mm)	Evaporation (mm)	Difference (mm)
January	6.2	550.5	-544.3
February	18.1	452.4	-434.3
March	21.6	418.6	-397
April	18.6	300.0	-281.4
May	4.5	206.4	-201.9
June	2.9	148.0	-145.1
July	3.7	166.8	-163.1
August	2.8	224.7	-221.9
September	4.2	302.3	-298.1
October	5.7	408.9	-403.2
November	7.9	467.1	-459.2
December	10.1	534.0	-523.9
Mean annual	106.5	4271.0	-4164.5

The data showed in the table above clearly displays the evaporation exceeding the precipitation values for every month of the year.

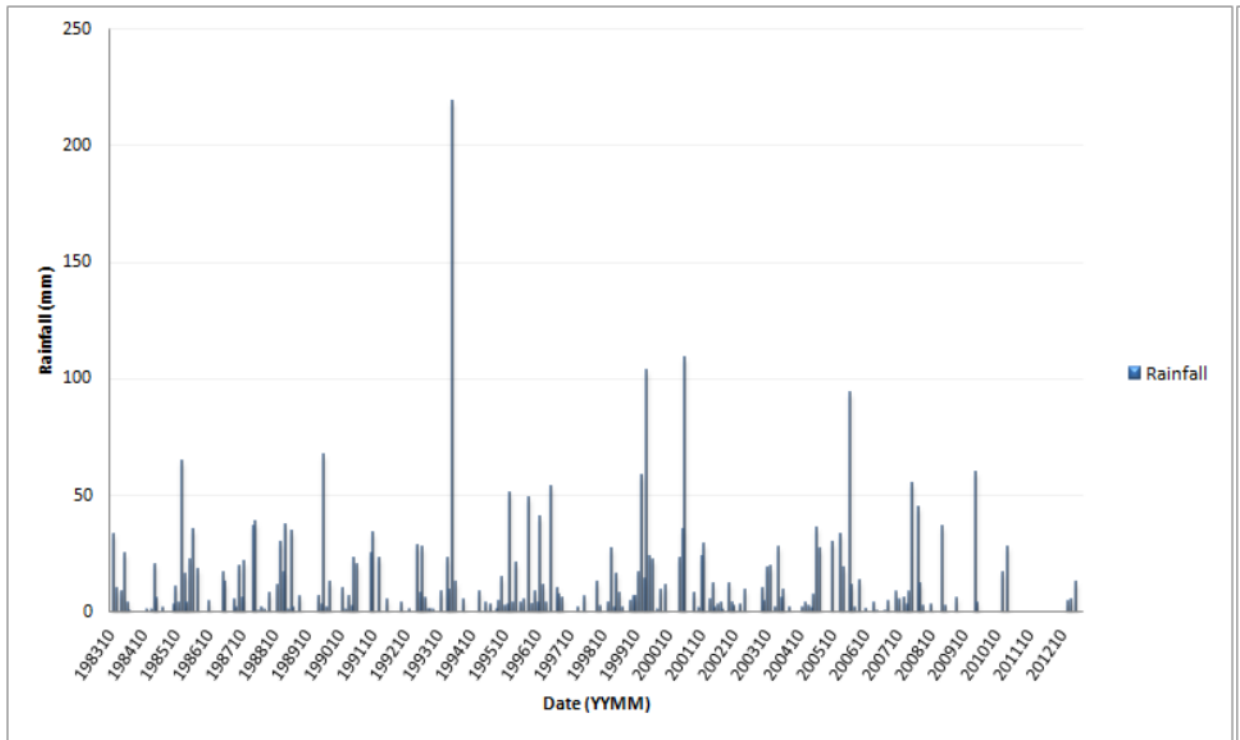


Figure 15: Time Series Rainfall

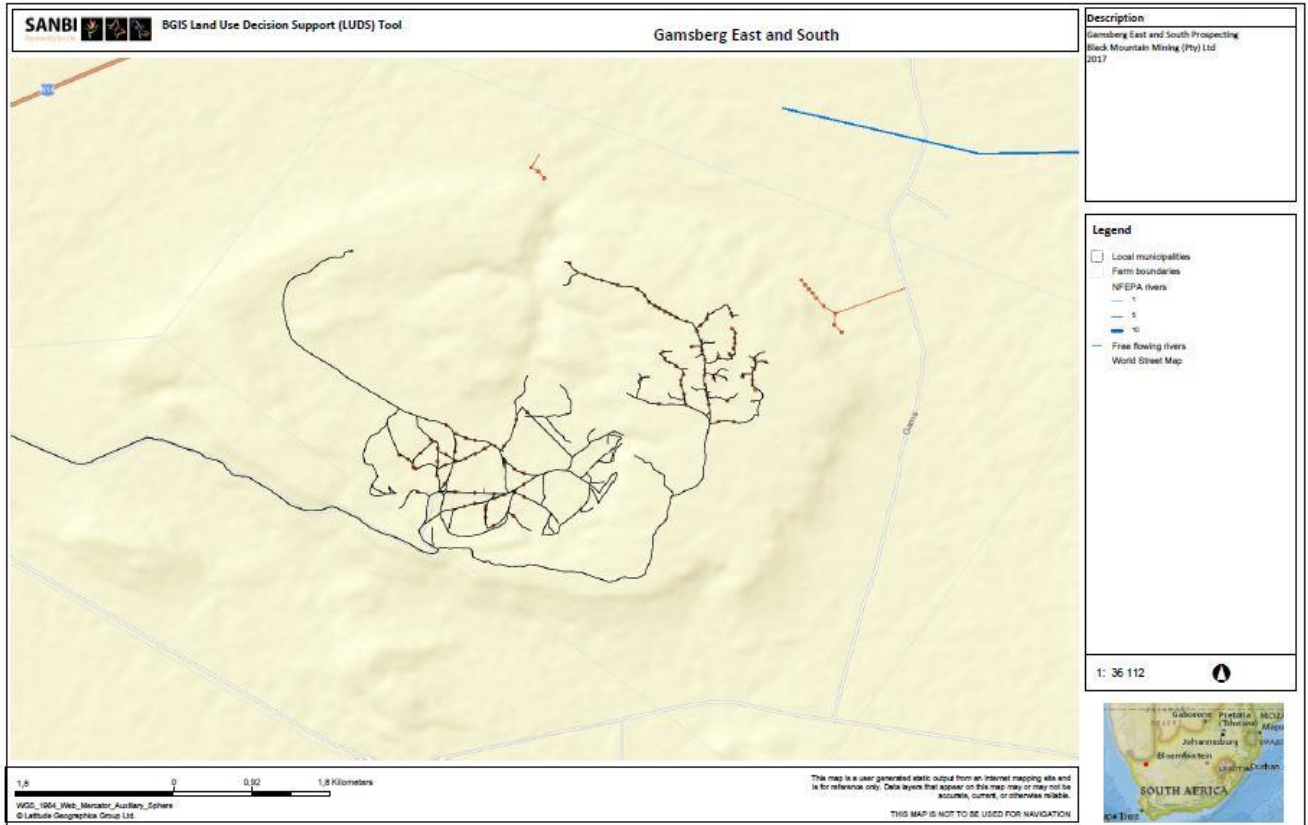


Figure 16: NFEPA map indicating freshwater sources in the Gamsberg area

There are some non-perennial rivers in the project area.



Figure 17: Natural drainage lines in the project area

Heritage Resources

Minimal work had been undertaken in the region prior to the project. Cultural Resource Management reports from the surrounding region refer to the Later and Middle Stone Age sites occurring. A rock painting site is described near Black Mountain Mine, while reference was made to a rock engraving seen in the landscape in the 1870s which is yet to be relocated. Stone Age traces can be expected to cluster around particular kind of features in the landscape such as waterholes and springs and in the shelter of hills while widely dispersed isolated artefacts might occur. Colonial traces are also expected to be sparse and ephemeral. Farmers were known to practice transhumance or seasonal movement between this region and Namaqualand.

The Southern slope of Gamsberg is richer in sites and seen as more sensitive. Higher sensitivity stems from evidence that the southern/ south eastern side of Gamsberg was the site of an incident in which a group of San were cornered and shot, part of what historians now characterize as a genocide against the indigenous people of the region.

Tangible archaeological or heritage traces are scarce within the inselberg itself and within the basin. This is a generally highly eroded, extremely rocky area resulting in a hostile environment.

Socio-economics

Generation of Bushmanland communities have grown up in the area occasional seeking out work from mission stations and seasonal crop picking in the Upington/ Kakamas area. Education levels in the area were generally low and young children would often leave school to seek out work.

The population for Namakwa District Municipality according to a 2001 Census is approximately 108111 which is a 1.41 decrease from 1996. The population density is less than 1 person/square mile. In the Khai-Ma municipality the largest increase in population can be found which is an increase of 21.5%. There has also been a substantial shift in population totals from rural to urban areas. Afrikaans is the language of choice in the area with English and Xhosa spoken to a lesser extent. The population was limited to a few widely-spaced farms prior to the opening of the mine with Pella and Pofadder being the nearest population centers at the time.

The Khai Ma Municipality has a relatively young population with over 80% of the population younger than 50 years of age. The gender distribution is even with 4709 males and 4638 females. The majority of the population falls within the Colored ethnic group.

Table 13: Summary of the population in the Khai-Ma Municipality

	1996	2001
Population	9331	11344
Urban	1024	1832
Rural	1199	921
Household	2223	2754
Male	4709	
Female	4638	
African	283	
Coloured	9178	
Indian	3	
White	1263	
Other	42	

b) Description of the current land uses

The project area is zoned mining with no farming activities taking place and limited free roaming wildlife utilizing the area. The land use in the application is mining and surrounding area is grazing (sheep, cattle and goats). There is evidence of historic bulk sampling and prospecting activities.

c) Description of specific environmental features and infrastructure on the site**Figure 18: Existing Tracks on Gamsberg**



Figure 19: Evidence of previously impacted areas as a result of prospecting (not rehabilitated)

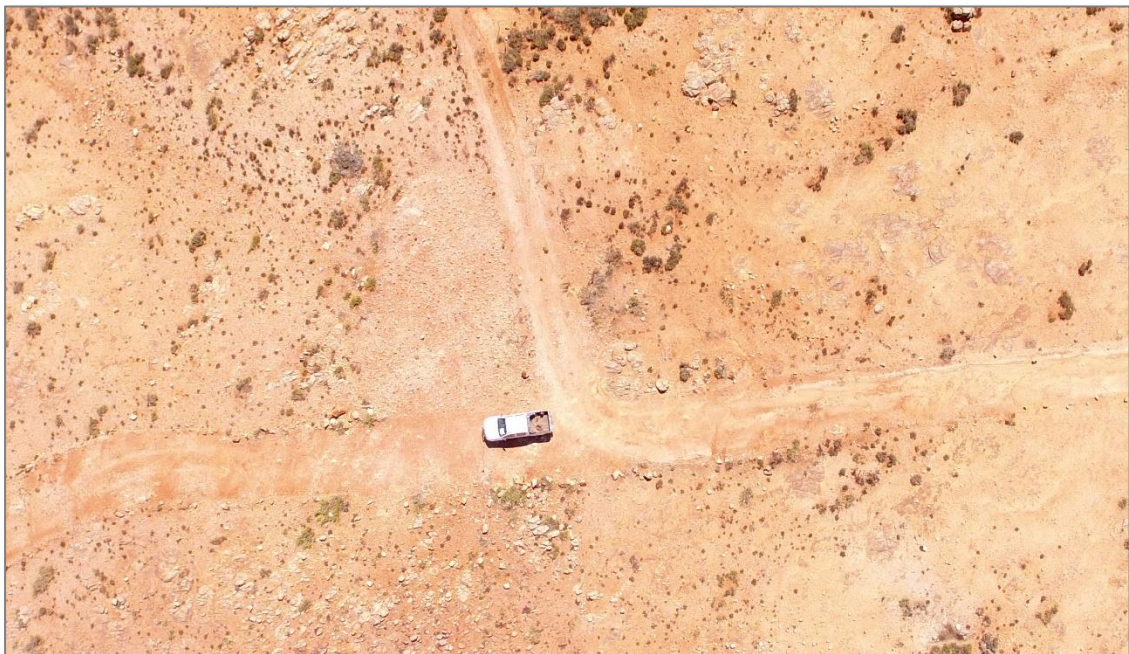


Figure 20: Evidence of previously impacted areas as a result of prospecting (rehabilitated)

d) Environmental and current land use map

.....
Show all environmental and current land use features
.....

Please refer to the sensitive habitats map for the site; the Vegetation Types map and the site map (Topo cadastral map) indicating services infrastructure indicating the environmental and land use features associated with the proposed prospecting area. Below is the ecological sensitivity map supporting the maps mentioned above.

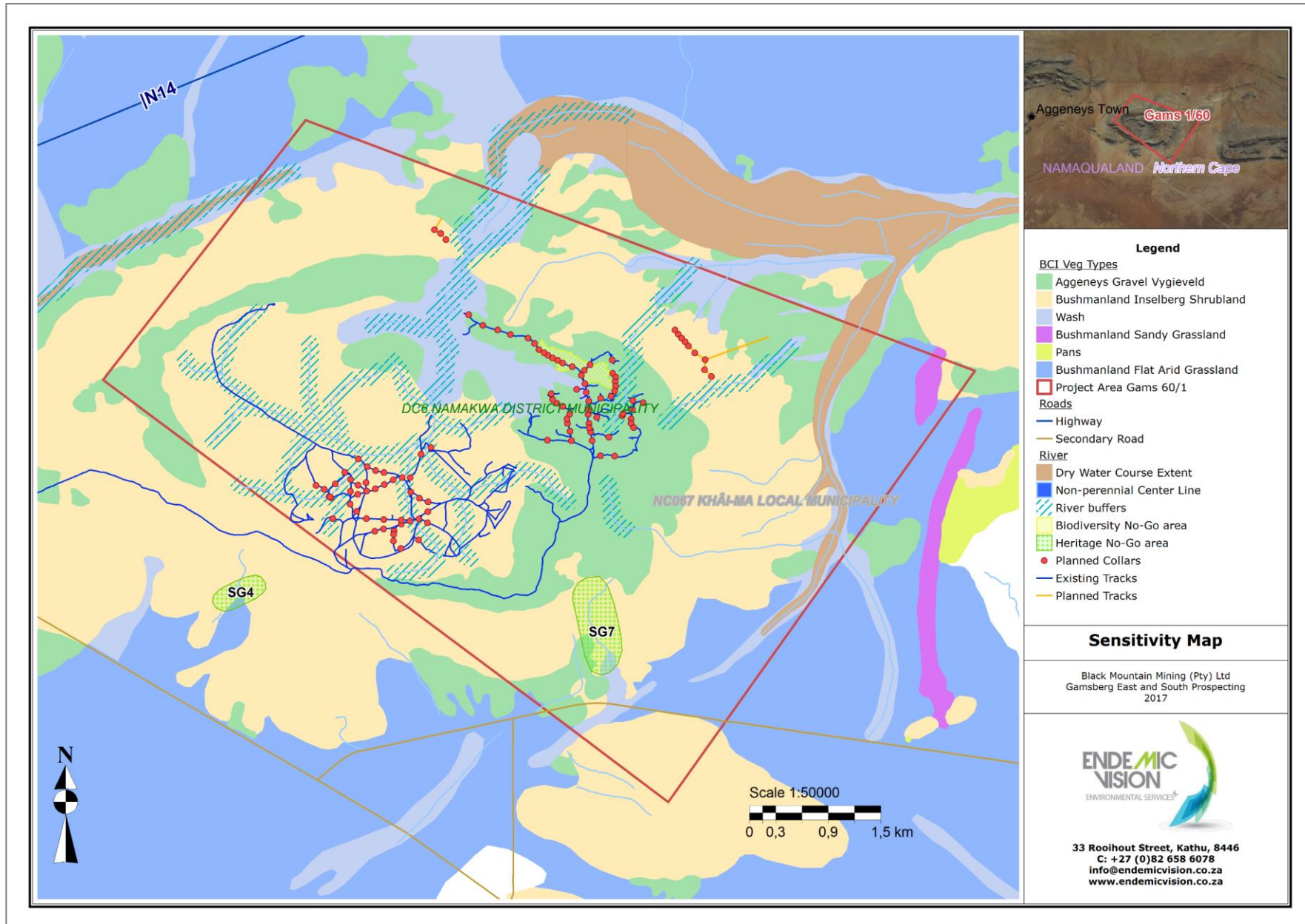


Figure 21: Ecological sensitivity map

The sites following sites at Gams North and Gams Far East, are located in areas that were not previously impacted. In terms of impact assessment all other areas have been impacted and rehabilitated with different degrees of success. A separate assessment is presented for areas not previously impacted.

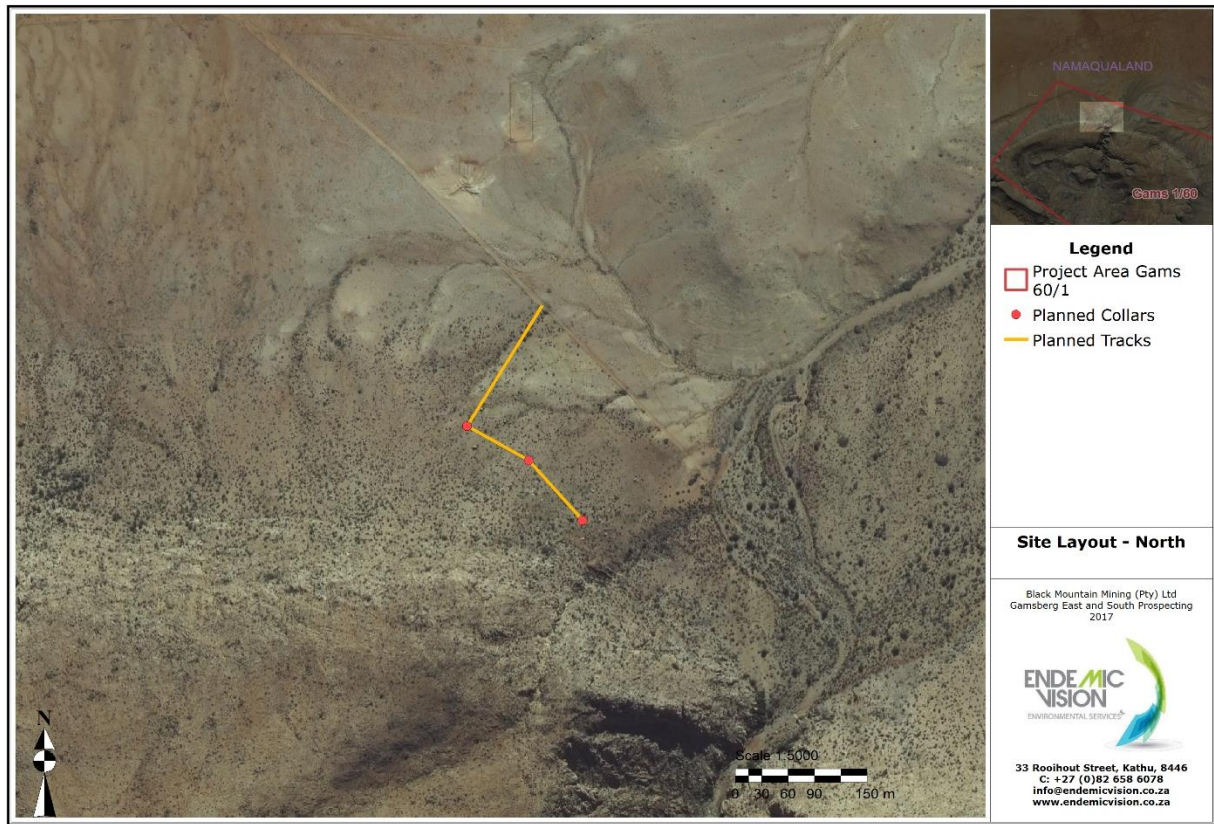


Figure 22: Gams North



Figure 23: Gams Far East**v) Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts can be reversed**

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

This section identifies and evaluates the actual and potential environmental consequences associated with the proposed prospecting activity. The potential for mitigation of negative impacts and enhancement of positive impacts (DEAT, 2003) to enable sustainable development principles are adhered to.

Table 14: Summary of impacts according to aspect as applicable to the project lifecycle

Summary of Impacts Applicable for Assessment	
The following aspects were identified as potentially significant	
Resource Use	<ul style="list-style-type: none"> - Prospecting for the associated minerals; - Topsoil - Soil disturbance and compaction and topsoil stockpiling resulting in soil erosion; - Potential water resource impacts resulting from groundwater extraction for prospecting activities; - Surface water (where affected as dirty water runoff); and - Potential destruction of heritage resources (if applicable).
Waste Management	Potential water and soil pollution resulting from improper waste storage and management (drill sludge, hydrocarbon spillage).
Biodiversity Disturbance	<ul style="list-style-type: none"> - Site clearance for new access roads to the drill sites, drill site clearance for drilling during the invasive prospecting phases of the programme; - Destruction and/or disturbance of on-site fauna, flora and sensitive areas; and - Activities within the watercourse could result in disturbance to the natural geomorphology and safety hazards during rainy periods.
Air Emission	Dust emission resulting from site clearing, soil stripping and construction activities (including dust generated by vehicle movement).
Water Pollution	Hydrocarbon spillage as a main source of groundwater pollution. Surface water - storm water run-off from exposed areas and drill sludge.
Noise / Vibration	Noise as a result of construction, operation and vehicle movement resulting in disturbance of fauna / livestock / wildlife.

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

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

Standard evaluation methods are applied as defined below.

An impact can be defined as any change in the physical-chemical, biological, cultural and/or socio-economic environmental system that can be attributed to human activities related to alternatives under study for meeting a project need.

Assessment of impacts will be based on DEAT's (2014) Guideline Document: EIA Regulations. The various environmental impacts and benefits of this project are discussed in terms of impact status, probability, duration, scale/extent and magnitude/severity.

The significance of the aspects/impacts of the process will be rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process. These matrixes use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

The significance of the potential impacts will be determined through a synthesis of the criteria below:

Impact Status

The nature or status of the impact is determined by the conditions of the environment prior to construction and operation. A discussion on the nature of the impact will include a description of the cause of the effect, the aspect that will be affected and how it will be affected. The nature of the impact can be described as negative or positive.

Table 15: Impact Nature Rating

RATING	DESCRIPTION	RATING
Positive	A benefit to the receiving environment	(+ve)
Negative	A cost to the receiving environment	(-ve)

Probability This describes the likelihood of the impact actually occurring.

- Improbable:** The possibility of the impact occurring is very low, due to the circumstances, design or experience.
- Probable:** There is a probability that the impact will occur to the extent that provision must be made therefore.
- Highly Probable:** It is most likely that the impact will occur at some stage of the development.
- Definite:** The impact will take place regardless of any prevention plans, and there can only be relied on mediatory actions or contingency plans to contain the effect.

Duration: The lifetime of the impact.

- Short term:** The impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases.
- Medium term:** The impact will last up to the end of the phases, where after it will be negated.
- Long term:** The impact will last for the entire operational phase of the project but will be mitigated by direct human action or by natural processes thereafter.
- Permanent:** Impact that will be non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.

Scale: The physical and spatial size of the impact

- Site:** The impacted area extends only as far as the activity, e.g. footprint
- Local:** The impact could affect the whole, or a measurable portion of the above-mentioned properties and adjacent properties.

Regional: The impact could affect the area including the neighbouring residential areas.

Magnitude/ Severity:	Does the impact destroy the environment, or alter its function.
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Low: The impact alters the affected environment in such a way that natural processes are not affected.

Medium: The affected environment is altered, but functions and processes continue in a modified way.

High: Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

Significance	This is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.
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Negligible: The impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.

Low: The impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.

Moderate: The impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.

High: The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.





The ratings of the identified impacts were undertaken in a quantitative manner as provided from section (vi) above. A risk matrix will be used to determine the significance of the impacts. The magnitude of the impact, the extent of the impact, the reversibility of the impact, the duration of the impact and the probability of the impact occurring were taken into consideration. The assessment has been conducted without implementing any mitigation or management measures and then with the implementation of management and mitigation measures. During the process, a score was determined to divide the significance of the impacts into negligible, low, moderate and high.

The following scale is used to determine the significance score of the impact.

Table 16: Impact Significance Rating

Aspect	Description	Weight	Significance Rating	Weight	Score Colour
Duration	Short term	1	Negligible	<20	Grey
	Medium term	3			
	Long term	4			
	Permanent	5			
Scale/Extent	Site	1	Low	<40	Green
	Local	2			
	Regional	3			
Magnitude/Severity	Low	2	Moderate	<60	Orange
	Medium	6			
	High	8			
Probability	Improbable	1	High	>60	Red
	Probable	2			
	Highly probable	4			
	Definite	5			

For the baseline vegetation impact assessment, specialist conducted a high-level desktop assessment to determine the botanical setting in which the Gamsberg East and South project is located. The various resources used to determine the significance and sensitivity of the environmental considerations include:



-  The Gamsberg Database;
-  Geographic Information System maps;
-  SANBI's PRECIS herbarium record database; and
-  SANBI's NFEPA maps, etc.

Given the depth of existing botanical knowledge of the site a detailed site visit was not required. The site visit was undertaken in August 2012 to fill data gaps.

For Heritage and Paleontological impact assessments, a high-level desktop study was conducted to determine the environmental setting in which the Gamsberg East and South project is located.

Various fieldwork was undertaken between 1999 and 2013 for the heritage study. A Gap Analysis was undertaken to establish which areas needed to be examined in more detail followed by fieldwork and the review of earlier work.

For the faunal impact assessment, specialist conducted a desktop assessment to establish the species previously recorded within the study area and to determine the species expected to occur in the region. The various resources used included:

-  The International Union for Conservation of Nature (IUCN) Red List; and
-  The Convention on International Trade in Endangered Species (CITES).

A site visit was conducted in May 2009 and invertebrate surveys was conducted in 2009 and 2012

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

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

Potential positive and negative impacts of the proposed activity include the following:

Potential impact on palaeontological resources

A Palaeontological Impact Assessment of the prospecting area has been conducted to identify any palaeontological or fossil resources in the subsurface which may be impacted on. No particular sensitive areas were identified. It is considered unlikely that significant fossil occurrences will be found due to the sparse and patchy distribution of fossils in the subsurface and the impact intensity is thus considered low. The impact of finding fossils or the loss thereof will be permanent and will result in long term cumulative impact which can be both partly negative and partly positive.

Potential impact on heritage resources

A Heritage Impact Assessment of the prospecting area has been conducted to identify any cultural, heritage and/or archaeological features which may be impacted on. The study site was divided into three areas namely, North of Gamsberg, South of Gamsberg and Gamsberg Inselberg and Basin.

Construction and operational activities would result in a major direct negative impact of on archaeological resources pre-mitigation. The residual impact will be reduced to moderate significance after mitigation. There will be a moderate direct negative impact on cultural heritage resources due to a possible massacre site and a potential

gravesite on the southern slopes. The impact on cultural heritage resources will be reduced from a moderate to a minor impact after mitigation measures.



Impacts on plants, habitat or vegetation

Major impacts include habitat loss and fugitive dust. Impacts are predicted to be significant even with extensive mitigation. The following possible impacts can result from the prospecting:

- Habitat loss is a direct negative impact resulting from the construction and operational phase. The likelihood of restoring the original ecosystems is low;
- Reduced ecological function and habitat degradation due to run-off from stream or surface flow diversion and dust generation;
- The impact of dust deposition on habitat and species can be significant;
- Loss of biodiversity due to surface water runoff quality and dust fallout;
- Prospecting operations will increase the amount of people and may have an impact on vegetation due to collection of flora, litter, and creation of off-road tracks;
- Spread of alien and invasive species; and
- Impacts on landscape-level ecological processes by disruption of ecosystem processes and habitat fragmentation, disruption of meta-population processes, reduction of ecological corridor function, and reduction of ecological refuge function.

The residual impacts include the size of Gamsberg and other important habitat patches permanently reduced in size. This could lead to total species diversity decline which cannot be fully mitigated. Species associated with the fine-grain quartz patches could also be significantly impacted beyond viable population limits.



Disturbance of on-site fauna

The following key impacts are noted:

- Direct loss of fauna and faunal habitat through construction;
- Direct loss of fauna due to increased road kills, hunting, trapping, poaching of animals, etc.;
- Increased habitat fragmentation;
- Disturbance of habitat through unnatural factors such as fires, off-road driving, increased movement of people, etc.;
- Indirect loss of aquatic features and fauna due to groundwater/surface water impacts.;
- Disturbance from water contamination and air pollution.;
- Impacts from increased noise and use of artificial lighting.



Impacts on communities, individuals or land uses in close proximity

The following impacts are regarded as community impacts:

- Potential water and soil pollution resulting from hydrocarbon spills and soil erosion;
- Noise due to prospecting activities;



Water quality and availability

Limited quantities of hazardous goods (fuel, oil and lubricants) will be stored on site. A diesel bowser will be used for storage of diesel on site for re-fuelling. The transportation, handling and storage of such materials may result in spills and further water quality impacts in the event of spills when carried by storm water to the water courses.

100 000 ℓ may be used per day for the prospecting activities and use must not exceed the general authorisation volume for the area. Water will only be extracted from boreholes for monitoring purposes. Water management should be implemented to prevent unnecessary spillage and waste of water.

Possible pollution sources include stockpiled soil and all areas cleared of vegetation. The eroded soil particles may be carried by storm water to watercourses which will result in an increase in the Total Suspended Solids (TSS) and Total Dissolved Solids (TDS) of the watercourses. The storage of hazardous goods, temporary ablution facilities and discharge of drill fluids may also lead to surface- and groundwater pollution if not managed properly.



Visual impact

The prospecting activities is not expected to result in localised visual impacts due to the adjacent open pit mine.



Positive impacts

- While no significant short term positive impacts are expected with the prospecting activities, in the event that viable mineral reserve is confirmed, and pending the outcome of detailed social and environmental impact assessment processes, a positive socio-economic benefit must be investigated and optimized. Based on existing and historical mining activities which are known from within the larger region it is anticipated that similar conditions will prevail for this prospecting project.
- The finding and recovery of fossils could have a positive impact on palaeontological resources ranging from regional to international in extent depending the nature of the finds, regarding that mitigation measures are taken to look out for any resources.
- Rehabilitation of impacted areas.
- Prospecting will mostly be undertaken by contractors, personal of Black Mountain Mining and specialists but some temporary employment opportunities for local and/regional communities will be available.

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

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

This section provides a summary of the key management measures associated with the impacts identified in the previous section. The detailed rating and management plan is presented in *Table 17*.



Measures to manage the potential impact on palaeontological resources

A palaeontological Impact Assessment has been conducted on the area where drilling activities are planned.

No particular sensitive areas were identified. It is considered unlikely that significant fossil occurrences will be found due to the sparse and patchy distribution of fossils in the subsurface and the impact intensity is thus considered low. On-site personnel will monitor excavations under the supervision of the Environmental Site Officer (ESO). In the event of a significant fossil find, a palaeontologist will supervise the excavation of the fossils and record the contexts.



Measures to manage the potential impact on heritage resources












A Heritage Impact Assessment has been conducted on the area where drilling activities are planned.

During the construction and operational phase mitigation measures must be taken to minimise the development footprint to what is absolutely needed. All working areas need to be clearly demarcated with appropriate signage. Any heritage or cultural resources found will be reported immediately. Further investigation is recommended of











the possible massacre sites on the southern slope of Gamsberg. Sites SG1, SG4 and SG7 as described in the heritage impact assessment report should be considered "no-go" areas. As much as possible infrastructure must be removed from the site during decommissioning. All disturbed sites must be rehabilitated.

Should any unknown heritage sites be identified during the drilling activities, all activities will cease immediately and SAHRA will be contacted. After assessment, and if appropriate, a permit will be obtained from SAHRA to remove such remains/artefacts.

Measures to manage the potential impact on plants, habitat and vegetation.

-  Reduce dust emission;
-  Manage surface water run-off in the basin;
-  Protect all known regional populations of species at risk via biodiversity offset to buffer species against possible loss of or changes in source populations;
-  All workers must be trained and educated on environmental sensitivities of the site and appropriate behaviour especially with regard species introductions;
-  No-go areas should be clearly demarcated on the ground and on mine plans;
-  A detailed biodiversity management plan developed to ensure that the proposed avoidance and mitigation measures associated with construction are effectively implemented incorporated by the Black Mountain Mine Environmental Management team;
-  A concurrent rehabilitation plan for permanent (permanent drill platforms) infrastructure and temporary infrastructure (laydown areas) should be in place, implemented and monitored for compliance;
-  Search and rescue of flora species of special concern. It might be possible to rescue protected and specially protected plants, especially geophytes and succulents that can be transplanted successfully;
-  Alien Plant and Animal Monitoring and Control is managed by Black Mountain mine's environmental management team;
-  Gams North and Gams Far East will be delayed for drilling in the 3rd year of the project; and
-  Biodiversity feasibility and offset calculations will be completed to offset the biodiversity loss for these areas.

Measures to manage the potential disturbance of on-site fauna

-  The footprint should be reduced as far as possible;
-  Sensitive areas, i.e. aquatic systems and habitats supporting key faunal species should be avoided;
-  Group mining facilities such as roads together to reduce fragmentation of natural habitats supporting a rich diversity of fauna;
-  All disturbed areas must be rehabilitated during all phases of the project to reinstate natural habitat. If applicable, a rehabilitation plan should be designed by an appropriate specialist which includes erosion control structures and revegetation measures with indigenous shrubs and grasses only;
-  Personnel and contractors must be prohibited from having domestic dogs and cats on the premises. A feral dog and cat control programme must be implemented;
-  The movement of people and vehicles must be restricted and controlled and areas should be clearly demarcated;
-  Speed limits must be implemented and enforced;
-  Maintain roads and implement dust control measures as far as practical;
-  Light pollution must be kept to a minimum so as to not interfere with insect life cycles and nocturnal vertebrates as far as safety does not decrease. Low pressure sodium vapour lights/ LED lights with wavelengths of limited attractiveness to insects, facing inwards to the mine, are recommended;
-  Drill holes must be temporarily plugged directly after drilling is completed and remain plugged until they are permanently plugged below ground to eliminate risk posed to fauna by open drill holes;

- The loss of the sensitive habitats must be avoided; and
- A concurrent rehabilitation plan for permanent (permanent drill platforms) infrastructure and temporary infrastructure (laydown areas) should be in place, implemented and monitored for compliance.

The following obligations for monitoring and conservation carried by the mine are noted and incorporated by Black Mountain Mine's environmental management team.

- Knowledge gaps must be improved through a detailed regional study of key fauna in order to assess impacts with higher confidence as well as to better inform offset opportunities for conservation of fauna;
- During a true wet season survey the possibility that summer active species of *Mantophasmatodea* may be present, must be checked;
- Monitoring should be done on key invertebrate indicator groups to evaluate the effectiveness of mitigation measures and to allow monitoring of progress of rehabilitation;
- A monitoring programme to monitor Red Lark populations should be implemented;
- Fixed-point camera monitoring should take place during all phases of the project. The mine could also collaborate with an independent NGO or academic institutions to conduct faunal monitoring studies to expand the current baseline study and to monitor for unexpected changes;
- Implement a biodiversity offset programme to properly identify and set aside areas for conservation;
- Develop and implement an environmental awareness programme for workers and contractors which emphasises faunal biodiversity issues. Signed contracts must include policy to ensure compliance is achieved; and
- Implement existing management plans to deal with waste, storm water, faunal recovery and relocation, spills etc.



Measures to manage the potential impacts on communities, individuals or land uses in close proximity

- Potential water and soil pollution resulting from hydrocarbon spills and soil erosion;
 - ◆ Mitigation and management measures must be implemented to prevent environmental pollution which may impact on environmental resources utilized by communities, landowners and other stakeholders where applicable.
- Potential water resource impacts resulting from groundwater extraction for prospecting activities;
 - ◆ Water management in terms of the prevention of spillage/waste of water should be implemented on site; and
 - ◆ Groundwater monitoring should be in place and implemented.
- Noise due to prospecting activities;
 - ◆ Background noise level not to increase with more than 85dB.



Measures to manage the potential impact on water quality and availability

- Potential water and soil pollution resulting from hydrocarbon spills and soil erosion will be mitigated and managed as follows:
 - ◆ Current infrastructure on the surface properties for access to the drill-hole positions must be used as far as is practical to minimize the potential for soil erosion. Should roads be required to drill sites, clearing will be undertaken with a view to maintain vegetation cover to limit soil erosion potential;
 - ◆ The area impacted by the drill site must be kept to a minimum and vegetation removal minimized to limit soil erosion;
 - ◆ Prevent wind erosion by mulching with rocks and brush packing with damaged vegetation;
 - ◆ When establishing the drill pad, topsoil that will be removed will be stockpiled up-slope of the pad. The stockpile will be shaped to divert storm water around the drill pad. The stockpile will be re-used for the rehabilitation of the sites.;
 - ◆ To reduce potential for water pollution during the drilling activities, a sump will be constructed with sufficient capacity to receive drill fluids and allow for evaporation;

- ◆ To avoid clean storm water inflow, the sump will be constructed to divert storm water away;
- ◆ A waste management system will be implemented and sufficient waste bins provided on site. A system to prohibit littering and poor housekeeping practices on site will be implemented;
- ◆ Oils and lubricant will be stored within secondary containment structures;
- ◆ Vehicle maintenance will be undertaken off-site where practical. Vehicle maintenance undertaken on-site, the use of drip trays and/or PVC sheets will be used to prevent spills and leaks onto the soil;
- ◆ Waste separation will be undertaken on-site and separate containers will be provided (i.e. general waste, hazardous waste, recyclable waste);
- ◆ Disposal of waste will be at an appropriately licensed landfill/facility and recyclables will be taken to a licensed recycling facility;
- ◆ Waste containers will be closed (i.e. fitted with a lockable lid) to eliminate the possible access of animals overnight;
- ◆ Drill holes must be temporarily plugged directly after drilling is completed and remain plugged until they are permanently plugged below ground to eliminate risk posed to fauna by open drill holes;
- ◆ Drill holes must be permanently capped at decommissioning;
- ◆ Water management in terms of the prevention of spillage/waste of water should be implemented on site; and
- ◆ Commercial oil spill kits will be kept at each site to be used in the event of any spillages.



Measures to manage the potential visual impact

- All temporary infrastructures such as portable ablution facilities, water tanks etc. should be acquired with consideration for colour. Natural colour options which blend in with the surrounding area must be favoured;
- A waste management system will be implemented and sufficient waste bins provided on site. A system to prohibit littering and poor housekeeping practices on site will be implemented; and
- Dust fall out will be managed to be less than 600 mg per day/m². Based on visual observation, wet dust suppression will be undertaken to manage dust emissions from vehicle movement and other construction activities as and when needed. Depending on need and quantity of water used for wet suppression, a suitable, low environmental impact chemical suppression alternative must be considered in order to conserve water resources.



Measures to manage rehabilitation (positive impact)

- Rehabilitation in itself can result in additional impacts;
- Rehabilitation should be done according to similar vegetation diversity, vegetation cover constituency as described by the baseline;
- Rehabilitation should be monitored using Landscape Functional Analysis to ensure the rehabilitation efforts can be quantified as successful;
- Rehabilitation maintenance is required until the rehabilitation is self-sufficient; and
- It is required that only indigenous flora is re-established on impacted areas where rehabilitation takes place.

ix) Motivation where no alternative sites were considered

Alternatives have been considered in the assessment of alternatives as tabled above.

x) Statement motivating the alternative development location within the overall site

.....

Provide a statement motivating the final site layout that is proposed

.....

The final layout is presented where existing footprints are used 76.53% of the time.

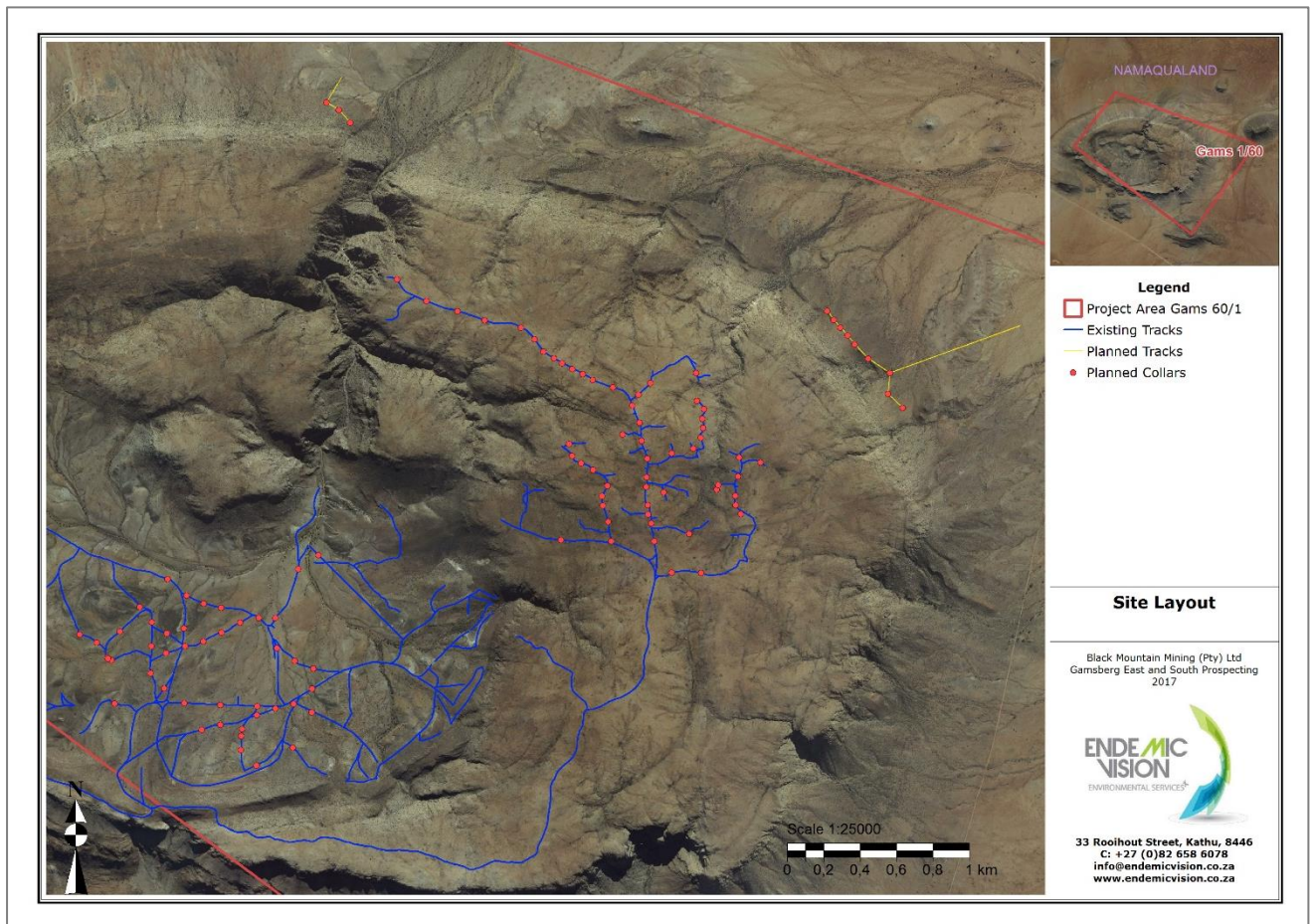


Figure 24: Site layout indicating new drill collars on existing footprint and on new roads to be constructed

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

.....

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

.....

Methodology of all specialist studies are described in full in section (vi) above.

The ratings of the identified impacts were undertaken in a quantitative manner as provided from section (vi) above. A risk matrix will be used to determine the significance of the impacts. The magnitude of the impact, the extent of the impact, the reversibility of the impact, the duration of the impact and the probability of the impact occurring were taken into consideration. The assessment has been conducted without implementing any mitigation or management measures and then with the implementation of management and mitigation measures. During the process, a score was determined to divide the significance of the impacts into negligible, low, moderate and high.

The identification of management measures and impact management objectives were developed to ensure that adverse socio-economic impacts are minimised and socio-economic benefits are maximised. Measures were further defined to avoid, prevent, limit or manage any impacts. Closure objectives were further measured against Section 28 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and Regulation 52(2)(f) of the MPRDA regulations.

i) Assessment of each identified potentially significant impact and risk

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

This section identifies and evaluates the actual and potential environmental consequences associated with the proposed drilling activity. The potential for mitigation of negative impacts and enhancement of positive impacts (DEAT, 2003) to enable sustainable development principles are adhered to.

Table 17: Impact Assessment of activities BEFORE mitigation

Element	Project Phase	Activity	Impact Description	Impact Type Degree of loss	Duration	Scale	Severity	Initial Probability	Initial Score Before mitigation
Legislative	Plan & Design	Clearing Indigenous Vegetation	Unlawful activity: Impacting protected species without permission	Direct Negative High	Long term	Site	Medium	Highly Probable	44
Legislative	Plan & Design	Construction of Roads	Unlawful activity: Affecting a water resource without permission	Direct Negative High	Long term	Site	High	Definite	65
Legislative	Plan & Design	Invasive Prospecting: Drilling	Unlawful activity: transgressing regulation 704 specifications	Direct Negative High	Long term	Site	High	Definite	65
Legislative	Plan & Design	Clearing Soils	Unlawful activity: Impacting heritage without notification to regulator or permission	Direct Negative High	Long term	Site	High	Definite	65
Biodiversity	Site Clearance	Disturbance: fauna and flora	Change in species composition	Direct Negative Moderate	Permanent	Site	Medium	Definite	60
Dust	Site Clearance	Generation of Dust	Changes in air quality - dust	Direct Negative Low	Short term	Site	Low	Definite	20
Ecology	Site Clearance	Clearing Indigenous Vegetation	Ecological system impacts: Ecological process & function deterioration/ breakdown	Direct Negative Moderate	Long term	Site	Medium	Highly Probable	44
Ecology	Site Clearance	Construction of Roads	Ecological system impacts: habitat fragmentation	Direct Negative High	Long term	Site	High	Definite	65

Ecology	Site Clearance	Generation of Dust	Ecological system impacts: Ecological process & function deterioration/ breakdown	Indirect Negative High	Long term	Regional	High	Definite	75
Water - Hydrology	Site Clearance	Generation of hydrocarbon spills	Changes in surface water quality runoff	Indirect Negative Low	Long term	Site	Medium	Definite	55
Water - Hydrology	Site Clearance	Construction of Roads	Changes in surface hydrological patterns and processes	Indirect Negative High	Permanent	Site	Medium	Definite	60
Water - Groundwater	Site Clearance	Generation of hydrocarbon spills	Changes in ground water quality	Indirect Negative Low	Permanent	Local	Low	Definite	45
Fauna	Site Clearance	Clearing Indigenous Vegetation	Changes in surface water quality runoff	Direct Negative Low	Short term	Site	Low	Probable	8
Fauna	Site Clearance	Disturbance: Traffic	Disturbance of fauna engagement patterns	Indirect Negative Moderate	Medium term	Site	Medium	Definite	50
Fauna	Site Clearance	Clearing Indigenous Vegetation	Loss of habitats	Direct Negative High	Permanent	Site	High	Definite	70
Fauna	Site Clearance	Generation of Dust	Loss of habitats	Direct Negative Moderate	Short term	Local	Medium	Probable	18
Fauna	Site Clearance	Disturbance: Noise	Disturbance of fauna engagement patterns	Direct Negative Low	Short term	Site	Medium	Probable	16
Fauna	Site Clearance	Disturbance: Light	Disturbance of fauna engagement patterns	Direct Negative Low	Short term	Site	Medium	Probable	16
Noise	Site Clearance	Disturbance: Noise	Disturbance: noise	Direct Negative Low	Short term	Site	Low	Definite	20
Flora	Site Clearance	Clearing Indigenous Vegetation	Change in species composition	Direct Negative Moderate	Permanent	Local	High	Definite	75

Flora	Site Clearance	Clearing Indigenous Vegetation	Loss of vegetation cover	Direct Negative High	Long term	Site	High	Definite	65
Flora	Site Clearance	Clearing Indigenous Vegetation	Loss of habitats	Direct Negative High	Long term	Local	High	Definite	70
Flora	Site Clearance	Generation of Dust	Loss of species	Direct Negative High	Permanent	Regional	High	Improbable	16
Soil	Site Clearance	Clearing Soils	Changes in soil functionality: depletion	Direct Negative Low	Medium term	Site	Medium	Definite	50
Soil	Site Clearance	Generation of hydrocarbon spills	Contamination of Soil - loss of soil function	Direct Negative Moderate	Short term	Site	Medium	Definite	40
Social	Site Clearance	Clearing Soils	Changes to landscape: transformation	Direct Negative Moderate	Long term	Site	Medium	Definite	55
Rehabilitation	Site Clearance	Lack of Maintenance	Costs: increase in rehabilitation costs	Indirect Negative Moderate	Short term	Site	Medium	Definite	40
Rehabilitation	Site Clearance	Lack of Monitoring	Costs: increase in rehabilitation costs	Indirect Negative Low	Short term	Site	Low	Definite	20
Rehabilitation	Site Clearance	Maintenance	Costs: shift in rehabilitation costs	Indirect Positive Moderate	Short term	Site	Medium	Definite	40
Rehabilitation	Site Clearance	Monitoring	Costs: shift in rehabilitation costs	Direct Positive Low	Short term	Site	Low	Definite	20
Heritage	Site Clearance	Clearing Soils	Loss of heritage artefacts or archaeological resources	Direct Negative High	Permanent	Local	High	Probable	30
Heritage	Site Clearance	Clearing Soils	Loss of heritage artefacts or paleontological resources	Direct Negative Low	Permanent	Site	Low	Improbable	8
Soil	Operational	Generation of hydrocarbon spills	Contamination of Soil - loss of soil function	Direct Negative Moderate	Short term	Site	Medium	Definite	40
Fauna	Operational	Disturbance: Traffic	Disturbance of fauna engagement patterns	Indirect Negative Moderate	Medium term	Site	Medium	Definite	50

Fauna	Operational	Human interaction with environment: vehicle accidents	Persecution of fauna - road kills	Indirect Negative Low	Short term	Site	Low	Definite	20
Fauna	Operational	Disturbance: Noise	Disturbance of fauna engagement patterns	Direct Negative Moderate	Long term	Local	Medium	Probable	24
Fauna	Operational	Disturbance: Light	Disturbance of fauna engagement patterns	Direct Negative Moderate	Long term	Local	Medium	Probable	24
Flora	Operational	Invasive Prospecting: Drilling	Changes in vegetation composition: Alien species encroachment	Indirect Negative Moderate	Short term	Local	Medium	Probable	18
Fauna	Operational	Generation of Dust	Loss of habitats	Direct Negative High	Long term	Regional	Medium	Probable	26
Biodiversity	Operational	Disturbance: fauna and flora	Change in species composition	Indirect Negative Moderate	Medium term	Site	Medium	Definite	50
Dust	Operational	Generation of Dust	Changes in air quality - dust	Direct Negative Low	Short term	Site	Low	Definite	20
Water - Hydrology	Operational	Generation of hydrocarbon spills	Changes in surface water quality runoff	Indirect Negative Low	Long term	Site	Medium	Definite	55
Land use	Operational	Generation and accumulation of general waste	Costs: increase in rehabilitation costs	Indirect Negative Low	Short term	Site	Low	Definite	20
Noise	Operational	Disturbance: Noise	Disturbance: noise	Direct Negative Low	Short term	Site	Low	Definite	20
Ecology	Operational	Invasive Prospecting: Drilling	Loss of habitats	Direct Negative High	Permanent	Local	High	Definite	75
Water - Groundwater	Operational	Generation of hydrocarbon spills	Changes in ground water quality	Indirect Negative Low	Permanent	Local	Low	Definite	45

Social	Operational	Generation of Dust	Social: Health and Safety of individuals on site	Indirect Negative Low	Short term	Site	Medium	Highly Probable	32
Social	Monitoring	Maintenance	Change in management decisions	Direct Positive Moderate	Long term	Site	Medium	Probable	22
Social	Monitoring	Rehabilitation	Change in management decisions	Direct Positive Moderate	Long term	Site	Medium	Probable	22
Social	Monitoring	Rehabilitation	Social: Health and Safety of individuals on site	Direct Positive Low	Short term	Site	Medium	Probable	16
Socio-Economic	Rehabilitation	Rehabilitation	Costs: shift in rehabilitation costs	Direct Negative High	Medium term	Site	High	Highly Probable	48
Socio-Economic	Rehabilitation	Rehabilitation	Costs: Change in land use value	Direct Positive High	Long term	Site	High	Probable	26
Socio-Economic	Rehabilitation	Maintenance	Costs: shift in management costs	Direct Negative Low	Short term	Site	Medium	Probable	16
Rehabilitation	Rehabilitation	Rehabilitation	Change in species composition	Indirect Positive Low	Long term	Site	Low	Definite	35

The un-affected areas of Gams North and Far East is assessed separately. Actual and potential environmental consequences associated with the proposed drilling activity will be a higher risk since these sites are located in areas that have not been previously impacted. The impacts not listed in the table below has been assessed above and the risk potential does not deviate from the existing tables.

Table 18: Impact Assessment of activities BEFORE mitigation for Gams North and Far East

Element	Project Phase	Activity	Impact Description	Impact Type Degree of loss	Duration	Scale	Severity	Initial Probability	Initial Score Before mitigation
Biodiversity	Site Clearance	Disturbance: fauna and flora	Change in species composition	Direct Negative High	Long term	Site	High	Definite	65
Ecology	Site Clearance	Clearing Indigenous Vegetation	Ecological system impacts: Ecological process & function deterioration/ breakdown	Direct Negative High	Long term	Site	High	Definite	65

Ecology	Site Clearance	Construction of Roads	Ecological system impacts: habitat fragmentation	Direct Negative High	Long term	Site	High	Definite	65
Biodiversity	Site Clearance	Clearing Indigenous Vegetation	Loss of habitats	Direct Negative High	Permanent	Site	High	Definite	70

j) Summary of specialist reports

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

The specialist studies and recommendations incorporated in the report are indicated in the table below.

Table 19: Summary of Specialist Reports

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
Palaeontological impact assessment	<p>1. Mitigation measures to limit loss of palaeontological resources</p> <ul style="list-style-type: none"> ✎ All staff must be informed of the need to watch for potential fossil occurrences. ✎ Inform staff of procedures to be followed in the event of fossil occurrences. ✎ Excavations must be monitored by on-site personnel under the supervision of the Environmental Site Officer (ESO). ✎ Liaise on nature of potential finds and appropriate responses. ✎ A professional palaeontologist must be appointed to respond to queries about any possible or definite fossils found. In the event of a significant fossil find, a palaeontologist will supervise the excavation of the fossils and record the contexts. This 	x	<p>Baseline Environment: Type of environment affected by the proposed activity.</p> <p>Description of specific environmental features and infrastructure on the site.</p> <p>The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the</p>

	<p>palaeontologist must undertake the recording of the stratigraphy and sedimentary geometry of the exposures, must attempt sampling of the ambient small fossil content and must undertake the compilation of the detailed report.</p> <ul style="list-style-type: none"> ✎ A permit will have obtained from SAHRA for any finds. 		<p>environment and the community that may be affected.</p> <p>The possible mitigation measures that could be applied and the level of risk.</p> <p>Assessment of each identified potentially significant impact and risk</p> <p>Summary of the key findings of the environmental impact assessment;</p>
<p>Heritage Impact Assessment</p>	<p>1. Mitigation measures to limit loss of heritage and cultural resources</p> <ul style="list-style-type: none"> ✎ Minimise the development footprint to what is needed. ✎ Restrict all construction and operational activities to demarcated areas with appropriate signage. ✎ Any heritage trace or cultural resources found must be immediately reported. ✎ Site SG7, SG3 and SG4 must be investigated further to ensure protection of this sensitive zone. ✎ Decommissioning to be limited to the existing disturbed areas. ✎ Remove as much as possible of the mine infrastructure from the site during decommissioning. ✎ All disturbed areas to be rehabilitated and attempt to reinstate the impacted areas as closely as possible to their original state. 	<p>X</p>	<p>Baseline Environment: Type of environment affected by the proposed activity</p> <p>Description of specific environmental features and infrastructure on the site</p> <p>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</p> <p>The possible mitigation measures that could be applied and the level of risk</p> <p>Assessment of each identified potentially significant impact and risk</p>

			Summary of the key findings of the environmental impact assessment;
Flora Impact Assessment	<p>1. Mitigation measures to limit loss of biodiversity</p> <ul style="list-style-type: none"> ✎ Reduce dust emission ✎ Manage surface water quality run-off in the basin ✎ Protect all known regional populations of species at risk via Biodiversity Offset to buffer species against possible loss of or changes in source populations. <p>2. Mitigation measures to limit the spread of alien and invasive species</p> <ul style="list-style-type: none"> ✎ All workers must be trained and educated on environmental sensitivities of the site and appropriate behaviour especially with regard species introductions. <p>The following obligations for monitoring and conservation carried by the mine are noted and incorporated by Black Mountain Mine’s environmental management team.</p> <ul style="list-style-type: none"> ✎ An Alien Plant and Animal Monitoring and Control program is incorporated in Black Mountain Mine’s management. <p>No-go areas should be clearly demarcated on the ground and on mine plans. Development of a detailed biodiversity management plan to ensure that the proposed avoidance and mitigation measures associated with construction are effectively implemented (incorporated by the Black Mountain Mine Environmental Management team)</p>	x	<p>Baseline Environment: Type of environment affected by the proposed activity</p> <p>Description of specific environmental features and infrastructure on the site</p> <p>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</p> <p>The possible mitigation measures that could be applied and the level of risk</p> <p>Assessment of each identified potentially significant impact and risk</p> <p>Summary of the key findings of the environmental impact assessment;</p>
Fauna Specialist Report	<p>1. Measures to manage the potential disturbance of on-site fauna.</p> <ul style="list-style-type: none"> ✎ The footprint should be reduced as far as possible ✎ Sensitive areas, i.e. aquatic systems and habitats supporting key faunal species should be avoided. ✎ Group mining facilities such as roads together to reduce fragmentation of natural habitats supporting a rich diversity of fauna. 	x	<p>Baseline Environment: Type of environment affected by the proposed activity</p> <p>Description of specific environmental features and infrastructure on the site</p>

	<ul style="list-style-type: none"> ➤ All disturbed areas must be rehabilitated during all phases of the project to reinstate natural habitat. If applicable, a rehabilitation plan should be designed by an appropriate specialist which includes erosion control structures and revegetation measures with indigenous shrubs and grasses only. ➤ Personnel and contractors must be prohibited from having domestic dogs and cats on the premises. A feral dog and cat control programme must be implemented. ➤ The movement of people and vehicles must be restricted and controlled and areas should be clearly demarcated. ➤ Speed limits must be implemented and enforced. ➤ Maintain roads and implement dust control measures as far as practical ➤ Light pollution must be kept to a minimum so as to not interfere with insect life cycles and nocturnal vertebrates. Low pressure sodium vapour lights/ LED lights with wavelengths of limited attractiveness to insects, facing inwards to the mine, are recommended. <p>The following obligations for monitoring and conservation carried by the mine are noted and incorporated by Black Mountain Mine’s environmental management team.</p> <ul style="list-style-type: none"> ➤ Develop and implement an environmental awareness programme for workers and contractors which emphasises faunal biodiversity issues. Signed contracts must include policy to ensure compliance is achieved. ➤ Develop and implement management plans to deal with waste, storm water, faunal recovery and relocation, spills etc. ➤ An aquatic biomonitoring plan that covers all the phases of the project should be designed by an appropriate specialist. ➤ Knowledge gaps must be improved through a detailed regional study of key fauna in order to assess impacts with higher confidence as well as to better inform offset opportunities for conservation of fauna. 		<p>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</p> <p>The possible mitigation measures that could be applied and the level of risk</p> <p>Assessment of each identified potentially significant impact and risk</p> <p>Summary of the key findings of the environmental impact assessment;</p>
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	<ul style="list-style-type: none"> ➤ During a true wet season survey the possibility that summer active species of Mantophasmatodea may be present, must be checked. ➤ Monitoring should be done on key invertebrate indicator groups to evaluate the effectiveness of mitigation measures and to allow monitoring of progress of rehabilitation. ➤ A monitoring programmes to monitor Red Lark populations should be implemented. ➤ Fixed-point camera monitoring should take place during all phases of the project. The mine could also collaborate with an independent NGO or academic institutions to conduct faunal monitoring studies to expand the current baseline study and to monitor for unexpected changes. ➤ Implement a biodiversity offset programme to properly identify and set aside areas for conservation 		
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Attach copies of Specialist Reports as appendices, marked **Appendix D1** (Palaeontological Impact Assessment Report), **Appendix D2** (Heritage Impact Assessment Report), **Appendix D3** (Flora Impact Assessment) and **Appendix D4** (Fauna Impact Assessment).

k) Environmental impact statement**(i) Summary of the key findings of the environmental impact assessment;****Table 20: Summary of Impact Assessment WITH mitigation**

Element	Project Phase	Activity	Impact Description	Impact Type Degree of loss	Final Probability	Final Score Residual
Legislative	Plan & Design	Clearing Indigenous Vegetation	Unlawful activity: Impacting protected species without permission	Direct Negative High	Improbable	11
Legislative	Plan & Design	Construction of Roads	Unlawful activity: Affecting a water resource without permission	Direct Negative High	Improbable	13
Legislative	Plan & Design	Invasive Prospecting: Drilling	Unlawful activity: transgressing regulation 704 specifications	Direct Negative High	Improbable	13
Legislative	Plan & Design	Clearing Soils	Unlawful activity: Impacting heritage without notification to regulator or permission	Direct Negative High	Improbable	13
Biodiversity	Site Clearance	Disturbance: fauna and flora	Change in species composition	Direct Negative Moderate	Probable	24
Dust	Site Clearance	Generation of Dust	Changes in air quality - dust	Direct Negative Low	Probable	8
Ecology	Site Clearance	Clearing Indigenous Vegetation	Ecological system impacts: Ecological process & function deterioration/ breakdown	Direct Negative Moderate	Probable	22
Ecology	Site Clearance	Construction of Roads	Ecological system impacts: habitat fragmentation	Direct Negative High	Improbable	13
Ecology	Site Clearance	Generation of Dust	Ecological system impacts: Ecological process & function deterioration/ breakdown	Indirect Negative High	Probable	30
Water - Hydrology	Site Clearance	Generation of hydrocarbon spills	Changes in surface water quality runoff	Indirect Negative Low	Improbable	11
Water - Hydrology	Site Clearance	Construction of Roads	Changes in surface hydrological patterns and processes	Indirect Negative High	Improbable	12
Water - Groundwater	Site Clearance	Generation of hydrocarbon spills	Changes in ground water quality	Indirect Negative Low	Improbable	9
Fauna	Site Clearance	Clearing Indigenous Vegetation	Changes in surface water quality runoff	Direct Negative Low	Improbable	4

Fauna	Site Clearance	Disturbance: Traffic	Disturbance of fauna engagement patterns	Indirect Negative Moderate	Improbable	10
Fauna	Site Clearance	Clearing Indigenous Vegetation	Loss of habitats	Direct Negative High	Probable	28
Fauna	Site Clearance	Generation of Dust	Loss of habitats	Direct Negative Moderate	Improbable	9
Fauna	Site Clearance	Disturbance: Noise	Disturbance of fauna engagement patterns	Direct Negative Low	Probable	16
Fauna	Site Clearance	Disturbance: Light	Disturbance of fauna engagement patterns	Direct Negative Low	Improbable	8
Noise	Site Clearance	Disturbance: Noise	Disturbance: noise	Direct Negative Low	Definite	20
Flora	Site Clearance	Clearing Indigenous Vegetation	Change in species composition	Direct Negative Moderate	Probable	30
Flora	Site Clearance	Clearing Indigenous Vegetation	Loss of vegetation cover	Direct Negative High	Probable	26
Flora	Site Clearance	Clearing Indigenous Vegetation	Loss of habitats	Direct Negative High	Probable	28
Flora	Site Clearance	Generation of Dust	Loss of species	Direct Negative High	Improbable	16
Soil	Site Clearance	Clearing Soils	Changes in soil functionality: depletion	Direct Negative Low	Probable	20
Soil	Site Clearance	Generation of hydrocarbon spills	Contamination of Soil - loss of soil function	Direct Negative Moderate	Improbable	8
Social	Site Clearance	Clearing Soils	Changes to landscape: transformation	Direct Negative Moderate	Improbable	11
Rehabilitation	Site Clearance	Lack of Maintenance	Costs: increase in rehabilitation costs	Indirect Negative Moderate	Improbable	8
Rehabilitation	Site Clearance	Lack of Monitoring	Costs: increase in rehabilitation costs	Indirect Negative Low	Improbable	4
Rehabilitation	Site Clearance	Maintenance	Costs: shift in rehabilitation costs	Indirect Positive Moderate	Definite	40
Rehabilitation	Site Clearance	Monitoring	Costs: shift in rehabilitation costs	Direct Positive Low	Definite	20
Heritage	Site Clearance	Clearing Soils	Loss of heritage artefacts or archaeological resources	Direct Negative High	Improbable	15
Heritage	Site Clearance	Clearing Soils	Loss of heritage artefacts or paleontological resources	Direct Negative Low	Improbable	8

Soil	Operational	Generation of hydrocarbon spills	Contamination of Soil - loss of soil function	Direct Negative Moderate	Improbable	8
Fauna	Operational	Disturbance: Traffic	Disturbance of fauna engagement patterns	Indirect Negative Moderate	Probable	20
Fauna	Operational	Human interaction with environment: vehicle accidents	Persecution of fauna - road kills	Indirect Negative Low	Probable	8
Fauna	Operational	Disturbance: Noise	Disturbance of fauna engagement patterns	Direct Negative Moderate	Probable	24
Fauna	Operational	Disturbance: Light	Disturbance of fauna engagement patterns	Direct Negative Moderate	Improbable	12
Flora	Operational	Invasive Prospecting: Drilling	Changes in vegetation composition: Alien species encroachment	Indirect Negative Moderate	Improbable	9
Fauna	Operational	Generation of Dust	Loss of habitats	Direct Negative High	Improbable	13
Biodiversity	Operational	Disturbance: fauna and flora	Change in species composition	Indirect Negative Moderate	Improbable	10
Dust	Operational	Generation of Dust	Changes in air quality - dust	Direct Negative Low	Improbable	4
Water - Hydrology	Operational	Generation of hydrocarbon spills	Changes in surface water quality runoff	Indirect Negative Low	Improbable	11
Land use	Operational	Generation and accumulation of general waste	Costs: increase in rehabilitation costs	Indirect Negative Low	Improbable	4
Noise	Operational	Disturbance: Noise	Disturbance: noise	Direct Negative Low	Definite	20
Ecology	Operational	Invasive Prospecting: Drilling	Loss of habitats	Direct Negative High	Probable	30
Water - Groundwater	Operational	Generation of hydrocarbon spills	Changes in ground water quality	Indirect Negative Low	Improbable	9
Social	Operational	Generation of Dust	Social: Health and Safety of individuals on site	Indirect Negative Low	Improbable	8
Social	Monitoring	Maintenance	Change in management decisions	Direct Positive Moderate	Highly Probable	44
Social	Monitoring	Rehabilitation	Change in management decisions	Direct Positive Moderate	Highly Probable	44
Social	Monitoring	Rehabilitation	Social: Health and Safety of individuals on site	Direct Positive Low	Highly Probable	32
Socio-Economic	Rehabilitation	Rehabilitation	Costs: shift in rehabilitation costs	Direct Negative High	Improbable	12
Socio-Economic	Rehabilitation	Rehabilitation	Costs: Change in land use value	Direct Positive High	Highly Probable	52
Socio-Economic	Rehabilitation	Maintenance	Costs: shift in management costs	Direct Negative Low	Improbable	8
Rehabilitation	Rehabilitation	Rehabilitation	Change in species composition	Indirect Positive Low	Definite	35

Gams North and Far East will be delayed till the 3rd year of the project and biodiversity feasibility and offset calculations will be completed for these areas. The impacts not listed in the table below has the same rating as the rest of the drill sites.

Table 21: Summary of Impact Assessment WITH mitigation for Gams North and Far East















Element	Project Phase	Activity	Impact Description	Impact Type Degree of loss	Final Probability	Final Score Residual
Biodiversity	Site Clearance	Disturbance: fauna and flora	Change in species composition	Direct Negative High	Probable	28
Ecology	Site Clearance	Clearing Indigenous Vegetation	Ecological system impacts: Ecological process & function deterioration/ breakdown	Direct Negative High	Probable	26
Ecology	Site Clearance	Construction of Roads	Ecological system impacts: habitat fragmentation	Direct Negative High	Probable	26
Biodiversity	Site Clearance	Clearing Indigenous Vegetation	Loss of habitats	Direct Negative High	Improbable	14

(ii) Final Site Map

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

(iii) Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

Not replacing the impacts identified the summary of highlighted potential impacts includes:





-  Increased ambient noise levels resulting from increased traffic movement and invasive prospecting activities during all prospecting phases;
-  Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on environmental resources utilized by landowners and stakeholders;
-  Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on ecosystem functioning;
-  Potential visual impacts caused by drilling activities;
-  Increased vehicle activity and vegetation clearance within the area resulting in the possible destruction and disturbance of fauna and flora;
-  Dust emissions caused by increased vehicle movement on site;
-  Potential sensitive habitat loss;
-  Rehabilitation of impacted areas (positive);
-  Loss of vegetation cover;
-  Potential loss of palaeontological, archaeological, cultural and heritage resources;
-  Potential find of palaeontological, archaeological, cultural or heritage resources (positive);
-  Loss of biodiversity;
-  The possible spread of alien species; and
-  Potential impact on landscape-level ecological processes.

I) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr




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




Impact management objectives will be developed to ensure that adverse socio-economic impacts are minimised and socio-economic benefits are maximised. Measures will further be defined to avoid, prevent, limit or manage any impacts.

The objectives of the EMPr will be to:

-  Provide sufficient information and guidance to plan prospecting activities in a manner that would reduce both social and environmental impacts as far as possible;
-  Provide sufficient information to strategically plan the prospecting activities to avoid unnecessary social and environmental impacts;
-  Provide a management plan that is effective and practical for implementation; and
-  Ensure an approach that will provide the necessary confidence in terms of environmental compliance.

Through the implementation of the mitigation and management measures it is expected that:



-  Noise impacts can be managed through consultation and restriction of operating hours;
-  Risks associated with crime can be mitigated through the avoidance of recruitment activities on site and also monitoring and reporting;
-  The water and soil resource pollution can be effectively managed through containment;

-  Water resource availability can be managed through groundwater monitoring strategies;
-  Ecological impact can be managed through the implementation of pollution prevention measures, land clearance minimisation, faunal disturbance by restricting working hours and rehabilitation; and
-  Visual impact can be minimised through the consideration of the material used for temporary infrastructure and drill site infrastructure used.

m) Aspects for inclusion as conditions of Authorisation

.....
Any aspects which must be made conditions of the Environmental Authorisation
.....



The following conditions should be considered for inclusion in the Authorisation:

-  If any extra drill sites need to be created an in-depth botanical survey overlain with the detail final design and engineering works for the drill sites and roads of all possible alternatives will be required. This overlain data set must be presented as a risk assessment to consider the qualification (or not) and feasibility of a biodiversity off-set for the prospecting impacts on the area; and
-  If any prospecting takes place within the buffer areas of any river an application for general authorization in terms of section 21 c and i must be applied for where required.

n) Description of any assumptions, uncertainties and gaps in knowledge

.....
Which relate to the assessment and mitigation measures proposed
.....

The following assumptions, uncertainties and gaps are applicable to this project:

-  Final comment from SAHRA is not yet available.
-  Final feasibility with botanical study and biodiversity offset study is not yet available

o) Reasoned opinion as to whether the proposed activity should or should not be authorised**i) Reasons why the activity should be authorized or not**



The option of not authorizing the activities will result in a significant loss to valuable information regarding the presence and quality of the minerals present on the property.

A major driver for this assessment is the expansion of the life of mine for Gamsberg Mining Project.

The major driver in conflict with this is that prospecting is now required in areas declared as biodiversity sensitive (no-go) and excluded for mining. The current mining footprint have been off-set to compensate for the loss of biodiversity. The areas where prospecting will now take place has not been offset in any way.

ii) Conditions that must be included in the authorisation

The following conditions should be considered for inclusion in the Authorisation:

-  If any extra drill sites need to be created an in-depth botanical survey overlain with the detail final design and engineering works for the drill sites and roads of all possible alternatives will be required. This overlain data set must be presented as a risk assessment to consider the qualification (or not) and feasibility to secure a biodiversity off-set for the prospecting impacts on the area.
-  If any prospecting takes place within the buffer areas of any river an application for general authorization in terms of section 21 c and i must be applied for where required.

p) Period for which the Environmental Authorisation is required

The life of project is anticipated to be 3 years.

q) Undertaking

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

An undertaking by the EAP is provided for in Section 2 of the EMP (Part B) and is applicable to both the Basic Assessment Report and the Environmental Management Programme report.

r) Financial Provision

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

Table 22: Summary of Closure Provision

Quantum Assessment			
Amended Quantum Assessment 2017			
			Total Quantum 2017 Estimate: R 3,217,800.00
FARM:		Dated: 18-09-17	
Black Mountain Prospecting Project - Gamsberg East and South			
Farm: Gams 60, Portion 1			
Life of Project Drill Sites	180	Split costs according to rehab schedule	0
Planned Boreholes	60	Keep original costing of boreholes	0
Previous Period Boreholes	0	Add Roads and laydown areas (m ²)	120000
AMENDED COST SUMMARY			
Pollution Mitigation and Remediation			R 1,985,400.00
Rehabilitation			R 456,600.00
Monitoring and Maintenance			R 188,500.00
Management and Contingencies			R 51,000.00
TOTAL COSTS			R 3,217,800.00

i) Explain how the aforesaid amount was derived.

.....
The following section details the methodologies adopted to calculate the quantities, associated rehabilitation (clean closure) rates and eventually the final (clean) closure cost estimate

Please refer to the BMM Gamsberg East and South Financial Provision Cost Report appended to this submission that details methodologies and approach.

The financial provision provided in terms of section 41 and regulation 53 of the Act must be periodically reviewed and adjusted to conform to the relevant prospecting activities.

Concurrent rehabilitation costs occur annually as drilling progressed. Rehabilitation costs are incorporated both into the drilling program and the drilling operator contract.

The detail tables of the assessment are available in the financial provision report attached to this application.

ii) Confirm that this amount can be provided for from operating expenditure.

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

The rehabilitation costs are incorporated as part of the prospecting tender and secured in the budget to appoint drilling contractor before commencement and a financial guarantee is secured before commencement.

s) Specific Information required by the competent Authority

- i) Compliance with the provisions of sections 24(4) (a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). The EIA report must include the: -**

(1) Impact on the socio-economic conditions of any directly affected person.

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

No specific report was generated for the purposes of the socio-economic conditions.

The assessment of the anticipated social-economic impacts was done by the EAP and is presented this document.

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

.....
*Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as **Appendix D2** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6 and 2.12. herein.*

A Heritage Impact Assessment of the prospecting area has been conducted to identify any cultural, heritage and/or archaeological features which may be impacted on.

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

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

Existing and historical mining activities are known from within the larger region and it is anticipated that similar conditions will prevail for this project.

Further investigation is recommended of the possible massacre sites on the southern slope of Gamsberg. Sites SG1, SG4 and SG7 as described in the heritage impact assessment report should be considered "no-go" areas.

Should any unknown heritage sites be identified during the drilling activities, all activities will cease immediately and SAHRA will be contacted. After assessment, and if appropriate, a permit will be obtained from SAHRA to remove such remains/artefacts.

PART B: ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1. Draft environmental management programme

a) Details of the EAP,

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

The requirement for the provision of the details and expertise of the EAP are included in Part A, Section (1) (a).

b) Description of the Aspects of the Activity

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

The requirement to describe the aspects of the activity that are covered by the draft environmental management programme is included in Part A, Section (1) (h).

c) Composite Map

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





Please refer to **Appendix F** for the composite map.

d) Description of Impact management objectives including management statements

i. Determination of closure objectives

.....
Ensure that the closure objectives are informed by the type of environment described.

Black Mountain Complex currently commits to the following closure objectives:

1. To secure the effective and sustainable transfer of the municipal services of the town, Aggeneys, and the Pella-drift Water Board to the Khai-Ma municipality.
2. To ensure that the biodiversity and environment on the site is protected.
3. To make sure that the following commitments will be achieved as a minimum:
 -  The site will be made safe for both humans and animals,
 -  The site will be rehabilitated to be physically, chemically and biologically stable
 -  The residual impacts will be managed to acceptable levels and will not deteriorate over time, and
 -  Closure will be achieved with minimal socio-economic upheaval.
4. To provide sufficient funds at the end of life of mine, to properly implement the closure plan, and also to make provision for possible premature closure, and post closure monitoring requirements.

Concurrent rehabilitation is required from the contracted company. Each drill site has to be cleaned from all evidence of pollution and made safe as part of decommissioning. All drill holes are capped and marked for safety of persons and animals on site.

Post drilling rehabilitation status evaluation will be evaluated and provide specific remedial measures for implementation until satisfactory rehabilitation has been completed.

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

During the operational phase of the prospecting activities an estimate of 100 000 l water will be used per day. It is currently not anticipated that water use will exceed the general authorisation volume for the area. The site has a water use license and is authorised to use water beyond the generally authorised amounts.

iii. Has a water use licence been applied for?

Black Mountain Mine has an existing water use license. Licence number 14/D82C/ABCGIJ/2654 issued on 2016/04/14. In terms of legal application, in summary water can legally be used without a WUL for domestic use for the prospecting project and water can be stored up to 50 000 cubic meters for domestic and prospecting use.

No water use license is required where water use is limited to the above volumes, drilling takes place outside 100 meters of a water course and regulation 704 buffer areas of 500 meters is applied to pans. Drilling can be conducted legally without a WUL or regulation 704 exemption application as long as BMM avoids drilling within 100 meters of a water course. However, if drilling will take place within 100m from a water course section 21 c and i will be applied for.

iv. Impacts to be mitigated in their respective phases*Measures to rehabilitate the environment affected by the undertaking of any listed activity***Table 23: Concurrent Rehabilitation Schedule**

Rehabilitation plan								
ITEM	2018	2019	2020	2021	2022	2023	2024	
REHABILITATION PLANNING AND BASELINE VERIFICATION								
Demarcation of areas: rehabilitation	60	60	60					
Demarcation of areas: drill pads and roads	60	60	60					
Site verification and staff training	all	all	all					
Schedule transplantation, nursery specimens, seed collecting.	60	60	60	Seed collecting to continue if need be				
Fixed photo baseline monitoring	60	60	60					
CONCURRENT REHABILITATION								
Site clearance and topsoil stockpiling	60	60	60					
Direct transplantation	50	50	50	30				
DRILLING AND POLLUTION CONTROL								
Drilling	60	60	60					
Pollution control and clean-up	60	60	60					
Closure of drill sumps	30	60	60	30				
De-compaction	30	60	60	30				
Safeguarding the drill site	30	60	60	30				
REHABILITATION - POST DRILLING								
Rehabilitation status inspection	30	60	60	30				
Fixed photo post impact monitoring	30	60	60	30				
Soil amelioration	30	60	60	30				
Re-vegetation - transplantation	30	60	60	30				
Re-vegetation - sowing	30	60	60	30				
Fixed photo post rehabilitation monitoring	30	60	60	30				
REHABILITATION MONITORING AND MAINTENANCE								
Annual Monitoring	0	30	90	150	180	180	180	
Annual Maintenance	0	30	90	150	180	180	180	

e) Impact Management Outcomes

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

Table 24: Impact Management Outcomes

ASPECTS								Element	OUTCOMES
Resource Use	Waste Management	Air Emission	Water Pollution	Noise / Vibration	Land Contamination	Biodiversity Disturbance	Socio Economic Changes		Environmental Management Objective
1			1					Legislative	Ensure compliance to the National Water Act and applicable regulations
1			1					Legislative	Manage Section 21 c and i water use risks
1			1					Legislative	Ensure surface water management in terms of Regulation 704
1			1					Water - Hydrology	Reduce impact on surface hydrology and consequential secondary impacts
						1		Flora	Ensure vegetation protection through the project life cycle
						1		Flora	Protect indigenous vegetation
						1		Flora	Ensure vegetation establishment as soon as possible after clearing.
						1		Fauna	Limit habitat destruction and fragmentation during road construction
						1		Legislative	Ensure legal compliance through monitoring
						1		Flora	Ensure vegetation protection through the project life cycle
		1						Dust	Limit dust impacts from traffic

									Ecology	Limit ecological impacts because of traffic
									Ecology	Limit habitat destruction and fragmentation during road construction
									Health and Safety	Limit injuries to individuals on site
									Economic	Maintenance and monitoring management
									Flora	Manage alien invasive species
									Fauna	Manage interaction with fauna during construction
									Fauna	Manage interaction with fauna during construction
									Ecology	Manage interaction with the environment during construction
									Rehabilitation	Manage rehabilitation sustainability through proper planning
									Soil	Prevent and manage soil contamination
									Noise	Reduce noise impacts
									Land use	Restore land use value to sustainable land use or natural pre-determined state
									Water - Surface & Groundwater	Manage and limit the impact of mineral waste generation and accumulation on surface water and groundwater
										Manage and limit impact on groundwater levels and quality
									Biodiversity	To minimise biodiversity impact, soil erosion in the proposed development area.
									Ecology	To minimise ecological sensitive area impacted the proposed development area.

f) Impact Management Actions

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

Table 25: Impact Management Actions

OUTCOMES	ACTIONS			
Environmental Management Objective	Avoidance Measures	Reduction Measures	Remedial Measures	Monitoring Measures
<p>Ensure compliance to the National Water Act and applicable regulations</p>	<p>Various roads and boreholes are located within the 100m buffer zone of non-perineal rivers and required application for general authorization in terms of section 21 c and i must be applied for where required.</p>			
<p>Manage Section 21 c and i water use risks</p>		<p>Water use in the instream and/or riparian habitats as applicable must not result in potential, measurable, cumulative detrimental decline in diversity of communities and composition of the natural, endemic vegetation</p>	<p>In terms of rehabilitating impacts (water use) (a) a systematic rehabilitation program must be undertaken to restore the watercourse to its condition prior to the commencement of the water use; (b) all disturbed areas must be revegetated with indigenous vegetation suitable to the area and (c) active alien invasive plant control measures must be implemented to prevent invasion by exotic and alien vegetation within the disturbed area.</p>	<p>In terms of monitoring, annual environmental audits for three years are required to ensure that the rehabilitation is stable; failing with remedial action must be taken to rectify any impacts.</p>

<p>Ensure surface water management in terms of Regulation 704</p>		<p>Proponent must ensure concurrent rehabilitation to reduce surface areas where dirty water can accumulate. Storm water berms must be vegetated immediately to protect against wind and water erosion and possible failure.</p> <p>Concurrent rehabilitation must address water pollution control concerns.</p>	<p>Old areas not rehabilitated must be rehabilitated as a priority to ensure the requirement is met.</p>	<p>Implementation of concurrent rehabilitation and rehabilitation monitoring of riverine habitat is required.</p>
<p>Reduce impact on surface hydrology and consequential secondary impacts</p>		<p>Reduce long term impacts and maintenance by road rehabilitation immediately after drilling</p>	<p>Restoration of the hydrological regime as well as storm water control during operations will be required to ensure minimal silt and loose soils wash downwards towards the Aggeneys Gravel Vygie veld which is most susceptible to such disturbance.</p>	<p>Monitoring of secondary impacts and storm water infrastructure to maintain integrity of mitigation measures.</p>
<p>Ensure vegetation protection through the project life cycle</p>		<p>Temporary lay-down areas should be located within previously transformed areas or areas that have been identified as being of low sensitivity.</p>	<p>Temporary roads and storage areas should be investigated and rehabilitated after use, even if vegetation clearance were minimal.</p>	

<p>Protect indigenous vegetation</p>		<p>Inspect vegetation for protected species and ensure search and rescue before vegetation clearance. Any nationally protected trees within close proximity of the development footprint to be identified as no-go areas or special permits obtained to remove the trees, meeting the obligations of such permits issued.</p>	<p>The development footprint should be kept to a minimum and natural vegetation should be encouraged to return to disturbed areas by excluding grazing and trampling while vegetation is establishing</p>	
<p>Ensure vegetation establishment as soon as possible after clearing.</p>		<p>Limit vegetation clearing to areas that will be impacted immediately.</p>	<p>Ensure all vegetation is stockpiled for re-use in rehabilitation.</p>	<p>Monitor vegetation crown cover to ensure cleared areas are sufficiently restored to baseline values.</p>
<p>Limit habitat destruction and fragmentation during road construction</p>		<p>Reduce the number and width of roads required by proper planning and agreement to a single traffic management plan.</p>	<p>Road verges should be restored to natural state as soon as possible after road construction. This would include storm water diversions and landscaping, replacement of topsoil, brush packing, seeding and/or planting.</p>	
<p>Ensure legal compliance through monitoring</p>	<p>Sufficient resources and funds must be available to maintain the required monitoring, data analysis and management of elements monitored throughout the project.</p>	<p>Monitoring must be outsourced where skills and expertise are not found in-house.</p>	<p>Where monitoring is adhered to according to authorisations, notification and rectification plan should be submitted to the relevant authority. Where data deviate from required norms and standards, immediate actions plans to rectify root cause for change in element quality must be put in place, executed and monitored for success.</p>	<p>Monitoring records should be kept for life of the project and at least five years after project closure.</p>

<p>Ensure vegetation protection through the project life cycle</p>	<p>No unauthorised site clearing or disturbance at the site without an ECO present.</p>	<p>The final development area should be surveyed for species suitable for search and rescue, which should be translocated prior to the commencement of vegetation clearance or construction.</p>	<p>Ensure concurrent vegetation establishment on cleared areas before next rain season.</p>	
<p>Limit dust impacts from traffic</p>	<p>Travel on demarcated roads only and apply dust suppressant or wetting agent to seal road surfaces.</p>	<p>Maintain speed limits to reduce dust on site and in area.</p>	<p>Dust impacts cannot be remediated.</p>	
<p>Limit ecological impacts because of traffic</p>	<p>Ensure that construction activities are staggered and vehicular activities are kept to a minimum.</p>	<p>Vehicle speed should be limited to 40km per hour in areas with indigenous vegetation to reduce probability of road kills.</p>	<p>Where more than one roadkill is encountered, the area should be investigated for fauna breeding or migration and an alternative route considered.</p>	<p>Road kills should be recorded for the project to give indication of fauna activity in the area. Recording should include species, date, area.</p>
<p>Limit habitat destruction and fragmentation during road construction</p>	<p>No dry watercourse, wetland, flood line or riparian vegetation should be fragmented by road construction. Where this is inevitable, on-site environmental risk assessment by suitably competent person should be conducted to reduce impacts before construction.</p>	<p>Reduce the number and width of roads required by proper planning and agreement to a single traffic management plan.</p>	<p>Road verges should be restored to natural state as soon as possible after road construction. This would include storm water diversions and landscaping, replacement of topsoil, brush packing, seeding and/or planting.</p>	
<p>Limit injuries to individuals on site</p>	<p>Site access should be controlled and no unauthorized persons should be allowed onto the site.</p>		<p>No open holes should be left without rehabilitation at the site as persons can fall in and get injured.</p>	

<p>Maintenance and monitoring management</p>	<p>Sufficient resources and funds must be available to maintain the required monitoring and maintenance, data analysis and management of elements monitored throughout the project.</p>		<p>Maintenance plans should be in place for the site.</p>	<p>Alien vegetation monitoring and maintenance plans adhered for the site during operation and for the rehabilitated areas after operation has ceased.</p>
<p>Manage alien invasive species</p>	<p>Prevent and limit alien invasive species establishing on site by conducting concurrent rehabilitation and vegetating bare areas as soon as possible.</p>	<p>Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.</p>	<p>Reintroduce local indigenous seed and species during rehabilitation. Vegetate area with specimens rescued from site where possible. This should be done where areas were cleared and where alien species were removed.</p>	<p>Alien vegetation monitoring and maintenance plans should be in place for the site during operation and for the rehabilitated areas after operation has ceased</p>
<p>Manage interaction with fauna during construction</p>	<p>Site access should be controlled and no unauthorized persons should be allowed onto the site.</p>	<p>The collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off the demarcated construction site.</p>	<p>Any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person.</p>	
<p>Manage interaction with fauna during construction</p>	<p>All construction vehicles should adhere to a low speed limit to avoid collisions with susceptible species such as snakes and tortoises.</p>	<p>If the site must be lit at night, this should be done with low-UV type lights (such as most LEDs), which do not attract insects.</p>	<p>Faunal sweeps within habitats such as bush clumps should take place before clearing and any fauna located should form part of a search and rescue and relocated to safety.</p>	
<p>Manage interaction with the environment during construction</p>	<p>No dogs should be allowed on site. No fires (heating or cooking) is allowed on site. No fuel wood collection is allowed on-site.</p>	<p>Where vagrant dogs/cats are found without owner or tag, the dog/cat should be removed. Tagged dogs should be removed and owner</p>		<p>Monitor community members accessing the site, maintain a complaint register and respond to concerns as appropriate.</p>

		notified to collect dog / cat immediately.		
Manage rehabilitation sustainability through proper planning	Ensure a rehabilitation plan is in place that incorporate physical and biophysical (biotic and abiotic remediation) designs specific to the site conditions.	Reduce rehabilitation costs by implementing rehabilitation according to the rehabilitation plan and review plan and monitoring results annually to adjust for continual improvement.	Fire, flood, wind and trampling impacts on rehabilitation works should be mapped and prioritised for follow-up as frequently as these impacts on rehabilitation occur.	Monitor the rehabilitation plan and rehabilitation success annually.
Prevent and manage soil contamination	Re-fuelling must take place on a sealed surface area to prevent ingress of hydrocarbons into topsoil.	It must be ensured that all hazardous storage containers in transport or storage comply with the relevant SABS standards to prevent leakage and pollution on site.	Any parking areas, refuelling areas or storage areas where soil is contaminated needs to be cleaned up and soil despatched to registered hazardous waste site or bio-remedial plant. Evidence of final disposal must be kept on site.	The implementation, monitoring and management of hydrocarbons on site are critical to prevent soil contamination. Monitor equipment for pollution potential: All vehicles must be regularly inspected for leaks.
Reduce noise impacts		Adjacent landowners to the proposed activity will be notified of commencement of construction and expected timing for construction activities that would result in significant noise generation.		The responsible engineer should check legislation and ensure that municipal regulations relating to noise generation are observed.
Restore land use value to sustainable land use or natural pre-determined state	No area should be left unsafe, or as waste land after the project. All areas (small or great) must be rehabilitated	Land use should be acceptable to the community and sustainable on the long term.	Where areas are cannot be restored to sustainable land use or natural pre-determined state and alternative land use	Monitor final land use quality before project closure and or handover.





	to reduce cumulative effect of land use reduction as a result of the project.		can be selected through specialist and community consultation process.	
Manage and limit impact on groundwater levels and quality	<p>Some of the exploration borehole should be equipped as piezometers to assess the extent of dewatering. Should this not be possible then additional monitoring boreholes should be drilled. Aquifer tests should be conducted the monitoring boreholes should they be drilled. It is envisaged that this will be conducted as part of the Project Feasibility Study.</p> <p>During the operational phase the mine water must be used or pumped to dirty water dams or pollution control facilities in order to avoid deterioration of the mine water.</p> <p>A hydro census should be conducted in at least a 7 kilometre radius around the Project. This data should also be used to update the groundwater model.</p> <p>A monitoring protocol and action plan should be drafted. This protocol will describe procedures in the event that groundwater monitoring information indicates that action is required.</p>	<p>Visual inspection should be conducted underground to identify the zones of seepage and related back to the geology.</p> <p>As part of the monitoring program, the area should be visually assessed for any seepage emanating from the shafts or areas in proximity to the shafts</p> <p>The monitoring results must be interpreted annually by a qualified hydrogeologist and network audited annually as well to ensure compliance with regulations</p> <p>It is recommended that the geochemical assessment is updated during the life of the mine in order to construct an effective closure plan</p>	<p>If it can be proven that the project is indeed affecting the quantity of groundwater available to certain users, the affected parties should be compensated. This may be done through the installation of additional boreholes for water supply purposes, or an alternative water supply</p>	<p>The volume of water currently being abstracted from the mine should be measured daily.</p> <p>The mine water level should also be measured daily.</p> <p>Groundwater levels and quality should be monitored as mentioned in Section 12.1 to establish groundwater level and quality trends.</p> <p>Two additional boreholes should be installed, upstream and downstream from the project to monitor direct impacts of the project.</p>

<p>Manage and limit the impact of mineral waste generation and accumulation on surface water and groundwater</p>	<p>Drill sludge should be isolated and managed on site.</p>	<p>Construct surface water runoff catchment channels around sludge containment areas and drill platforms. Line all mineral waste stockpile laydown areas.</p>		
<p>To minimise biodiversity impact, soil erosion in the proposed development area.</p>	<p>All indigenous species is retained as far as possible and where alien species are encountered they are removed. The selection of laydown areas will consider already disturbed areas first. Any nationally protected trees within close proximity of the development footprint to be identified as no-go areas. All construction staff should undergo an environmental induction from a suitably qualified person regarding the importance of footprint management. 'General waste accumulating on site should be sorted, stored and deposited of at a registered waste facility Sanitary waste must be contained in mobile toilets and removed from site by a competent contractor. All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. The material and its waste must be placed on a PVC liner, in a bunded area with a lid to contain the material.</p>		<p>Mineral waste in the form of overburden material, residue from blasting and drill sludge should be contained and removed from site to allow for site recovery. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.</p>	

<p>To minimise ecological sensitive area impacted the proposed development area.</p>	<p>Avoidance and reduced activity (in terms of activities, extent and duration) should be applied to highly sensitive ecological areas as mapped on the sensitivity mapping.</p> <p>Habitat fragmentation (by cross cutting any one habitat type) should be avoided as far as possible.</p> <p>No fires should be allowed on-site.</p> <p>No fuelwood collection should be allowed on-site.</p> <p>It should be endeavoured that the construction site and loose material will not be exposed to rain resulting in excessive erosion, siltation and general disturbance down slope.</p>	<p>In order to minimize the disturbed area and disturbance impact the project should be completed as soon as possible and return to a state of recovery before the next rain season.</p>		
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i. Financial Provision**1) Determination of the amount of Financial Provision****a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.**

Black Mountain Mine currently commits to the following closure objectives:

5. To secure the effective and sustainable transfer of the municipal services of the town, Aggeneys, and the Pella-drift Water Board to the Khai-Ma municipality.
6. To ensure that the biodiversity and environment on the site is protected.
7. To make sure that the following commitments will be achieved as a minimum:
 -  The site will be made safe for both humans and animals,
 -  The site will be rehabilitated to be physically, chemically and biologically stable
 -  The residual impacts will be managed to acceptable levels and will not deteriorate over time, and
 -  Closure will be achieved with minimal socio-economic upheaval.
8. To provide sufficient funds at the end of life of mine, to properly implement the closure plan, and also to make provision for possible premature closure, and post closure monitoring requirements.

The main alignment to the baseline environment is aiming for the protection of the biodiversity through all the phases of the project. This will be achieved by implementing the rehabilitation plan.

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

The landowner is also the proponent. The nearest neighboring farm is approximately 1.29 km from the drill sites. The Basic Assessment Report and Environmental Management Plan are now made available to each registered stakeholder for review and comment. All comments will be recorded in the issues and response section and will be included into the final report.

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

The proposed rehabilitation approach is to conduct rehabilitation concurrently while drilling takes place according to the different prospecting areas and phases.

The non-intrusive phase is expected to cover the whole area while drilling will take place according to the different prospecting areas and phases as outlined below. Timeline for exploration is a projection and completely dependent on zinc prices and budget availability for exploration activities. Please refer to the financial provision report appended to this submission for more detail.

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

The rehabilitation plan has been developed on the basis that the rehabilitated areas are safe, stable, non-polluting and are able to support an ecosystem similar to the surrounding natural environment. Due to the nature of the activities, the impacts will be limited and of short duration. The management plan is provided in such a manner as to ensure concurrent rehabilitation. To ensure the alignment of the rehabilitation plan with the closure objective, a high-level risk assessment of the prospecting activities has been conducted to establish the potential risks associated with it.

e) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.**Table 26: Estimated Total Rehabilitation Cost and Annual Provision**

Quantum Assessment			
Amended Quantum Assessment 2017			
			Total Quantum 2017 Estimate: R 3,217,800.00
FARM:			
Black Mountain Prospecting Project - Gamsberg East and South			Dated: 18-09-17
Farm: Gams 60, Portion 1			
Life of Project Drill Sites	180	Split costs according to rehab schedule	0
Planned Boreholes	60	Keep original costing of boreholes	0
Previous Period Boreholes	0	Add Roads and laydown areas (m ²)	120000
AMENDED COST SUMMARY			
Pollution Mitigation and Remediation			R 1,985,400.00
Rehabilitation			R 456,600.00
Monitoring and Maintenance			R 188,500.00
Management and Contingencies			R 51,000.00
TOTAL COSTS			R 3,217,800.00

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

Black Mountain Mining (Pty) Ltd, a member of Vedanta plc, is considered financially competent and undertakes concurrent rehabilitation in the company resolution as provided in the Prospecting Work Programme.

Black Mountain Mining (Pty) Ltd will provide bank guarantee if prospecting project is approved.

- j) Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including**
- a) Monitoring of Impact Management Actions**
 - b) Monitoring and reporting frequency**
 - c) Responsible persons**
 - d) Time period for implementing impact management actions**
 - e) Mechanism for monitoring compliance**

It is the primary responsibility of Black Mountain Mining (Pty) Ltd to ensure that the execution of the monitoring and management programme is done in accordance with this environmental management programme (EMP).

In instances where contractors will be appointed, it remains the responsibility of the BMM Manager to communicate the requirements of this EMP to the said contractors. An environmental officer or other appointed representative will at least conduct EMP audits monthly during prospecting to ensure compliance with the EMP.

All existing ISO14001 procedures and standards will be applied to this site as for the rest of the BMM operation. Where new requirements are detailed in this report that is not in the existing standards, the standards will be reviewed and updated. Roles and responsibilities need to be defined clearly in such a procedure. The Manager must ensure that all reporting to specific government department is done as per this EMP.

The table below provides details of how environmental impacts must be managed and monitored and also provides the monitoring frequency as well as the reporting frequency.

Table 27: Mechanisms for Monitoring Compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Site access/roads Drill sites Exploration drilling	Land disturbed by prospecting	Measure concurrent rehabilitation in terms of: - Number of holes drilled - Number of holes rehabilitated - Number of trenches - Number of trenches rehabilitated - Roads constructed - Roads rehabilitated or handed over to landowner	Prospecting Manager	Monitoring: Monthly Reporting: Monthly
		Remove all foreign matter from site and disposed at designated site	Prospecting Manager	Monitoring: Every drill site, daily Reporting: Monthly
		Cap and mark all boreholes	Prospecting Manager	Monitoring: Every drill site, daily Reporting: Monthly
		Take photographs prior and after drilling as records	Prospecting Manager	Monitoring: Every drill site, daily Reporting: Monthly
Exploration drilling Re-Fuelling and maintenance Ablution facilities Waste management	Soil loss and quality deterioration	Topsoil placement at sump areas	Prospecting Manager	Monitoring: Every drill site, daily Reporting: Monthly
		Prevent hydro carbons spills by using drip pans or PVC linings. Remove content of drip pan and dispose at a designated disposal site.	Prospecting Manager	Monitoring: Every drill site, daily Reporting: Monthly
		If spill occur, stop drilling and clean spill, remove contaminated soil off site to a designated disposal facility.	Prospecting Manager	Monitoring: Every drill site, daily Reporting: Monthly

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Site access/roads Drill sites Exploration drilling	Fauna and flora affected by prospecting activities	Fence off drill site to ensure demarcation	Prospecting Manager	Monitoring: Every drill site Reporting: Monthly
		Avoid damaging endangered or protected plants	Prospecting Manager; Environmental Specialist	Monitoring: Prior to prospecting Reporting: Annually with performance assessment
		Translocate plants, obtain permits, where necessary	Prospecting Manager; Environmental Specialist	Monitoring: Prior to prospecting Reporting: Annually with performance assessment
		Monitor prevention of damage to fauna and flora	Prospecting Manager	Monitoring: Every drill site, daily Reporting: Monthly
Water management Exploration drilling	Groundwater quality affected by prospecting activities	Clean hydro carbons spills	Prospecting Manager	Monitoring: Every drill site, daily Reporting: Monthly
		Water Quality Monitoring after drilling	Contracting Company	Monitoring & Reporting: After rehabilitation of drill sites. Annually thereafter depending on results
Ablution facilities Waste management	Waste generated	Keep records for ton of hazardous waste removed from site.	Prospecting Manager	Monitoring: Monthly Reporting: Monthly

**l) Indicate the frequency of the submission of the performance assessment/
environmental audit report**

Internal and external inspections will be conducted on a regular basis to confirm the compliance to this EMP.

EMP performance results and quantum update from these inspections will be reported to the relevant regulator according to the prescribed manner annually.

m) Environmental Awareness Plan**(1) Manner in which the applicant intends to inform his or her employees of any
environmental risk which may result from their work**

All employees and subcontractor staff involved with the project will undergo Safety-Health-Environmental Induction that is updated on a regular basis to adhere to changes in compliance requirements.

A Safety-Health-Environmental (SHE) representative is appointed for the working teams to assist in highlighting operational SHE issues while drilling takes place.

The reporting hierarchy for operational performance is also used to ensure environmental communication and awareness. Competent contractors are appointed with supervisors that can translate SHE risks to foremen and operating staff. This takes place through morning meetings before drilling commence (toolbox meetings) and SHE meetings held specifically for this purpose.

**(2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of
the environment**

Black Mountain Mining Pty (Ltd) will aim to apply a risk management system where risks are identified and rated. Site inspections in terms of EMP compliance take place and will serve as a training opportunity.

Emergency procedures of risks are practiced at least annually and improvements made to ensure emergency preparedness and response is adequate to address environmental incidents.

Recommendations and Incident reporting of events takes place during site inspections and are addressed to ensure continual improvement of the environmental management on site.

Vedanta plc applies international IFC best practice standards on site and BMM is an ISO14001 certified operation.

n) Specific information required by the Competent Authority

.....
Among others, confirm that the financial provision will be reviewed annually
.....

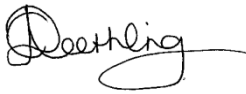
No specific information has been required by the Competent Authority.

2. UNDERTAKING

The EAP herewith confirms

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

Signature of the environmental assessment practitioner:



Name of company:

EndemicVision Environmental Services

Date:

18 September 2017

Appendix A

EAP CURRICULUM VITAE

**For the Gamsberg East and South Prospecting Basic Assessment Report
September 2017**

Appendix B

LOCALITY MAP

**For the Gamsberg East and South Prospecting Basic Assessment Report
September 2017**

Appendix C

SITE MAP

**For the Gamsberg East and South Prospecting Basic Assessment Report
September 2017**

Appendix D1

PALAEONTOLOGICAL IMPACT ASSESSMENT

**For the Gamsberg East and South Prospecting Basic Assessment Report
September 2017**

Appendix D2

HERITAGE IMPACT ASSESSMENT

**For the Gamsberg East and South Prospecting Basic Assessment Report
September 2017**

Appendix D3

FLORA IMPACT ASSESSMENT

**For the Gamsberg East and South Prospecting Basic Assessment Report
September 2017**

Appendix D4

FAUNA IMPACT ASSESSMENT

**For the Gamsberg East and South Prospecting Basic Assessment Report
September 2017**

Appendix E

STAKEHOLDER ENGAGEMENT

**For the Gamsberg East and South Prospecting Basic Assessment Report
September 2017**

Appendix F

CLOSURE QUANTUM

**For the Gamsberg East and South Prospecting Basic Assessment Report
September 2017**