



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

NAME OF APPLICANT: Henk Bemarking CC
REFERENCE NUMBER: NC 30/5/1/3/2/10227 MP

ENVIRONMENTAL MANAGEMENT PLAN FOR SMALL-SCALE MINING

**APPLICABLE TO MINING PERMITS WHERE LESS
THAN 2000 m³ PER QUARTER WILL BE
EXCAVATED USING MANUAL LABOUR
TECHNIQUES AND
NOT TO BE USED FOR GOLD OR COAL MINING**

**SUBMITTED
IN TERMS OF SECTION 39 AND OF REGULATION
52 OF THE MINERAL AND PETROLEUM
RESOURCES DEVELOPMENT ACT, 2002,
(ACT NO. 28 OF 2002) (the Act)**

STANDARD DIRECTIVE

Applicants for mining permits which do not include coal or gold mining, and where the total excavations will not exceed 2 000 m³ with a maximum of 16 000 m³ over the life of the mine including any permit renewal periods, are herewith, in terms of the provisions of Section 29 (a) and in terms of section 39 (5) of the Mineral and Petroleum Resources Development Act, directed to submit an Environmental Management Plan strictly in accordance with the subject headings herein, and to compile the content according to all the sub items to the said subject headings referred to in the guideline published on the Departments website, within 60 days of notification by the Regional Manager of the acceptance of such application. This document comprises the standard format provided by the Department in terms of Regulation 52 (2) insofar it relates to small scale miners using manual labour techniques only, provided that it will only be valid in the hands of the person to whom the permit is issued and not in cases of a change in the scale of the operation or in cases of sub contracting, sub letting or the disposal of the permit to a third party. **It is not intended for general use in the case of mining permits.** The standard environmental management plan which was in use prior to the year 2011, will no longer be accepted.

IDENTIFICATION OF THE APPLICATION IN RESPECT OF WHICH THE ENVIRONMENTAL MANAGEMENT PLAN IS SUBMITTED.

ITEM	APPLICANT CONTACT DETAILS	REPRESENTATIVE CONTACT DETAILS
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ITEM	LANDOWNER CONTACT DETAILS
Name	Gemeenskap van Pella Khai-Ma Municipality
Tel no	(054) 933 1000
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Cellular no	
E-mail address	
Postal address	PO Box 108, POFADDER, 8890 New Street, POFADDER

1 REGULATION 52 (2) (g): Record of the public participation and the results thereof.

1.1 Identification of interested and affected parties

IDENTIFICATION CRITERIA	Mark with an X where applicable	
	YES	NO
Has the landowner been identified?	X	
Is there a lawful occupier on the property other than the Landowner?	X	
Is there a tribal authority or host community that may be affected?		X
Can it be confirmed that there are no land claims in respect of the area?	X	
Have the landowners or lawful occupiers of neighbouring properties been identified?	X	
Has the local municipality been identified?	X	
Are there power lines within 100 metres of the area applied for?		X
Are there public roads or railway lines within 100 metres of the area applied for?		X
Is there any other infrastructure within 100 metres of the area applied for? (Specify)		X
Has the Provincial Department responsible for the environment been identified	X	
Have all of the parties identified above been provided with a description of the proposed mining operation as referred to in paragraph 2 below?	X	
Have all the parties identified above been requested in writing to provide information as to how their interests (whether it be socio-economic, cultural, heritage or environmental) will be affected by the proposed mining project?	X	

1.2 List of parties identified in 1.1 above that were in fact consulted.

LIST THE NAMES OF INTERESTED AND AFFECTED PARTIES CONSULTED	LIST THE INTEREST OF THE INTERESTED AND AFFECTED PARTIES CONSULTED e.g. Landowner, Neighbours, Community representative, Land claims commissioner, Local municipality, Government departments responsible for the environment, Departments or agencies responsible for infrastructure in the area.
Municipal Manager	Landowner & Local Authority Khai-Ma Municipality
Advertisement in press	General public
DESCRIBE BELOW HOW THE CONSULTATION WAS CONDUCTED Mark with an X where applicable	
Written communication (Written responses must be attached as an annexure)	X
Meetings (Minutes of meetings must be attached as an annexure)	
Other (specify)	Advertisement in press X

1.3 Impact of the proposed mine on interested and affected parties.

LIST THE NAMES OF INTERESTED AND AFFECTED PARTIES CONSULTED	DESCRIBE THE POTENTIAL IMPACT ON THE INTERESTED AND AFFECTED PARTY CONSULTED AS IDENTIFIED BY THAT PARTY.
Municipal Manager	Comments to be send to DMR
Advertisement in press	Comments to be send to DMR

1.4 Information regarding objections

	Mark with an X where applicable	
	YES	NO
Have any of the interested or affected parties objected to the application?		X

DESCRIBE BELOW WHAT THE NATURE OF THE OBJECTION IS
No objections against the proposed mining operation that need to be dealt with by the REMDEC committee were received to date.

2 Description of the proposed mining operation

Quartz and other gemstone outcrops will be mined by manual labour making use of picks and shovels. The areas would first be stripped of all available topsoil. This topsoil would be stockpiled separately for later use when the quarry is rehabilitated.

Only ore with a surface expression will be mined and all excavations will be less than 1.5m to 3m deep as only manual labour will be available.

No processing will take place only sorting as the material will be used in the manufacturing of curios and jewellery. First grade material will have to be carried out due to the inaccessibility of the area.

Waste rock will be backfilled into the excavation and profiled and the topsoil will be replaced. After rehabilitation only an even depression will be remain with minimal impact on the environment. The estimated footprint of the mining operation is 3Ha.

3 Description of the environment likely to be affected by the proposed mining operation

Heritage environment

The area is very inaccessible and can only be reached on foot therefore only manual labour will be used during the mining operation. Excavations will therefore be shallow and only the ore body with a surface expression will be removed with picks and shovels and carried out to the nearest route (diagram 2). The possibility to unearth any fossils or artifacts is very slim due to the low invasive nature of the mining operation, and given the high cost of a visit to this site, no first phase paleontological assessment is deemed necessary. No other heritage resources such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves of victims of conflict, and cultural landscapes or viewscapes are present on the mining area applied for.

Diagram 1: Layout of mining area

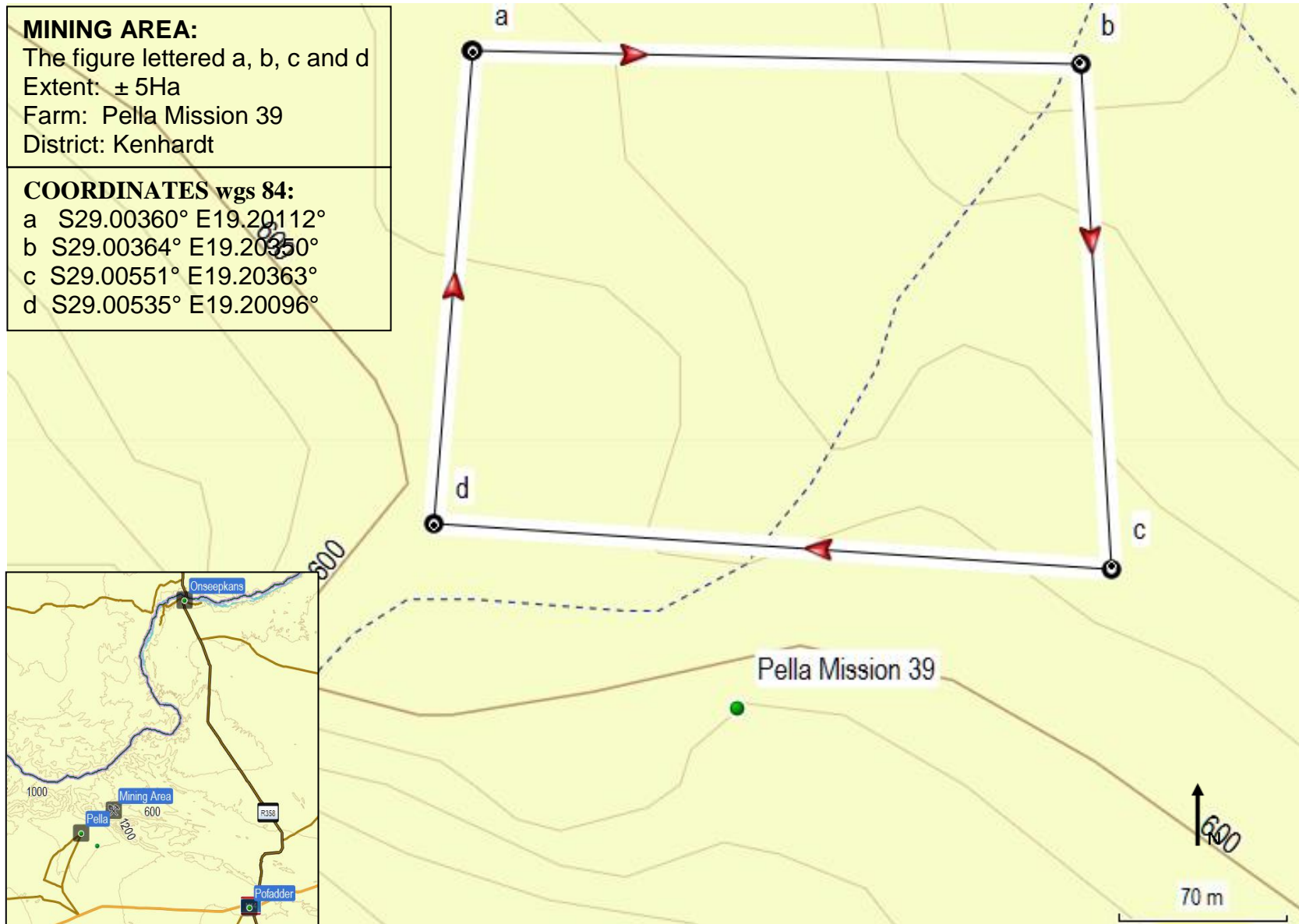


Diagram 2: Landscape showing inaccessibility of area



Diagram 3: Landscape



Land use and the socio-economic environment

Approximately 90% of the region is used for livestock grazing and production, with the remainder comprising of agriculture and urban development. Urban development is not a major feature of the landscape, and is not expected to increase much in the coming years.

Mining will only be a temporary land use where after land use will revert back to the pre-mining land use grazing. Productivity of the land with regard to land use is very low and mining will have no impact on the productivity of the area.

Infrastructure

No infrastructure will be affected due to the remote locality of the operation. Existing roads and tracks will be used and in the case of new tracks be developed it will be addressed at final closure and rehabilitation. As was mentioned the area is very inaccessible and can only be reached on foot therefore only manual labour will be used during the mining operation.

Biophysical environment

Topography

The area is characterized by an expansive, undulating landscape. The area is dominated by a plain of dry grasslands with scattered ancient rocky outcrops and mountains.

Soil

The sands and calcrete are of Quarternary sediments. The area is mostly representing the Af land type, with deep red sands predominant. The soils are typically weakly structured with low organic content. These soils drain freely which results in a soil surface susceptible to erosion, especially wind erosion when the vegetation cover is sparse and gully erosion in areas where storm-water is allowed to concentrate. The soils in the area are generally not suitable for dry land crop production therefore the pre-mining land capacity is categorized as Class III grazing land. The productivity of the area is very low at 8-10Ha/SSU.

Natural vegetation / plant life

The mining area is situated within the Nama-Karoo Biome. The vegetation consist of Bushmanland Arid Grassland vegetation type covering an area of 45478.96 Ha that is rated as least threatened with little of the area transformed less than 0.6%. Erosion is very low (60%) and low (33%). Altitude varies mostly from 600–1 200 m. The dominant species outside the mining area is covered by sparse open grassland, with *Stipagrostis* species prominent, with scattered, drought resistant dwarf shrubs.

Prominent species are as follow:

Dwarf shrubs

<i>Aridaria noctiflora</i>	<i>Eriocephalus microphyllus</i>	<i>Galenia fruticosa</i>
<i>Lycium bosciifolium</i>	<i>Pentzia spinescens</i>	<i>Plinthus karroicus</i>
<i>Pteronia mucronata</i>	<i>Rhigozum trichotomum</i>	<i>Rosenia humilis</i>
<i>Sarcostemma viminale</i>	<i>Tetragonia arbuscula</i>	

Grasses

<i>Aristida adscensionis</i>	<i>Aristida congesta</i>	<i>Centropodia glauca</i>
<i>Enneapogon desvauxii</i>	<i>Schmidtia kalahariensis</i>	<i>Stipagrostis brevifolia</i>
<i>Stipagrostis ciliate</i>	<i>Stipagrostis obtusa</i>	

Forbs

<i>Barleria rigida</i>	<i>Berkheya spinosissima</i>	<i>Crassula muscosa</i>
<i>Dicoma capensis</i>	<i>Gazania lichtensteinii</i>	<i>Grielum humifusum</i>
<i>Hermannia spinosa</i>	<i>Hirpicium echinus</i>	<i>Manulea nervosa</i>
<i>Monechma incanum</i>	<i>Peliostomum leucorrhizum</i>	<i>Salsola tuberculata</i>
<i>Requienia sphaerosperma</i>	<i>Ruschia robusta</i>	<i>Senecio cotyledonis</i>

Animal Life

Various small mammals and reptiles. Larger herbivore species are absent due to the conflicting land use. The habitat is well represented in the surrounding area.

Surface Water

No drainage channels occur within the mining area and there is no dendritic system which could be disturbed. Surface water only accumulates in the drainage channels after exceptional good rains. Given the variability of semi-arid rainfall, the calculation of the mean annual runoff (MAR) would be of no use. The MAR is in any event very low given the low rainfall less than 110 mm per year occurring mainly in the summer months, high evaporation rates, and shallow grade of the slope toward the drainage channels and the permeability of the soils

The surface water quality (when available) is suitable for animal consumption but not for potable water. No natural wetlands exist in the area.

Groundwater

Groundwater level is very deep on the mountain where mining will take place and no water will be used during the mining operation.

Air Quality

The air background quality is very good due to low industrial activity and very low population density. Given the surrounding extent of semi-desert, dust generation is high under windy conditions (dust storm) however under normal conditions no extreme dust conditions are noted on site.

Noise

Background noise level is the same as for other small settlements and at present such noise levels are low, below 55dBA.

4 REGULATION 52 (2) (f): Closure and environmental objectives.

DESCRIBE ANY MINIMUM CLOSURE REQUIREMENTS IDENTIFIED BY THE LANDOWNER OR OTHER INTERESTED AND AFFECTED PARTIES (Attach written comments as appendices)
Non identified by landowner except for the overall description below
OVERALL DESCRIPTION OF THE MANNER IN WHICH THE LAND WILL BE REHABILITATED AND THE CONDITION IT WILL BE LEFT IN AFTER REHABILITATION HAS BEEN COMPLETED
<p>The environment affected by the mining operations shall be rehabilitated, as far, as is practicable, to its natural state. Land use will be the same as before prospecting with the same production with regard to small stock farming. The affected environment shall be maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation.</p> <p>The goal of rehabilitation with respect to the area where mining has taken place is to leave the area level and even, and in a natural state containing no foreign debris or other materials. All scrap and other foreign materials will be removed from the area and disposed of as in the case of other refuse, whether these accrue directly from the mining operation or are brought in from outside. Removal of these materials shall be done on a continuous basis and not only at the start of rehabilitation.</p> <p>All waste rock needs to be backfilled and no waste dumps above surface will be created.</p> <p>All excavations will be profiled and waste rock used as backfill needs to be covered with the available topsoil.</p>

4.1 Minimum closure objectives that will be adhered to

4.1.1 Rehabilitation of access roads

- Whenever a mining permit is suspended, cancelled or abandoned or if it lapses and the holder does not wish to renew the permit or right, any access road or portions thereof, constructed by the holder and which will no longer be required by the landowner/tenant, shall be removed and/or rehabilitated to the satisfaction of the Regional Manager.
- Any gate or fence erected by the holder which is not required by the landowner/tenant, shall be removed and the situation restored to the pre mining/prospecting situation.
- Roads shall be ripped or ploughed, and if necessary, appropriately fertilized (based on a soil analysis) to ensure the re-growth of vegetation. Imported road construction materials which may hamper re-growth of vegetation must be removed and disposed of in an approved manner prior to rehabilitation.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the mining operation, be corrected and the area be seeded with a seed mix to the Regional Manager's specification.

4.1.2 Rehabilitation of the office/ campsite

- On completion of operations, all buildings, structures or objects on the camp/office site shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002):
- Where office/camp sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
- Areas containing French drains shall be compacted and covered with a final layer of topsoil to a height of 10cm above the surrounding ground surface.
- The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the mining/prospecting operation be corrected and the area be seeded with a vegetation seed mix to his or her specification.
- Photographs of the camp and office sites, before and during the mining/ prospecting operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the Regional Manager.

4.1.3 Rehabilitation of vehicle maintenance yard and secured storage areas

- On completion of mining/prospecting operations, the above areas shall be cleared of any contaminated soil, which must be dumped as referred to in section F 2.4.3 above.
- All buildings, structures or objects on the vehicle maintenance yard and secured storage areas shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002.
- The surface shall then be ripped or ploughed to a depth of at least 300mm and the topsoil previously stored adjacent the site, shall be spread evenly to its original depth over the whole area. The area shall then be fertilized if necessary (based on a soil analysis).
- The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the mining/prospecting operation be corrected and the area be seeded with a seed mix to his or her specification.

4.1.4 Rehabilitation of access to a river bed

- When rehabilitating the access point, the original profile of the river-bank will be re-established by backfilling the access point with the original material excavated or other suitable material.
- The topsoil shall then be returned over the whole area to its original depth and if necessary fertilized and the vegetation allowed to grow.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the mining/prospecting operation be corrected and the area be seeded with a seed mix to his or her specification.
- In the event of damage from an occurrence where high flood waters scour and erode access points in the process of rehabilitation over the river-bank or an access point currently in use, repair of such damage shall be the sole responsibility of the holder of the mining permit or prospecting right.
- Repair to the river-bank to reinstate its original profile to the satisfaction of the Regional Manager must take place immediately after such event has occurred and the river has subsided to a point where repairs can be undertaken.
- Final acceptance of rehabilitated river access points will be awarded only after the vegetation has re-established to a point where the Regional Manager is satisfied that the river-bank is stable and that the measures installed are of durable nature and able to withstand high river-flow conditions.

4.1.5 Rehabilitation of a mining area in the bed of a river

- The goal of rehabilitation with respect to the area where mining/prospecting has taken place in the river-bed is to leave the area level and even, and in a natural state containing no foreign debris or other materials and to ensure the hydrological integrity of the river by not attenuating or diverting any of the natural flow.
- All scrap and other foreign materials will be removed from the bed of the river and disposed of as in the case of other refuse (see section F 2.3.2 above), whether these accrue directly from the mining/prospecting operation or are washed on to the site from upstream.
- Removal of these materials shall be done on a continuous basis and not only at the start of rehabilitation.
- Where reeds or other riverine vegetation have been removed from areas, these shall be re-established systematically in the approximate areas where they occurred before mining/prospecting.
- An effective control programme for the eradication of invader species and other exotic plants, shall be instituted on a regular basis over the entire mining/prospecting area under the control of the holder of the mining permit/ prospecting right, both during mining/prospecting and at the stage of final rehabilitation.

4.1.6 Rehabilitation of excavated areas

- The excavated area must serve as a final depositing area for the placement of tailings during processing.
- Rocks and coarse material removed from the excavation must be dumped into the excavation simultaneously with the tailings.
- Waste, as described in paragraph F 2.3.2 above, will not be permitted to be deposited in the excavations.
- Once excavations have been refilled with overburden, rocks and coarse natural materials and profiled with acceptable contours and erosion control measures, the topsoil previously stored, shall be returned to its original depth over the area.
- The area shall be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the mining/ prospecting operation, be corrected and the area be seeded with a vegetation seed mix to his or her specification.

4.1.7 Rehabilitation of processing areas

- Coarse natural material used for the construction of ramps must be removed and dumped into the excavations.
- On completion of mining/prospecting operations, the surface of the processing areas especially if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 300mm and graded to an even surface condition and the previously stored topsoil will be returned to its original depth over the area.
- Prior to replacing the topsoil the material that was removed from the processing area will be replaced in the same order as it originally occurred.
- The area shall then be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the mining/prospecting operation be corrected and the area be seeded with a seed mix to his or her specification.

4.1.8 Final rehabilitation

- All infrastructure, equipment, plant, temporary housing and other items used during the mining period will be removed from the site (section 44 of the MPRDA)
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognized landfill facility. It will not be permitted to be buried or burned on the site.
- Final rehabilitation shall be completed within a period specified by the Regional Manager.

5 REGULATION 52 (2) (b) and (c): Assessment and summary (Rating) of the potential impacts of the proposed operation on the environment,

5.1 Criteria used for the significance rating.

- 5.1.1 All surface disturbances are rated high
- 5.1.2 Dust is rated low if only minimal dust is expected to accumulate over the permit period, medium if it is expected to require dust suppression such as watering, and high if there is a risk that it will migrate beyond the permit area.
- 5.1.3 Noise is rated low if no machinery is to be used, medium if machinery is to be used, and high if there is a potential for complaints from public and neighbours.
- 5.1.4 All drainage is rated high
- 5.1.5 All blasting is rated high
- 5.1.6 All dust and noise from loading, hauling and transport is rated high
- 5.1.7 Drainage from ablution facilities are rated high.

This impact assessment only deals with significant impacts and as mining will be carried out by manual labor and all equipment needs to be carried onto the mining area and ore carried out the overall impact will be of low significance. The implementation of the mitigating and management measures prescribed in the EMP will address all the impacts and after implementation of the mitigating measures most impacts can be classified as insignificant.

Topography

Significance/Magnitude Duration Probability Timing

High Long term Certain Activity

Any excavation remaining after mining will have an insignificant impact on the visual aspect of the topography due to the undulating nature of the topography and small scale of operations. Backfilling of waste rock and low grade material will take place and no waste dumps will remain on natural ground level. The excavation for waste rock will be covered with the available topsoil to promote natural re-vegetation. After profiling only a small even depression will remain.

Soils

Significance/Magnitude Duration Probability Timing

High Permanent Certain Activity

No or very little topsoil is present on the quartz outcrops. The excavations require all available topsoil to be removed and stockpiled. The topsoil thus retained will be used in the rehabilitation of the site as growth medium to be spread over areas ready for final rehabilitation.

Ground water

Significance/Magnitude Duration Probability Timing

Medium Point Unlikely Activity

Due to the shallow nature of operations the impact on the groundwater is considered insignificant. No machinery will be used in the mining operation therefore there will be no impact through oil and fuel spills and soil contamination. No water is needed during the mining operation.

Visual aspects

Significance/Magnitude Duration Probability Timing

Medium Long term Certain Activity

Due to the change in topography there is an insignificant impact on the aesthetic value of the area. This impact can be increased with the absence of an adequate waste management system. The mining site is not readily visible from any main through fare.

Topsoil will be neatly stockpiled in a convenient location close to the excavation and after backfilling of any waste rock the topsoil will spread evenly over the disturbed area.

5.2 Significance rating

ACTIVITY Mark with X which activities are applicable		POTENTIAL IMPACT	SIGNIFICANCE RATING		
			LOW	MEDIUM	HIGH
Excavations	X	Surface disturbance			X
		Dust	X		
		Noise	X		
		Drainage	X		
Blasting	NA	Fly Rock			
Stockpiles	NA	Surface disturbance			
		Dust			
		Drainage			
Discard dumps or dams	NA	Surface Disturbance			
		Dust			
		Drainage			
Loading, hauling and transport	NA	Noise			
		Dust			
Water supply dams and boreholes.	NA	Surface disturbance			
Accommodation, offices, ablution, stores, workshops etc.	NA	Surface disturbance			
		Drainage			
Processing Plant	NA	Noise			
		Dust			
		Drainage			
		Surface disturbance			
OTHER (Specify)					

5.3 REGULATION 52 (2) (c) Proposed mitigation measures to minimise adverse impacts. Technical or management options chosen.

ACTIVITY Mark with X which measures are applicable	MITIGATION MEASURE	DESCRIPTION OF THE MEASURE TO BE PUT IN PLACE (e.g.: Stockpiles will be thoroughly soaked once per day. e.g . Excessive dust on roads will be collected monthly and mixed into fill of excavations. e.g. Storm water trenches will be constructed with the necessary settling dams to separate clean and dirty water)
Excavations	X Rehabilitation	The goal of rehabilitation with respect to the area is to leave the area level and even, and in a natural state containing no foreign debris or other. All scrap and other foreign materials will be removed from the area and disposed of as in the case of other refuse whether these accrue directly from the mining operation or are brought on to the site from outside. Stone chips and waste rock and coarse material removed from the excavation will be spread evenly over the excavation areas. No waste dumps will be created above surface. Once waste has been backfilled the excavations will be profiled with acceptable contours and erosion control measures and covered with the available topsoil. Backfilling and profiling will take place simultaneously with mining. Backfilling of stone chips will be done manually.
		Dust control measures
		Noise control measures
	X Storm water system	Construct waste collection points and remove all solid waste from site and dispose of at municipal waste site on a weekly basis (do not bury or burn on site)
Blasting		Access control measures
Stockpiles		Rehabilitation
		Dust Control Measures
		Storm water system
Discard dumps or dams		Rehabilitation
		Dust control Measures
		Storm water system
Loading, hauling and transport		Noise control measures
		Dust control Measures
Water supply dams and boreholes.		Rehabilitation
Accommodation, offices, ablution, stores, workshops etc.		Rehabilitation

Processing Plant		Noise control measures	
		Dust control Measures	
		Storm water system	
		Rehabilitation	
OTHER (Specify)		X Domestic Waste	All waste needs to be carried out and will not be buried on site

5.4 Regulation 52 (2) (c): Measures to address impacts identified by Interested and affected parties.

LIST THE POTENTIAL IMPACTS IDENTIFIED BY INTERESTED AND AFFECTED PARTIES AS RECORDED IN PARAGRAPH 1.3 ABOVE.	DESCRIBE THE MANNER IN WHICH THE IMPACTS IDENTIFIED BY INTERESTED AND AFFECTED PARTIES WILL BE ADDRESSED
No additional impacts identified to date	Impacts identified if any will be addressed as part of an addendum to this EMP

In cases where a need for monitoring has been identified provide detail below. (Explain what will be monitored, how it will be monitored, by whom it will be monitored, and how frequently it will be monitored).

I will, on a bi-monthly basis, check every aspect of my operation against the prescriptions given in this document and, if I find that certain aspects are not addressed or impacts on the environment are not mitigated properly, I will rectify the identified inadequacies immediately. Regular monitoring of all the environmental management measures and components shall be carried out to ensure that the provisions of this program are adhered to.

Inspections and monitoring shall be carried out on both the implementations of the program and the impact on the environment. Visual inspections on erosion and physical pollution shall be carried out on a regular basis.

Layout plans will be updated on a regular basis and updated copies will be submitted on an annual basis to the Regional Manager together with a performance assessment and update of the financial provision for rehabilitation.

Reports confirming compliance with various points identified in the environmental management program will be submitted to the Regional Manager on a regular basis and as decided by the said manager.

Any emergency or unforeseen impact will be reported as soon as possible. An assessment of environmental impacts that were not properly addressed or were unknown when this program was compiled shall be carried out and added as a corrective action.

An open line of communication will also be kept with all interested and affected parties during the life of the operation and any new input will be communicated to DME and recorded and addressed in the EMP.

5.5 Minimum operational standards that will be adhered to for environmental management

5.5.1 The relevant legislative provisions of the following will be adhered to

- National Monuments Act 1969 (Act 28 of 1969).
- National Parks Act, 1976 (Act 57 of 1976)
- Environmental Conservation Act, 1989 (Act 73 of 1989)
- National Environmental Management Act, 1998 (Act No. 107 of 1998)
- Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965)
- The National Water Act, 1998 (Act 36 of 1998)
- Mine Safety and Health Act, 1996 (Act 29 of 1996)
- The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983).

5.5.2 Demarcation of the mining area and restrictions

- The mining area must be clearly demarcated by means of beacons at its corners, and along its boundaries if there is no visibility between the corner beacons.
- The mining of and prospecting for any mineral shall only take place within this demarcated mining area.
- If riverine vegetation is present in the form of reeds or wetland vegetation, the presence of these areas must be entered in Part C 1.45 of the EMPlan and indicated on the layout plan.
- On assessment of the application, the Regional Manager may prohibit the conducting of mining or prospecting operations in vegetated areas or over portions of these areas

5.5.3 Topsoil

- Topsoil shall be removed from all areas where physical disturbance of the surface will occur.
- The topsoil removed, shall be stored in a bund wall on the high ground side of the mining area outside the 1:50 flood level within the boundaries of the mining area/ prospecting.
- Topsoil shall be kept separate from overburden and shall not be used for building or maintenance of access roads.
- The topsoil stored in the bund wall shall be adequately protected from being blown away or being eroded.

5.5.4 Access roads on the site

- The access road to the mining area and the camp-site/site office must be established in consultation with the landowner/tenant and existing roads shall be used as far as practicable.
- The design, construction and location of access to provincial roads will be in accordance with the requirements laid down by the provincial or controlling authority
- Should a portion of the access road be newly constructed the following must be adhered to:
 - The route shall be selected that a minimum number of bushes or trees are felled and existing fence lines shall be followed as far as possible.
 - Water courses and steep gradients shall be avoided as far as is practicable.
 - Adequate drainage and erosion protection in the form of cut-off berms or trenches shall be provided where necessary.
- The erection of gates in fence lines and the open or closed status of gates in new and existing positions shall be clarified in consultation with the landowner/tenant and maintained throughout the operational period.
- No other routes will be used by vehicles or personnel for the purpose of gaining access to the site.

5.5.5 Maintenance of access roads

- In the case of dual or multiple use of access roads by other users, arrangements for multiple responsibility must be made with the other users. If not, the maintenance of access roads will be the responsibility of the holder of the mining permit.
- Newly constructed access roads shall be adequately maintained so as to minimize dust, erosion or undue surface damage.

5.5.4 Dust control on the access and haul roads

- The liberation of dust into the surrounding environment shall be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. The speed of haul trucks and other vehicles must be strictly controlled to avoid dangerous conditions, excessive dust or excessive deterioration of the road being used.

5.5.5 Office sites

- Office sites shall be established, as far as is practicable, outside the flood plain, above the 1 in 50 flood level mark within the boundaries of the mining/ prospecting area.
- The area chosen for these purposes shall be the minimum reasonably required and which will involve the least disturbance to vegetation
- No camp or office site shall be located closer than 100 metres from a stream, river, spring, dam or pan.
- No trees or shrubs will be felled or damaged for the purpose of obtaining firewood, unless agreed to by the landowner/tenant.
- Fires will only be allowed in facilities or equipment specially constructed for this purpose. If required by applicable legislation, a fire-break shall be cleared around the perimeter of the camp and office sites.
- Lighting and noise disturbance or any other form of disturbance that may have an effect on the landowner/tenant/persons lawfully living in the vicinity shall be kept to a minimum.

5.5.6 Toilet facilities, waste water and refuse disposal

- As a minimum requirement, the holder of a mining permit shall, at least, provide pit latrines for employees and proper hygiene measures shall be established.
- Chemical toilet facilities or other approved toilet facilities such as a septic drain shall preferably be used and sited on the camp site in such a way that they do not cause water or other pollution.
- The use of existing facilities must take place in consultation with the landowner/tenant.
- In cases where facilities are linked to existing sewerage structures, all necessary regulatory requirements concerning construction and maintenance should be adhered to.
- All effluent water from the camp washing facility shall be disposed of in a properly constructed French drain, situated as far as possible, but not less than 200 metres, from any stream, river, pan, dam or borehole.
- Only domestic type wash water shall be allowed to enter this drain and any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility.
- Spills will be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility.
- Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., shall be stored in a container at a collecting point and collected on a regular basis and disposed of at a recognized disposal facility. Specific precautions shall be taken to prevent refuse from being dumped on or in the vicinity of the camp site.
- Biodegradable refuse generated from the office/camp site, processing areas vehicle yard, storage area or any other area shall either be handled as indicated above or be buried in a pit excavated for that purpose and covered with layers of soil, incorporating a final 0,5 metre thick layer of topsoil (where practicable). Provision should be made for future subsidence of the covering.

5.5.7 Vehicle maintenance yards, storage areas and equipment.

- Any vehicle maintenance yard and secured storage area will be established as far as is practicable, outside the flood plain, above the 1 in 50 flood level mark within the boundaries of the mining/prospecting area.
- The area chosen for these purposes will be the minimum reasonably required and involve the least disturbance to tree and plant life
- The storage area shall be securely fenced and all hazardous substances and stocks such as diesel, oils, detergents, etc., shall be stored therein. Drip pans, a thin concrete slab or a facility with PVC lining, shall be installed in such storage areas with a view to prevent soil and water pollution.

- The location of both the vehicle maintenance yard and the storage areas are to be indicated on the layout plan.
- No vehicle may be extensively repaired in any place other than in the maintenance yard.
- The maintenance of vehicles and equipment used for any purpose during the mining operation will take place only in the maintenance yard area.
- Equipment used in the mining process will be adequately maintained so that during operations it does not spill oil, diesel, fuel, or hydraulic fluid.
- Machinery or equipment used on the mining area will not be allowed to constitute a pollution hazard in respect of the above substances.
- The Regional Manager may order such equipment to be repaired or withdrawn from use if he or she considers the equipment or machinery to be polluting and irreparable.

5.5.8 Waste disposal

- Suitable covered receptacles shall be available at all times and conveniently placed for the disposal of waste.
- All used oils, grease or hydraulic fluids shall be placed therein and these receptacles will be removed from the site on a regular basis for disposal at a registered or licensed disposal facility.
- All spills should be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility.

5.5.9 Limitations on mining

- The mining of minerals or precious stones shall take place only within the approved demarcated mining or prospecting area.
- Mining will be limited to the areas indicated as excavations on the plan provided in terms of paragraph 2 herein.
- Operations will not be conducted closer than one and a half times the height of the bank from the edge of the river channel and in such manner that the stability of the bank of the river is affected.
- Precautions shall also be taken to ensure that the bank of the river is adequately protected from scouring or erosion.
- Damage to the bank of the river caused by the operations, will be rehabilitated to a condition acceptable to the Regional Manager at the expense of the holder.
- Restrictions on the disturbance of riverine vegetation in the form of reeds or wetland vegetation must be adhered to. The presence of these areas must be shown on the plan required in terms of paragraph 3 herein.

5.5.10 Mining operations within a riverine environment

- The mining of minerals and/or precious stones in the river or the banks of the river will be undertaken only if paragraphs 1.2 and 1.3 above show that the Department of Water Affairs and Forestry has been consulted, only if the best practice guideline for small scale mining developed by DWAF (BPG 2.1) is attached hereto, and only in accordance with such guideline, and any additional conditions that that Department may impose.
- The canalisation of a river will not be undertaken unless the necessary permission has been obtained from the Department of Water Affairs and Forestry. Over and above the conditions imposed by the said Department, which conditions shall form part of this EMPlan, the following will also apply:
 - ❖ The canalisation of the flow of the river over different parts of the river bed shall be constructed in such a manner that the following are adhered to at all times:
 - ◆ The flow of the river may not be impeded in any way and damming upstream may not occur.
 - ◆ The canalisation of the flow may not result in scouring or erosion of the river-bank.
 - ◆ Well points or extraction pumps in use by other riparian users may not be interfered with and canalisation may not impede the extraction of water at these points.

- Access to the riverbed for the purpose of conducting excavations in the river-bed, shall be through the use of only one access at a time. The location of the access to the river channel across the river-bank shall be at a point of the river-bank where the least excavation and damage to vegetation will occur and shall not be wider than is reasonably required. The position of the river access together with all planned future access points, must be indicated on the layout plan.
- Mining will be conducted only in accordance with the Best Practice Guideline for small scale mining that relates to stormwater management, erosion and sediment control and waste management, developed by the Department of Water Affairs and Forestry (DWAf), and any other conditions which that Department may impose.

5.5.11 Establishing the excavation areas

- Whenever any excavation is undertaken for the purpose of locating and/or extracting ore bodies of all types of minerals, including precious stone-bearing gravels, the following operating procedures shall be adhered to:
 - ❖ Excavations shall take place only within the area indicated on the plan provided in terms of paragraph 2 herein..
 - ❖ Overburden rocks and coarse material shall be placed concurrently in the excavations or stored adjacent to the excavation, if practicable, to be used as backfill material once the ore or gravel has been excavated.
 - ❖ Trenches shall be backfilled immediately if no ore or precious stone-bearing gravel can be located.

5.5.12 Establishing processing areas, waste piles, tailings dams or slimes dams.

- Processing areas waste piles, tailings dams or slimes dams, will not be established within 100 metres of the edge of any river channel or other water bodies.
- Processing areas will be established, as far as practicable, near the edge of excavations to allow the waste, gravel and coarse material to be processed therein.
- The areas chosen for this purpose will be the minimum reasonably required and involve the least disturbance to vegetation.
- Prior to development of these areas, the topsoil will be removed and stored as described in paragraph F 2.1 above.
- Processing area, waste piles tailings dams or slimes dams will not be established unless the location and dimensions of the areas are clearly indicated on the plan referred to in paragraph 2 herein, and once established, the processing of minerals or ore containing precious stones shall be confined to these areas and no stockpiling or processing will be permitted on areas not correctly prepared.
- Tailings from the extraction process must be so treated and/or deposited that it will in no way prevent or delay the rehabilitation process.

6 REGULATION 52 (2) (e): Planned monitoring of the environmental management plan.

IDENTIFICATION	Mark with an X where applicable	
	YES	NO
Have the interested and affected parties identified that noise must be monitored?		X
Have the interested and affected parties identified that dust must be monitored?		X
Have the interested and affected parties identified that water quality must be monitored?		X

7 Environmental awareness plan.

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

Environmental awareness will be fostered in the following manner:

- a) Induction course for all workers on site, before commencing work on site.
- b) Refresher courses as and when required
- c) Daily toolbox talks at the start of each day with all workers coming on site, where workers can be alerted to particular environmental concerns associated with their tasks for that day or the area/habitat in which they are working.
- d) Taking part in national and international environmental campaigns like National Marine Week, National Harbour Day, National Wetlands Day etc.
- e) Displaying of information posters and other environmental awareness material in the general assembly points.

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

The induction course will consist of the following steps:

- The first step will include background discussion of the environment concept: of what it comprises and how we interact with it.
- The second step will be a description of the components and phases of the specific mining operation.
- The third step will be a general account of how the mining operation and its associated activities can affect the environment, giving rise to what we call Environmental Impacts.
- The fourth and most important step will be a discussion of what staff can do in order to help prevent the negative environmental impacts from degrading our environment. This is known as Environmental Impact Management.

8 REGULATION 52 (2) (d): Financial provision.

8.1 Information for Quantum calculation.

LIST OF ACTIVITY AREAS ON SITE	Mark with X where applicable		State the area of the activity in m ²	State the volume of the activity in m ³
	YES	NO		
Excavations	X		10 000	16 000
Stockpiles				
Discard dumps				
Discard dams				
Loading areas				
Water supply dams				
Accommodation areas				
Offices or buildings				
Workshops				
Access roads				
Other (Specify)				
TOTAL AREA and /or volume to be rehabilitated			10 000	16 000

8.2 Undertaking to provide financial provision

The area will be rehabilitated with the original land use namely small stock farming in mind. The productivity of the area after closure will be the same as before the start of the mining operation. Rehabilitation cost was estimated with the proposed end-state in mind and although the applicant has his own equipment the tariffs for equipment were based on local hiring tariffs.

Rehabilitation of access roads

No access roads will be constructed by the holder of the permit.

Rehabilitation of the office/camp site

No office/camp sites will be constructed. Mining equipment will all be portable and will be removed at the end of the operation.

Rehabilitation of vehicle maintenance yard and secured storages areas

No vehicle maintenance yard and secured storages areas will be constructed as mining will only consist of manual labour.

Rehabilitation of excavation areas

The goal of rehabilitation with respect to the area is to leave the area level and even, and in a natural state containing no foreign debris or other.

All scrap and other foreign materials will be removed from the area and disposed of as in the case of other refuse whether these accrue directly from the mining operation or are brought on to the site from outside.

Stone chips and waste rock and coarse material removed from the excavation will be spread evenly over the excavation areas. Once waste have been backfilled the excavations will be profiled with acceptable contours and erosion control measures and covered with available topsoil. Backfilling and profiling will take place simultaneously with mining but the cost was calculated for the whole area. Backfilling of stone chips and waste and profiling of the excavations will be done manually.

Extent of area for profiling:	10 000 m ²
Maximum volume of waste for backfilling:	4 000 m ³
Equipment require:	Manual labour
Duration of rehabilitation:	16 hours
Cost per hour:	R 400.00
Cost of rehabilitation:	R 6 400.00

Rehabilitation of processing areas

Processing in the form of sorting will be done within the excavation and rehabilitation will be done together with the excavation areas.

Final rehabilitation

All equipment, and other items used during the mining period will be removed from the site. Waste material of any description will be removed entirely from the mining area and disposed of at a recognised landfill facility. It will not be buried or burned on the site.

Extent:	10 000 m ²
Duration of rehabilitation:	8 hours
Equipment require:	Manual labour
Cost per hour:	R 80.00
Cost of rehabilitation:	R 640.00

Total cost of rehabilitation:

Rehabilitation of access roads	R 0.00
Rehabilitation of the office/camp site	R 0.00
Rehabilitation of vehicle maintenance yard and storages areas	R 0.00
Rehabilitation of excavation areas	R 6 400.00
Rehabilitation of processing areas	R 0.00
Final rehabilitation	R 640.00
Total	R 7 040.00

The applicant will escalate the calculated amount of R7040.00 to R10 000.00 and financial provision required under Regulation 54 for the amount of R 10 000.00 will be furnish to DME. This amount is more than is necessary for the rehabilitation of damage caused by the operation in case of sudden closure during the normal operation of the project or at final, planned closure.

9 REGULATION 52 (2) (h): Undertaking to execute the environmental management plan.

Herewith I, the person whose name and identity number is stated below, confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application, I herewith confirm that the above report comprises the EMP compiled in accordance with directive, in terms of sections 29 of the Act contained herein, and that the Environmental management plan will be executed as proposed should the permit be issued. I acknowledge that since this Environmental Management Plan is specific to the scale of the mining operation in the hands of the applicant/holder, the operation of the mine specifically by the holder in the manner and scale proposed in the applicable financial and technical ability report and in this Environmental management plan constitute material terms and conditions of the permit, and any change in the scope of the work or the party operating the mine, albeit on a subcontracting or subletting basis, will constitute a contravention contemplated in section 47(1) of the Act.

Full Names and Surname	Petrus Paulus Johannes Oosthuizen
Identity Number	5007295137086

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