



# mineral resources

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Department:  
Mineral Resources  
**REPUBLIC OF SOUTH AFRICA**

**NAME OF APPLICANT: Rhino Crushers cc**

**REFERENCE NUMBER: FS 30/5/1/3/2/10130MP**

**FARM: ROODEWAL 292/RE, BLOEMFONTEIN DISTRICT**

**ENVIRONMENTAL MANAGEMENT PLAN**

**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 rights or mining permits, 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), and 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.**

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**1 REGULATION 52 (2): DESCRIPTION OF THE ENVIRONMENT LIKELY TO BE AFFECTED BY THE PROPOSED MINING OR MINING OPERATION**

**1.1 Description of the environment on site relative to the environment in the surrounding area**

The proposed borrow pit is located on the remainder of the farm Roodewal 292 approximately 14km from outside the city centre of Bloemfontein. The total application area is 4.82 hectares in extent and is within a natural vegetated area with no environmental sensitive features such as rivers, wetlands or sensitive habitat. The site is located on weathered dolerite that will be mined, with very little overburden. There are no servitudes for power lines or roads that intersect the site. Please refer to Map 1, Appendix A for an indication of the locality of the proposed mining area.

**a) Vegetation:**

The site is located within the Bloemfontein Dry Grassland (Gh 5). Vegetation consists of tall, dense grassland alternating with patches of karroid scrub (Mucina ad Rutherford, 2006). Dominant shrubs and small trees include *Antheophora pubescens*, *Arestida congesta*, *A. diffusa*, *Cynodon dactylon*, *Digitaria argyrograpta*, *Elionurus muticus*, *Eragrostis chloromelas*, *Eragrostis trichophora*, *Eragrostis lehmanniana*, *Eragrostis obtusa*, *Eragrostis plana*, *Eragrostis superba*, *Heteropogon contortus*, *Panicum stapfianum*, *Setaria sphacelata*, *Themeda triandra*, *Tragus koelerioides*, *Aristida stipitata*, *Chlorus virgata*, *Cymbopogon pospischilii*, *Pogonarthria squarrosa*, *Sporobolus fimbriatus*, *Trichoneura grandiglumis* and *Triraphis andropogonoides* (Mucina and Rutherford, 2006). Most of the 4.82 ha site only consists of grass.

**b) Geology and soils:**

The area where the mine site will be is located inside the Ca22 landtype dominated by Plinthic soils. However, the proposed site has a very shallow soil layer covering it and in some areas, the dolerite can

be found on the surface on the study area as indicated in the photographic report in Appendix D. Regionally, the area is characterised by geological formations of the Beaufort Group with sandstone, shale and mudstone with dolerite intrusions (ENPAT, 2001).

**c) Climate:**

The region experiences moderate climatic conditions. The average precipitation during the summer is approximately 450mm rain per annum. Rainfall is almost exclusively due to showers and thunderstorms during the months of October to April, with the most rainfall occurring in March.

The summer temperatures are usually high while frost occurs in winter (Musina & Rutherford, 2006).

**d) Surface- and Ground Water:**

There are no major surface water resources within 500 m of the proposed borrow pit. The nearest major surface water feature is the Renosterspruit, which is located approximately 2.7 km to the west of the site.

**e) Air quality and Noise:**

The air quality is good with no major industries or external sources that impact on it.

The background noise in the area is typical to usual farm activities.

**1.2 Description of the specific environmental features on the site applied for which may require protection, remediation, management or avoidance**

The site is located within the Bloemfontein Dry Grassland biome which is endangered and may therefore require the implementation of management measures. However, the natural vegetation on the site has been disturbed as a result of grazing of cattle.

During rehabilitation of the site it must be ensured that the sloped area is covered with topsoil in order for natural vegetation to re-establish on the site.

There are no other environmental features within a 500 m radius from the application area that require specific protection.

**1.3 Map indicating the spatial locality of all environmental, cultural/heritage and current land use features identified on site**

Refer to Map 1, Appendix A.

**1.4 Confirmation that the description of the environment has been compiled with the participation of the community, the landowner and interested and affected parties**

The EMPr was discussed with the landowner and the applicant who also took part in the site assessment. The EMPr will be sent to all I&AP's who commented on the project or registered as I&APs.

## 2 REGULATION 52 (2) (B): ASSESSMENT OF THE POTENTIAL IMPACTS OF THE PROPOSED MINING OR MINING OPERATION ON THE ENVIRONMENT, SOCIO-ECONOMIC CONDITIONS AND CULTURAL HERITAGE

### 2.1 Description of the proposed mining or mining operation

#### 2.1.1 List of the main mining activities (e.g. access roads, topsoil storage sites and any other basic mining design features)

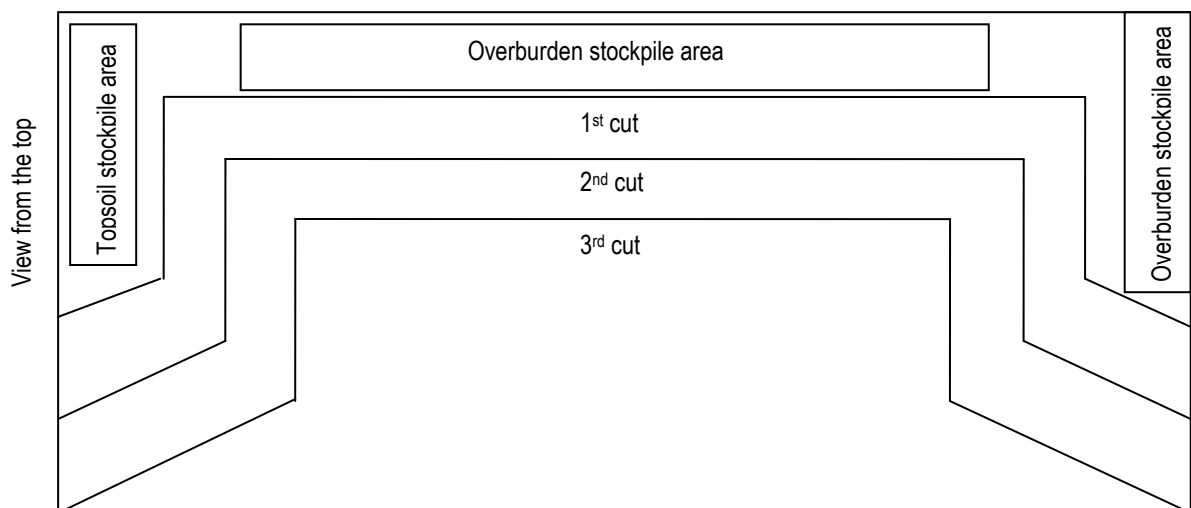
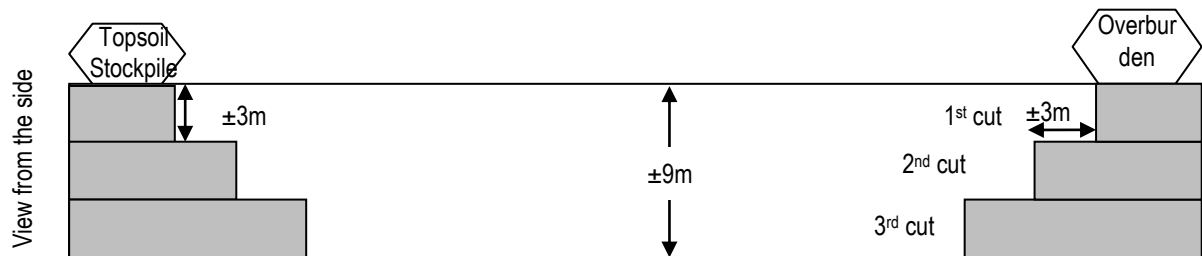
The main activities will be:

- Stripping of topsoil for the first cut,
- Storing of topsoil next to the excavation,
- Excavating of weathered dolerite by use of excavators,
- Loading of material on trucks for dispatch to clients.

#### 2.1.2 Plan of the main activities with dimensions

- Weathered dolerite will be excavated using machinery (e.g. excavators) over an area of 4.82 ha,
- The material will be mined in benches of 3 x 3m,
- The depth of the borrow pit will not exceed 9m.

Planned Layout Plan:



#### 2.1.3 Description of construction, operational, and decommissioning phases:

**Construction phase:**

- The clearing of vegetation and topsoil to prepare for first cut,

- b) The proposed mining area should be fenced off / clearly demarcated to prevent easy access to the site,
- c) Arrival of the equipment on site,
- d) Preparation of the access road,
- e) There will be no permanent buildings or structures constructed,

**Potential impacts identified related with the Construction phase:**

- a) Stripping of topsoil and vegetation
- b) Possible generation of dust and noise

**Operational phase:**

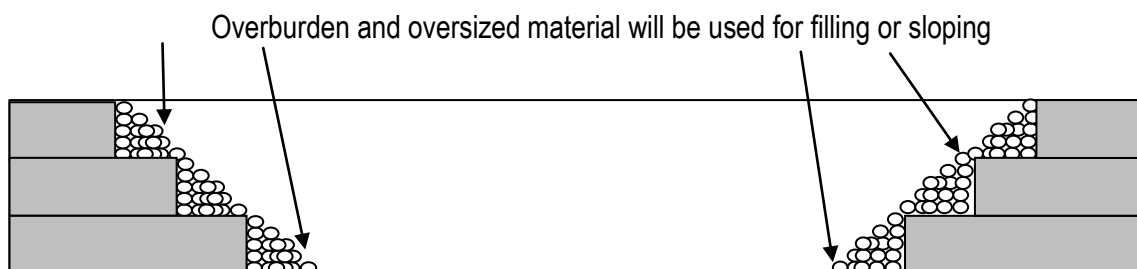
- a) There will be approximately 6 permanent employees on site, including skilled and unskilled employees.
- b) The following equipment will be used:
  - 1 x Excavator
  - 1 x Front end loader
- c) Material will be excavated using a excavator.
- d) Gravel is stockpiled next to the pit from where it is loaded onto transportation vehicles which transports it to the construction sites.

**Potential impacts identified related with the Operational phase:**

- a) Loss of topsoil and vegetation,
- b) Generation of dust and noise,
- c) Alteration of the landscape/topography,
- d) Safety of neighbours and their livestock and property,
- e) Dumping of waste,
- f) Impact on the quality and quantity of surface and groundwater as a result of contamination.
- g) Negative aesthetic impact.

**Decommissioning phase:**

- a) All the equipment will be removed from the site.
- b) Any residual waste will be collected and removed from site. General waste will be disposed of at the authorised landfill site in Bloemfontein, while recyclable waste (e.g. scrap metal) will be recycled as far possible. Any potential hazardous material left on site will be managed appropriately and disposed of at an authorised hazardous waste facility.
- c) Overburden and oversized material will be used for filling or sloping especially the areas to be made safe (e.g. steep cuts)
- d) Available topsoil will be used to cover exposed areas / roads to be rehabilitated for the establishment of vegetation
- e) Completing rehabilitation and apply for closure.
- f) The area will be fenced off in order to provide a safe environment and to prevent easy access to the site



**Potential impacts identified:**

- a) Generation of dust and noise
- b) Dumping of waste

#### **2.1.4 Listed activities (in terms of the NEMA EIA regulations)**

The only listed activity, as published under Section 24(2) and 24D of the National Environmental Management Act, 1998 (Act No. 107 of 1998), published Listing Notice 1 of the activities and competent authorities identified in the Schedule, applicable to this proposed project is a listed activity No. 19: *“Any activity which requires a mining right or renewal thereof as contemplated in section 16 and 18 respectively of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)”*.

The competent authority in respect of activity Nr. 19 in this Schedule is the environmental authority in the province in which the activity is to be undertaken, unless (b) the activity is to be conducted in or on a mining area or is to transform the area where the activity is to be conducted into a mining area in which case the competent authority is the Minister of Minerals and Energy. Thus no EIA is required in terms of NEMA, but only in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), in terms of Section 16.

## 2.2 Identification of potential impacts

### 2.2.1 Potential impacts per aspect and listed activities

The following table (**Table 1**) consists of a list of the main activities that will be performed under each aspect.

**Table 1:** Potential impacts of mining activities during all phases

Activity	AFFECTED ENVIRONMENT	MAIN POTENTIAL IMPACTS	SIGNIFICANCE	PHASE
<b>1. Upgrading and clearing of roads</b>	Soil	<ul style="list-style-type: none"> <li>• Surface compaction due to vehicle movement</li> </ul>	Low	Construction & Operational
	Land use	<ul style="list-style-type: none"> <li>• Loss of land use to support grazing</li> </ul>	Low	Construction Operational, Decommissioning & Closure
	Vegetation	<ul style="list-style-type: none"> <li>• Clearing of vegetation for road</li> </ul>	Low	Construction
	Fauna	<ul style="list-style-type: none"> <li>• Destruction/change/disturbance of habitat</li> <li>• Injury or death to wildlife because of vehicle movement</li> </ul>	Low	Construction & Operational
<b>2. Clearing of vegetation</b>	Soil	<ul style="list-style-type: none"> <li>• Clearing of vegetation may lead to soil erosion</li> </ul>	Low-medium	Construction & Operational
	Vegetation	<ul style="list-style-type: none"> <li>• Loss of vegetation of the entire mining area (i.e. 4.82 ha)</li> </ul>	High	Construction & Operational
	Fauna	<ul style="list-style-type: none"> <li>• Destruction/change/disturbance of habitat</li> <li>• Injury or death to wildlife because of vehicle movement.</li> </ul>	Low	Construction & Operational
<b>3. Excavation of material</b>	Geology	<ul style="list-style-type: none"> <li>• Loss of weathered dolerite during excavation</li> </ul>	High	Operational
	Topography	<ul style="list-style-type: none"> <li>• The excavation of ±9m deep will form a permanent depression</li> </ul>	Medium	Operational & Decommissioning
	Soil	<ul style="list-style-type: none"> <li>• Loss of topsoil</li> <li>• Surface compaction due to infrastructure and vehicle movement</li> <li>• Loss of soil due to erosion</li> </ul>	Low-medium	Construction & Operational



	Noise pollution	<ul style="list-style-type: none"> <li>• Generation of noise because of mining and related activities (i.e. transportation of material) occurring on weekdays.</li> </ul>	Medium	Operational & Decommissioning
	Air Quality	<ul style="list-style-type: none"> <li>• Dust generation because of movement of mine vehicles and machinery.</li> </ul>	Medium	Construction, Operational & Decommissioning
	Surface and groundwater	<ul style="list-style-type: none"> <li>• Contamination of surface and/or groundwater as a result of pollutants,</li> <li>• Quantity of groundwater may be affected.</li> </ul>	Medium	Construction, Operational & Decommissioning
	Fauna	<ul style="list-style-type: none"> <li>• Destruction/change/disturbance of habitat</li> <li>• Injury or death to wildlife because of vehicle movement</li> </ul>	Low	Operational & Decommissioning
	Land use	<ul style="list-style-type: none"> <li>• Loss of natural vegetation for grazing purposes</li> </ul>	Medium	Operational, Decommissioning & Closure
	Socio economics	<ul style="list-style-type: none"> <li>• Job creation and service rendered to mining operation</li> </ul>	Low (Positive impact)	Construction & Operational

### **2.2.2 Potential cumulative impacts**

- The possibility to create or contribute to a cumulative dust and noise impact within the area is very low as there are no other active mining activities within close proximity of the proposed site.
- An increase in the traffic on the road with the construction vehicles using it, may have a cumulative impact on the environment.

### **2.2.3 Potential impact on resources**

A specialist study was conducted by Dr. Lloyd Rossouw on 19 November 2014. Please refer to Appendix B for the letter of exemption for the HIA.

### **2.2.4 Potential impacts on communities, individuals or competing land uses in close proximity**

*Comments received from the I&APs during the public consultation process are included in this section. The following are the potential impacts on adjacent landowners:*

- Dust from the access road used by trucks will have an impact on landowners adjacent to it.
- There will be an increase in noise levels caused by transportation vehicles travelling on the access road and the excavation of the gravel in the borrow pit. This will have an impact on adjacent landowners.
- Surface and groundwater water may become contaminated if there are spillages of potentially hazardous substances and if sewage is not managed appropriately.
- The quantity of groundwater may decrease if the depth of the natural water table are exceeded during mining.
- The gravel access road (Riverside Road) from the Maselspoort road will deteriorate as a result of the transportation vehicles using it.
- The safety of other road users and adjacent landowners may be compromised as a result of an increase in vehicles on the road.
- Runoff of storm water may increase as a result of the clearance of vegetation at the borrow pit and roads which may cause flooding to neighbours located lower than the borrow pit.
- Loss of topsoil and natural vegetation due to clearance for roads and excavation.
- Veld fires that started at the borrow pit may cause damages to adjacent property.
- Stockpiled topsoil or other material may runoff with storm water and be deposited at properties situated at a lower altitude than the borrow pit.
- Due to an increase of people in the area, the safety of adjacent landowners may be compromise and stock theft may increase.

### **Potential impacts on cultural and/or heritage resources**

A specialist study was conducted by Dr. Lloyd Rossouw on 19 November 2014. Please refer to Appendix B for the letter of exemption for the HIA.

### **2.2.5 Confirmation that the list of potential impacts has been compiled with the participation of the landowner and interested and affected parties**

- The potential impacts were discussed during meetings with the applicant, the landowner and I&APs.
- A copy of the Draft EMP was sent to the registered interested and affected parties.

### **2.2.6 Confirmation of specialist report appended**

- The specialist report (i.e. HIA) will be attached in the Final EMP.

### 3 REGULATION 52 (2) (C): SUMMARY OF THE ASSESSMENT OF THE SIGNIFICANCE OF THE POTENTIAL IMPACTS AND THE PROPOSED MITIGATION MEASURES TO MINIMISE ADVERSE IMPACTS

#### 3.1 Assessment of the significance of the potential impacts

##### 3.1.1 Approach followed

The nature of impacts can vary widely depending on the type of physical environment, the size of the activity and the perceptions and values of each of the affected parties. It must be accepted that any activities will have both physical and social impacts. It is the objective of this assessment to identify both positive and negative impacts. This chapter describes and evaluates the effect of the different mining aspects and the associated activities on the natural and social environment.

##### 3.1.2 Methods used to identify impacts

The existing information was reviewed to assess the present status of the environment and the extent to which they have already been modified. The site locality map is used as a reference to indicate where impacts have been identified. The impact identification and mitigation tables will quantify the identified impacts.

##### 3.1.3 Definitions used in the assessment and evaluation of impacts

The assessment and evaluation of environmental impacts is often complicated by the subjective nature of these impacts. Ideally, the degree of severity or significance of a particular impact should be expressed in quantitative terms, against a quantitative assessment of the conditions that pertained before a particular activity started. There must also be some expression as to whether a particular impact is desirable or not.

In order to address these issues and to provide a basis for comparison of the different impacts associated with the development, a number of standard definitions and approaches were used. The different terms are described in the following table (Table 2). The impact prediction step will determine whether the expected impact is beneficial (positive) or adverse (negative) while impact evaluation will comprise a rating of the impacts in terms of their magnitude, duration and significance.

**Table2: Definitions used in the assessment and evaluation of impacts**

CATEGORY	DESCRIPTION OR DEFINITION
Impact	A brief written statement, stating which environmental aspect is impacted by a particular project activity or sequence of project activities.
Impact prediction	Denotes the perceived effect of the impact on the affected area. ☺ Positive impact ☹ No impact ☹ Negative impact
Duration	Where duration will indicate whether the lifespan of the impact will be: <u>Temporary</u> : During construction. <u>Permanent</u> : Where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact

CATEGORY	DESCRIPTION OR DEFINITION
	can be considered transient.
Magnitude:	<p>A prediction of the extent of the impact that may result from the development. Magnitude refers to the size, in both spatial and qualitative terms, of an impact.</p> <p><u>Site:</u> Impact is site specific</p> <p><u>Local:</u> Impact is applicable to the local area, including neighbouring farms in the specific district.</p> <p><u>Regional:</u> Impact is significant for the region, including the rest of the Province</p> <p><u>National:</u> Impact has national implications.</p>
Impact Rate: Pre-mitigation	<p>This is integration (i.e. an opinion) of the prediction, duration and magnitude of the impact.</p> <p><u>High:</u> The impact is high with permanent duration and substantial disruption.</p> <p><u>Moderate:</u> The impact is a real but measurable impact and should have an influence on the decision unless it is mitigated.</p> <p><u>Low:</u> The impact is low and not significant, minor mitigation needed but should not have an influence on the decision.</p>
Discussion & mitigation	The relevance of the impact will be discussed and the appropriate mitigation measures provided that will either soften or enhance impacts.
Impact Rate: Post mitigation	Based on the same methodology at Pre-mitigation level, but shows the revised rate if mitigatory measures are taken.
Cumulative impacts	Cumulative impacts that the aspects may have on the environment

### 7.1.3 Impact and Mitigation Tables

The impacts identified are reflected in Table 3, according to operational and closure phase.

The different environmental elements, on which the project may have an impact, are:

1. Geology
2. Topography
3. Soil
4. Land capability & Land use
5. Vegetation
6. Animal life
7. Ground water
8. Air Quality
9. Noise
10. Visual Aspects
11. Socio-economic Structures
12. Interested and Affected Parties

Table 3: The construction phase:

No	Impact Description	Impact Prediction	Duration	Magnitude	Impact Rate: Pre-mitigation	Cumulative impacts
<b>A</b>	<b>NATURAL PHENOMENA</b>					
1.	<b>Climate</b> • No impact	☺	N/A	N/A	N/A	N/A
2.	<b>Geology</b> • No impact	☺	N/A	N/A	N/A	N/A
3.	<b>Soils: Removal and stockpiling of topsoil</b> • Surface compaction due to vehicle movement	☹	Temporary	Site	Low	N/A
4.	<b>Land Capability</b> • Clearing of mining area of 4.82 hectares	☹	Permanent	Site	Moderate	N/A
5.	<b>Flora</b> • Clearing of vegetation in the Bloemfontein Dry Grassland biome for the mining area on 4.82 hectares. • Clearing of vegetation for mine roads.	☹	Temporary	Site	High	N/A
6.	<b>Air Quality</b> • Dust generated by vehicle movement and mining	☹	Temporary	Site	Low	An increase in traffic on the Maselspoort Road may result in the release of more CO <sub>2</sub> into the atmosphere.

No	Impact Description	Impact Prediction	Duration	Magnitude	Impact Rate: Pre-mitigation	Cumulative impacts
7.	<b>Noise</b> • Equipment busy preparing the site will result in elevated noise levels during working hours.	☹	Temporary	Site	Low	N/A
8.	<b>Water quality</b> • Potential surface or ground water contamination caused by spillage from vehicles during clearance of site.	☹	Temporary	Site	Low	N/A
<b>B</b>	<b>CULTURAL IMPACTS</b>					
8.	<b>Cultural Resources and Heritage Sites</b> • No archaeological or paleontological sites were identified within the boundaries of the proposed mining area.	☺	N/A	N/A	N/A	N/A
9.	<b>Sensitive Landscape</b> • Vegetation will be removed from the Bloemfontein Dry Grassland biome during the clearance of vegetation	☹	Permanent	Site	High	N/A
<b>C</b>	<b>SOCIO-ECONOMIC IMPACTS</b>					
10.	<b>Socio-economic Structure</b> • Positive impact as local individuals will be employed for this construction phase	☺	Temporary	Site & local	Low	Increase in activity will add to economic growth and development

No	Impact Description	Impact Prediction	Duration	Magnitude	Impact Rate: Pre-mitigation	Cumulative impacts
11.	<b>Interested and Affected Parties</b> <ul style="list-style-type: none"> <li>• Safety of adjacent landowners due to increase in people employed at the proposed borrow pit.</li> <li>• Stock theft may increase as a result of an increase in people in the area.</li> <li>• Degradation of the road as a result of the increase in heavy vehicle traffic on it.</li> <li>• Possible veld fires started by employees of the borrow pit.</li> </ul>	☹	Temporary	Site	Moderate	N/A

**Table 4: The operational phase:**

No	Impact Description	Impact Prediction	Duration	Magnitude	Impact Rate: Pre-mitigation	Cumulative impacts
<b>A</b>	<b>NATURAL PHENOMENA</b>					
1.	<b>Geology</b> <ul style="list-style-type: none"> <li>• Mining of weathered dolerite rock formation</li> </ul>	☹	Permanent	Site	Moderate	N/A
2.	<b>Soils: Removal and stockpiling of topsoil</b> <ul style="list-style-type: none"> <li>• Surface compaction due to vehicle movement</li> <li>• Loss of topsoil</li> </ul>	☹	Temporary	Site	Medium	N/A

No	Impact Description	Impact Prediction	Duration	Magnitude	Impact Rate: Pre-mitigation	Cumulative impacts
3.	<b>Land Capability</b> <ul style="list-style-type: none"> <li>• Change in land capability due to mining activities on the mining area of 4.82 ha.</li> </ul>	☹	Permanent	Site	Moderate	N/A
4.	<b>Land use</b> <ul style="list-style-type: none"> <li>• Mining on 4.82 hectares</li> </ul>	☹	Temporary	Site	Moderate	N/A
5.	<b>Flora</b> <ul style="list-style-type: none"> <li>• Clearing of natural vegetation in the Bloemfontein Dry Grassland biome for excavations on 4.82 hectares.</li> </ul>	☹	Permanent	Site	High	N/A
6.	<b>Fauna</b> <ul style="list-style-type: none"> <li>• Mining related activities will be limited to 4.82 ha during any phase, but will lead to the temporary emigration of local species from the disturbed area onto the adjacent area.</li> <li>• Permanent change in habitat</li> </ul>	☹	Temporary	Site	Moderate	N/A
7.	<b>Surface Water</b> <ul style="list-style-type: none"> <li>• Change in surface water flow due to excavation</li> </ul>	☹	Permanent	Site	Low	N/A
8.	<b>Ground water</b> <ul style="list-style-type: none"> <li>• Pollution of groundwater</li> </ul>	☹	Temporary	Site & local	Low	N/A



No	Impact Description	Impact Prediction	Duration	Magnitude	Impact Rate: Pre-mitigation	Cumulative impacts
11.	<b>Air Quality</b> • Dust generated by vehicle movement and mining activities.	☹	Temporary	Site	High	N/A
12.	<b>Noise</b> • Excavation, loading, transporting, vehicle movement	☹	Temporary	Site	High	N/A
13.	<b>Visual Aspects</b> • Negative aesthetic impact on adjacent landowners	☹	Temporary	Site	Low	N/A
<b>B</b>	<b>CULTURAL IMPACTS</b>					
14.	<b>Cultural Resources and Heritage Sites</b> • No impact	☺	N/a	N/A	N/A	N/A
15.	<b>Sensitive Landscape</b> • Vegetation will be removed from the Bloemfontein Dry Grassland biome during the clearance of vegetation	☺	Permanent	Site	High	N/A
<b>C</b>	<b>SOCIO-ECONOMIC IMPACTS</b>					
16.	<b>Socio-economic Structure</b> • Low positive impact as people from the local community will be employed at the borrow pit.	☺	Temporary	Site & local	Low	Increase in activity will add to current growth and development.

No	Impact Description	Impact Prediction	Duration	Magnitude	Impact Rate: Pre-mitigation	Cumulative impacts
17.	<p><b>Interested and Affected Parties</b></p> <ul style="list-style-type: none"> <li>• Concern of the increase in crime rates in the area due to higher human activity. Stock theft may increase as a result of an increase in people in the area.</li> <li>• Degradation of the road as a result in the increase in heavy vehicle traffic on it.</li> <li>• Veld fires started by employees at the borrow pit.</li> </ul>	☹	Temporary	Site	Low	N/A

#### 7.1.4 Assessment of potential cumulative impacts

The only aspects that have any possibility to create or contribute to a cumulative environmental impact within the area, this application are situated in is:

- The use of the road to the silo's:
  - The road to the entrance of the site is used by other road users. An increase in the traffic on this road may cause deterioration of the road and safety issues.

### 3.2 Proposed mitigation measures to minimise adverse impacts

3.2.1 Table 5: Proposed mitigation measures

Impact Description	Impact Prediction	Impact Rate: Post mitigation?	Discussion/ Mitigation
<b>Geology</b> <ul style="list-style-type: none"> <li>Gravel will be removed from the borrow pit.</li> </ul>	⊖	Moderate	<ul style="list-style-type: none"> <li>Material that is not sold will be used as filling material for the borrow pit.</li> </ul>
<b>Soils</b> <ul style="list-style-type: none"> <li>Loss of topsoil</li> <li>Compaction of surfaces where vehicles move</li> </ul>	⊖	Low -	<ul style="list-style-type: none"> <li>Vehicle movement will be limited to existing roads and disturbed area to limit compaction of soil surfaces.</li> <li>Spillages of petrochemicals will be handled in a responsible manner where emergency breakdowns do occur.</li> <li>All available topsoil will be conserved by removing it from the borrow pit area and stockpiling it.</li> </ul>
<b>Land use</b> <ul style="list-style-type: none"> <li>Clearing of 4.82 ha of grazing area for mining of weathered dolerite</li> </ul>	⊖	Low -	<ul style="list-style-type: none"> <li>The use of preserved topsoil for rehabilitation will enhance re-vegetation (contain a seed bank of local plant species)</li> <li>The area will be “made safe” and will be used for grazing after rehabilitation</li> <li>Concurrent rehabilitation will be done. The area opened for mining will never exceed 1.2 ha at any given time.</li> </ul>
<b>Flora</b> <ul style="list-style-type: none"> <li>Clearing of vegetation of the Bloemfontein Dry Grassland biome on the 4.82 hectare mining area</li> <li>Veld fires</li> </ul>	⊖	Moderate	<ul style="list-style-type: none"> <li>The use of preserved topsoil for rehabilitation will enhance re-vegetation (contain a seed bank of local plant species).</li> <li>Vehicle movement will be limited to existing roads and disturbed area to prevent the loss of vegetation.</li> <li>No collection of firewood will be allowed at the site or the surrounding environment.</li> <li>No open fires will be allowed on site.</li> </ul>
<b>Air Quality</b>	⊖	Low	<ul style="list-style-type: none"> <li>Dust suppression will be implemented through the spraying of water at the borrow pit and</li> </ul>

Impact Description	Impact Prediction	Impact Rate: Post mitigation?	Discussion/ Mitigation
<ul style="list-style-type: none"> <li>• Transporting of gravel on dirt roads</li> <li>• Dust coverage on plants because of vehicle movement</li> </ul>			<ul style="list-style-type: none"> <li>on dust roads, if dust is a problem.</li> <li>• Vehicles and machinery will be properly maintained to reduce CO<sub>2</sub> emissions</li> <li>• Speed of trucks will be limited to 40 km/h on the gravel roads.</li> <li>• Speed bumps will be constructed to ensure that the speed at which vehicles travel on the road does not exceed 40 km/hr.</li> </ul>
<p><b>Noise</b></p> <ul style="list-style-type: none"> <li>• Excavating, loading and transporting.</li> </ul>	⊕	Low	<ul style="list-style-type: none"> <li>• Vehicles will be properly maintained to reduce noise.</li> <li>• Speed of trucks will be limited to 40 km/h on the gravel roads.</li> <li>• Speed bumps will be constructed to ensure that the speed at which vehicles travel on the road does not exceed 40 km/hr.</li> <li>• The borrow pit will only be operational on weekdays during daylight hours. Material will not be transported after 15:00pm in the afternoon. The borrow pit will not be in operation on weekends and public holidays.</li> </ul>
<p><b>Water quality and quantity</b></p> <ul style="list-style-type: none"> <li>• Use of water</li> <li>• Excavating, loading and transportation of material</li> <li>• Storm water management</li> </ul>	⊕	Low	<ul style="list-style-type: none"> <li>• Should water be used on the site, the water use will be registered or obtained legally. Water will not be abstracted from boreholes and used at the borrow pit if it is not registered.</li> <li>• Vehicles and machinery will be serviced and inspected on a regular basis</li> <li>• All spills will be cleaned and managed appropriately to prevent contamination.</li> <li>• Any potentially hazardous substance will be stored within a bunded area on a concrete floor. This area will have the capacity of 110% of the volume of the substance to be stored inside it.</li> <li>• Storm water will be directed around the site to ensure that clean and dirty storm water does not mix.</li> <li>• A contractor will be appointed to manage sanitary facilities (i.e. place temporary toilets on site) and to dispose of effluent from these facilities.</li> <li>• Ensure that material used to backfill the voids during rehabilitation is clean.</li> </ul>

Impact Description	Impact Prediction	Impact Rate: Post mitigation?	Discussion/ Mitigation
<b>Interested and affected parties</b> <ul style="list-style-type: none"> <li>• Impact on security due to increase in people in the area</li> <li>• Increase in stock theft</li> <li>• Degradation of the road</li> </ul>	☹	Moderate	<ul style="list-style-type: none"> <li>• Employees of the borrow pit will stay in town and not on site.</li> <li>• Employees will be transported to and from work and will not walk through neighbouring farms</li> <li>• Should the road deteriorate as a result of the increase in traffic, arrangements will be made between the applicant, other users of the road and the municipality to upgrade the road. The upgrade of the road will be done with the assistance of the municipality.</li> </ul>
<b>Socio-economic Structure</b> <ul style="list-style-type: none"> <li>• Profit generated from the operation of the mining activity</li> </ul>	☺	Low +	<ul style="list-style-type: none"> <li>• Labour used from local community</li> </ul>

### 7.1.3 Concomitant list of appropriate technical or management options

Please refer to Table 6 for a summary of the appropriate technical or management options to be undertaken at the proposed mining operation.

**Table 6:** Environmental Management / Mitigation Measures / Action Plans and / or Commitments Regarding each of the Environmental Components at the Proposed Mining Operation

<b>ENVIRONMENTAL COMPONENT</b>
<b>1.1 SOIL</b>
<b>ENVIRONMENTAL MANAGEMENT/MITIGATION MEASURES/ACTION PLANS/COMMITMENTS</b>
<p><b>Handling of topsoil as a natural resource:</b></p> <ul style="list-style-type: none"> <li>• Any future expansion of the excavations or construction of infrastructure should be preceded by the removal of <u>all available topsoil</u>.</li> <li>• The surface of any new areas to be disturbed must be kept to a minimum.</li> <li>• All available topsoil/overburden material should be removed and stockpiled for rehabilitation purposes.</li> </ul> <p><b>Access roads, etc:</b></p> <ul style="list-style-type: none"> <li>• The clearing of soil surface areas would be restricted to what is really necessary for the construction of infrastructure. Wherever possible all topsoil should be removed and stockpiled for rehabilitation purposes.</li> <li>• Overburden material should also be stockpiled separately if practically possible.</li> <li>• Topsoil and overburden material should be transported to an area earmarked for rehabilitation.</li> </ul> <p><b>Soil compaction:</b></p> <ul style="list-style-type: none"> <li>• The mining operation should only be restricted to what is really required (demarcated area of exploitation) within the fenced-off area.</li> <li>• Access roads towards the sites would be restricted only to the roads (existing farm roads).</li> <li>• No land would be disturbed unnecessarily.</li> <li>• Mining &amp; rehabilitation should be done in a well-planned manner (according to a mining plan) and in the process ensuring that activities are only restricted to surface areas really required.</li> <li>• Compaction of soil surface areas would be alleviated once rehabilitation of certain area starts.</li> <li>• Certain roads would probably remain for access (in consultation with the surface owner).</li> <li>• Those that would not be required would be ripped and rehabilitated.</li> </ul> <p><b>Potential for soil contamination:</b></p> <ul style="list-style-type: none"> <li>• Vehicles to be inspected to ensure no oil and hydraulic fluid leaks occur.</li> <li>• All oil spills on soil to be removed and bio-remediated immediately (certain commercial products are available such as Terrasorb or it could be rehabilitated by means of the application of fertilizer and turn with a spade from time to time in order to enhance the natural occurring soil microbial activity).</li> <li>• No servicing of vehicles must occur except on a concrete floor in an area allocated for that.</li> <li>• Drip trays must be available and used where emergency repairs are done.</li> <li>• Training with reference to pollution hazards and their impact on the environment must be given as part of induction training.</li> <li>• An incidence register for this purpose must be kept.</li> </ul>
<b>CLOSURE OBJECTIVE</b>
<ul style="list-style-type: none"> <li>• The topsoil removed in the site preparation process should be replaced during the rehabilitation exercise</li> <li>• Alleviation of compaction of soils will be done during rehabilitation of the terrain, including roads</li> <li>• No soil erosion must be visible and no potential for soil erosion must be present at closure</li> <li>• No soil contamination must be visible or known before closure can be given</li> <li>• No compaction of any roads or any other area must be present during closure</li> <li>• If the soil structure is disturbed mitigation measures e.g. the use of organic material, lime and fertilisers must be</li> </ul>

implemented to restore the soil structure

- The soil must be fertile enough to sustain vegetation

## 1.2 LAND USE

### ENVIRONMENTAL MANAGEMENT/MITIGATION MEASURES/ACTION PLANS/COMMITMENTS

- The disturbance of grazing land must be restricted (kept to a minimum) to the planned active, fenced-off mining site only.
- Remove topsoil where it is available.
- Take care that roads are the only areas used to enter the area for mining purposes.
- If new land is used for roads to enter the area it must be done in consultation with the land owner.
- Topsoil will be placed in areas where it was removed and the areas will be re-vegetated accordingly.

### CLOSURE OBJECTIVE

- To rehabilitate the pit area by sloping the sides to such a state that vegetation can recover and sustain sustainable growth and be used for natural grazing again.
- Measures to address soil erosion will be implemented.

## 1.3 VEGETATION

### ENVIRONMENTAL MANAGEMENT/MITIGATION MEASURES/ACTION PLANS/COMMITMENTS

- Activities will be restricted to the existing roads and mining area.
- Vegetation will not be removed from any area where it is not part of the mining activity.
- Vegetation must not be removed from the topsoil when it is cleared as it will enhance re-growth after rehabilitation.
- No firewood will be collected on site or the surrounding environment.
- No open fires will be allowed on site to prevent veld fires.
- Replace the vegetation by reseeding of grasses.

#### Habitat change, loss of species, spread of alien and invasive species:

- Reseed and plant trees.
- Bulk sampling should be done in a well-planned manner (according to a mining plan) and in the process ensuring that activities are only restricted to surface areas really required.

#### Develop and implement an invasive and alien control programme to control the spread of weeds and other invasive species

- Eradicate exotic weeds and invader species if it invades the terrain.
- All illegal invader plants and weeds shall be eradicated as required in terms of Regulation 15 & 16 of the Act on Conservation of Agricultural Resources, 1983 (Act no. 43 of 1983) which list the plants.
- An invasive and alien control programme must be drafted and implemented by the mine.

### CLOSURE OBJECTIVE

- During rehabilitation indigenous vegetation cover comprising of local plant species should be established in order to ensure a well-adapted sustainable plant cover that would be able to prevent erosion of the replaced topsoil on the disturbed mining site exposed surfaces.
- No invasive and alien species must be present after closure.
- A post-closure control program must also be implemented.
- No excessive dust must be present during the normal growth season after closure
- Concurrent rehabilitation will be done.

## 1.4 WILD LIFE

### ENVIRONMENTAL MANAGEMENT/MITIGATION MEASURES/ACTION PLANS/COMMITMENTS

#### Wildlife or wildlife habitat destruction /change / disturbance

- To take care that no new or unnecessary destruction of habitats, other than the demarcated mining site should take place.

**Injury and death to wildlife:**

- Re-establish trees and grass cover as soon as possible during and after mining.
- Ensure that the rehabilitation plan is compiled and executed.
- No employees of the proposed quarry will be allowed to walk to and from work crossing other properties.
- Employees at the proposed borrow pit will not be allowed on the land of the adjacent landowners except with the permission of said landowner.
- Keep incidence register on killings and disturbances.
- No open fires allowed on site.

**Restoration of habitat:**

- Make game catching, traps, snares, poaching and any other unnecessary disturbance of animals a disciplinary offence.
- Keep an environmental incidence register to log all kills of birds and mammals.
- All staff must undergo basic environmental awareness lecture during induction training.
- Machine operators and drivers to undergo appropriate level of environmental impact training to ensure they understand their impact on the environment.
- Ensure all staff working on the opencast section undergo basic lecture during induction phase.
- The names (signed by them) of staff that has done this training must be provided during the audit.
- Introduce the actions as listed above into disciplinary code as offence.

**CLOSURE OBJECTIVE**

- The animal life habitat must be restored after decommissioning.
- Success will be measured against the extent to which the animals return to the area.
- The post-closure phase must be suitable for further restoration of the newly man-made animal habitat.
- The area must be stable and acceptable for the return of animal- and plant life.

**1.5 AIR QUALITY****ENVIRONMENTAL MANAGEMENT/MITIGATION MEASURES/ACTION PLANS/COMMITMENTS****Dust**

- Cease dust generating activities during extremely windy conditions.
- In the event that dust is a problem, the roads will be sprayed with water to limit the dust. Water used will be obtained lawfully.
- Inspection on construction vehicles should be done on a daily basis.
- Vehicles should be serviced and maintained to lower CO<sub>2</sub> emissions.
- Vehicles will be restricted to 40km/h on dust roads.
- Construct speed bumps and signs on the road to lower speeds at which truck travel.

**CLOSURE OBJECTIVE**

- Rehabilitation of the excavations/mining area would ensure that no dust is generated from exposed surfaces.

**1.6 NOISE****ENVIRONMENTAL MANAGEMENT/MITIGATION MEASURES/ACTION PLANS/COMMITMENTS**

- Ensure the required silencers are placed on all engines.
- No mitigation to reverse hooters is allowed due to safety standards.
- Inspection of vehicles and machinery to ensure silencers are fitted.
- Ensure that a complaints register is created, managed and maintained.
- No blasting or crushing will occur on this site.
- Vehicles will be restricted to 40km/h on dust roads.
- Construct speed bumps and signs on the road to lower speeds at which truck travel.

**CLOSURE OBJECTIVE**

- No noise attributed to mining will be generated from the site after closure anymore.
- During decommissioning and closure phase some earth moving equipment and trucks would be utilized for rehabilitation.



## 1.7 VISUAL ASPECTS

### ENVIRONMENTAL MANAGEMENT/MITIGATION MEASURES/ACTION PLANS/COMMITMENTS

- Visual impact would be addressed by means of the re-vegetation of disturbed areas with grasses
- The borrow pit will be visible to adjacent landowners to the south of the proposed site.
- Specific rehabilitation options would mitigate the impact.

### CLOSURE OBJECTIVE

- No residual visual impacts will remain after closure. The terrain should blend in with the surrounding landscape.

## 1.8 SURFACE AND GROUND WATER

### ENVIRONMENTAL MANAGEMENT/MITIGATION MEASURES/ACTION PLANS/COMMITMENTS

- Water used during the mining activities will be registered.
- Storm water channels, berms and other storm water management systems will be implemented to ensure that clean storm water is diverted around the site.
- Any spills of potentially hazardous substances should be cleaned and managed immediately.
- Temporary toilets will be placed on site. The toilets and the disposal of effluent from the toilets will be managed by an outside contractor.
- The depth of the natural water table will not be exceeded by the mining activities.

### CLOSURE OBJECTIVE

- The impact on water resources will not remain after closure.

## 1.9 SOCIO-ECONOMICS

### ENVIRONMENTAL MANAGEMENT/MITIGATION MEASURES/ACTION PLANS/COMMITMENTS

- Increase in Socio – economic activity at local level.

### CLOSURE OBJECTIVE

- The economic development must deliver a multiplier effect that will contribute to the local economy long after closure

## 1.10 INTERESTED AND AFFECTED PARTIES

### ENVIRONMENTAL MANAGEMENT/MITIGATION MEASURES/ACTION PLANS/COMMITMENTS

- Employees at the borrow pit will not be allowed to enter or pass through neighbouring properties without permission from that landowner,
- Employees will not be allowed to stay at the borrow pit permanently,
- The Riverside Road will be maintained to accommodate other road users,
- Ensure that the entrances to properties are kept open during the maintenance of the road.
- Should there be a significant negative aesthetic impact on adjacent landowners, trees will be planted to alleviate the impact.

### 7.1.4 Review the significance of the identified impacts after bringing the proposed mitigation measures into consideration

All the impacts will be properly mitigated to acceptable levels that will not have adverse impact on the environment and adjacent landowners.

## 4 REGULATION 52 (2) (D): FINANCIAL PROVISION

The applicant is required to:

- Identify the disturbance for which financial provision must be made
- Align rehabilitation with the closure objectives
- Calculate the quantum and
- Undertake to provide financial provision

### 4.1 Identification of the disturbance for which financial provision must be made

#### 7.1.3 Plans for quantum calculation purposes

Please refer to Map 1, Appendix A for an indication of the mining area to be excavated during the mining activities.

**The construction phase will include the following:**

- a) Clearing of the 4.82 hectare mining area
- b) Removing and stockpiling of topsoil
- c) Clearing of existing access road area from existing farm road to the mining area

**Operational Phase:**

The area where the first excavation took place will be open.

**The closure phase will include the following:**

- a) The mine roads will be rehabilitated by means of ripping the surface area and sowing of grass seeds in order to obtain sustainable vegetation which will have no wind or water erosion and ensure no after closure impacts if the road will not be used by the landowner in future.
- b) The excavation area will be rehabilitated concurrently by means of the following:
  - All available mining waste and overburden material will be backfilled into the pit.
  - The area opened for mining will never exceed 1.2ha in size. An area of 1.2ha will be mined completely, rehabilitated, and then a new area will be opened for mining.
  - The sides of the excavation will be sloped to sustain vegetation.
  - The topsoil will be placed back onto this sloped area to act as a sustainable growth medium.
  - If the natural vegetation seeds from the topsoil does not germinate and grow within one growing season, seeds will be sown to assist. As there is a big seed source surrounding this mining area it is foreseen that sufficient growth will take place within the first growing season.
  - After rehabilitation the land will be available for livestock grazing.

#### 7.1.4 Alignment of rehabilitation with the closure objectives

In order for Authorities to determine whether or not rehabilitation is done in accordance with the closure objectives as set out in this document, the applicant will submit information to inform the relevant department of the impacts and the progress being made with respect to the mitigation of the impacts occurring from the current operation. It will also reflect if rehabilitation is on track to accomplish the closure objectives.

Concurrent rehabilitation will be done on the site to ensure that the area that is open never exceeds 1.2 ha in size. This will also lower rehabilitation costs at the end of the project.

The following information will be submitted to the respective Departments within the stipulated time frames:

#### a) Submission of information:

- Topography

To ensure that rehabilitation post-mining slopes are stable, free draining and no final slopes that is not grade to be safe and able to sustain natural vegetation.

Monitoring will be done on an **annual basis** to ensure that the levels and the slopes are in order.

- **Soil**

Monitoring will be done at rehabilitated areas on an **annual basis** or after a heavy rain event, where soil depth and chemical composition will be tested and possible erosion damage will be assisted and rectified.

- **Vegetation**

To ensure that the rehabilitated areas become self-maintaining, monitoring will be done in mid-summer and mid-winter at the rehabilitated areas where species diversity and vegetation cover will be investigated.

- **Air quality**

To ensure that the mine minimizes dust emissions, so that dust does not become a nuisance for affected parties and a health hazard.

Visual inspections will be done and managed by dust suppression by a water tanker.

## b) **Submission of the report**

- **Monthly monitoring** of all environmental management measures will be done by the holder of the mining authorization in order to ensure that the provisions of this programme are adhered to.
- **Yearly reporting** of the progress of implementation of this programme will be done by an independent consultant.
- Various points of compliance will be identified with regards to the various impacts that the operations will have on the environment.
- The layout plan will be updated **annually** to indicate areas that were cleared and areas that have been rehabilitated. Updated copies will be submitted on an **annual basis** to the Regional Manager: DMR.
- Reports confirming compliance with various points identified in the environmental management programme will be submitted to the Regional Manager: DMR at the end of **every year** with special reference to the progress of vegetated areas.
- Any emergency or unforeseen impacts will be reported as soon as possible (within 24 hours).
- An assessment of environmental impacts that were not properly addressed or were unknown when the programme was compiled shall be carried out and added as a corrective action.

**7.1.5 Quantum calculations of the financial provision required to manage and rehabilitate the environment, in accordance with the guideline prescribed in terms of Regulation 51(1) in respect of each of the phases referred to**

It is proposed to make available R94 044.10 as a rehabilitation guarantee.

See calculation below:

**Table B.9: Template for Level 2: "Rules-based" assessment of the quantum for financial provision**

CALCULATION OF THE QUANTUM							
Mine:	Roodewal Borrow Pit			Location:	Roodewal 292/RE		
Evaluators:	G. L. De Villiers			Date:	8/11/2014		
No	Description	Unit	A Quantity	B Master rate	C Multiplication factor	D Weighting factor 1	E=A *B*C*D Amount (rands)
			Step 4.5	Step 4.3	Step 4.3	Step 4.4	
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	m <sup>3</sup>	0	12	1	1.1	R 0.00
2(A)	Demolition of steel buildings and structures	m <sup>2</sup>	0	170	1	1	R 0.00
2(B)	Demolition of reinforced concrete buildings and structures	m <sup>2</sup>	0	251	1	1	R 0.00
3	Rehabilitation of access roads	m <sup>2</sup>	100	30	1	1.1	R 3,300.00
4(A)	Demolition and rehabilitation of electrified railway lines	m	0	295	1	1	R 0.00
4(B)	Demolition and rehabilitations of non-electrified railway lines	m	0	161	1	1	R 0.00
5	Demolition of housing and/or administration facilities	m <sup>2</sup>	0	340	1	1	R 0.00
6	Opencast rehabilitation including final voids and ramps	ha	4.82	178368	0.04	1.1	R 37,828.29
7	Sealing of shaft, adits and inclines	m <sup>3</sup>	0	91	1	1	R 0.00
8(A)	Rehabilitation of overburden and spoils	ha	0.1	118912	1	1	R 11,891.20
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	ha	0	148103	1	1	R 0.00
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	ha	0	4300162	0.51	1	R 0.00
9	Rehabilitation of subsided areas	ha	0	93571	1	1	R 0.00
10	General surface rehabilitation	ha	0.1	94199	1	1	R 9,419.90
11	River diversions	ha	0	94199	1	1	R 0.00
12	Fencing	ha	4.82	107	1	1	R 515.74
13	Water Management	ha	0	35817	0.17	1	R 0.00
14	2 to 3 years of maintenance and aftercare	ha	0	12536	1	1	R 0.00
15(A)	Specialists study	Sum	0			1	R 0.00
15(B)	Specialists study	Sum	0				R 0.00
<b>Sub Total 1</b> (Sum of items 1 to 15 above)							R 62,955.13
1	Preliminary and General	12.5% of Subtotal 1	<b>Weighting factor 2 (step 4.4)</b>				
					1.05		R 8,262.86
2	Administration and supervision costs		6.0% of Subtotal 1				R 3,777.31
3	Engineering drawings and specifications		2.0% of Subtotal 1				R 0.00
4	Engineering and procurement of specialist work		2.5% of Subtotal 1				R 0.00
5	Development of a closure plan		2.5% of Subtotal 1				R 0.00
6	Final groundwater modelling		2.5% of Subtotal 1				R 0.00

		<b>Sub Total 2</b>	R
		(Subtotal 1 plus sum of management and administrative items, 1 to 6 above)	74,995.29
7	Contingency	10.0% of Subtotal 1	R 7,499.53
		<b>Sub Total 3</b>	R
		(Subtotal 2 plus contingency)	82,494.82
		Vat (14%)	R 11,549.28
		<b>GRAND TOTAL</b>	R
		(Subtotal 3 plus VAT)	<b>94,044.10</b>

### 7.1.6 Undertaking by the applicant to provide financial provision

The applicant will submit a bank guarantee to the amount of R94 044.10 as soon as the quantum amount is been confirmed.

## 5 REGULATION 52 (2) (E): PLANNED MONITORING AND PERFORMANCE ASSESSMENT OF THE ENVIRONMENTAL MANAGEMENT PLAN

### 5.1 List of identified impacts that requires monitoring programmes

Environmental Component	Identified impacts that requires monitoring programmes
<b>Soils</b>	<ul style="list-style-type: none"> <li>• Compaction of surfaces where vehicles move.</li> </ul>
<b>Topsoil</b>	<ul style="list-style-type: none"> <li>• Loss of topsoil.</li> </ul>
<b>Air Quality</b>	<ul style="list-style-type: none"> <li>• Generation of dust from mining and transporting of material</li> </ul>
<b>Noise</b>	<ul style="list-style-type: none"> <li>• Higher noise levels in the area as a result of mining and transporting of material.</li> </ul>
<b>Flora</b>	<ul style="list-style-type: none"> <li>• Loss of vegetation from the Bloemfontein Dry Grassland</li> </ul>
<b>Surface and groundwater</b>	<ul style="list-style-type: none"> <li>• Contamination of water</li> </ul>

### 5.2 Functional requirements for monitoring programmes

The consultant will properly discuss with the manager and assist where necessary.

As part of the general terms and conditions for a mining permit and in order to ensure compliance with the approved environmental management plan and to access the continued appropriateness and adequacy to the environmental management plan. The applicant/holder shall:

- Conduct monitoring on a continuous basis:

<b>A. Objectives to be reached</b>	
Vegetation	<ul style="list-style-type: none"> <li>• To obtain a self-sustaining, well-established indigenous vegetation cover on each disturbed area and to eradicate all illegal invaders &amp; weed species in a controlled way.</li> </ul>
Noise	<ul style="list-style-type: none"> <li>• To monitor the noise levels and create a safe working and better quality environment</li> </ul>

	for the worker and the adjacent landowners.
Dust	<ul style="list-style-type: none"> <li>To monitor the dust levels and create a safe working and better quality environment for the worker and the adjacent landowners.</li> </ul>
Soil	<ul style="list-style-type: none"> <li>To ensure that all available topsoil be stored and spillages of petrochemicals be handled correctly.</li> </ul>
Water	<ul style="list-style-type: none"> <li>Ensure that the water used at the borrow pit is lawful.</li> <li>Ensure that spillages are cleaned and managed appropriately.</li> </ul>
<b>B. Variables, which will be considered</b>	
Vegetation	<ul style="list-style-type: none"> <li>Basal and crown cover</li> <li>Species diversity</li> <li>Vitality of vegetation</li> </ul>
Noise	<ul style="list-style-type: none"> <li>Measured noise levels in dB</li> </ul>
Dust	<ul style="list-style-type: none"> <li>Measured dust levels – particulate matter (respiratory dust measurements), dust fall-out</li> </ul>
Soil	<ul style="list-style-type: none"> <li>Degree of erosion</li> <li>Occurrence of spillages of petrochemicals</li> </ul>

<b>C. Location of monitoring points</b>	
Vegetation	<ul style="list-style-type: none"> <li>All rehabilitated areas</li> </ul>
Noise	<ul style="list-style-type: none"> <li>Excavated sites, roads, mine border, farm dwelling (houses).</li> </ul>
Dust	<ul style="list-style-type: none"> <li>Mining area and nearest receptors</li> </ul>
Soil	<ul style="list-style-type: none"> <li>All rehabilitated areas and active mining site.</li> </ul>
<b>D. The nature of monitoring equipment</b>	
Vegetation	<ul style="list-style-type: none"> <li>Wheel point apparatus</li> </ul>
Noise	<ul style="list-style-type: none"> <li>As specified by the Mine Health and Safety Act no 29 of 1996</li> </ul>
Dust	<ul style="list-style-type: none"> <li>As specified by the Mine Health and Safety Act no 29 of 1996</li> </ul>
Soil	<ul style="list-style-type: none"> <li>No equipment – only observation.</li> </ul>
<b>E. Frequency of sampling and measurement</b>	
Vegetation	<ul style="list-style-type: none"> <li>During and after every raining season</li> </ul>
Noise	<ul style="list-style-type: none"> <li>3 months</li> </ul>
Dust	<ul style="list-style-type: none"> <li>3 months</li> </ul>
Soil	<ul style="list-style-type: none"> <li>3 months and concurrently.</li> </ul>
<b>F. The format of data recordings</b>	
Vegetation	<ul style="list-style-type: none"> <li>Report</li> </ul>
Noise	<ul style="list-style-type: none"> <li>Report</li> </ul>
Dust	<ul style="list-style-type: none"> <li>Report</li> </ul>
Soil	<ul style="list-style-type: none"> <li>Report</li> </ul>
<b>G. Format of report</b>	
<p>The report will include the following:</p> <ul style="list-style-type: none"> <li>Background</li> <li>Conditions of approval</li> <li>Results of the monitoring program</li> <li>Interpretation of the data</li> <li>Proposed remedial actions</li> <li>Action plan</li> <li>Review of the current monitoring plan</li> </ul>	

- Conclusions

Every report will show the trend of the monitoring results according to the mentioned objectives and variables.

- Conduct performance assessment of the environmental management programme as required; and
- Compile and submit a performance assessment report to the minister to demonstrate adherence to the environmental management programme.

### **5.3 Roles and responsibilities for the execution of monitoring programmes**

The applicant and his appointed manager on site will be responsible and execute the monitoring programme.

### **5.4 Committed time frames for monitoring and reporting**

Please note that the monitoring will be done as described above (Section 5.2) through Performance Assessment Reporting on an annual basis.

## 6 REGULATION 52 (2) (F): CLOSURE AND ENVIRONMENTAL OBJECTIVES

### 6.1 Rehabilitation plan

Please refer to Map 1, Appendix A for the locality map as an indication of the anticipated prospected area at the time of closure

### 6.2 Identification of the closure objectives and their extent of alignment to the pre-mining environment

<b>SOIL CLOSURE OBJECTIVE</b>
<ul style="list-style-type: none"> <li>• The topsoil removed in the site preparation process should be replaced during the rehabilitation exercise.</li> <li>• Alleviation of compaction of soils would be done during rehabilitation of the terrain, including roads.</li> <li>• No soil erosion must be visible and no potential for soil erosion must be present at closure.</li> <li>• No soil contamination must be visible or known before closure can be given.</li> <li>• No compaction of any roads or any other area must be present during closure. If the soil structure is disturbed mitigation measures e.g. the use of organic material, lime and fertilisers must be implemented to restore the soil structure.</li> <li>• The soil must be fertile enough to sustain vegetation.</li> </ul>
<b>LANDUSE CLOSURE OBJECTIVE</b>
<ul style="list-style-type: none"> <li>• To rehabilitate the excavation areas by sloping the sides to such a state that vegetation can recover and sustain sustainable growth and be used for natural grazing again.</li> <li>• Measures to address soil erosion will be put in place.</li> </ul>
<b>VEGETATION CLOSURE OBJECTIVE</b>
<ul style="list-style-type: none"> <li>• During rehabilitation, indigenous vegetation cover comprising of local plant species should be established in order to ensure a well adapted sustainable plant cover that would be able to prevent erosion of the replaced topsoil on the disturbed mining site exposed surfaces.</li> <li>• No invasive and alien species must be present after closure.</li> <li>• A post-closure control program must also be implemented.</li> <li>• No excessive dust must be present during the normal growth season after closure</li> </ul>
<b>AIR QUALITY CLOSURE OBJECTIVE</b>
<ul style="list-style-type: none"> <li>• Rehabilitation of the excavations/mining area would ensure that no dust is generated from exposed surfaces.</li> </ul>
<b>NOISE CLOSURE OBJECTIVE</b>
<ul style="list-style-type: none"> <li>• No noise attributed to mining will be generated from the site after closure anymore.</li> <li>• During decommissioning and closure phase some earth moving equipment and trucks would be utilized for rehabilitation.</li> </ul>
<b>OPEN PITCLOSURE OBJECTIVE</b>
<ul style="list-style-type: none"> <li>• The sides of the pit will be sloped to enhance the establishment of vegetation</li> </ul>

### 6.3 Confirmation of consultation

Please note that the environmental closure objectives were discussed with landowner and applicant.



## 7 REGULATION 52 (2) (G): RECORD OF THE PUBLIC PARTICIPATION AND THE RESULTS THEREOF

### 7.1 Identification of interested and affected parties

#### 7.1.1 Identification of the community / communities

No community was identified as possible interested and / or affected parties as the application area is within a rural farming area surrounded by plots. The nearest neighbour is located 740 m to the southwest of the proposed site.

The landowner and neighbours were identified as I&AP's as well as individuals in the area whom comments have been received from.

Please refer to Appendix C for more information on the Public Participation Process undertaken as part of the current project.

#### 7.1.2 Landowner

The land is not communal property as it is privately owned. The landowner gave consent to the project (Refer to the completed form in Appendix C)

#### 7.1.3 Notification to Land Affairs

Refer to Appendix C for proof of notification to land affairs.

#### 7.1.4 Land Claim

A land claim certificate was not received from DLA, however, according to the landowner there is no land claim on the property.

#### 7.1.5 Traditional Authority

No Traditional Authority was identified.

#### 7.1.6 Landowner

The property does not belong to traditional landowners.

The Title Deed Owner is Jacobus Gustavus Buys (Title Deed Number: T2533/1982)

#### 7.1.7 Lawful occupiers of the land

The lawful occupier of the land concerned is the owner and workers on the farm.

#### 7.1.8 Possible change of other persons' (adjacent and non-adjacent properties) socio-economic status

Comments received from adjacent landowners indicated that the borrow pit may have a negative socio-economic impact on them for the following reasons:

- The activities at the proposed borrow pit may have an impact on the groundwater in the area which may affect them. Groundwater may be contaminated and the quantity may decrease,
- Due to the negative aesthetic impact and the noise associated with the borrow pit and related activities, the value of their properties may decrease,
- Dust from the access road during transportation of material will have a negative impact on adjacent landowners,

- Houses located at a lower altitude may become flooded during heavy rain events as a result of the clearance of vegetation,
- There may be a safety risk to landowners adjacent to the road used for transportation of material or other road users as a result of the increase in traffic and speeds at which trucks move,
- The economic conditions of the landowner of the farm Roodewal 292/RE will improve as the applicant will compensate him for material removed.
- In addition, the proposed project will result in direct job opportunities to 6 members from the local community. The project will result in a positive impact on the local economy of the area as approximately 6 households should receive a bigger income. This will result in more money being spend by the local community, in the local community.

No other person or adjacent neighbour will be economically directly affected, as the mining will be limited to this specific area on the specific farm with its own entrance roads and infrastructure.

### **7.1.9 Local Municipality**

Mangaung Metropolitan Municipality

#### **7.1.10 List of the relevant Government Departments, agencies and institutions responsible for the various aspects of the environment and for infrastructure which may be affected by the proposed project**

Department Water Affairs and Forestry

Department of Agriculture

Department of Environmental Affairs (DETEA)

South African Heritage Resource Agency (SAHRA)

Department of Rural Development and Land Affairs

Mangaung Metropolitan Municipality - Planning Department

Mangaung Metropolitan Municipality - Environmental Department

#### **7.1.11 Proof that all identified IAP's were notified**

Please refer to Appendix C attached hereto for proof that all IAP's were notified of the proposed project.

## **8.2 The details of the engagement process**

### **7.2.1 Description of the information provided to the community, landowners, and interested and affected parties**

The landowner was personally informed about the proposed mining by the applicant and the I&AP's were informed by the environmental consultants, Eko Environmental about the proposed mining and what it will entail.

The application area was indicated to them on a map.

An advertisement was placed in a newspaper that is distributed to the area.

A notice was placed at the entrance to the site informing the public of the proposed mining activities.

Please also refer to Appendix C for an example of the letter submitted to I&AP's, site notice and advertisement as part of the notification process of the relevant parties.

### **7.2.2 List of which parties identified in 7.1 above that were in fact consulted, and which were not consulted**

All the listed parties were consulted; see proof attached in Appendix C

- Mr. J. Kukuk (Adjacent landowner)
- Ms. Su (Adjacent landowner)
- Mr. M. Diretse (Adjacent landowner)
- Ms. M. Mpeli (Adjacent landowner)
- Mr. E. Pienaar (Adjacent landowner)
- Mr. K. Van Eeden (Adjacent landowner)
- Ms. F. Slamdien (Adjacent landowner)
- Mr. J. Maranyane (Adjacent landowner)
- Mr. H. Van Schalkwyk (Adjacent landowner)
- Mr. M. Moahlou (Adjacent landowner)
- New Beginnings Charity (Adjacent landowner)
- Mr. F. D. Du Plessis (Adjacent landowner)
- Mr. A. Watson (Adjacent landowner)
- Ms. Melaney Adams (Adjacent landowner)
- Mr. S. Crafford (Adjacent landowner)
- Ms. R. Bester (Adjacent landowner)
- Ms. M. Botha (Adjacent landowner)
- Ms. F. Matongo (Adjacent landowner)
- Ms. E. Kock - Zuurfontein Properties (Adjacent landowner)
- Mr. H. Steyn (Adjacent landowner)
- Ms. V. Merite (Adjacent landowner)
- Mr. S. Vlok (Adjacent landowner)
- Mr. and Ms. J. H .T. Van Der Merwe
- Mr. S. Mazibuko (Mangaung Metro Municipal Manager)
- Ward 17 Ward Councillor (Mangaung Metro)
- Mr. C. Dihemo (Mangaung Metro - Planning Department)
- Ms. M. Kolobe (Mangaung Metro - Environmental Department)
- Mr. W. Grobler (Deptment of Water Affairs)
- Mr. J. Morton (Dept. Agric)
- Ms. G. Mkhosana (DETEA)
- Mr. A. Salamon (SAHRA)
- Ms. L. May (Department of Rural Development and Land Reform)

### **7.2.3 List of views raised by consulted parties regarding the existing cultural, socio-economic or biophysical environment.**

No comments regarding the above were raised.

### **7.2.4 List of views raised by consulted parties on how their existing cultural, socio-economic or biophysical environment potentially will be impacted on by the proposed mining or mining operation**

- Stock theft might increase in the area with an increase in the number of people in the area,
- The safety of residents adjacent to the access road may be affected as a result of truck using that road if they do not comply to the speed limits,
- There may be a negative impact on groundwater and surfacewater as a result of the mining activities (i.e. spillage of petrochemical substances),
- The natural groundwater quantity in the area may be impacted upon if the depth of the borrow pit exceeds the natural groundwater level,

- Mudslides may occur as a result of the excavation which may damage adjacent properties to the south and southwest of the borrow pit,
- Material from other areas used for backfilling may contaminate the water in the area,
- The clearance of vegetation may result in flooding of houses located lower than the borrow pit,
- There will be a negative aesthetic impact on adjacent landowners to the south and southwest,
- Higher dust levels from the mining and transportation of gravel will become problematic,
- The noise levels will increase as a result of mining and transportation of gravel,
- The road will deteriorate as a result of the increase in traffic and especially trucks using it.

### **7.2.5 Other concerns raised by the aforesaid parties**

The Mangaung Metro made the following comments:

- A mining permit must be obtained,
- A HIA, PIA and Ecological study must be conducted,
- No mining must take place outside the mining area,
- The previously mined area must be rehabilitated,
- Persons responsible for implementation of management and mitigation measures must be included in the EMP.

### **7.2.6 Confirmation that minutes and records of the consultations are appended.**

Please refer to Appendix C for all Public Participation proof. Most of the adjacent landowners were notified telephonically and some comments were received. However, written notifications were also sent to all adjacent landowners and authorities via e-mail, registered mail or personal delivery. Proof of notifications sent is attached in Appendix C.

### **7.2.7 Information regarding objections received**

- Use of the proposed access road that will increase dust levels and noise which will impact on properties adjacent to it,
- Quality and quantity of groundwater may decrease as a result of the mining,
- Negative aesthetic impact.

## **8.3 Description of the most appropriate means to carry out the proposed activities with due accommodation of the issues raised in the consultation process**

Most of the comments received were with regard to the initially proposed location of the borrow pit. It was however decided to move the borrow pit further away from adjacent properties to accommodate them. The following will be implemented to address issues raised by I&APs:

- No mining activities will take place within a horizontal distance of 100 m from any watercourse.
- No excavating activities will exceed the level of the natural water table.
- Storm water management measures will be implemented by implementing berms.
- Comply with all conditions of the National Water Act (Act 36 of 1998).
- No water may be used without the necessary legal compliance.
- No employees to camp and/or be housed at the borrow pit site.
- No open fires will be made on site as no food will be cooked at the borrow pit.
- Employees of the borrow pit will not be allowed to enter adjacent land.
- Vehicles and machinery will be maintained and serviced and fitted with the necessary silencers to limit noise during operation.

- The borrow pit will only be operational on weekdays during daylight hours. Material will not be transported after 15:00pm in the afternoon.
- Vehicles and machinery will be well maintained to prevent spillages of hazardous substances.
- Spills will be cleaned and managed according to best practices.
- Land will be rehabilitated before closure to fit the end land use (i.e. livestock grazing).
- Concurrent rehabilitation will occur on the site. It is not permitted that an area larger than 1.2ha is open for mining. If mining is completed on one 1.2ha land, that land will be rehabilitated before the next piece of land is opened for mining.
- Temporary toilets will be placed on the site by an outside contractor and the disposal of the effluent from the toilets will be managed by the contractor.

### **Ambient Air Quality**

- The liberation of dust into the surrounding environment should be effectively controlled if it becomes problematic by the use of, inter alia, dust-allaying agents.
- The speed of trucks and other vehicles on the access road should be limited to 40 km/hour to avoid dangerous conditions, excessive dust or excessive deterioration of the road being used. Road signs and speed bumps must be implemented and constructed to ensure this.
- The access road will be maintained if it becomes deteriorated. During maintenance it will be ensured that properties adjacent to the road can be accessed by its owners. All access roads and storm water systems next to the road must be kept open.
- Vehicles should be maintained in a road worthy condition.

### **Groundwater Resources**

- It is not anticipated that the quality of groundwater will be affected due to the proposed activities.
- No water will be used if water use is not registered or licensed with the Department of Water Affairs.
- Storm water mitigation measures will be implemented to ensure that clean run-off water is not contaminated by any activities related to the proposed project.
- Mitigation measures will be implemented to reduce the possibility of spills of hazardous material such as oil and diesel. In the event of a spill, best practices will be implemented to limit soil and or water pollution.
- The depth of the borrow pit will not exceed the natural groundwater level.

### **Noise Levels**

- Construction vehicles will be equipped with silencers and will be well maintained.
- Speed limit of 40km/hour will be implemented by use of road signs and construction of speed bumps.
- No blasting or crushing will occur at the borrow pit.
- The borrow pit will only be operational on weekdays during daylight hours (7am - 6pm). Material will not be transported after 15:00pm in the afternoon. The borrow pit will not be in operation on weekends and public holidays.

### **Waste**

- Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., shall be disposed and stored in a suitable container at a collecting point and collected on a regular basis and disposed of at an authorized waste disposal facility in Bloemfontein. Specific precautions shall be taken to prevent refuse from being dumped on or in the vicinity of the site.
- Suitable covered receptacles shall be available at all times and conveniently placed for the disposal of waste for general and hazardous waste.
- Spills of any product such as paint, oil, cleaning agents etc. should be cleaned up immediately by removing the spillage together with the polluted soil and by disposing it at a recognised facility.
- All used oils, grease or hydraulic fluids, paints, thinners etc. that cannot be re-used shall be placed in a hazardous waste container for disposal at a suitable waste disposal facility.
- Temporary toilet facilities must be made available on site during construction, operational and decommissioning phase.

- Sewage from these toilets should be managed appropriately and not be disposed of on site or the surrounding environment to cause water or other pollution.

**Loss Of Vegetation**

- It is not anticipated that the vegetation on adjacent property will be influenced due to the proposed mining activities as these activities will be carried out on the farm Roodewal 292/RE.
- In addition, no open fires will be allowed on site as the site will be treated as a fire-free zone.

## 8 SECTION 39 (3) (C) OF THE ACT: ENVIRONMENTAL AWARENESS PLAN

### 9.1 Employee communication process

- Weekly production meeting
- Induction program for any new employee which will include environmental, emergency procedures, health and safety aspects.
- Weekly toolbox talks regarding to address any issues regard environment, health and safety.

### 9.2 Description of the manner in which a risk will be dealt with in order to avoid pollution or degradation of the environment

All environmental incidents will be evaluated to determine appropriate correction actions that need to be implemented.

Relevant regulating authority will be informed.

Specialist consulting advice will be sourced in extreme cases.

### 9.3 Description of the general environmental awareness and training on emergency situations

The applicant is committed to train the employees to distinguish between normal mining activities and activities that will be detrimental to the environment. The training will include, but is not limited to, the following:

- Induction program for any new employee which will include environmental, emergency procedures, health and safety aspects.
- Weekly toolbox talks to address any issues regarding environment, emergency situations, health and safety.

## 9 SECTION 39 (4) (A) (III) OF THE ACT: CAPACITY TO REHABILITATE AND MANAGE NEGATIVE IMPACTS ON THE ENVIRONMENT

Section 39 (4)(a)(iii) of the Act, read together with Section 37(2) of the Act requires that the applicant must have the capacity, or have provided for the capacity, to rehabilitate and manage negative impacts on the environment.

### 9.1 The annual amount required to manage and rehabilitate the environment

The annual amount required to manage and rehabilitate the environment was calculated at a value of R 50 000

Management activity	Amount
Dust suppression	R12 000.00
<b>Total</b>	<b>R 12 000.00</b>

### 9.2 Confirmation that the stated amount has been adequately provided for in the corresponding budget reflected in the Prospecting Work Programme as required in accordance with Regulation 7(1)(j)(ii).

It is hereby confirmed that the stated amount has been adequately provided for.

**10 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, and confirm that the above report comprises EIA and EMP compiled in accordance with the guideline on the Departments official website and the directive in terms of sections 29 and 39 (5) in that regard, and the applicant undertakes to execute the Environmental management plan as proposed.

<b>Full Names and Surname</b>	Phillippus Christoffel Bender
<b>Identity Number</b>	5402285043082

-END-