

File number: LP 30/5/1/1/2/2394 PR

DEPARTMENT OF MINERALS AND ENERGY

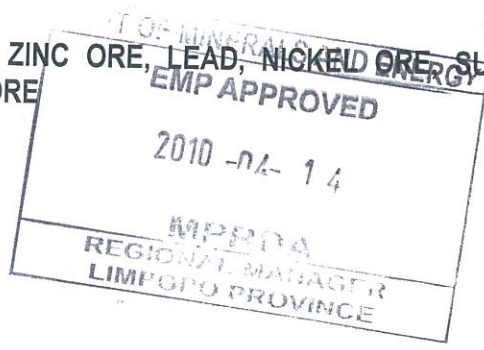
ENVIRONMENTAL MANAGEMENT PLAN

Submitted in support of application for a prospecting right.
Section 39 and Regulation 52 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)



Table with 2 columns: Application a: and for. Rows: Prospecting Right (checked), Mining Permit.

Applicant: DE BEERS CONSOLIDATED MINES LIMITED
Farms: VENETIA 103 MS (PTNS 1, 2, 3, 4, 5 AND REMAINING EXTENT)
District: MUSINA DISTRICT, LIMPOPO PROVINCE
Mineral: COPPER ORE, COBALT, ZINC ORE, LEAD, NICKEL ORE, SULPHUR, SILVER ORE AND GOLD ORE
Date: 12 October 2009



## Contents

### Section A:

A.1	Introduction	Page 3
A.2	Scope	Page 3
A.3	Purpose	Page 3
A.4	Use of the document	Page 4
A.5	Legislation/ Regulations	Page 4
A.6	Other relevant legislation	Page 5
A.7	Word definitions	Page 6

### Section B:

B.1	Biographical information about the applicant	Page 7
-----	--	--------

### Section C:

C 1 - 5	Environmental Impact Assessment/ information about the environment	Page 8
C 6	Specific Regulatory requirements	Page 17

### Section D:

D	Scoring of the EIA	Page 23
---	--------------------	---------

### Section E:

E	Undertaking by applicant	Page 24
---	--------------------------	---------

### Section F:

F	Environmental Management Plan	Page 25
---	-------------------------------	---------

### Section G:

G	Specific additional requirements determined by the Regional Manager and agreed to by the Applicant	Page 44
---	--	---------

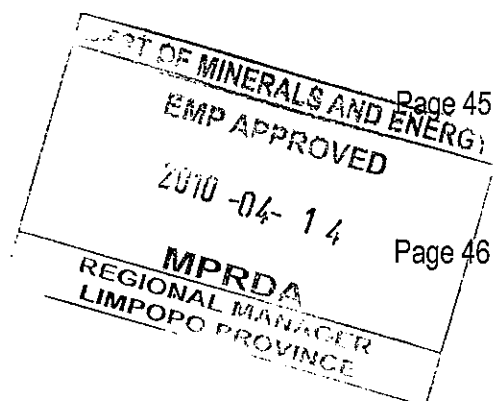
### Section H:

H	Undertaking	Page 45
---	-------------	---------

### Section J:

J	Approval	Page 46
---	----------	---------

### Appendices



## A.1 INTRODUCTION

This document aims to provide a simplified national standard for applicants for prospecting rights and mining permits to comply with the relevant legislation and environmental regulations as apply to their respective applications in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)(MPRDA).

Applicants in this sector of the mining industry typically disturb smaller surface areas of land, whether drilling boreholes, small trenches, or mining on a small area, less than 1,5 hectares of land, under a mining permit as contemplated in Section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)

## A.2 SCOPE

This document is intended for use by applicants for mining permits and prospecting rights. Typically, operations in this sector of the mining industry:

- Use little or no chemicals to extract mineral from ore,
- Work on portions of land of 1,5 hectares in size or smaller,
- Disturb the topography of an area somewhat but have no significant impact on the geology

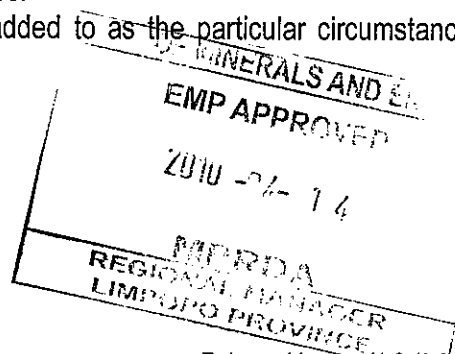
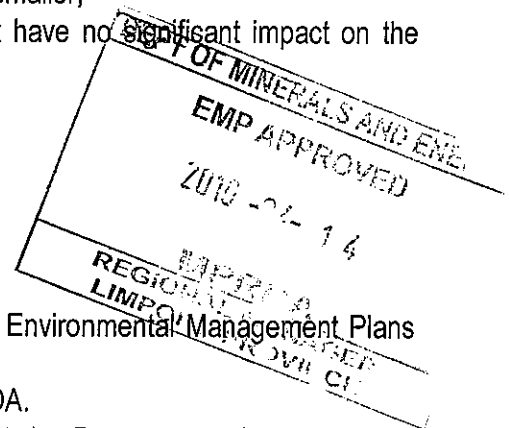
## A.3 PURPOSE

This document aims to:

- Provide a national standard for the submission of Environmental Management Plans for the types of applications mentioned above.
- Ensure compliance with Regulation 52 of the MPRDA.
- Assist applicants by providing the information that the Department of Minerals and Energy (DME) requires in a simple language and in a structured, prescribed format, as contemplated in Regulation 52 (2) of the (MPRDA).
- Assist regional offices of the DME to obtain enough information about a proposed prospecting/ reconnaissance or mining permit operation to assess the possible environmental impacts from that operation and to determine corrective action even before such right is granted and the operation commences.

This document aims both to provide the DME regional offices with enough information about applicants for mining permits and applicants with guidance on environmental management matters pertaining to the mitigation of environmental impacts arising from their operations. Given this dual focus and the generic nature of the document, it might not be sufficient for all types of operations under various circumstances.

The document may therefore be altered or added to as the particular circumstances of the application in question may require.



#### A.4 USE OF THE DOCUMENT:

This document is designed for use by non-professionals and newcomers to the environmental management industry and it incorporates a *very simple* Environmental Impact Assessment (EIA). The EIA is contained in Section C of this document and was designed specifically with the target sectors of the mining industry (described in A.2 above) in mind.

The aim is ultimately to (a) gather information from applicants themselves; (b) to assess the impact of the operation based on that information and then (c) to guide the applicant to mitigate environmental impacts to limit damage to the environment.

Section B of the document gathers demographic information about the applicant. Section C gathers the information that will be used in the Environmental Impact Assessment. The applicant must complete the relevant sections of this document, but the regional office of the DME will do the scoring of these for the impact assessment rating in Section D.

Section F (the Environmental Management Plan) of the document is prescriptive and gives guidance to the miner or prospector on how to limit the damage of the operation on the environment. This part may be added to by the regional manager, who has the prerogative to decide whether this Environmental Management Plan will adequately address the environmental impacts expected from the operation or whether additional requirements for proper environmental management need to be set. Where these additional requirements are set, they will appear in Section G of this document. The Environmental Management Plan (Section F) of the document is legally binding once approved and, in the undertaking contained in Section H, the applicant effectively agrees to implement all the measures outlined in this Environmental Management Plan.

#### A.5 LEGISLATION/ REGULATIONS

The relevant sections of Mineral and Petroleum Resources Development Act and its supporting Regulations are *summarised below* for the information of applicants. The onus is on the applicant to familiarise him/herself with the provisions of the full version of the Mineral and Petroleum Resources Development Act and its Regulations.

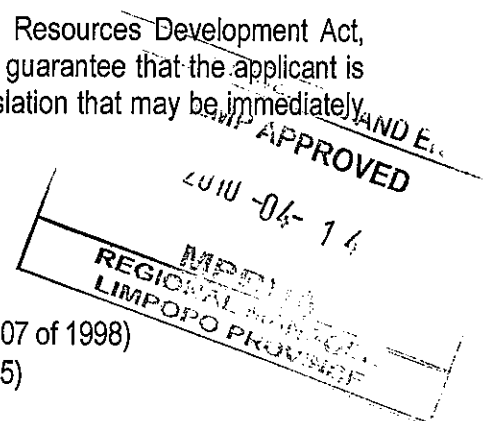
Section of Act	Legislated Activity/ Instruction/ Responsibility or failure to comply	Penalty in terms of Section 99
5(4)	No person may prospect, mine, or undertake reconnaissance operations or any other activity without an approved EMP, right, permit or permission or without notifying land owner	R 100 000 or two years imprisonment or both
19	Holder of a Prospecting right must: lodge right with Mining Titles Office within 30 days; commence with prospecting within 120 days, comply with terms and conditions of prospecting right, continuously and actively conduct prospecting operations; comply with requirements of approved EMP, pay prospecting fees and royalties	R 100 000 or two years imprisonment or both
20(2)	Holder of prospecting right must obtain Minister's permission to remove any mineral or bulk samples	R 100 000/ or two years imprisonment or both
Section of Act	Legislated Activity/ Instruction/ Responsibility or failure to comply	Penalty in terms of Section 99

26(3)	A person who intends to beneficiate any mineral mined in SA outside the borders of SA may only do so after notifying the Minister in writing and after consultation with the Minister.	R 500 000 for each day of contravention
28	Holder of a mining right or permit must keep records of operations and financial records AND must submit to the DG: monthly returns, annual financial report and a report detailing compliance with social & labour plan and charter	R 100 000 or two years imprisonment or both
29	Minister may direct owner of land or holder/applicant of permit/right to submit data or information	R 10 000
38(1)(c)	Holder of permission/permit/right MUST manage environmental impacts according to EMP and as ongoing part of the operations	R 500 000 or ten years imprisonment or both.
42(1)	Residue stockpiles must be managed in prescribed manner on a site demarcated in the EMP	A fine or imprisonment of up to six months or both
42(2)	No person may temporarily or permanently deposit residue on any other site than that demarcated and indicated in the EMP	A fine or imprisonment of up to six months or both
44	When any permit/right/permission lapses, the holder may not remove or demolish buildings, which may not be demolished in terms of any other law, which has been identified by the Minister or which is to be retained by agreement with the landowner.	Penalty that may be imposed by Magistrate's Court for similar offence
92	Authorised persons may enter mining sites and require holder of permit to produce documents/ reports/ or any material deemed necessary for inspection	Penalty as may be imposed for perjury
94	No person may obstruct or hinder an authorised person in the performance of their duties or powers under the Act.	Penalty as may be imposed for perjury
95	Holder of a permit/right may not subject employees to occupational detriment on account of employee disclosing evidence or information to authorised person (official)	Penalty as may be imposed for perjury
All sections	Inaccurate, incorrect or misleading information	A fine or imprisonment of up to six months or both
All sections	Failure to comply with any directive, notice, suspension, order, instruction, or condition issued	A fine or imprisonment of up to six months or both

## A.6 OTHER RELEVANT LEGISLATION

Compliance with the provisions of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) and its Regulations does not necessarily guarantee that the applicant is in compliance with other Regulations and legislation. Other legislation that may be immediately applicable includes, but is not limited to:

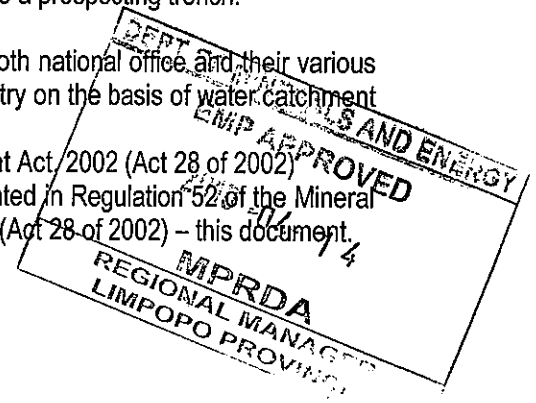
- National Monuments Act, 1969 (Act 28 of 1969).
- National Parks Act, 1976 (Act 57 of 1976)
- Environmental Conservation Act, 1989 (Act 73 of 1989)
- National Environmental Management Act, 1998 (Act No. 107 of 1998)
- Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965)
- The National Water Act, 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).



## A.7 WORD DEFINITIONS

In this document, unless otherwise indicated, the following words will have the meanings as indicated here:

<b>Act (The Act)</b>	Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
<b>Borehole</b>	A hole drilled for the purposes of prospecting i.e. extracting a sample of soil or rock chips by pneumatic, reverse air circulation percussion drilling, or any other type of probe entering the surface of the soil.
<b>CARA</b>	The Conservation of Agricultural Resources Act
<b>EIA</b>	An Environmental Impact Assessment as contemplated in Section 38(1) (b) of the Act
<b>EMP</b>	an Environmental Management Plan as contemplated in Section 39 of the Act
<b>Fauna</b>	All living biological creatures, usually capable of motion, including insects and predominantly of protein-based consistency.
<b>Flora</b>	All living plants, grasses, shrubs, trees, etc., usually incapable of easy natural motion and capable of photosynthesis.
<b>Fence</b>	A physical barrier in the form of posts and barbed wire and/or "Silex" or any other concrete construction, ("palisade"- type fencing included), constructed with the purpose of keeping humans and animals within or out of defined boundaries.
<b>House</b>	any residential dwelling of any type, style or description that is used as a residence by any human being
<b>NDA</b>	National Department of Agriculture
<b>NWA</b>	National Water Act, Act 36 of 1998
<b>Pit</b>	Any open excavation
<b>"Porrel"</b>	The term used for the sludge created at alluvial diamond diggings where the alluvial gravels are washed and the diamonds separated in a water-and-sand medium.
<b>Topsoil</b>	The layer of soil covering the earth which- <ul style="list-style-type: none"> <li>(a) provides a suitable environment for the germination of seed;</li> <li>(b) allows the penetration of water;</li> <li>(c) is a source of micro-organisms, plant nutrients and in some cases seed; and</li> <li>(d) is not of a depth of more than 0,5 metres or such depth as the Minister may prescribe for a specific prospecting or exploration area or mining area.</li> </ul>
<b>Trench</b>	A type of excavation usually made by digging in a line towards a mechanical excavator and not pivoting the boom – a large, U-shaped hole in the ground, with vertical sides and about 6 – 8 metres in length. Also a prospecting trench.
<b>Vegetation</b>	Any and all forms of plants, see also Fauna
<b>DWAF</b>	The Department of Water Affairs and Forestry – both national office and their various regional offices, which are divided across the country on the basis of water catchment areas.
<b>MPRDA</b>	the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
<b>EMPlan</b>	An Environmental Management Plan as contemplated in Regulation 52 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) – this document.



**B. BIOGRAPHIC DETAILS OF THE APPLICANT:**

<b>B 1.1</b> Full name (and surname) of person or company applying for permit or right	<i>De Beers Consolidated Mines Limited</i>
<b>B 1.2</b> ID number of person or company/ CC registration number	<i>1888/000007/06</i>
<b>B 1.3</b> Postal address	<i>P O Box 616 Kimberley 8300</i>
<b>B 1.4</b> Physical/ residential address	<i>36 Stockdale Street Kimberley 8301</i>
<b>B 1.5</b> Applicant's telephone number	<i>053 839 4248</i>
<b>B 1.6</b> Applicant's cellular phone number	<i>n/a</i>
<b>B 1.7</b> Alternative contact's name	<i>A W Dreyer</i>
<b>B 1.8</b> Alternative contact's telephone/cell phone numbers	<i>053 839 4643</i>
<b>B 2.1</b> Full name of the property on which mining/ prospecting operations will be conducted	<i>The farm Venetia 103 MS</i>
<b>B 2.2</b> Name of the subdivisions	<i>Venetia 103 MS – Portions 1, 2, 3, 4, 5 and remaining extent</i>
<b>B 2.3</b> Approximate centre of mining/prospecting area: Longitude	<i>29 ° 19 min 00 sec East</i>
Latitude	<i>22 ° 26 min 30 sec South</i>
<b>B 2.4</b> Magisterial district	<i>Musina</i>
<b>B 2.5</b> Name of the registered owner of the property	<i>De Beers Consolidated Mines Limited</i>
<b>B 2.6</b> His/her Telephone number	<i>053 839 4248</i>
<b>B 2.7</b> His/ her Postal address	<i>P O Box 616 Kimberley 8300</i>
<b>B 2.8</b> Current uses of surrounding areas	<i>Mining: Venetia Diamond Mine; conservation: Venetia Limpopo Nature Reserve; game and cattle farming</i>
<b>B 2.9</b> Are there any other, existing land uses that impact on the environment in the proposed mining / prospecting area?	
	<i>Mining: Venetia Diamond Mine</i>
<b>B 2.10</b> What is the name of the nearest town?	
	<i>Alldays, approx. 35 km SW and Musina, approx. 75 km E</i>

**C. ENVIRONMENTAL IMPACT ASSESSMENT:**

The information provided in this section will enable officials to determine how serious the impact of the prospecting/mining operation will be.

Please also refer to the attached Aspects and Impacts register compiled for this project, presented as Appendix 1.

**DESCRIBE THE ENVIRONMENT THAT WILL BE AFFECTED BY THE PROPOSED PROSPECTING/MINING OPERATIONS UNDER THE FOLLOWING HEADINGS:**

C.1 DESCRIPTION OF THE ENVIRONMENT LIKELY TO BE AFFECTED BY PROPOSED PROSPECTING/MINING OPERATIONS: (REGULATION 52(2)(a))			
ENVIRONMENTAL ELEMENT/ IMPACTOR	VALUE	TICK	OFFICE USE
<p><b>C 1.1</b> What does the landscape surrounding the proposed operation look like? (Open veldt/ valley/ flowing landscape/ steep slopes)</p> <p>The application area naturally comprises rocky, slightly hilly terrain covered in Mopani woodland, with an overall slope to the north and west. The mean elevation of the area applied for was originally approximately 680 m.a.s.l. with the highest point in the central-southern part being 722 m.a.s.l and the lowest point on the northern boundary being approximately 635 m.a.s.l. However the original land surface and vegetation have been extensively modified by the mining operations on the property. Refer to 1:50,000 topographic map sheet 2229AD.</p>			
<p><b>C 1.2</b> Describe the type of soil found on the surface of the site</p> <p>In the north-western parts, prisma-cutanic &amp; pedocutanic horizons are dominant (code Db218), grading into Glenrosa and Mispah forms in the centre with lime present (code Fc622). The south-eastern and south-western parts contain red to yellow, apedal, freely drained soils (codes Ae308 and Ah104).</p>			
<p><b>C 1.3</b> How deep is the topsoil?</p> <p>Soil depths are variable, mostly described as less than 450 mm, but some areas are deeper.</p>			
	0 - 300mm		8
	300 - 600mm	✓	APPROVED
	600mm	✓	1 2

DEPT OF MINERALS AND ENERGY  
 EMP APPROVED  
 ZILU  
 REGIONAL MANAGER  
 LIMPOPO PROVINCE



**C 1.4** What plants, trees and grasses grow naturally in the area around the site?

Most of the area has been transformed from the natural vegetation due to mining operations.

*The area naturally comprises Mopani woodland (specifically Musina Mopane Bushveld code SVmp1 and Limpopo Ridge Bushveld code SVmp2).*

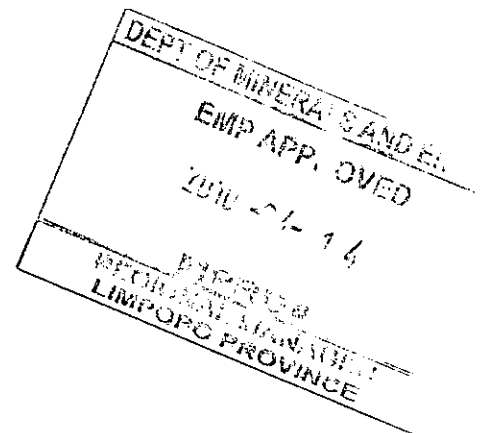
Source:

Mucina, L. and Rutherford, M.C. (eds) 2006. The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

*The comprehensive vegetation study of the greater Venetia mine area identified the following species, all of which are generally widespread and not threatened:*

*Woody species: Colophospermum mopane, Acaia tortilis, Acacia erubescens, Acacia nigrescens, Combretum apiculatum, Combretum imberbe, Combretum mossambicense, Terminalia pruinoides, Lonchocarpus capassa, Kirkia acuminata, Commiphora spp., Boscia albitrunca, Boscia foetida, Grewia bicolor.*

*Grass species: Cenchrus ciliaris, Enneapogon desvauxii, Aristida congesta, Eragrostis lehmanniana, Eragrostis rigidior, Panicum maximum, Stipagrostis uniplumis, Urochloa mosambicensis.*



**C 1.5 What animals naturally occur in the area?**

Animals such as impala, kudu, waterbuck and warthog within the mine lease area have been afforded a degree of protection from predators and are relatively tame. Eleven Red Data mammal species could be present in the area (see table below), however, it is unlikely that the larger species such as the Aardwolf, Brown Hyaena and Leopard would be found within the mine lease area due to the robustness of the security fence. Jameson's red rock rabbit is endemic to rocky areas within southern Africa. The vulnerable Pangolin was previously observed on site.

Three reptile species were recorded. These are the Kalahari Tent Tortoise (*Psammobates oculiferus*), the Horned Adder (*Bitis caudalis*) and the Spotted Sandveld Lizard (*Nucras intertexta*). Three Red Data reptile species may be found in the study area (see table below).

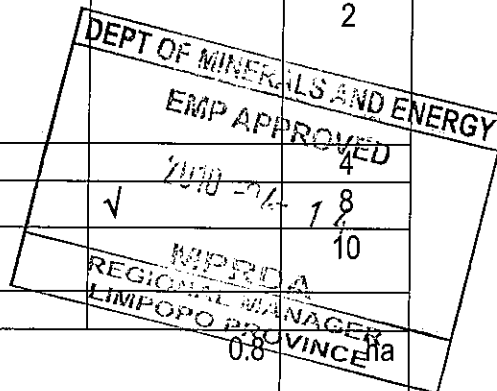
A total of 123 bird species was previously recorded for the area. None of the bird species that may occur in the area are listed as Red Data species. Thirty-three bird species are uncommon. The Peregrine Falcon (*Falco peregrinus*), which may occur in the study area, is classified as rare, meaning that it has been recorded ten times or less in any year in suitable habitat.

Source: Golder Associates, 2004: Addendum to the EMPR Proposed Construction of a New Fine Residue Deposit.

<b>Mammals</b>		
Vulnerable	Rare	
Pangolin ( <i>Manis temminckii</i> )	Selous' mongoose ( <i>Paracynictis selousi</i> )	
Antbear ( <i>Orycteropus afer</i> )	African civet ( <i>Civettictis civetta</i> )	
Honey badger ( <i>Mellivora capensis</i> )	Serval ( <i>Felis serval</i> )	
African wild cat ( <i>Felis lybica</i> )	Leopard ( <i>Panthera pardus</i> )	
	Brown hyaena ( <i>Hyaena brunnea</i> )	
	Aardwolf ( <i>Proteles cristatus</i> )	
	Southern African hedgehog ( <i>Atefrix frontalis</i> )	
<b>Reptiles</b>		
Vulnerable	Rare	Restricted
Southern African Rock Python ( <i>Python natalensis</i> )	Transvaal Quill-snouted snake ( <i>Xenocalamus transvaalensis</i> )	Soutpansberg Flat Lizard ( <i>Platysaurus relictus</i> )

The planned prospecting is unlikely to have a significant additional impact on these animals.

	VALUE	TICK	OFFICE USE
<b>C 1.6</b> Are there any <i>protected areas</i> (game parks/nature reserves, monuments, etc) close to the proposed operation?	Yes	√	4
	No		0
The Venetia Limpopo Nature Reserve (also owned by De Beers Consolidated Mines Limited) lies immediately adjacent to the area to the north, west and east.			
<b>C 1.7</b> What mineral are you going to prospect or mine for?	Copper ore, cobalt, zinc ore, lead, nickel ore, sulphur, silver ore and gold ore.		
<b>C 1.8</b> Describe the type of equipment that will be used:	4x4 LDVs to access the area, various portable (man carried) geophysical surveying instruments, possibly skid and/or truck mounted drill rigs and ancillary equipment, possibly light earthmoving equipment.		
<b>C.2 HOW WILL THE PROPOSED OPERATION IMPACT ON THE NATURAL ENVIRONMENT? (REGULATION 52(2)(b))</b>			
<i>Note that a phased approach to prospecting will be used, with progression to subsequent phases of work being dependant upon results obtained from each phase. Thus it is not certain that all possible activities and thus impacts will occur, but for the purposes of this section all are included.</i>			
ENVIRONMENTAL ELEMENT/ IMPACTOR	VALUE	TICK	OFFICE USE
<b>C 2.1</b> What will the ultimate depth of the proposed prospecting/mining operations be?	0 – 5m		2
<i>Pitting/trenching if required, is unlikely to exceed 15m whilst drilling could reach depths of up to 200m.</i>	6 – 10m		4
	10 – 25m	√	8
	25m +		10
<b>C 2.2</b> How large will the total area of all excavations be?			0.8
<i>Should this project extend into pitting, trenching and/or drilling the total area of all excavations is estimated not to exceed c 8000m<sup>2</sup></i>			
<b>C 2.3</b> How large will each excavation be before it is filled up?	<10 X 10m		2
<i>If excavated, each pit including an access ramp will not exceed 150 m<sup>2</sup>. Trenches are expected to be up to</i>	<20 X 20m	√	4
	>20 X 20m		8



200 m long and up to 1m wide. Boreholes will be <165mm diameter each near surface, reducing to 63.5 mm diameter at depth.			
<b>C 2.4</b> How many prospecting boreholes or trenches will there be?	The number required cannot be accurately predetermined and will depend on the nature of the target to be investigated. Current estimates are that up to 25 boreholes, approximately 1600m of trenches and two pits will be required. To be determined once initial results have been obtained, will be included in the annual progress reports.		

	VALUE	TICK	OFFICE USE
<b>C 2.5</b> Will employees prepare food on the site and collect firewood?	Yes		4
Suitable accommodation is available in the area so this is not necessary.	No	√	0
<b>C 2.6</b> Will water be extracted from a river, stream, dam or pan for use by the proposed operation?	Yes		4
	No	√	2
<b>C 2.7</b> If so, what is the name of this water body?			
<b>C 2.8</b> If water will not be extracted from an open surface source, where will it be obtained?	Mine water to be used (existing supply)		
<b>C 2.9</b> How much water per day will the mineral processing operation require?	1000 – 10 000 Litres		2
No water is required for mineral processing but some will be required for drilling.	20 000 – 40 000 L		3
	40 000 – 60 000 L		5
	60 000 – 100 000 L		8
	More		10
<b>C 2.10</b> How far is the proposed operation from open water (dam, river, pan, lake)?	0 – 15m		8
Ephemeral streams drain the area to the north and west. The non-perennial Kolope river flows from south to north through the south-western corner of the area. There is no permanent open water in or close to the area. Although geophysical surveying may cover some of the streams, this will cause no disturbance. There should be no need to drill or create excavations within 60 metres of any of these. (Ref. 1:50,000 scale topographic sheet 2229AD).	16 – 30m		6
	31 – 60m		4
	More than 60 metres	√	2

<p><b>C 2.11</b> What is the estimated depth of the water table/ borehole?</p>	<p><i>The depth of the water table in the area as a whole varies between 8 and 29 metres, but is deeper close to the open pit due to dewatering operations. The estimated borehole depth is no more than 200 metres.</i></p>	<p>8 to 29 metres</p>	
<p><b>C 2.12</b> How much water per day will the proposed operation utilize for employees? <i>Water for drinking purposes will be brought onto site and would be a maximum of 50 litres per day.</i></p>	<p>c 50</p>	<p>Litres</p>	
<p><b>C 2.13</b> What toilet facilities will be made available to workers?</p>	<p>None</p>	<p></p>	<p>8</p>
<p><i>Due to the very short time taken for geophysical surveying, no toilet facilities need be provided, however should the project progress to pitting / trenching and/or drilling, chemical toilets will be provided. Only if this proved impractical would pit latrines be used.</i></p>	<p>Pit latrine (longdrop)</p>	<p></p>	<p>4</p>
	<p>Chemical toilet</p>	<p>√</p>	<p>2</p>
<p><b>C 2.14</b> Would it be necessary to construct roads to access the proposed operations?</p>	<p>Yes</p>	<p>√</p>	<p>4</p>
<p><i>Geophysical surveying, mapping and geochemical sampling is largely done on foot and will not require access roads to be built. Access to the property will be via existing roads and tracks. Should the project progress to phases requiring pitting/trenching and/or drilling, tracks may need to be cleared to allow for vehicular access. This will be done as set out in section F2.2.1</i></p>	<p>No</p>	<p></p>	<p>0</p>
<p><b>C 2.15</b> How long will these access road(s) be (from a public road to the proposed operations)</p>	<p>0 – 0,5 km</p>	<p></p>	<p></p>
<p><i>It is not possible to predetermine whether the work programme will advance to a phase requiring pitting/trenching and/or drilling and, thus, it is not possible to predetermine the route for any access roads (tracks). If a road is necessary the length of the road will depend on the location of the work site. The route will be the shortest possible distance from the existing mine roads / tracks. There are many existing roads and tracks on the property, so the distance required for a new track would not exceed 0.5 km.</i></p>	<p>0,6 – 1,5 km</p>	<p></p>	<p>2</p>
	<p>1,6 – 3 km</p>	<p></p>	<p>4</p>
<p><b>C 2.16</b> Will trees be uprooted to construct these access road(s)?</p>	<p>Yes</p>	<p></p>	<p>4</p>
<p><i>If an access road is necessary no trees larger than 3m will be uprooted. However, it should be possible to avoid all trees as there are relatively few in the area.</i></p>	<p>No</p>	<p>√</p>	<p>0</p>

<b>C 2.17</b> Will any foreign material, like crushed stone, limestone, or any material other than the naturally occurring topsoil be placed on the road surface?	Yes		4
<i>Topsoil will not be used for any road capping as it will be stored for rehabilitation of any small borrow pits made.</i>	No	√	0
<b>C.3 TIME FACTOR</b>			
<b>C 3.1</b> For what time period will prospecting/mining operations be conducted on this particular site?	0 – 6 months		2
<i>The prospecting operation is conducted in phases. In this case, the initial phase, geophysical surveying, mapping and geochemical sampling, will take no longer than a few weeks. If the project matures to drilling, pitting and/or trenching, these may take up to 8 months combined. The duration of the entire physical prospecting activities on site within the work programme, possibly extending over a 5 year period and allowing for additional work not currently planned, is unlikely to exceed 18 months.</i>	6 – 12 months		4
	12 – 18 months	√	6
	18 – 24 months		8
	>24 months		10

2004-05-16  
 EMD/AC/PRC  
 REGIONAL MANAGER  
 LIMPOPO PROVINCE

<b>C.4 HOW WILL THE PROPOSED OPERATION IMPACT ON THE SOCIO-ECONOMIC ENVIRONMENT? (REGULATION 52(2)(b))</b>			
ELEMENT/ IMPACTOR	VALUE	TICK	OFFICE USE
<b>C 4.1</b> How many people will be employed?	• 10		
<i>Is dependent on the phase of the work programme being executed. Estimated maximum is 10 during pitting/trenching and or drilling.</i>			
<b>C 4.2</b> How many men?	• 8(Estimate)		
<b>C 4.3</b> How many women?	• 2(Estimate)		
<b>C 4.4</b> Where will employees be obtained? (Own or employed from local communities?)	Own	√	2
<i>Most of the employees will be contractors.</i>	Local		4
<b>C 4.5</b> How many hours per day will employees work?	Sunrise → Sunset	√	4
	Less		2
	More		8
	VALUE	TICK	OFFICE USE
<b>C 4.6</b> Will operations be conducted within 1 kilometre from a residential area	Yes		6
	No	√	1
<b>C 4.7</b> How far will the proposed operation be from the nearest fence/windmill/house/dam/built structure?	0 – 50 metres		8
<i>Due to the presence of mining infrastructure on the site, prospecting operations will probably be within 100m of various structures. The actual distances from the above mentioned structures will be included in the progress report</i>	51 – 100 metres	√	4
	150 or more metres		2
<b>C.5 HOW WILL THE PROPOSED OPERATION IMPACT ON THE CULTURAL HERITAGE OF THE SURROUNDING ENVIRONMENT? REGULATION 52(2)(b)</b>			
ELEMENT/ IMPACTOR	VALUE	TICK	OFFICE USE
<b>C 5.1</b> Are there any graveyards or old houses or sites of historic significance within 1 kilometre of the area?	Yes	√	8
<i>It was indicated in the Venetia Mine EMPR that various Middle Stone Age and Iron Age sites were found on the farm Venetia. The sites of significance were fenced off and/or totally excavated. As no further disturbance will occur in these areas there will be no impact on these sites.</i>	No		0

<i>Should any new sites be encountered, prospecting operations in the immediate vicinity will be suspended until the site is inspected and reported on by an accredited archaeologist and a decision made by SAHRA as to whether work may continue or not.</i>			
--	--	--	--

DEPT OF MINERALS AND ENERGY  
EMP APPROVED  
2010-04-14  
MPRDA  
REGIONAL MANAGER  
LIMPOPO PROVINCE



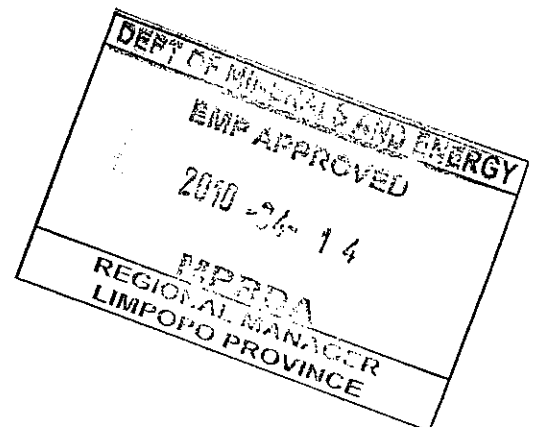
## C.6 SPECIFIC REGULATORY REQUIREMENTS

<p><b>C.6.1 Air quality Management and Control (Regulation 64)</b> Describe how the operation will impact on the quality of the air, taking into account predominant wind direction and other affected parties in the downwind zone:</p>				
<p><i>There will be minimal impact on the air quality. The possible air pollution that could occur is dust from accessing the site, drilling and the use of equipment; gas emissions from drilling and emissions from vehicles. Dust will be reduced through wetting access roads when and if necessary. Vehicles will be serviced on a regular basis to ensure that their engines are in good running order to keep emissions below the limits listed in the Atmospheric Pollution Prevention Act,</i></p>				
<p><b>C.6.2 Fire Prevention (Regulation 65)</b> Applicants for permits, rights or permissions involving <b>coal or bituminous rock</b> must:</p> <ul style="list-style-type: none"> <li>• <b>Indicate on a plan</b> where the coal or rock discard dump will be located <i>(If applied for a permit to mine or prospect for coal or bituminous rock, indicate the exact location of the discard dump on the plan and write "EMPlan C6.2" next to it)</i></li> </ul>				
<p><i>Not applicable</i></p>				
<p><b>C.6.3 Noise control (Regulation 66)</b> Indicate how much noise the operation will generate, and how it will impact on the surrounding environment, who might be influenced by noise from your operation.</p>				
<p><i>The initial phase of surveying will not generate any noise other than that of the LDVs used to access the sites, however trenching, pitting and/or drilling may result in some noise from vehicles and machinery. Given the short duration of any one phase the noise will be limited, it will also be limited to operating (daylight) hours only. Employees working close to equipment that generates a noise above 65 dB will wear the appropriate personal protective equipment.</i></p>				
<p><b>C.6.4 Blasting, vibration and shock (Regulation 67)</b> Please indicate whether any blasting operations will be conducted.</p>				
<table border="1"> <tr> <td>Blasting:</td> <td><del>Yes</del> No</td> <td>How often?</td> </tr> </table>		Blasting:	<del>Yes</del> No	How often?
Blasting:	<del>Yes</del> No	How often?		
<p><b>C.6.5 Disposal of waste material (Regulation 69)</b> <b>Indicate on your plan</b> where waste will be dumped in relation to the beneficiation works/ washing pans. Also indicate below how domestic waste material will be managed.</p>				
<p><i>In the case of surveying there will not be any waste generated on site. In the event of pitting, trenching or drilling the waste will be dealt with as follows:</i></p>				
<p><i>General/domestic waste – Any general or domestic waste will be taken back to the mine waste facility where it will be taken to the mine landfill site.</i></p> <p><i>Hazardous waste – this will be disposed as per the arrangements for the mine waste i.e. removed by an approved hazardous waste contractor to a suitably permitted waste site.</i></p>				
<p><b>C.6.6 Soil pollution and erosion control (Regulation 70)</b></p>				
<p>6.6.1 Indicate how topsoil will be handled on the area.</p>				
<p><i>In the case of pitting, trenching and/or drilling, the topsoil will be removed and stockpiled for use in the rehabilitation of the site. Topsoil will be stored as required in section F2.1</i></p>				
<p>6.6.2 Describe how spills of oil, grease, diesel, acid or hydraulic fluid will be dealt with.</p>				
<p><i>PVC sheeting will be placed under any machinery on site that has the potential to develop an oil leak. Should there be an oil leak onto the PVC sheeting this will be cleaned up and the cleaning material</i></p>				

sent for bioremediation or proper disposal. Drip trays will be used to collect oils and fluids from any emergency on-site servicing and repair of machinery and vehicles. Only emergency servicing will be permitted on site. All old oil will be removed for recycling. Should there be a spill of hydrocarbons onto the soil, the contaminated soil will be cleaned up and sent for bioremediation or proper disposal.

6.6.3 Briefly describe the storage facilities available for the above fluids:

Storage will be short-term (for the duration of the activity for which they are required only). All oil containers kept on site, if any, will be kept in drip trays and stored in a demarcated area with minimal pedestrian activity allowed to minimize the chance of the containers being knocked over. They will also be kept under cover to prevent contamination by rain water.



C.6.7 If significant impacts on any element of the environment mentioned in Section C 1 to C 6.6 above have been identified, summarise all of them here: (Regulation 52(2)(c))	C.6.8 How will the negative impacts on the environment be mitigated or managed (as described in C 6.11 to the left? (Regulation 57(2)(c))
<p>Example: Section C 6.4 Blasting. I have identified that the people living on the neighbouring property are sensitive to loud noises as they have children that must study during the afternoons</p>	<p>Example: I will mitigate the impact of my blasting operations on the Interested Parties by limiting blasting operations to school hours, when no one in the affected area is at home.</p>
1 None of the impacts are considered significant, see Appendix 1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8

DEPT OF MIN. RES. SAND ENERGY  
 EMP APPROVED  
 2011-07-14  
 REGIONAL MANAGER  
 LIMPOPO PROVINCE

**C.7 Financial provision: (Regulation 54)**

The amount that is necessary for the rehabilitation of damage caused by the operation, both after sudden closure during the normal operation of the project and at final, planned closure will be estimated by the regional office of the DME, based on the information supplied in this document. This amount will reflect how much it will cost the Department to rehabilitate the area disturbed in case of liquidation or abscondence.

Enter the amount of financial provision required here: R 118,850 (proposed; see attached estimate)
---

What method will be used to furnish DME with this financial provision?

Cash deposit	
Guarantee (Standard Bank, Kimberley) for an amount of R118,850.00 (to be supplied once requested by DME) ) See Annexure "B"	√
Trust Fund	
Other: (specify) (Note: other methods must be approved by the Minister)	

The standard formats for each of these types of guarantees are available from your regional office of the DME.

**C.8.1 Monitoring and performance assessment.**

Regulation 55 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) clearly describes the process and procedure as well as requirements for monitoring and auditing of the performance of this plan to adequately address environmental impacts from the operation. The following information must be provided:

**C.8.2 Please describe how the adequacy of this programme will be assessed and how any inadequacies will be addressed. (Regulations 55(1) and 52(2)(e))**

*Example: I will, on a bi-monthly basis, check every aspect of my operation against the prescriptions given in Section F of 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.*

*As part of the internal Environmental Management System (EMS) all employees and contractors receive environmental induction, environmental awareness is reinforced through regular SHE meetings. The EMS includes monitoring and reporting requirements, the purpose being to monitor the impact on the environment. The manager responsible for the project will check all aspects of the operation against both the requirements of the EMS and the applicable prescriptions in Section F of this document. A non conformance reporting system is in place as part of the EMS, any non conformances will be reported and the appropriate corrective and preventive actions taken.*

**C.9 Closure and Environmental objectives: (Regulation 52(2)(f))**

Clearly state the intended end use for the area prospected/mined after closing of operations

*The area will be returned to its current use i.e. diamond mining. In the event of the discovery of a viable ore body (of copper and/or other ores as applied for), appropriate mining operations will be initiated. This will however require an application for a mining right, using a plan that is compatible with the existing diamond mining operations.*

**C.9.1 Describe, in brief terms, what the environment will look like after a closure certificate has been obtained.**

*Provided there is no economically viable ore body discovered, the land will be returned to its current state i.e. a diamond mine site, with the property to be further managed in terms of the approved environmental management plan for the diamond mine.*

Note: The proposed end-state of your area must be consulted with interested and affected parties in terms of Regulation 52(2)(g). Details of the acceptability of the end-state must appear in the section below.

## **C 10 CLOSURE**

Regulations 56 to 62 outline the entire process of mine closure, and these are copied in Section F of this document, both as a guide to applicants on the process to be followed for mine closure, and also to address the legal responsibility of the applicant with regard to the proper closure of his operation. In terms of Section 37 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), the holder of a permit is liable for any and all environmental damage or degradation emanating from his/her operation, until a closure certificate is issued in terms of Section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002).

### **C.11 Public Participation: (Regulation 52(2)(g))**

In terms of the above regulation consultation with interested and affected person or persons must take place prior to the approval of the environmental management plan. This regulation is quoted below for ease of reference.

***"a record of the public participation undertaken and the results thereof"***

- C 11.1** Any comments lodged by an interested and affected person or persons in terms of section 10(1)(b) of the Act, must be in writing and addressed to the relevant Regional Manager.
- C 11.2** Any objections lodged by an interested and affected person or persons against the application for a right or permit in terms of the Act, must set out clearly and concisely the facts upon which it is based and must be addressed to the relevant Regional Manager in writing.
- C 11.3** The Regional Manager must make known by way of publication in a local newspaper or at the office of the Regional Manager, that an application for a right or permit in terms of the Act has been received.

In the table below, please list the names of people or organisations likely to be influenced by the proposed operations (these might include neighbours, other water users, etc.) Kindly indicate how these people were consulted (e.g. By letter or by phone) *and provide proof* of that consultation. What were the main concerns/ objections raised by the interested and affected parties to the proposed operation?

Name of Interested/ affected party	Contact details: Address & telephone number	How did consultation take place?*	What were his /her main concerns about the operation?
De Beers Consolidated Mines	PO Box 616, Kimberley, 8300 053 839 4248	The applicant and the owner is the same person	No Comments
Mr Mashile Mokono Regional Land Claims Commissioner	Private Bag X9552 PIETERSBURG 0700	A letter was send by registered mail.	Land Claim lodged by Tshivula Community

\* With regard to the consultative process, please refer to our letter dated 9 September 2009 addressed to the Regional Manager, DME, Limpopo. Copies of the letters referred to above were included with this letter. A further copy of our letter dated 9 September 2009 is attached to this EMPlan (master copy only).

## D SCORING OF EIA- FOR OFFICIAL USE ONLY

### Instructions for officials:

In this table, complete the totals of each section indicated below and do the calculation. **Remember to first add all the values of sections C 1,2,4 and 5 and then to multiply it by the time factor in Section C 3**

Note that the value for the time factor element of the impact rating appears in Section C3. This is the total amount of time that the operation is expected to impact on the environment and all other factors are MULTIPLIED by this value. Compare the score (Impact rating) with the table below to help you make a decision on the total impact of the operation and also on the sufficiency of this programme to address all expected impacts from the operation on the environment.

### D 1.1 CALCULATION TABLE

Section C 1 Total	+	Section C 2 Total	+	Section C 4 Total	+	Section C 5 Total	=	<u>Subtotal</u>	X	Time Factor Section C 3	=	Score (Impact rating)
	+		+		+		=		X		=	

### D 1.2 IMPACT RATING SCALE

SCORE ATTAINED	IMPACT RATING	REMARKS
46 – 300	Low	No additional objectives needed – this programme is sufficient
301 - 800	Medium	Some specific additional objectives to address focal areas of concern may be set.
801 - 1160	High	Major revision of Environmental Management Plan for adequacy and full revision of objectives.

### Additional Objectives:

Based on the information provided by the applicant and the regional office's assessment thereof, combined with the interpretation of the scoring and impact rating attained for the particular operation above, the Regional Manager of the regional office of the DME may now determine additional objectives /requirements for the mine owner/manager to comply with. *These measures will be specific and will address specific issues of concern that are not adequately covered in the standard version of this document.* These requirements are not listed here, but are specified under Section G of this document, so as to form part of the legally binding part of this Environmental Management Plan.

**E UNDERTAKING:**

I, IAN NORMAN SCHEEPERS, on behalf of the applicant for a prospecting right hereby declare that the above information is true, complete and correct. We undertake to implement the measures as described in Section F hereof. We understand that this undertaking is legally binding and that failure to give effect hereto will render us liable for prosecution in terms of Section 98 (b) and 99 (1)(g) of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002). We are also aware that the Regional Manager may, at any time but after consultation with me, make such changes to this plan as he/she may deem necessary. Further, we undertake to consider any specific additional requirements that may be set for the operation by the Regional Manager and, if those additional requirements are agreeable to us, to sign the undertaking comprising Section H of this Environmental Management Plan.

Signed on this 9<sup>th</sup> day of October 2009 at Kimberley  
**DE BEERS CONSOLIDATED MINES LIMITED**

  
Assistant Secretary

.....  
**Signature of applicant**

.....  
**Designation**

DEPT OF MINERALS AND ENERGY  
EMP APPROVED  
2009-04-14  
MIPRDA  
REGIONAL MANAGER  
LIMPOPO PROVINCE



## F. ENVIRONMENTAL MANAGEMENT PLAN:

### INTRODUCTION

This Environmental Management Plan contains guidelines, operating procedures and rehabilitation/pollution control requirements which will be binding on the holder of the mining permit/ prospecting permission/ reconnaissance permission after approval of the Environmental Management Plan. It is essential that this portion be carefully studied, understood, implemented and adhered to at all times.

### F 1 GENERAL REQUIREMENTS

#### F 1.1 MAPPING AND SETTING OUT

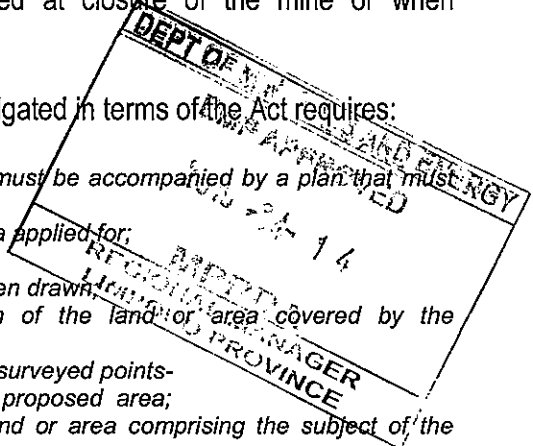
##### F 1.1.1 LAYOUT PLAN

- A copy of the layout plan as provided for in Regulation 2.2 must be available at the prospecting/mining site for scrutiny when required.
- The plan must be updated on a regular basis with regard to the actual progress of the establishment of surface infrastructure, mining operations and rehabilitation (a copy of the updated plan shall be forwarded to the Regional Manager on a regular basis).
- A final layout plan must be submitted at closure of the mine or when operations have ceased.

NOTE: Regulation 2.2 of the regulations promulgated in terms of the Act requires:

"An application contemplated in sub-regulation (1) must be accompanied by a plan that must contain –

- (a) the co-ordinates of the land or area applied for;
- (b) the north point;
- (c) the scale to which the plan has been drawn;
- (d) the name, number and location of the land or area covered by the application; and
- (e) in relation to farm boundaries and surveyed points-
  - (i) the size and shape of the proposed area;
  - (ii) the boundaries of the land or area comprising the subject of the application concerned;
  - (iii) the layout of the proposed reconnaissance, prospecting, exploration, mining or production operations;
  - (iv) surface structures and servitudes;
  - (v) the topography of the land or area; "



##### F 1.1.2 DEMARCATING THE MINING/ PROSPECTING AREA

- The mining/ prospecting 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.
- Permanent beacons as indicated on the layout plan or as prescribed by the Regional Manager must be firmly erected and maintained in their correct position throughout the life of the operation.
- Mining/ prospecting and resultant operations shall only take place within this demarcated area.

### F 1.1.3 DEMARCATING THE RIVER CHANNEL AND RIVERINE ENVIRONMENT

The following is applicable if operations are conducted within the riverine environment (See F 3.2):

- Beacons as indicated on the layout plan or as prescribed by the Regional Manager must be erected and maintained in their correct position throughout the life of the operation.
- These beacons must be of a permanent nature during the operations and must not be easily removable, especially those in a river channel. The beacons must, however, be removed at the end of the operations.
- 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 EMP plan and indicated on the layout plan.
- The holder of the mining permit/ prospecting right will also be required to permanently demarcate the areas as specified in F 1.1.2.

### F 1.2 RESTRICTIONS ON MINING/ PROSPECTING

- 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
- In the case of areas that are excluded from mining or prospecting, no operations shall be conducted within 5 m of these areas.

### F 1.3 RESPONSIBILITY

- The environment affected by the mining/ prospecting operations shall be rehabilitated by the holder, as far as is practicable, to its natural state or to a predetermined and agreed to standard or land use which conforms with the concept of sustainable development. 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 thereof.
- It is the responsibility of the holder of the mining permit/ prospecting right to ensure that the manager on the site and the employees are capable of complying with all the statutory requirements which must be met in order to mine, which includes the implementation of this EMP.
- If operations are to be conducted in an area that has already been disturbed, the holder must reach specific agreement with the Regional Manager concerning the responsibilities imposed upon himself/herself regarding the rehabilitation of the area and the pollution control measures to be implemented.

## F 2 INFRASTRUCTURAL REQUIREMENTS

### F 2.1 TOPSOIL

- Topsoil shall be removed from all areas where physical disturbance of the surface will occur.

- All available topsoil shall be removed after consultation with the Regional Manager prior to the commencement of any operations.
- The topsoil removed, shall be stored in a bund wall on the high ground side of the mining/prospecting 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.

## **F 2.2 ACCESS TO THE SITE**

### **F 2.2.1 Establishing access roads on the site**

- The access road to the mining/prospecting 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.
- 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.
- If imported material is used in the construction or upgrading of the access road this must be listed in C 2.17
- 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.

**NOTE: The design, construction and location of access to provincial roads must be in accordance with the requirements laid down by the Provincial or controlling authority.**

### **F 2.2.2 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/ prospecting right.
- Newly constructed access roads shall be adequately maintained so as to minimise dust, erosion or undue surface damage.

### **F 2.2.3 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.

### **F 2.2.4 Rehabilitation of access roads**

- Whenever a mining permit/ prospecting right 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 fertilised (based on a soil analysis) to ensure the regrowth of vegetation. Imported road construction materials which may hamper regrowth 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 analysed 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 the Regional Manager's specification.

## **F 2.3 OFFICE/CAMP SITES**

### **F 2.3.1 Establishing office / camp sites**

- Office and camp 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. Topsoil shall be handled as described in F 2.1 above
- 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.

### F 2.3.2 Toilet facilities, waste water and refuse disposal

- As a minimum requirement, the holder of a mining permit/ prospecting right 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 recognised facility.
- 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 recognised 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 recognised 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.

### F 2.3.3 Rehabilitation of the office/camp site

- 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), which states:
  - (1) *When a prospecting right, mining right, retention permit or mining permit lapses, is cancelled or is abandoned or when any prospecting or mining operation comes to an end, the holder of any such right or permit may not demolish or remove any building, structure, object -*
    - (a) *which may not be demolished in terms of any other law;*
    - (b) *which has been identified in writing by the Minister for purposes of this section; or*

(c) *which is to be retained in terms of an agreement between the holder and the owner or occupier of the land, which agreement has been approved by the Minister in writing.*

(2) *The provision of subsection (1) does not apply to bona fide mining equipment which may be removed*

- 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 analysed 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.

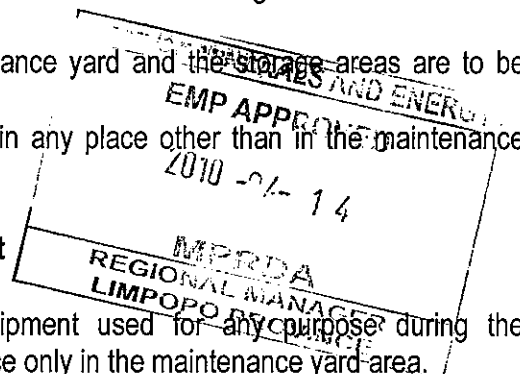
## **F 2.4 VEHICLE MAINTENANCE YARD AND SECURED STORAGE AREAS**

### **F 2.4.1 Establishing the vehicle maintenance yard and secured storage areas**

- The 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 shall be the minimum reasonably required and involve the least disturbance to tree and plant life. Topsoil shall be handled as described in F 2.1 above.
- 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.

### **F 2.4.2 Maintenance of vehicles and equipment**

- The maintenance of vehicles and equipment used for any purpose during the mining/prospecting operation will take place only in the maintenance yard area.
- Equipment used in the mining/prospecting process must be adequately maintained so that during operations it does not spill oil, diesel, fuel, or hydraulic fluid.
- Machinery or equipment used on the mining/prospecting area must not constitute a pollution hazard in respect of the above substances. The Regional Manager shall order



such equipment to be repaired or withdrawn from use if he or she considers the equipment or machinery to be polluting and irreparable.

#### **F 2.4.3 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 recognised facility.

#### **F 2.4.4 Rehabilitation of vehicle maintenance yard and secured storages 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 fertilised 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 analysed 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.

### **F 3 OPERATING PROCEDURES IN THE MINING AREA**

#### **F 3.1 Limitations on mining/prospecting**

- The mining of or prospecting for precious stones shall take place only within the approved demarcated mining or prospecting area.
- Mining/ prospecting may be limited to the areas indicated by the Regional Manager on assessment of the application.
- The holder of the mining permit/ prospecting right shall ensure that operations take place only in the demarcated areas as described in section F 1.1.2 above.
- 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 effected.
- 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, shall 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 entered in Part of the programme and indicated on the layout plan.

### F 3.2 Mining/ prospecting operations within the riverine environment

**NOTE: The Department of Water Affairs and Forestry may impose additional conditions which must be attached to this EMP. In this regard, please see the Best Practice Guideline for small scale mining developed by DWAF (BPG 2.1)**  
(available from <http://www.dwaf.gov.za>)

- The mining of or prospecting for precious stones in the river or the banks of the river will be undertaken only after the Regional Manager has consulted with the Department of Water Affairs and Forestry.
- 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 any planned future access points, must be indicated on the layout plan.

#### F 3.2.1 Rehabilitation of access to 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 fertilised 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 analysed 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.

### F 3.2.2 Rehabilitation of mining/prospecting area in the bed of the 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.

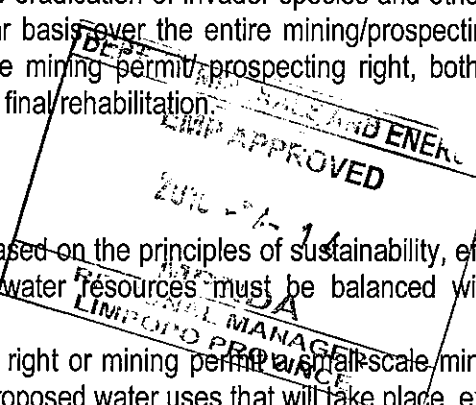
## 2. THE WATER USE LICENCE

The National Water Act, (Act 36 of 1998), is based on the principles of sustainability, efficiency and equity, meaning that the protection of water resources must be balanced with their development and use.

In addition to being issued with a prospecting right or mining permit, a small-scale miner may also need to get a **water use licence** for the proposed water uses that will take place, except in certain cases.

*NOTE: The Department of Water Affairs and Forestry (DWA) developed specific Best Practice Guideline for small scale mining that relates to stormwater management, erosion and sediment control and waste management. Copies of these guidelines can be obtained from the regional office of DME or DWA.*

Applications for a water use licence must be made in good time, such that approval can be granted before a water use activity can begin. The appropriate licence forms for each kind of expected water use should be completed together with supporting documentation. The main supporting document required is a technical report. To make the technical report easier, you



can refer to sections in this EMPlan, as most of what the technical report requires has already been done in the EMPlan. If you refer to the EMPlan it must be attached to the technical report.

### F 3.3 EXCAVATIONS

#### F 3.3.1 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:
  - ❖ Topsoil shall, in all cases (except when excavations are made in the river-bed), be handled as described in F 2.1 above.
  - ❖ Excavations shall take place only within the approved demarcated mining/prospecting area.
  - ❖ 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.

#### F 3.3.2 Rehabilitation of excavation areas

The following operating procedures shall be adhered to:

- 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 fertilised 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 analysed 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.

### F 3.4 PROCESSING AREAS AND WASTE PILES (DUMPS)

#### F 3.4.1 Establishing processing areas and waste piles

- Processing areas and waste piles shall not be established within 100 metres of the edge of any river channel or other water bodies.
- Processing areas should 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 shall be the minimum reasonably required and involve the least disturbance to vegetation.
- Prior to development of these areas, the topsoil shall be removed and stored as described in paragraph F 2.1 above.
- The location and dimensions of the areas are to be indicated on the layout plan and once established, the processing of 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.

#### F 3.4.2 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 fertilised 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 analysed 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.

#### F 3.5 TAILINGS DAM(S) (SLIMES DAM)

The permission of the Regional Manager must be obtained should a tailings dam be constructed for the purpose of handling the tailings of the mining/prospecting operations. The construction, care and maintenance of tailings dams have been regulated and the relevant regulation is copied herewith, both for your information and as a guideline to the commissioning, management, operation, closing and aftercare of a tailings deposition facility.

**Regulation 73 promulgated under the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) requires the following:**

##### **Management of residue stockpiles and deposits**

56. (1) The assessment of impacts relating to the management of residue stockpiles and deposits, where appropriate, must form part of the environmental impact assessment report and environmental management programme or the environmental management plan.
- (2) **Residue characterisation**
- (a) Mine residue must be characterised to identify any potentially significant health and safety hazard and environmental impact that may be associated with the residue when stockpiled or deposited at the site(s) under consideration.
- (b) Residue stockpiles and deposits must be characterised in terms of its –
- (i) physical characteristics, which may include –
- (aa) the size distribution of the principal constituents;

- (bb) the permeability of the compacted material;
- (cc) void ratios of the compacted material;
- (dd) the consolidation or settling characteristics of the material under its own weight and that of any overburden;
- (ee) the strength of compacted material;
- (ff) the specific gravity of the solid constituents; and
- (gg) the water content of the material at the time of deposition, after compaction, and at other phases in the life of the deposit.

(ii) chemical characteristics, which may include -

- (aa) the toxicity;
- (bb) the propensity to oxidize and /or decompose;
- (cc) the propensity to undergo spontaneous combustion;
- (dd) the pH and chemical composition of the water separated from the solids;
- (ee) stability and reactivity and the rate thereof; and
- (ff) neutralising potential.

(iii) mineral content, which include the specific gravity of the residue particles and its impact on particle segregation and consolidation;

(3) Classification of residue stockpiles and deposits

(a) All residue stockpiles and deposits must be classified into one or a combination of the following categories -

- (i) the safety classification to differentiate between residue stockpiles and deposits of high, medium and low hazard on the basis of their potential to cause harm to life or property; and
- (ii) the environmental classification to differentiate between residue stockpiles and deposits with -
  - (aa) a potentially significant impact on the environment due to its spatial extent, duration and intensity of potential impacts; or
  - (bb) no potentially significant impact on the environment.

(b) All mine residue stockpiles and deposits must be classified by a suitably qualified person(s).

(c) The classification of residue stockpiles and deposits shall determine the -

- (i) level of investigation and assessment required;
- (ii) requirements for design, construction, operation, decommissioning, closure and post closure maintenance; and
- (iii) qualifications and expertise required of persons undertaking the investigations, assessments, design, and construction thereof.

(d) The safety classification of residue stockpiles and deposits shall be based on the following criteria -

Number of residents in zone of influence	Number of workers in zone of influence	Value of third party property in zone of influence	Depth of underground mine workings	Classification
0	< 10	0 - R2 m	> 200m	Low hazard
1 - 10	11 - 100	R 2 m - R20 m	50m - 200 m	Medium hazard
> 10	> 100	> R20 m	< 50 m	High hazard

(e) A risk analysis must be carried out and documented on all high hazard residue stockpiles and deposits.

(f) The environmental classification of residue stockpiles and deposits must be undertaken on the basis of -

- (i) the characteristics of the residue;
- (ii) the location and dimensions of the deposit (height, surface area);

- (iii) *the importance and vulnerability of the environmental components that are at risk; and*
  - (iv) *the spatial extent, duration and intensity of potential impacts.*
- (g) *An assessment of the environmental impacts shall be done on all environmental components which are significantly affected.*
- (h) *The assessment of impacts and analyses of risks shall form part of the environmental assessment and management programme.*
- (4) *Site selection and investigation:*
- (a) *The process of investigation and selection of a site must entail -*
    - (i) *the identification of a sufficient number of possible candidate sites to ensure adequate consideration of alternative sites;*
    - (ii) *qualitative evaluation and ranking of all alternative sites;*
    - (iii) *qualitative investigation of the top ranking sites to review the ranking done in (ii);*
    - (iv) *a feasibility study to be carried out on the highest ranking site(s), involving -*
      - (aa) *a preliminary safety classification;*
      - (bb) *an environmental classification;*
      - (cc) *geotechnical investigations; and*
      - (dd) *groundwater investigations.*
  - (b) *The geotechnical investigations may include-*
    - (i) *the characterization of the soil profile over the entire area to be covered by the residue facility and associated infrastructure to define the spatial extent and depth of the different soil horizons;*
    - (ii) *the characterization of the relevant engineering properties of foundations soils and the assessment of strength and drainage characteristics.*
  - (c) *The groundwater investigations may include-*
    - (i) *the potential rate of seepage from the residue facility;*
    - (ii) *the quality of such seepage;*
    - (iii) *the geohydrological properties of the strata within the zone that could potentially be affected by the quality of seepage;*
    - (iv) *the vulnerability and existing potential use of the groundwater resource within the zone that could potentially be affected by the residue facility.*
  - (d) *From these investigations, a preferred site must be identified.*
  - (e) *Further investigation on the preferred site, shall include -*
    - (i) *land use;*
    - (ii) *topography and surface drainage;*
    - (iii) *infrastructure and man-made features;*
    - (iv) *climate;*
    - (v) *flora and fauna;*
    - (vi) *soils;*
    - (vii) *ground water morphology, flow, quality and usage; and*
    - (viii) *surface water.*
  - (f) *The investigations, laboratory test work, interpretation of data and recommendations for the identification and selection of the most appropriate and suitable site for the disposal of all residue that have the potential to generate leachate that could have a significant impact on the environment and groundwater must be carried out by a suitably qualified person.*

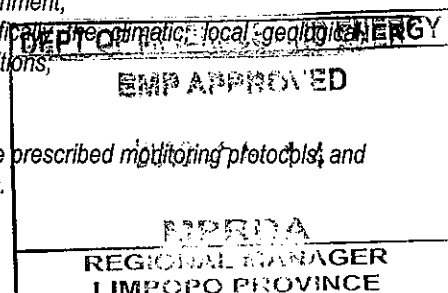
(5) *Design of residue stockpile and deposit*

- (a) *The design of the residue stockpile and deposit shall be undertaken by a suitably qualified person.*
- (b) *An assessment of the typical soil profile on the site is required for residue stockpiles and deposits which -*
- (i) *have a low hazard potential; and*
  - (ii) *have no significant impact on the environment.*
- (c) *The design of the residue stockpile and deposit must take into account all phases of the life cycle of the stockpile and deposit, from construction through to closure and must include -*
- (i) *the characteristics of the mine residue;*
  - (ii) *the characteristics of the site and the receiving environment;*
  - (iii) *the general layout of the stockpile or deposit, whether it is a natural valley, ring dyke, impoundment or a combination thereof and its 3-dimensional geometry at appropriate intervals throughout the planned incremental growth of the stockpile or deposit;*
  - (iv) *the type of deposition method used; and*
  - (v) *the rate of rise of the stockpile or deposit.*
- (d) *Other design considerations, as appropriate to the particular type of stockpile and deposit must be incorporated -*
- (i) *the control of storm water on and around the residue stockpile or deposit by making provision for the maximum precipitation to be expected over a period of 24 hours with a frequency of once in a 100 years, in accordance with the regulations made under section 8 of the National Water Act, 1998;*
  - (ii) *the provision, throughout the system, of a freeboard of at least 0.5 m above the expected maximum water level, in accordance with regulations made under the National Water Act, 1998, to prevent overtopping;*
  - (iii) *keeping the pool away from the walls; where there are valid technical reasons for deviating from this, adequate motivation must be provided and the design must be reviewed by a qualified person as required in terms of sections 9(6) or 9(7) of the Mine Health and Safety Act, 1996;*
  - (iv) *the control of decanting of excess water under normal and storm conditions;*
    - (aa) *the retention of polluted water in terms of polluted water in terms of GN R991(9), where measures may be required to prevent water from the residue deposit from leaving the residue management system unless it meets prescribed requirements;*
    - (bb) *the design of the penstock, outfall pipe, under-drainage system and return water dams;*
    - (cc) *the height of the phreatic surface, slope angles and method of construction of the outer walls and their effects on shear stability;*
    - (dd) *the erosion of slopes by wind and water, and its control by (ee) vegetation, berms or catchment paddocks; and*
    - (ee) *the potential for pollution.*
- (e) *A design report and operating manual shall be drawn up for all residue stockpiles and deposits which*
- (i) *have a medium to high hazard, and*
  - (ii) *have a potentially significant impact on the environment.*
- (f) *Relevant information must be included in the site environmental management programme or environmental management plan.*

(6) *Construction and operation of residue deposits:*

- (a) *The holder of any right or permit in terms of the Act, must ensure that-*

- (i) the residue deposits, including any surrounding catchment paddocks, is constructed and operated in accordance with the approved environmental management programme or environmental management plan;
- (ii) the design of the residue deposit is followed implicitly throughout the construction thereof, and that any deviations from the design be approved by the Regional Manager and the environmental manage programme and environmental management plan be amended accordingly;
- (iii) as part of the monitoring system, measurements of all residues transported to the site and of all surplus water removed from the site are recorded;
- (iv) the provision for appropriate security measures be implemented to limit unauthorised access to the site and intrusion into the residue deposit;
- (v) specific action be taken in respect of any sign of pollution;
- (vi) adequate measures be implemented to control dust pollution and erosion of the slopes; and
- (vii) details of rehabilitation of the residue deposit be provided in the draft environmental management programme or environmental management plan.
- (b) A system of routine maintenance and repair in respect of the residue deposit must be implemented to ensure the ongoing control of pollution, the integrity of rehabilitation and health and safety matters at the site.
- (7) **Monitoring of residue stockpiles and deposits:**
- (a) A monitoring system for residue stockpiles and deposits with respect to potentially significant impacts as identified in the environmental assessment must be included in the environmental management programme or environmental management plan.
- (b) In the design of a monitoring system for a residue stockpile or deposit, consideration must be given to –
- (i) baseline and background conditions with regard to air, surface and groundwater quality;
- (ii) the air, surface and groundwater quality objectives;
- (iii) residue characteristics;
- (iv) the degree and nature of residue containment;
- (v) the receiving environment and specific atmospheric, local, geological, hydrogeological and geochemical conditions;
- (vi) potential migration pathways;
- (vii) potential impacts of leachate;
- (viii) the location of monitoring points and the prescribed monitoring protocols; and
- (ix) the reporting frequency and procedures.
- (8) **Decommissioning, closure and after care:**
- (a) The decommissioning, closure and post closure management of residue deposits must be addressed in the closure plan, which must contain the following -
- (i) the environmental classification, including assumptions on which the classification was based;
- (ii) the closure objectives, final land use or capability;
- (iii) conceptual description and details for closure and post closure management;
- (iv) cost estimates and financial provision for closure and post-closure management; and
- (v) residual impacts, monitoring and requirements to obtain mine closure in terms of the Act.



### F 3.6 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 recognised 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.

#### F 4 MONITORING AND REPORTING

##### F 4.1 Inspections and monitoring

- Regular monitoring of all the environmental management measures and components shall be carried out by the holder of the prospecting right, mining permit or reconnaissance permission in order to ensure that the provisions of this programme are adhered to.
- Ongoing and regular reporting of the progress of implementation of this programme will be done.
- Various points of compliance will be identified with regard to the various impacts that the operations will have on the environment.
- Inspections and monitoring shall be carried out on both the implementation of the programme and the impact on plant and animal life.
- Visual inspections on erosion and physical pollution shall be carried out on a regular basis.

**Regulation 55 promulgated in terms of the MPRDA requires the following:**

#### Monitoring and performance assessments of environmental management programme or plan

- (1) *As part of the general terms and conditions for a prospecting right, mining right or mining permit and in order to ensure compliance with the approved environmental management programme or plan and to assess the continued appropriateness and adequacy of the environmental management programme or plan, the holder of such right must-*
- conduct monitoring on a continuous basis;*
  - conduct performance assessments of the environmental management programme or plan as required; and*
  - compile and submit a performance assessment report to the Minister to demonstrate adherence to sub-regulation (b).*
- (2) *The frequency of performance assessment reporting shall be-*
- in accordance with the period specified in the approved environmental management programme or plan, or, if not so specified;*
  - as agreed to in writing by the Minister; or*
  - biennially (every two years).*
- (3) *The performance assessment report, shall be in the format provided in guidelines that will from time to time be published by the Department and shall as a minimum contain-*
- information regarding the period that applies to the performance assessment;*
  - the scope of the assessment;*
  - the procedure used for the assessment;*
  - the interpreted information gained from monitoring the approved environmental management programme or plan;*
  - the evaluation criteria used during the assessment;*
  - the results of the assessment; and*
  - recommendations on how and when deficiencies that are identified and/or aspects of non-compliance will be rectified.*



- (4) *The holder of a prospecting right, mining right or mining permit may appoint an independent qualified person(s) to conduct the performance assessment and compile the performance assessment report provided that no such appointment shall relieve the holder of the responsibilities in terms of these regulations.*
- (5) *Subject to section 30(2) of the Act, the performance assessment report submitted by the holder shall be made available by the Minister to any person on request.*
- (6) *If upon consideration by the Minister, the performance assessment executed by the holder is not satisfactory or the report submitted by the holder is found to be unacceptable, the holder must-*
- (a) *repeat the whole or relevant parts of the performance assessment and revise and resubmit the report; and/or*
  - (b) *submit relevant supporting information; and/or*
  - (c) *appoint an independent competent person(s) to conduct the whole or part of the performance assessment and to compile the report.*
- (7) *If a reasonable assessment indicates that the performance assessment cannot be executed satisfactorily by the holder or a competent person(s) appointed by the holder, the Minister may appoint an independent performance assessment person(s) to conduct such performance assessment. Such appointment and execution shall be for the cost of the holder.*
- (8) *When the holder of a prospecting right, mining right or mining permit intends closing such operation, a final performance assessment shall be conducted and a report submitted to the Minister to ensure that -*
- (a) *the requirements of the relevant legislation have been complied with;*
  - (b) *the closure objectives as described in the environmental management programme or plan have been met; and*
  - (c) *all residual environmental impacts resulting from the holder's operations have been identified and the risks of latent impacts which may occur have been identified, quantified and arrangements for the management thereof have been assessed.*
- (9) *The final performance assessment report shall either precede or accompany the application for a closure certificate in terms of the Act.*

#### **F 4.2 Compliance reporting / submission of information**

- Layout plans will be updated on a regular basis and updated copies will be submitted on a biennial basis to the Regional Manager
- Reports confirming compliance with various points identified in the environmental management programme 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 the programme was compiled shall be carried out and added as a corrective action.

#### **F 5 CLOSURE**

When the holder of a prospecting right, mining permit or reconnaissance permission intends closing down his/her operations, an environmental risk report shall accompany the application for closure. The requirements of such a risk report is contained in Regulation 60 of the Regulations promulgated in terms of the Act and is quoted below:

## F 5.1 ENVIRONMENTAL RISK REPORT

"An application for a closure certificate must be accompanied by an environmental risk report which must include-

- (a) the undertaking of a screening level environmental risk assessment where-
  - (i) all possible environmental risks are identified, including those which appear to be insignificant;
  - (ii) the process is based on the input from existing data;
  - (iii) the issues that are considered are qualitatively ranked as –
    - (aa) a potential significant risk; and/or
    - (bb) a uncertain risk; and/or
    - (cc) an insignificant risk.
- (b) the undertaking of a second level risk assessment on issues classified as potential significant risks where-
  - (i) appropriate sampling, data collection and monitoring be carried out;
  - (ii) more realistic assumptions and actual measurements be made; and
  - (iii) a more quantitative risk assessment is undertaken, again classifying issues as posing a potential significant risk or insignificant risk.
- (c) assessing whether issues classified as posing potential significant risks are acceptable without further mitigation;
- (d) issues classified as uncertain risks be re-evaluated and re-classified as either posing potential significant risks or insignificant risks;
- (e) documenting the status of insignificant risks and agree with interested and affected persons;
- (f) identifying alternative risk prevention or management strategies for potential significant risks which have been identified, quantified and qualified in the second level risk assessment;
- (g) agreeing on management measures to be implemented for the potential significant risks which must include-
  - (i) a description of the management measures to be applied;
  - (ii) a predicted long-term result of the applied management measures;
  - (iii) the residual and latent impact after successful implementation of the management measures;
  - (iv) time frames and schedule for the implementation of the management measures;
  - (v) responsibilities for implementation and long-term maintenance of the management measures;
  - (vi) financial provision for long-term maintenance; and
  - (vii) monitoring programmes to be implemented."

## F 5.2 CLOSURE OBJECTIVES

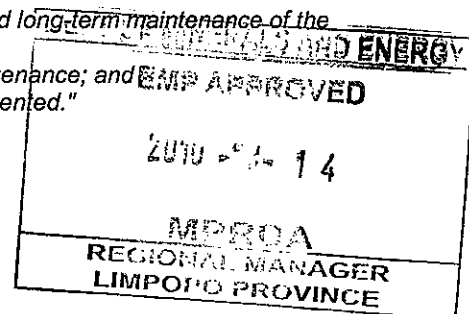
Closure objectives form part of this EMPlan and must-

- (a) identify the key objectives for mine closure to guide the project design, development and management of environmental objectives;
- (b) provide broad future land use objective(s) for the site; and
- (c) provide proposed closure cost

## F 5.3 CONTENTS OF CLOSURE PLAN

A closure plan forms part of the EMP and must include the following:

- (a) a description of the closure objectives and how these relate to the prospecting or mine operation and its environmental and social setting;
- (b) a plan contemplated in Regulation 2(2), coordinated according to generally accepted standards, showing the land or area under closure;
- (c) a summary of the regulatory requirements and conditions for closure negotiated and documented in the environmental management programme or plan;



- (d) a summary of the results of the environmental risk report and details of identified residual and latent impacts;
- (e) a summary of the results of progressive rehabilitation undertaken;
- (f) a description of the methods to decommission each prospecting or mining component and the mitigation or management strategy proposed to avoid, minimize and manage residual or latent impacts;
- (g) details of any long-term management and maintenance expected;
- (h) details of financial provision for monitoring, maintenance and post closure management, if required;
- (i) a plan or sketch at an appropriate scale describing the final land use proposal and arrangements for the site;
- (j) a record of interested and affected persons consulted; and
- (k) technical appendices, if any.

#### F 5.4 TRANSFER OF ENVIRONMENTAL LIABILITIES TO A COMPETENT PERSON

Should the holder of a prospecting right, mining permit or reconnaissance permission wish to transfer any environmental liabilities and responsibilities to another person or persons, the following will pertain:

- (1) An application to transfer environmental liabilities to a competent person in terms of section 48) of the Act, must be completed on Form O as set out in Annexure 1 to the Regulations and be lodged to the Minister for consideration.
- (2) The holder of a prospecting right, mining right or mining permit may transfer liabilities and responsibilities as identified in the environmental management plan and the required closure plan to a competent person as contemplated in Regulation 58.
- (3) When considering the transfer of environmental liabilities and responsibilities in terms of section 48) of the Act, the Minister must consult with any State department which administers any law relating to matters affecting the environment.
- (4) No transfer of environmental liabilities and responsibilities to a competent person may be made unless the Chief Inspector of Mines and the Department of Water Affairs and Forestry have confirmed in writing that the person to whom the liabilities and responsibilities is transferred to, have the necessary qualifications pertaining to health and safety and management of potential pollution of water resources.

#### F 5.5 NOTES ON LEGAL PROVISIONS

**NOTE:** The holder of a prospecting right, mining permit or reconnaissance permission must also take cognisance of the provisions of other legislation dealing with matters relating to conservation, and which include, *inter alia*, the following:

- \* 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).

**G. SPECIFIC ADDITIONAL REQUIREMENTS DETERMINED BY THE REGIONAL MANAGER.**

Officials in regional offices may use the following matrix to determine the necessity for additional objectives to be included in this Section of the document:

<b>POTENTIAL ENVIRONMENTAL IMPACTS OF MINING</b>										
Activity	Disturbance					Pollution				Visual
	Landform	Soil	Flora	Fauna	Heritage	Land	Water	Air	Noise	
Mining										
Access										
Topsoil removal										
Overburden removal										
Mineral Extraction										
Tailings disposal										
Water Abstraction										
Pipeline route										
Transport										
Accommodation										
Waste Disposal										
Electricity										
Hydrocarbon storage										
Workforce										

*Please indicate VL, L, M, H, and VH for Very Low, Low, Medium, high and Very High in each column to determine the main area and severity of impact.*

G. This section outlines the specific additional requirements that may be set for the operation by the Regional Manager. Additional requirements will only have been set if the Regional Manager is of the opinion that there are specific impacts on the environment which will not be adequately mitigated by the provisions set within the standard version of the Environmental Management Plan. These requirements form part of the Environmental Management Plan and all elements and instructions contained herein must be complied with by the applicant.

**H. UNDERTAKING**

We,.....  
.....  
..., the undersigned and duly authorised thereto  
by.....  
.....

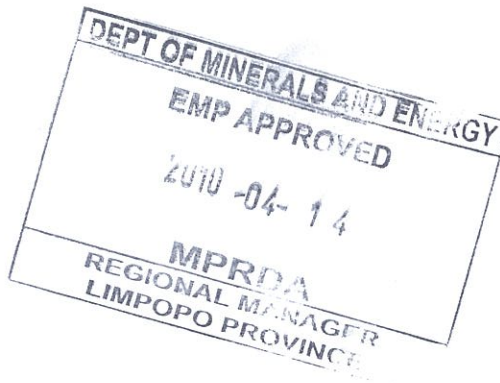
...  
Company/~~Close Corporation~~/Municipality (Delete that which is not applicable) have studied and understand the contents of this document in its entirety and now hereby duly undertake to adhere to the conditions as set out therein including the amendment(s) agreed to by the Regional Manager in Section G and approved on .....

Signed at ..... this.....day of.....20.....

.....  
**Signature of applicant**

.....  
**Designation**

**Agency declaration:** This document was completed by .....on behalf  
of.....



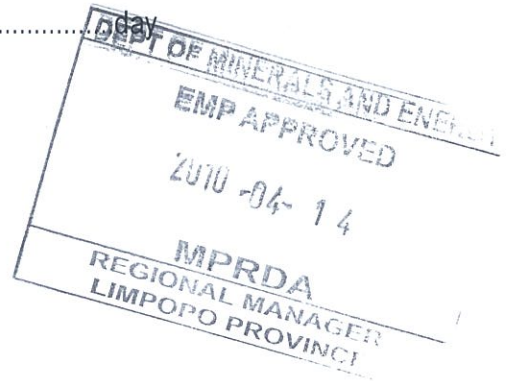
**J. APPROVAL**

Approved in terms of Section 39(4) of the Mineral and Petroleum Resources Development Act, 2002 (Act 29 of 2002)

Signed at POLOKWANE this 14<sup>TH</sup> day  
of APRIL 2010

.....  
REGIONAL MANAGER

REGION: LIMPOPO.....

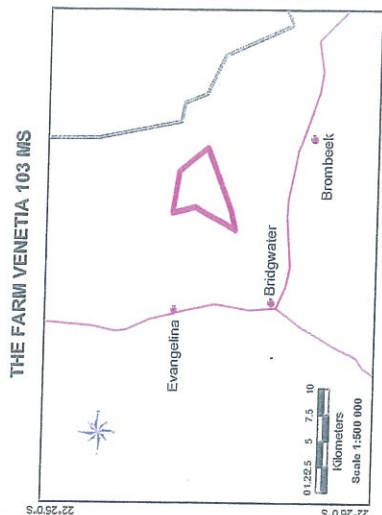
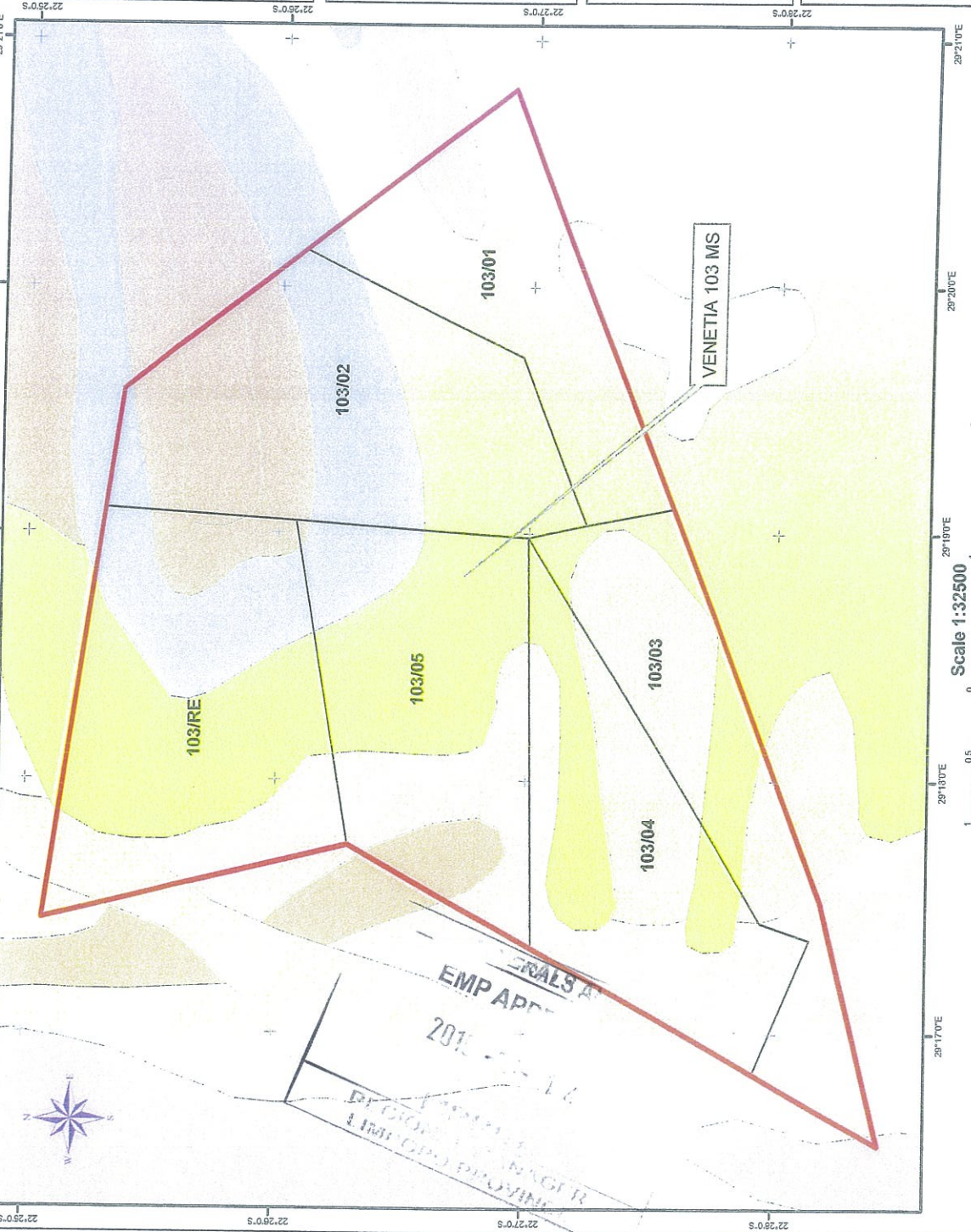


This document has been compiled by the Directorate: Mine Environmental Management of the Department of Minerals and Energy at their Head Office in Pretoria. Any comments, suggestions or inputs will be sincerely appreciated. If you have any comments or suggestions regarding this document or its application, please forward your contribution to:

The Director: Mine Environmental Management  
Private Bag X 59  
PRETORIA  
0001

Tel : 012 317 9288  
Fax: 012 320 6786  
E-mail: dorothy@mepta.pwv.gov.za

**PLAN AS REFERRED TO IN REGULATION 2.2 IN FORCE IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (28 OF 2002).  
IN SUPPORT OF AN APPLICATION FOR A PROSPECTING RIGHT IN TERMS OF SECTION 16 OF THE AFORESAID ACT.**



**DESCRIPTION OF LAND UNDER APPLICATION FOR A PROSPECTING RIGHT**  
**The Remaining Extent and Portions 1, 2, 3, 4 and 5 of the farm Venetia 103 MS**  
 This figure represents an area of land in extent  
**2245.3016 Hectares**  
 Magisterial District of MUSINA  
**PROVINCE LIMPOPO**

**LEGEND**

●	City / town / villages
—	Roads
□ (pink)	Land under Application
□ (white)	Farms
□ (light blue)	Magisterial Districts
□ (grey)	Province border

**LITHOLOGY**

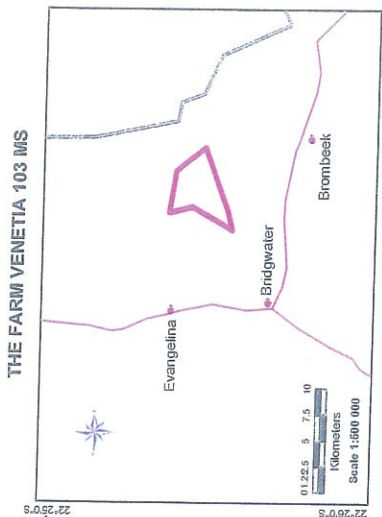
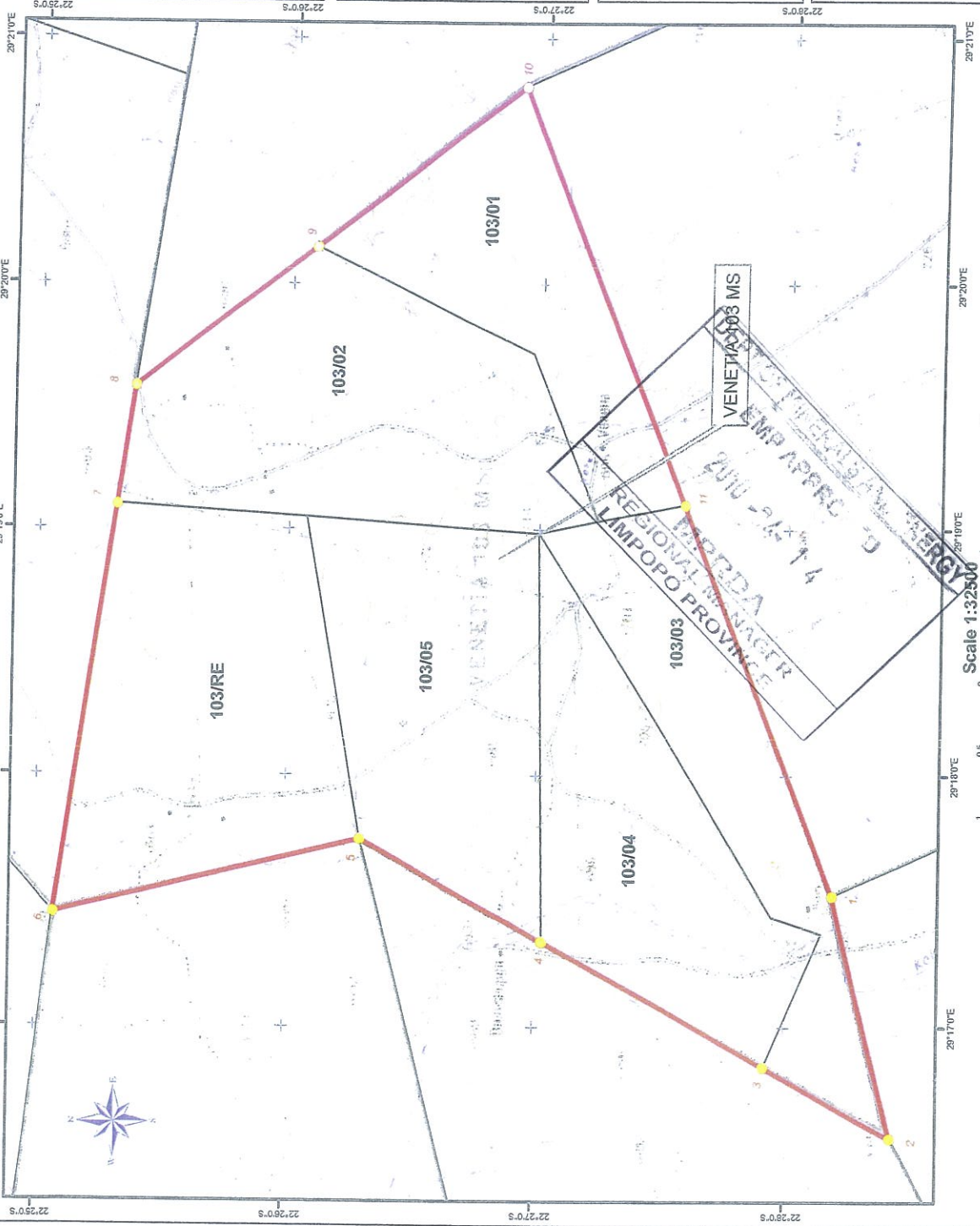
□ (light blue)	Mafic lava
□ (light green)	Mafic gneiss; tonalitic gneiss
□ (yellow)	Amphibole, mafic granulite
□ (orange)	Clastic sediments
□ (light purple)	Dabase; silt and prominent dykes
□ (light blue)	Marble, calc-silicate rocks
□ (light green)	Melangeite, magnetite quartzite
□ (light blue)	Quartzite-kalbarite gneiss
□ (light blue)	Recent deposits

Plan Approved:

Regional Manager  
**LIMPOPO PROVINCE**  
 Department of Minerals & Energy  
 DATE: \_\_\_\_\_

NAME OF APPLICANT:  
 DE BEERS CONSOLIDATED MINES LTD  
*[Signature]*  
 SIGNATURE OF APPLICANT:  
 NAME: **IN SCHEEPERS**  
 DATE: **21/07/2009**

**PLAN AS REFERRED TO IN REGULATION 2.2 IN FORCE IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (28 OF 2002).  
IN SUPPORT OF AN APPLICATION FOR A PROSPECTING RIGHT IN TERMS OF SECTION 16 OF THE AFORESAID ACT.**



**DESCRIPTION OF LAND UNDER APPLICATION FOR A PROSPECTING RIGHT**  
**The Remaining Extent and Portions 1, 2, 3, 4 and 5 of the farm Venetia 103 MS**  
 The figure numbered :  
 1, 2, .....10, 11, 1  
 Represents an area of land in extent  
**2246.3016 Hectares**  
 Magisterial District of  
 MUSINA  
**PROVINCE LIMPOPO**

- LEGEND**
- City / town / villages
  - ◻ Land under Application
  - ◻ Farms
  - ◻ Magisterial Districts
  - ◻ Province border
- NOTES**
- 1) Please see Table 2 for any specific servitudes registered against the title deeds.
  - 2) Co-ordinates for polygon of land under application: refer to accompanying listing file for details.

NAME OF APPLICANT :  
 DE BEERS CONSOLIDATED MINES LTD  
*De Beers*  
 SIGNATURE OF APPLICANT:  
 NAME : **IN SCHEEPERS**  
 DATE : **21/07/2009**

Plan Approved:  
 Regional Manager  
**LIMPOPO PROVINCE**  
 Department of Minerals & Energy  
 DATE : \_\_\_\_\_



<b>NODE_ID</b>	<b>X_COORD</b>	<b>Y_COORD</b>
1	29.29198073590	-22.46985866330
2	29.27605009070	-22.47379704030
3	29.28073661770	-22.46533090830
4	29.28893277790	-22.45051568950
5	29.29571742560	-22.43825423170
6	29.29074487080	-22.41790043760
7	29.31826489420	-22.42176069520
8	29.32637898620	-22.42289739300
9	29.33586066960	-22.43480416590
10	29.34676336500	-22.44849226080
11	29.31836018710	-22.45957309960

ANNEXURE "A" TO THE ENVIRONMENTAL MANAGEMENT PLAN

REMAINING EXTENT AND PORTION 1, 2, 3, 4 AND 5 OF THE FARM VENETIA 103 MS, ZOUTPANSBERG DISTRICT

FARM	PORTION	OWNER	ADDRESS
VENETIA 103 MS	RE	De Beers Consolidated Mines Limited  DEPT OF ENVIRONMENTAL AFFAIRS REPORTING OFFICER 2009-05-14 EMP APPROVED DEPT OF ENVIRONMENTAL AFFAIRS	PO Box 616, KIMBERLEY 8300  Phone: 053 839 4248  Fax.: 053 839 4250
VENETIA 103 MS	1		
VENETIA 103 MS	2		
VENETIA 103 MS	3		
VENETIA 103 MS	4		
VENETIA 103 MS	5		

**ANNEXURE "B" TO THE ENVIRONMENTAL MANAGEMENT PLAN**

**The remaining extent and portions 1, 2, 3, 4 & 5 of the farm Venetia 103 MS,  
Musina District, Limpopo  
(REF.NO.LP 30/5/1/1/2/2394 PR)**

**Estimation of rehabilitation costs for prospecting rights:**

The amount suggested as the initial financial provision for prospecting rights is based on the following:

In normal circumstances rehabilitation forms part of the prospecting programme, but should this fail to happen for some reason, rehabilitation would be required for drill, trench and pitting sites.

At drill sites, drill tailings would be returned to the hole, which is then capped or plugged as required and topsoil returned to the collar position. To do this work costs are estimated as follows:

Estimated 25 holes drilled would require:

2 x labourer for 25 days	R 7,000
1 x supervisor/driver	R 23,000
1 x environmental officer (check visits)	R 7,500
Vehicle costs	R 6,750
Material costs	R 5,000
<b>Sub-total</b>	<b>R 49,250</b>

Pits and trenches would normally be filled and rehabilitated as part of the prospecting programme, but if this failed to happen, these would need to be filled and topsoil returned to cover them. The costs for this work are estimated below:

1600m small trenches – return of subsoil, smoothing and return of topsoil:

Contract earthmoving (8 days)	R 36,000
1 x environmental officer (4 days)	R 6,000
Vehicle costs	R 4,200
<b>Sub-total</b>	<b>R 46,200</b>

2 x 100 t pits – return of subsoil, smoothing and return of topsoil:

Contract earthmoving (2 days)	R 9,000
1 x environmental officer (2 days)	R 3,000
Vehicle costs	R 3,300
<b>Sub-total</b>	<b>R 15,300</b>

Monitoring visit x 1	
1 x environmental officer (3 days)	R 4,500
Vehicle costs	R 3,600
<b>Sub-total</b>	<b>R 8,100</b>

**Combined total** **R 118,850**

COMPILER: A I MACDONALD  
DATE: 12 October 2009

**HEAD OFFICE**

De Beers Consolidated Mines Limited Registration No. 1888/000007/06

36 STOCKDALE STREET KIMBERLEY 8301  
PO BOX 616 KIMBERLEY 8300  
TEL +27 (0) 53 839 4111 FAX +27 (0) 53 839 4210  
www.debeersgroup.com

Directors: NF Oppenheimer (Chairman), EM Dipico (Deputy Chairman), DC Noko (Managing Director), SM Brown, Ms CA Carolus,  
RG Mills, JME Oppenheimer, GPH Penny, B Petersen.

Secretary: MJ Ward



DE BEERS CONSOLIDATED MINES LTD  
 ENVIRONMENTAL MANAGEMENT PLAN APPROVED  
 2009-10-14  
 MPRDA  
 ENVIRONMENTAL MAN.  
 APPROV

**TO BE READ IN CONJUNCTION WITH # C.2 to # C.5 OF THE ENVIRONMENTAL MANAGEMENT PLAN**

The primary objective of the work programme to which this Environmental Management Plan pertains is to locate and assess diamond deposits. All personnel executing the work programme are fully trained and have wide experience of their duties and all work is undertaken under the direct supervision of a geologist. In addition, all work is undertaken in accordance with the internal Environmental Management System.

Kimberlite is a volcanic rock, which occurs randomly and is not specific to any discrete host (country) rock lithology. Furthermore, because of erosion, kimberlites may have no surface expression and in many instances are hidden beneath surficial cover, which can reach tens of metres in thickness, and, thus, the detection thereof requires sophisticated methodologies and resources. Consequently, exploration programmes must be structured accordingly and commence with a reconnaissance sampling phase.

Prospecting for kimberlite is a dynamic, results driven, operation which proceeds in phases, the outcome of which cannot be predicted or predetermined. Excepting the reconnaissance soil/stream-sampling phase, the scope of each subsequent phase is dependent on the results of earlier phases. The results of the reconnaissance sampling will indicate the areas over which the subsequent phases of work are required. These subsequent (follow up) phases can include soil and/or stream sampling, geophysical surveys, pitting/trenching and/or drilling and first stage bulk sampling as well as activities such as detailed drilling and further bulk sampling (pitting/trenching and/or drilling) to gather the additional information required in support of feasibility studies. The sites for the follow-up phases of work cannot be identified in advance nor can the phases be quantified in advance. However, experience has shown each phase of physical prospecting to be short term and usually less than 2 months in duration.

Because of the time required to treat samples and to interpret their results, as well as to plan, schedule and resource the follow-up phases of work required, the phases of work will not follow directly after one another.

If required, soil samples will be collected within a 30m-radius per sample from areas not drained by streams, targeting good deflation sites. Vehicle access is limited and most of the sample sites are accessed on foot. Normally, the uppermost c 2cm of soil is collected from an area not exceeding 1m<sup>2</sup>. In areas with no good deflation surfaces, the samples will be collected by digging to about 20cm depth. Soil samples are normally spaced on a 4km to 500m grid for reconnaissance work, but the grid might have to be reduced to between 300m and 50m for any follow-up work. Minimal, temporary, disturbance is caused to the environment by soil sampling and there are no lasting impacts.

If required, reconnaissance stream samples will be collected from sections of streams known as trap sites. Trap sites may comprise boulders, rock barriers, potholes etc that have the ability to slow down and trap heavy minerals. The volume of the sample is dependent on the catchment area. The sites will be dug to depths of not more than 1m to access any heavy minerals that might have settled to the bottom of the trap site. The field teams will rehabilitate all stream sample sites after collecting the samples and equilibrium is restored by the natural water flow. Minimal, temporary, disturbance is caused to the environment by stream sampling and there are no lasting impacts.

Any rocks that are suspected to be kimberlite will be collected alongside stream and soil samples for petrographic studies. At reconnaissance stage, rock sampling will be *ad hoc* and will depend

be determined by the geologist and will depend on the type of anomaly and the geological conditions, including overburden. Small diameter percussion drilling uses a truck mounted rig and truck mounted compressor, each with its own diesel generated power. No local power source is used. Small diameter drilling is short term, drilling at any anomaly is usually completed in c 2 weeks or less but is target dependent. Small diameter drilling has no lasting impact on the natural environment; disturbance is restricted to small, localized, areas and is of short duration.

Core drilling will only be conducted if kimberlite is discovered. The diameter of core drilled does not usually exceed 120mm and is determined by such factors as cost, proposed core sampling, the degree of logging required and proposed geotechnical investigations. The orientation of core holes will vary depending on the drilling objective. In the case of delineation drilling, angled core holes will be drilled to give accurate ore / country rock boundaries at depth. Vertical holes will be drilled for geological modelling and / or sampling of the core. Core holes might be used as pilots for large diameter holes. The geological information provided by the core holes greatly reduces the risk of inappropriate Large Diameter Drilling (LDD) hole locations. Core holes allow for maximum control on information such as overburden thickness, likely kimberlite intersections and therefore allow more accurate determinations of likely Large Diameter Drilling holes for diamond recoveries. Core drilling equipment is usually skid mounted and uses a separate diesel power pack. No local power source is used. The duration of core drilling is dependent on the size and morphology of the kimberlite being investigated. Typically core drilling can be expected to be completed within 2 to 3 months. Core drilling has no lasting impact on the natural environment; disturbance is restricted to small, localized, areas and is of short duration.

Large diameter drilling (LDD), usually up to 450mm diameter, is used for bulk sampling and is the preferred method when there is the need to sample deeper than is practicable by pitting and/or trenching. The diameter and depth of the boreholes drilled will be determined by such factors as cost, proposed bulk sampling, availability of drilling machines, and the volume of sample required, amongst others. LDD will take place after small diameter drilling. LDD rigs and compressors are truck mounted, each with its own diesel generated power. Samples generated (drill chips) are de-slimed on site using a mobile screen and the resultant product discharged directly into bulk bags for transport to a sampling plant either at a central facility in Johannesburg or at a nearby site, dependent on the amount of sample processing to be carried out. Water used in the de-sliming process is recycled using a system of plastic lined earth dams and/or 'portapools'. No local power source is used. LDD is short term, drilling on any kimberlite is usually completed in 3 months or less but is dependent on the size and morphology of the kimberlite and weight of samples required. LDD has no lasting impact on the natural environment; disturbance is restricted to small, localized, areas and is of short duration.

