



## mineral resources

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

**NAME OF APPLICANT:** De Beers Consolidated Mines (Pty) Limited

**REFERENCE NUMBER:** FS 30/5/1/1/2/10190 PR

# **ENVIRONMENTAL MANAGEMENT PLAN**

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

## **STANDARD DIRECTIVE**

Applicants for prospecting rights or mining permits, are herewith, in terms of the provisions of Section 29 (a) and in terms of section 39 (5) of the Mineral and Petroleum Resources Development Act, directed to submit an Environmental Management Plan strictly in accordance with the subject headings herein, and to compile the content according to all the sub items to the said subject headings referred to in the guideline published on the Departments website, within 60 days of notification by the Regional Manager of the acceptance of such application. This document comprises the standard format provided by the Department in terms of Regulation 52 (2), and the standard environmental management plan which was in use prior to the year 2011, will no longer be accepted.

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

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## **1 REGULATION 52 (2): Description of the environment likely to be affected by the proposed prospecting or mining operation**

**1.1** The environment on site relative to the environment in the surrounding area.

### **1.1.1 Land Use**

The general area has been used for commercial farming and cultivation, specifically the grazing of cattle and sheep, with salt production to the north-east of the site and historical gypsum mining to the south-west.

The land in the property has been used for commercial. The area is also used as residence for farm owner and the family with supporting infrastructure such as water points supplied by wind pumps, shed, farmhouse and enclosures (kraals). There is no land development reported by the interested and affected parties. The closure objectives will be to return the land to its current state of land use.

### **1.1.2. Topography and drainage**

The general area is relatively flat, at an average elevation of around 1256m above sea level with a gentle slope to the north west. The drainage system is not well defined, with only ephemeral streams present and very small farm dams present. Approximately 1.5 km to the north of the site, the non-perennial Leeuwrivier flows from east to west. There is a large salt works located 4km north-west of the site. Immediately to the south-west is an old gypsum mining area, which has shallow depressions that fill with water after good rains. Refer to 1:50,000 topographic map sheets 2824 BD and 2824 DB, as shown in the attached Regulation 2.2 map.

### **1.1.3 Soils**

The soil in the area is relatively thin (<450mm). The soil is mainly of the hutton type and is mapped as red yellow apedal, freely drained soils, red and with high base status and deeper than 300mm (Code Ae46) Appendix VI.

### 1.1.4 Groundwater levels

The groundwater level is 20m to 30m below the surface on the property; there is no permanent surface water in the area. The farms rely on ground water, which is limited on some properties (reported by Izak Bartholomeus Fourie).

### 1.1.5 Vegetation

The Free State is almost treeless, consisting mainly of grasslands with some Karoo vegetation in the south. The vegetation of the area belongs to the Nama Karoo Biome; a complex of extensive plains, dominated by low shrubs intermixed with grasses, succulents, geophytes and annual forbs. The vegetation type of most of the property comprises of Northern Upper Karoo (Appendix VII).

#### Northern Upper Karoo (Code NKu3)

This vegetation is classed as least threatened with conservation target of 21%. Erosion is moderate (46.2%), very low (32%) and low (20%). *Prosopis glandulosa* regarded as one of the 12 agricultural most important invasive alien plants in South Africa is widely distributed in this vegetation type. The important taxa of this vegetation type are described below:

#### Important Taxa

Small Trees: *Acacia mellifera* subsp. *detinens*, *Boscia albitrunca*.

Tall shrubs: *Lycium cinereum* (d), *L. horridum*, *L. oxycarpum*, *L. schizocalyx*, *Rhigozum trichotomum*.

Low Shrubs: *Chrysocoma ciliata*(d), *Pentzia calcarea*(d), *P. globosa*(d), *P. incana*(d), *Amphiglossa triflora*, *Aptosimum marlothii*, *A. spinescens*, *Asparagus glaucus*, *Barleria rigida*, *Berkheya annectens*, *Eriocephalus ericoides*

subsp.ericoides,E .glandulosus,E.spinescens,Europs asparagoides. Felecia muricata,Helichrysum lucilioides,Hermannia spinosa,Leucas capensis,Limeum aethiopicum,Microloma armatum,Osteospermum leptolobum,O. spinescens,Pegolettia retrofracta,Pentzia lanata,Phyllanthus maderaspatensis, Plinthus karoocicus,Pteronia glauca,P. sordida, Selago geniculate, S. saxatilis,Tetragonia arbuscula,Zygophyllum lichtensteinianum.

Succulent Shrubs: Hertia pallens, Salsola calluna, S. glabrescens, S. rabieana,S. tuberculata,Zygophyllum flexuosum.

Semiparaitic Shrub: Thesium hystrix(d).

Herbs: Chamaesyce inaequilatera, Convolvulus sagittatua,Dicoma capensis,Gazania Krebsiana,Hermannia comosa, Indigofera alternans,Lessertia pauciflora, Radyera urens, Sesamum capense,Sutera pinnatifida,Tribulus terrestris,Vahlia capensis

Succulent Herbs: Psilocaulon coriarium.

Geophytic Herbs: Moraea pallida.

Graminoids: Aristida adscensions(d), A. congesta, A. diffusa(d), Enneapogon desvauxii(d), Eragrostis lehmanniana(d), E. obtuse(d), E. truncata(d),Sporobolus fimbriatus(d), Stipagrostis obtusa(d), Eragrostis bicolor, E.porosa,Fingerhuthia africana,Heteropogon contortus,Stipagrostis ciliate, Themeda triandra,Tragus berteonianus, T. koelerioides, T racemosus.

#### Biographically Important Taxa

Herb (western distribution limit): Convolvulus boedeckerianus.

Tall Shrubs: (southern distribution limit): Gymnosaporia szyszyłowiczii subsp.namibiensis

#### Endemic Taxa

Succulent Herbs: *Lithops hokeri*, *Stomatium pluidens*

Low Shrubs: *Atriplex spongiosa*, *Galena exigua*

Herb: *Manulea deserticola*

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

No specific protected trees have been reported. However invasive alien plant named *Prosopis glandulosa* regarded as one of the 12 agricultural most important alien plants in South Africa is widely distributed in this vegetation type.

### 1.1.6 Fauna

Mammal species that are known to naturally occur in the region as a whole are summarised in Table 1 below. This however does not imply that all of these species will occur at any given place in the region as a whole (source: Duncan Butchart, 2001, *Wildlife of the Lowveld, common animals and plants*).

Common name	Scientific name
<b>Carnivores</b>	
African Wild Dog	<i>Lycaon pictus</i>
African wild cat	<i>Felis lybica</i>
<b>Elephant</b>	
African Elephant	<i>Loxodonta africana</i>
<b>Ungulates</b>	
Kudu	<i>Tragelaphus strepsiceros</i>
Springbok	
Mountain Rhebok	
Black Wildebeest	
Red Hartebeest	
White rhinoceros	
Buffalo	
Zebra	
Eland	

Table 1: Mammal species occurring in the area



No specific protected animal species were reported. In its original natural state, the area would have supported a wide variety of game, but due to the land use of commercial farming (grazing) and nearby mining activities (salt and gypsum in the past), it's now only hosts some buck (kudu have been reported), small mammals, reptiles and birds suited to this environment, in addition to cattle and sheep.

Based on the distribution of Red Data Bird species, the following list of birds may be present.

The codes represent the status of each species as follows: Endangered Species (ES) and Vulnerable Species (VS), (Source: The Eskom red data book of birds of South Africa, Lesotho and Swaziland, Barnes K.N, 2000).

<b>English Name</b>	<b>Scientific Name</b>
Saddlebilled stork	Ephippiorhynchus senegalensis(E)
Pinkbacked Pelican	Pelecanus refescens(V)
Bald ibis	Geronticus calvus(V)
Cape vulture	Gyps coprotheres(V)
African whitebacked vulture	Gyps africanus(V)
Tawny eagle	Aquila rapax
Martial eagle	Polemaetus bellicosus(V)
African marsh harrier	Circus ranivorus(V)
Lesser kestrel	Falco naumanni(V)
Blue crane	Anthropoides paradiseus
Grey crowned crane	Balearica regulorum
Kori bustard	Ardeotis kori
Ludwig's bustard	Neotis ludwigii
Grass owl	Tyto capensis(V)

No protected bird species were reported by surface owners.

### **1.1.7 Protected Areas**

The following is a protected and conserved area under the Environmental Management Act No 7 of 2003 and Tourism Act No 72 of 1993, they are located within the greater area although will not be directly affected by prospecting activities.

- Bentfontein and Grootfontein located 52km NW, mainly used for special habitat for plant and animals and historical site and it is composed of endangered acacia erioloba forest.

The gravesites have been reported to be present in the farm Pretoriusdam; however heritage and archaeological impact assessment will have to be done if the prospecting project proceeds to advanced phases.

### **1.2 The specific environmental features on the site applied for which may require protection, remediation, management or avoidance.**

Due to the fairly dry nature of the area and the existing land use, the vegetation, soil and groundwater are the main elements that need protection in general. In particular, damage to small farm dams and water boreholes (wind pumps) must be avoided. Damage to farmhouses (with associated graves) and other structures should also be avoided, as should damage to fences, gates, farm roads or tracks.

During drilling activities water strike depth is noted and any significant changes in water volumes are recorded. In cases where drilling is through the aquifer plugging of the hole will be investigated as an option. Moreover, during extensive drilling water quality can be monitored to mitigate contamination of water. Ground water pollution must be avoided through the use of only environmentally friendly drilling additives and the proper closing of boreholes on completion.

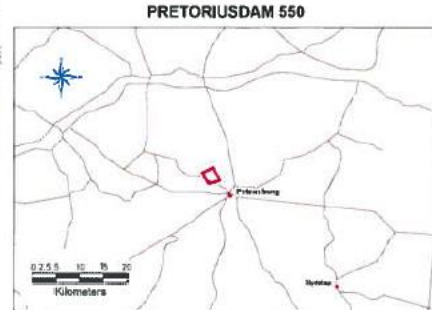
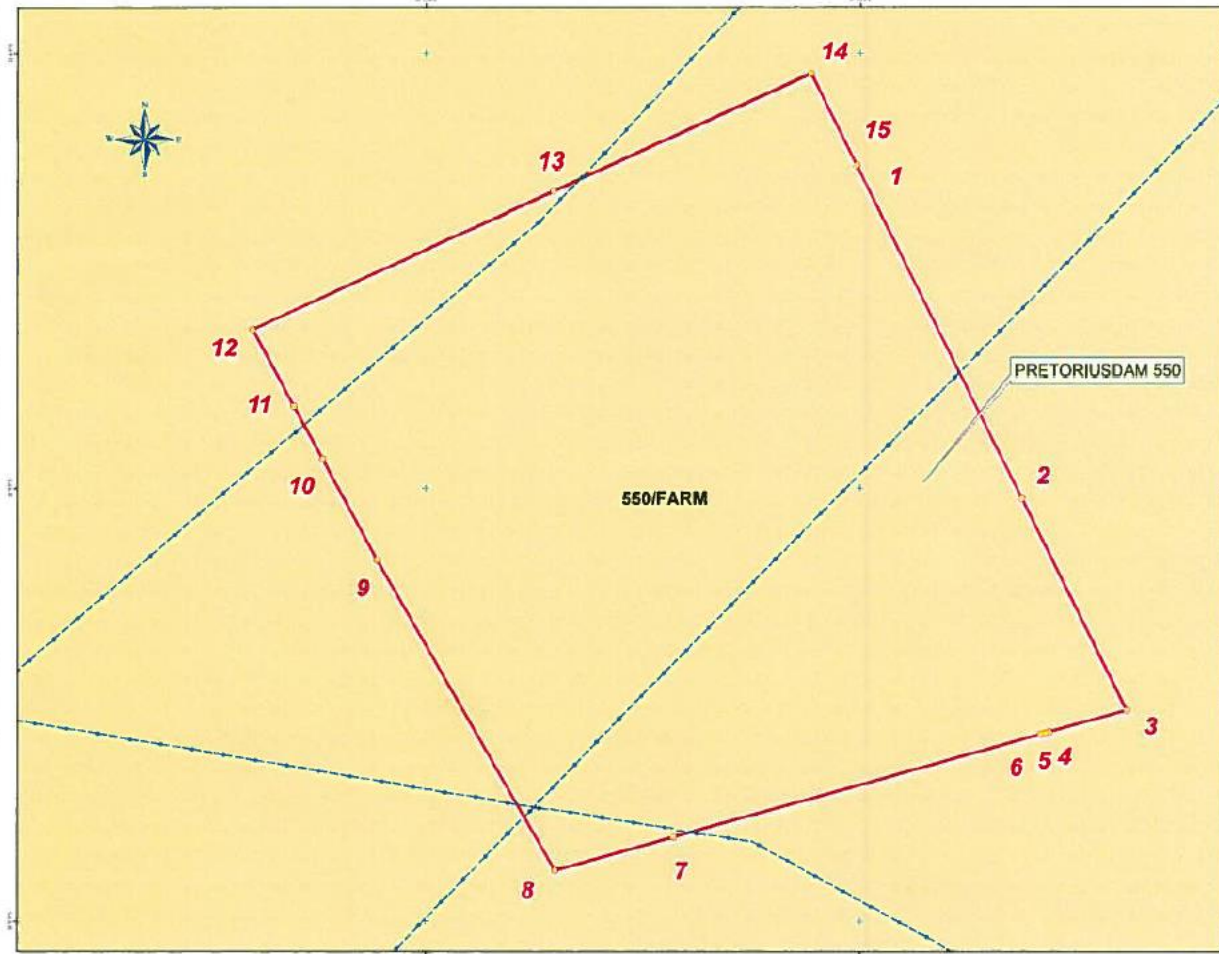
Other aspects to be addressed in all our prospecting work (although not raised directly) through the Environmental Management Plan include:

- Avoiding soil pollution - preventing and controlling oil or hydraulic fluid spills.
- Avoiding grass fires - no fires to be used when prospecting, precautions and controls in place for machinery.
- Avoiding littering - proper waste removal and disposal to be practiced.
- Minimising vegetation destruction - by limiting the creation of new tracks, clearing minimal areas for drilling and rehabilitating effectively. Disturbed areas may need to be fenced off to allow vegetation recovery.
- Avoiding excessive noise & dust - this will require specific measures depending on the nature of work. Prospecting is mostly restricted to daylight hours so noise will be limited to these periods. Dust suppression measures can be taken where this is a problem.
- Impact on fauna - as prospecting takes place in a limited area for a relatively short duration, impacts on fauna will be minimal.

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

The Regulation 2.2 plan attached shows the general features of the area, such as farm dams, wind pumps, buildings, ruins and roads/tracks; no other specific features have been identified. Graves are stated to be present at the farm.

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 farm Pretoriusdam 550

The figure numbered :

1, 2, ...14, 15, 1

Represents an area of land  
in extent

**635.2504 Hectares**

Magisterial District of  
FAURESMITH

PROVINCE FREE STATE

LEGEND

- City / town / villages
  - Roads
  - ESCOM Power Lines
  - Land under Application
  - Farms
  - Magisterial Districts
  - Province border
- GEOLOGY**
- Volksrust

NAME OF APPLICANT:  
DE BEERS CONSOLIDATED MINES  
PROPRIETARY LIMITED

*[Signature]*  
SIGNATURE OF APPLICANT:

NAME: H Kocks (Print)

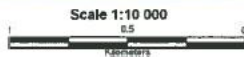
DATE: 26/07/2013

Plan Approved:

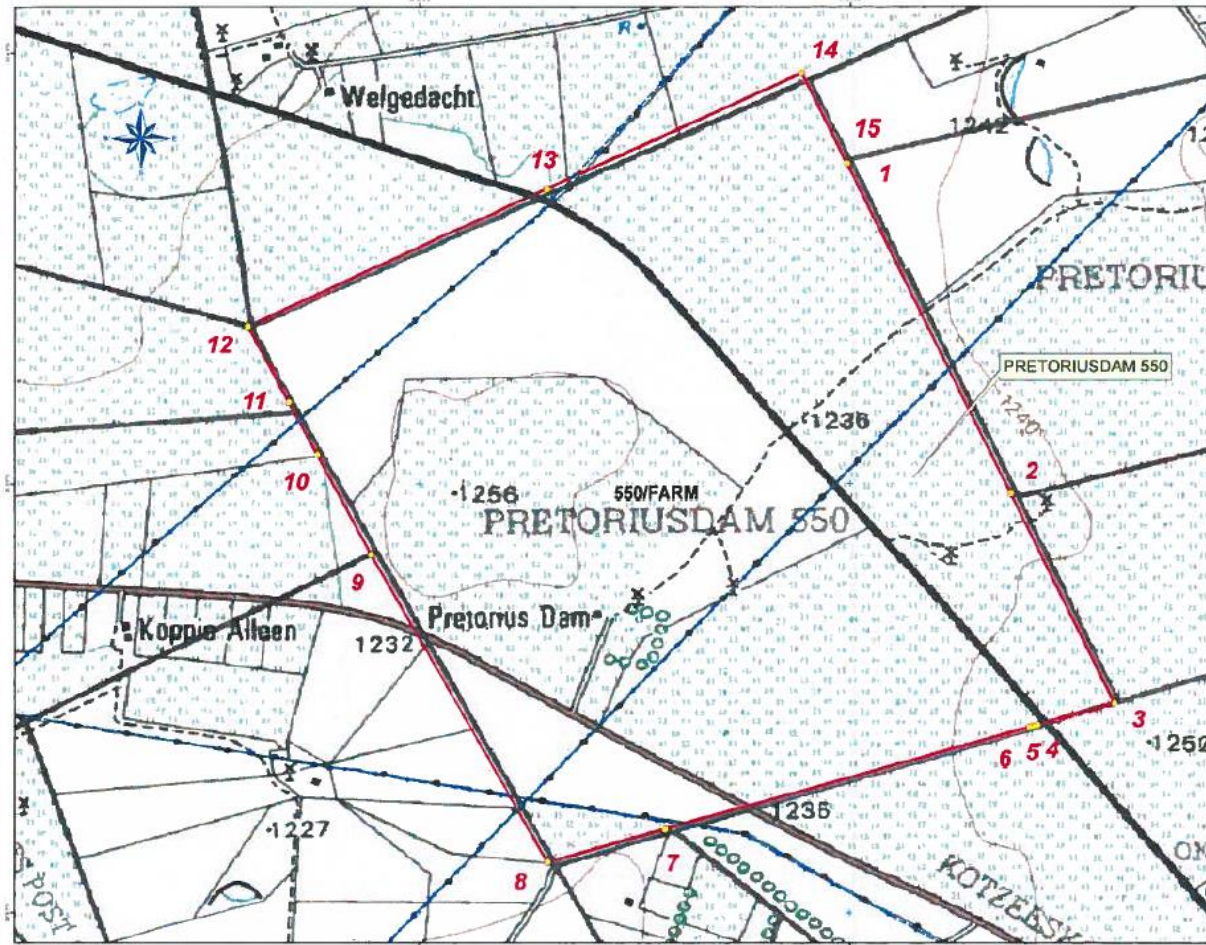
Regional Manager  
FREE STATE PROVINCE

Department Mineral Resources

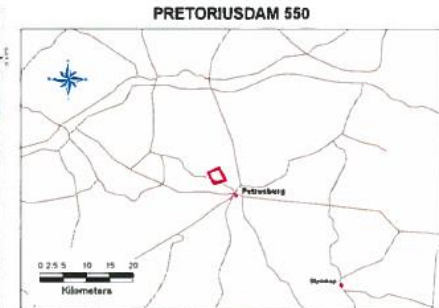
DATE: \_\_\_\_\_



**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.**



GOV MAP SHEET : 2925AB



**DESCRIPTION OF LAND UNDER APPLICATION FOR A PROSPECTING RIGHT**

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in extent

**635.2504 Hectares**

Magisterial District of  
FAURESMTIH

**PROVINCE FREE STATE**

LEGEND	NOTES
● City / town / villages	1) Please see Table 2 for any specific servitudes registered against the title deeds. 2) Coordinates for polygon of land under application: refer to accompanying listing file for details.
— Roads	
— ESCOM Power Lines	
▭ Land under Application	
▭ Farms	
▭ Magisterial Districts	
▭ Province border	

NAME OF APPLICANT:  
**DE BEERS CONSOLIDATED MINES PROPRIETARY LIMITED**

*[Signature]*  
SIGNATURE OF APPLICANT:

NAME: **H Kocks** (Print)  
DATE: **26/07/2013**

Plan Approved:

Regional Manager  
**FREE STATE PROVINCE**

Department Mineral Resources

DATE: \_\_\_\_\_



Coordinates referred to in plan. Coordinates based on Clarke1880/Cape Datum

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<b>NODE_ID</b>	<b>X_COORDINATES</b>	<b>Y_COORDINATES</b>
1	25.38320237590	-29.07095979540
2	25.38954635900	-29.08374976010
3	25.39357473900	-29.09187461820
4	25.39058966380	-29.09270617750
5	25.39042180230	-29.09275196130
6	25.39026157750	-29.09279770790
7	25.37617729800	-29.09675519550
8	25.37162812250	-29.09803494450
9	25.36478629150	-29.08609561260
10	25.36269580760	-29.08221438170
11	25.36159714500	-29.08017553030
12	25.36001590830	-29.07723456260
13	25.37156717670	-29.07194580520
14	25.38145521480	-29.06743522370
15	25.38320237590	-29.07095979540

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

During the consultation process, the parties were asked about land use and the environment, both verbally and in the form of a short questionnaire. Please refer to the report on consultation.

**2 REGULATION 52 (2) (b): Assessment of the potential impacts of the proposed prospecting or mining operation on the environment, socio-economic conditions and cultural heritage.**

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

Prospecting for kimberlite is a dynamic, results driven operation, which proceeds in phases, the outcome of which cannot be predicted or predetermined. Excepting the first phase, the scope of each subsequent phase is dependent on the results of earlier phases. The results of the reconnaissance sampling and geophysics will indicate the areas over which the subsequent phases of work are required. These subsequent phases can include drilling and first stage bulk sampling as well as activities such as detailed drilling, geophysical surveys and further bulk sampling 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 although some estimates are presented in this work programme, as presented below. Note that these estimates can be considered as being reasonably accurate for the first year of work only. The prospecting will take place in phases as described in the prospecting work plan (PWP) summary in Table 2 below.

Table 2: Summary of prospecting activities.

Phase	Activity  (what are the activities that are planned to achieve optimal prospecting)	Skill(s) required  (refers to the competent personnel that will be employed to achieve the required results)	Timeframe  (in months) for the activity)	Outcome  (What is the expected deliverable, e.g. Geological report, analytical results, feasibility study, etc.)	Timeframe for outcome  (deadline for the expected outcome to be delivered)	What technical expert will sign off on the outcome?  (e.g. geologist, mining engineer, surveyor, economist, etc)
1	<b>Desktop Study</b>	Geologist & geophysicist	1 month	Report on specific targets with sampling and/or survey plan	Month 1	Geologist
2	<b>Target delineation</b> a) Local geological mapping b) Surface sampling (30 soil) c) Sample treatment & analysis d) Integration & interpretation of new information e) Ground geophysical surveying (magnetic and gravity methods) f) Integration & interpretation of new information	Geologist & geophysicist, field officer, laboratory technicians	1 month 1 month 3 months 1 month 2 months 3 months	Geological sketch map & report Sample results Geophysical survey data Targets for drilling Drilling plan	Month 12	Geologist and Geophysicist



3	<p><b>Testing of targets</b></p> <p>a) Core drilling (up to 63.5 mm). Maximum depth 400 m.</p> <p>b) Manual pitting if there is no or shallow cover</p> <p>c) Drill/pit sample analysis (petrography, mineral chemistry, physical properties)</p> <p>d) Integration &amp; interpretation of new information, planning</p>	<p>Geologist, field officer, drill contractors, laboratory technicians, petrologist, geophysicist</p>	<p>2 months</p> <p>0.5 months</p> <p>4 months</p> <p>1 month</p>	<p>Geological report with drill/pit logs and preliminary model</p> <p>Analytical results of samples</p> <p>Plan for additional geophysics &amp; core drilling</p>	<p>Month 20</p>	<p>Geologist</p> <p>and</p> <p>Petrologist</p> <p>and</p> <p>Geophysicist</p>
4	<p><b>Kimberlite delineation and initial diamond testing</b></p> <p>a) Detailed ground geophysical surveys &amp; modelling</p> <p>b) Core drilling to a maximum of 400 m</p> <p>c) Manual pitting if there is no or shallow cover (limited to 2m x 2m wide and 1.5 m deep)</p> <p>d) Drill/pit sample analysis (petrography, density, mineral chemistry, micro-diamond)</p>	<p>Geologist, field officer, drill contractors, laboratory technicians, petrologist, micro-diamond specialist, geophysicist</p>	<p>1 month</p> <p>1 month</p> <p>4 months</p>	<p>Geological report with drill/pit logs, revised model and micro-diamond grade estimate</p> <p>Analytical results of samples</p> <p>Mini-bulk sampling plan</p>	<p>Month 28</p>	<p>Geologist</p> <p>and</p> <p>Geophysicist</p> <p>and</p> <p>Diamond specialist</p> <p>and</p> <p>Petrologist</p>

	content) d) Integration & interpretation of new information, planning		2 months			
5	<b>Mini Bulk Sampling</b> a) Large Diameter Drilling and/or Mechanised Pitting to extract approx. 200 tonne sample. b) Transport & processing of 200 tonne sample c) Diamond recovery and examination d) Integration & interpretation of new information and planning	Geologist, field officer, drill contractors, laboratory technicians, diamond specialist.	2 months 4 months 3 months 3 months	Geological report with drill/pit logs, revised model and initial diamond grade estimate  Analytical results of samples  Full bulk sampling and additional drilling plan	Month 40	Geologist  and Mineral Resource Manager  and Diamond specialist
6	<b>Full Bulk Sampling</b> a) Core drilling (pilot holes and micro-diamond samples), maximum depth 400 m b) Large Diameter Drilling and/or Mechanised Pitting to extract approx. 1,000 tonne sample. c) Processing of 10,00 tonne	Project Manager, Geologists, field officers, drill contractors, laboratory technicians, plant operators, micro-diamond specialist, diamond specialist, mineral resource manager.	4 months 4 months	Geological report with drill/pit logs, revised model, diamond grade and value estimate  Analytical results of samples  Decision on pre-feasibility studies  Application for renewal of	Month 60	Project Manager  and Mineral Resource Manager

	<p>sample</p> <p>d) Micro- and macro-diamond recovery and examination</p> <p>e) Integration &amp; interpretation of new information</p>		<p>4 months</p> <p>6 months</p> <p>2 months</p>	prospecting right		
7	<p><b>Pre-feasibility study</b></p> <p>a) Scoping of feasibility studies</p> <p>b) Initial economic assessment</p>	<p>Mineral Resource Manager,</p> <p>Mining Engineer, Geologist, Accountant, Project Manager</p>	To be scoped after Phase 6	<p>Initial economic assessment</p> <p>Decision on feasibility studies and scope</p>		<p>Project Manager and Mineral Resource Manager</p>
8	<p><b>Feasibility Study</b></p> <p>a) Additional geological and geotechnical core drilling &amp; sampling as required</p> <p>b) Metallurgical &amp; geotechnical testwork</p> <p>c) Desktop review, modeling, engineering and financial studies</p>	<p>Mineral Resource Manager,</p> <p>Mining Engineers, Metallurgist, Geologist, Geotechnical specialist, Accountant, ECOHS practitioner, Project Manager</p>	To be scoped after Phase 7	<p>Feasibility study report</p> <p>Decision on application for mining right</p>		<p>Project Manager and Mineral Resource Manager and ECOHS Practitioner and Accountant</p>

### **2.1.1 The main prospecting activities (e.g. access roads, topsoil storage sites and any other basic prospecting design features).**

Access to the site will be by foot and vehicles using existing tracks on the property, thus creating minimal impacts on vegetation. The storage and processing of rock, soil or stream samples will have no impact on the natural environment as it is done off site.

Geological mapping of possible areas of interest is carried out with conjunction with ground geophysical surveys. Geological mapping and geophysical survey work has minimal impact on the environment. Geophysical surveys may be conducted by air (helicopters or fixed wing aircraft) or on the ground. If airborne surveys are planned, surface owners will be consulted beforehand to assess the problems that could arise due to noise, so that the surveys plans can be adjusted accordingly.

The method of temporary site marking for ground surveys shall be by means of biodegradable material tied next to survey stations which are removed once the survey is completed. Survey areas will vary between 500m x 500m to 4km x 4km depending on the size of the targeted block and survey lines will be spaced at maximum of 100m and minimum of 20m interval between the lines. Geophysical surveys are carried out on foot, usually by teams consisting of two people or more. All geophysical instruments are powered by rechargeable batteries and have minimal impact on the environment.

If required, soil samples will be collected within a 30m radius per sample from areas not drained by streams, with up to 30 litres of both surface and sub-surface material (up to 20cm depth for geochemical samples) collected. Soil samples are normally spaced at 1km to 500m for reconnaissance work and 300m to 50m for any follow up work. Minimal, temporary disturbance is caused to the environment by sampling but there are no lasting impacts.

If required, stream samples will be collected from sections of streams known as trap sites which may comprise boulders, rock barriers, potholes etc. that have the ability to slow down and trap heavy minerals. The volume of the sample depends on the catchment area. The sites are 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 (of two or more) rehabilitate all stream sample sites after collecting the samples and equilibrium is restored by natural water flow. Minimal, temporary disturbance is caused to the environment by sampling but there are no lasting impacts.

Any rocks that are suspected to be kimberlitic will be collected alongside stream and soil samples for petrographic studies. The samples will be collected manually by using geological hammers and would not exceed 2kg in mass. The process has no significant impact on the natural environment.

If the prospecting techniques above indicate that there are kimberlites on the property, pitting and small diameter drilling will be conducted to test for their presence and economic potential. Excavations and boreholes will be sited on a practical basis, in consultation with the land owner.

The dimensions of such trenches and pits shall be limited to the minimum required to achieve the desired results and within regulated specification and standards. Trenching and pitting are suited to resolve shallow targets that might be identified and for extracting bulk samples from kimberlite discovered under shallow cover. Pitting and trenching for the purpose described above may be done manually or using light earthmoving equipment. All sites are fenced prior to start of excavation work. The fencing remains in place until the sites have been successfully rehabilitated. The Impact is limited to the immediate natural environment and is temporary.

Percussion or core drilling will be carried out on indicator mineral or geophysical anomalies to test for the presence of kimberlite where the overburden thickness or local conditions make pitting and trenching impractical. The holes may be vertical or inclined, usually at a maximum angle of 60 degrees to horizontal. The

borehole depth will be determined by the geologist and will depend on the type of anomaly and geological conditions, including overburden.

Core drilling will usually only be conducted if kimberlite is discovered. The diameter of core drilled doesn't usually exceed 120mm and it is determined by factors such as cost, proposed core sampling and purpose. Core holes might also be used as pilot holes for large diameter drilling holes. Core holes allow more accurate determination of geology of the kimberlite.

Small diameter percussion and core drilling normally uses a truck or trailer mounted rig and compressor, each with its own diesel generated power. No local power sources are used. Small diameter percussion drilling is short term and drilling at any anomaly is usually completed in two weeks or less with core drilling taking up to two months, but this depends on the target.

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

No plan and specific coordinates can be provided at present for the activities as the location and extent of such activities will depend on the results of the desktop study and target delineation work, phases 1 and 2 as per Table 2 above. A plan for the initial drilling and trenching (phase 3 - 6) can be prepared and submitted once these preliminary phases have been completed.

The footprint of each activity is typically as follows:

- Core drilling: 20 x 20 m per site (4 x drillholes)
- Large diameter drilling: 50 x 50 m per site (1 x drillhole)
- Manual pit: 6 m x 6 m per site (1 pit: 2 m x 2 m x 1.5 m deep pit)
- Bulk sample pit: 30 m x 22.5 m (2 pits: 30 m x 22.5 m x 6 m and 8m deep pit)

#### **2.1.3. Description of construction, operational, and decommissioning phases.**

No construction will be carried out during prospecting activities.

Operations of the prospecting project are conducted in phases (refer to Table 2 and section 2.1.1 above).

Prospecting activities are in phases where decision to carry on to the next phase is dependent on the outcomes of the previous phase. During the closure phase of the project, a final report outlining work done, results and areal coverage of prospecting activities is submitted to the Department of Mineral Resources in terms of Section 43(4) of the Mineral and Petroleum Resources Development Act 28 of 2002.

A closure plan with description of activities, methods for mitigation, closure costs is submitted with final assessment of environmental management plan and environmental risk report. Monitoring of rehabilitated areas forms part of the decommissioning phase and continues until a closure certificate is obtained.

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

There are no listed activities during the early stages. The phases of work that may include NEMA listed activities are in phases 5 and 6, depending on the scale of any vegetation clearing required or access tracks created, in certain geographical areas of the country. However as this site in general is not a protected or sensitive area and is currently used for commercial farming, no current listed activities have been identified. However the NEMA EIA process will be applied ahead of work in phase 5 and beyond, to ensure that local sensitive sites are avoided and impacts properly managed.

#### **2.1.5. Identification of potential impacts**

Refer to the baseline risk assessment, Appendix I

#### **2.1.6 Potential impacts per activity and listed activities.**

Please refer to the baseline risk assessment attached as Appendix I. The main impacts of concern across all the work planned are use of resources, damage

to vegetation and potential pollution to soil and water. The main activities that can create such impacts are drilling and the use of vehicles and other machinery, in phases 3 to 6 as per Table 2 above.

### **2.1.7 Potential cumulative impacts.**

If a kimberlite is found, the successive phases of work (from 3 through to 6) could create a cumulative impact on vegetation and soil at the much localised site identified, as well as on access tracks where prospecting activities may contribute to creation of dust; in extreme cases this may require dust suppression may be required. Disturbance and removal of soil has the potential to directly and indirectly impact on vegetation in the prospecting area and also impact wildlife by removing habitat that is used for foraging, burrowing/nest, and breeding.

The cumulative impact may be on the roads and tracks, where prospecting activities may contribute to wear on the roads and rising of dust. In extreme cases this may require the grading or scraping of farm tracks & roads. If a lot of traffic is to be using tracks e.g. during bulk sampling, dust suppression may be required. Another cumulative impact could be the presence of historical diggings/disturbances on the properties. An environmental liability assessment will be conducted on the disturbances; this will be addressed through the Environmental Management Plan and consultation with DMR.

### **2.1.8 Potential impact on heritage resources**

The only heritage resources identified are graves located in the farm Pretoriusdam 550. There are no other specific heritage aspects identified; the area comprises privately owned farms used for commercial purposes; some of the owners also use them for residential purposes. Prospecting activities could impact on graves but usually it is quite practical to stay well away (at least 50 metres) from such sites. Should graves etc. be within an area planned for drilling (from phase 3 onwards), then a Heritage Impact Assessment should be conducted.



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

There is no community in or near the area and there will be no impact due to close proximity.

Some impact on land use may be expected from phase 3 onwards, as the damage to vegetation, although limited in spatial extent, will somewhat reduce the grazing available to the farmers. Noise and dust impacts will be minimal as these are localised to the drill site and access tracks, for a short duration only.

From phase 3 there may also be an impact on the state of farm tracks, when heavier vehicles enter the property. Depending on the sites to be accessed, some impact on gates and fences may also be of concern. Dust and noise will be a concern in this case. Water or soil pollution would have an impact on the farming.

The area is accessed by means of a public road, then by private farm tracks which pass through gates in the fences. Aside from the tracks and fences, there are power and phone lines, wind pumps, small reservoirs, sheds/barns, farmhouses and enclosures (kraals) which are of avoidance.

### **2.1.10 Confirmation that the list of potential impacts has been compiled with the participation of landowners and interested and affected parties.**

The issue of the potential impacts on grazing tracks and environment in general was discussed with the property owners. It was made clear that it will be De Beers' responsibility to rehabilitate drilling sites, including any fencing off that may be required to achieve this.

No concerns were raised directly relating to the prospecting, but the main concerns are generally around safety/security. Security concerns will be

addressed by controlling access through appointments and by providing the names and ID numbers of staff coming to work on the farms. The Farmers were also concerned about possible field fires, and the effect prospecting might have on current farming activities

Veld fire is a concern for the land owners and must be avoided. Water to be used for drilling will have to be sourced either in the farm or externally from the stronger boreholes in the area provided the water use permission can be obtained. If there is a need to source water from the farm, water usage should not exceed 5000l/day as per DWARF regulation provided there is an agreement with the farmowner.

#### **2.1.11 Confirmation of specialist report appended.**

No specialist report was carried out. If the project progresses to advanced work (phases 4 to 6 in Table 2 above), it is recommended that Heritage and Archaeological Impact Assessments be carried out for specific sites where large diameter drilling or pitting or trenching is planned. Should listed activities under NEMA be considered, then specialist studies may be required in support of Basic Assessment or full Environmental Impact Assessment, whichever is required.

### **3 REGULATION 52 (2) (c): Summary of the assessment of the significance of the potential impacts and the proposed mitigation measures to minimise adverse impacts.**

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

Please refer to baseline risk assessment of the potential impacts (Appendix I).

##### **3.1.1 Criteria of assigning significance to potential impacts.**

The criteria applied were a combination of severity and probability of the potential impact.

Severity was based on how long the impact would last combined with the extent of that impact relative to the site of the specific activity and the property as a whole.

Probability was based on the frequency of the activity taking place combined with the frequency of the unwanted event or situation arising, based on normal operations (track record).

Note that these ratings are made with existing mitigation considered.

### **3.1.2 Potential impact of each main activity in each phase, and corresponding significance assessment.**

Please refer to baseline risk assessment in Appendix I and the phases in Table 2 above.

Phase 1 – no impacts.

Phase 2 – impacts on soil and water from vehicle use during access to site, as well as potential fire hazard impacting on vegetation, from vehicles or other accidental causes. These are not rated as significant and will be minimal during this phase.

Phases 3 & 4 – impacts on soil and water from vehicle use during access to site; on soil, water and vegetation from drilling as well as potential fire hazard impacting on vegetation, from vehicles, drill rigs or other accidental causes. Dust and noise will be created but will be fairly minor. These are not rated as significant and will be limited to a small area and short duration during these phases.

Phases 5 & 6 - impacts on soil and water from vehicle use during access to site, including heavy vehicles; on soil, water and vegetation from drilling and plant operation as well as potential fire hazard impacting on vegetation, from vehicles, drill rigs or other accidental causes. Dust and noise generation will be

more substantial than in the earlier phases. Although these impacts are not individually rated as significant, their cumulative impact on vegetation at the specific site(s) and on the state of access tracks could be considered significant.

### **3.1.3 Assessment of potential cumulative impacts.**

If a kimberlite is found, the successive phases of work (3 to 6) could create a cumulative impact on vegetation at the specific site(s) involved, as well as on the state of access tracks. This could become significant if not properly managed.

## **3.2 Proposed mitigation measures to minimise adverse impacts.**

### **3.2.1 List of actions, activities, or processes that have sufficiently significant impacts to require mitigation.**

With reference to Appendix I, although all individual impacts are rated as insignificant, this is because existing mitigation procedures are in place to achieve this rating. These procedures must be followed to avoid these impacts becoming significant.

The potentially significant impacts of advanced drilling & bulk sampling (phases 5 and 6) on the vegetation will require proper management of the specific mitigation required to enable the recovery of the land to allow its original use to resume within a reasonable timeframe.

### **3.2.2 Concomitant list of appropriate technical or management options.**

Existing operational procedures EXP-PR-02 to 6 are attached (Appendix II to V). These document the requirements for technical actions with regard to the different activities. With regard to the potentially significant impact on vegetation in phases 5 and 6 of the work programme, the rehabilitation procedure EXP-PR-06 is most relevant (Appendix III).

### **3.2.3 Review the significance of the identified impacts**

Provided that the relevant procedures are followed, the significance of all impacts should be low as per Appendix I.

## **4 REGULATION 52 (2) (d): Financial provision.**

### **4.1 Plans for quantum calculation purposes.**

This application is not for mining. As prospecting takes a phased approach, no plans can be provided in this regard.

### **4.2 Alignment of rehabilitation with the closure objectives.**

The rehabilitation actions form part of each operational phase of prospecting. This ensures that should prospecting stop at any stage, based on the results not being encouraging, the initial physical rehabilitation work has already been completed. Thereafter only monitoring and remedial actions, if required, will need to be carried out to obtain the closure objectives.

### **4.3 Quantum calculations.**

Calculation of the quantum of the financial provision required to manage and rehabilitate the environment, in accordance with the guideline prescribed in terms of regulation 54 (1) in respect of each of the phases are summarised below:

- Phase 1 – no costs (desktop work)
- Phase 2 – no costs (surficial sampling and geophysical survey work)
- Phase 3 – narrow diameter drilling requires cleaning up of chips/tailings and capping of hole.

- Phase 4 – narrow diameter core drilling with sumps requires cleaning up of spoil, capping of hole, refilling of sumps and levelling topsoil.
- Phase 5 – back filling of manual pits and drilling requires cleaning up of chips/tailings and capping of hole.
- Phase 6 – back filling of manual pits and drilling requires cleaning up of chips/tailings and capping of hole.
- Phase 7 – Not yet provided for, to be determined in the annual review process.
- Phase 8 – Not yet provided for, to be determined in the annual review process.

CALCULATION OF THE QUANTUM							
Applicant:		De Beers Consolidated Mines (Proprietary) Limited (FS 30/5/1/1/2/10190 PR)			Location:		
					Date:		
No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	10.87	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	151.42	1	1	
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	223.14	1	1	0
3	Rehabilitation of access roads	m2	0,00	27.1	1	1	0
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	262.98	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	143.45	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	302.83	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0	158747.3	1	1	0
7	Sealing of shafts adits and inclines	m3	0	81.29	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0	105831.5	1	1	0
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	131811.2	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	382842.3	1	1	0
9	Rehabilitation of subsided areas	ha	0	88617.95	1	1	0
10	General surface rehabilitation	ha	0.56	83836.41	1	1	46948.39
11	River diversions	ha	0	83836.41	1	1	0.00
12	Fencing	m	0	95.63	1	1	0.00
13	Water management	ha	0	31876.96	1	1	0.00
14	2 to 3 years of maintenance and aftercare	ha	0	11156.92	1	1	0.00
15 (A)	Specialist study	Sum	0			1	0.00
15 (B)	Specialist study	Sum				1	0.00
						Sub Total 1	46948.39
1	Preliminary and General		5633.806752		weighting factor 2 1		5633.81
2	Contingencies			4694.83896			4694.84
						Subtotal 2	57277.04
						VAT (14%)	8018.78
						Grand Total	65296

A financial provision of R 65,296 is calculated.

Note:

<b>Activity</b>	<b>Surface area affected</b>	<b>Number of drillholes/pit</b>	<b>Hectares</b>
Core drilling	20m x 20m	4	0.04
Large diameter	50m x 50m	1	0.25
Manual pit	6m x 6m	1	0.0036
Bulk sample pit	30m x 22.5m	2	0.27
			<b>0.56 ha</b>

As per the quantum calculator the total surface area affected is 0.56ha. All phases of prospecting activities have been included in the quantum calculation. The prospecting activities are in stages and result driven where one stage of work is dependent on the result of the previous stage(refer to PWP).The quantum of this provision will be reviewed annually as required and adjusted should the project progress beyond phase 6 or should the planned scope of work change.

During Phase 1 to 4 the following apply:

- Minimal access road opening, generally use existing tracks.
- Mainly rehabilitating drill sites or excavations.
- Monitoring of borehole site every 6 month until DMR inspection. If DMR is satisfied it will grant closure certificate.
- HIA studies to be conducted once per drilling site.
- Botany study to be carried out where 50% of the vegetation is threatened (protected)
- Water quality will be tested before and after extensive drilling if the drilling is conducted in close proximity to the water bodies.

#### **4.4 Undertaking to provide financial provision.**

The required financial provision of R 65,296.00 for phases 1 to 6 of the work programme, during the first two years of prospecting activities, will be provided in the form of a bank guarantee, through Standard Bank Kimberley, should this prospecting right be granted.

## **5 REGULATION 52 (2) (e): Planned monitoring and performance assessment of the environmental management plan.**

### **5.1 List of identified impacts requiring monitoring programmes.**

Damage to vegetation and tracks will require monitoring, thus drill sites will be monitored to observe the return to the near original state of the land use after completion of drilling. Likewise excavated pits will be filled up and monitored to check that no erosion occurs and that the vegetation reverts towards its original state.

### **5.2 Functional requirements for monitoring programmes.**

Site visits by the project geologist and/or environmental officer will be required. Photographic evidence will be used to document the state of drilling sites, excavation and access tracks.

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

The environmental officer must check on the state of rehabilitation of drilling sites, excavation sites and access tracks, either in person or based on photographs of the sites combined with contact with interested and affected parties.

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

Routine monitoring and reporting will take place at six monthly intervals. The results of this work will be incorporated in the annual assessment report for this Environmental Management Plan.



Should a problem of invasive plants arise, specific monitoring and remedial actions to deal with this will take place on an annual basis as per the procedure EXP-PR-06 (Appendix III).

## **6. REGULATION 52 (2) (f): Closure and environmental objectives.**

### **6.1 Rehabilitation plan (areas and aerial extent of the main prospecting activities, including the anticipated prospected area at the time of closure).**

As explained above it is not possible to show any locality map until at least phases 1 and 2 of the prospecting work programme have been completed. This information can be provided at that stage, if the project is planned to progress further.

### **6.2 Closure objectives and their extent of alignment to the pre-mining environment.**

Early phase activities (phases 1 & 2) cause no or little disturbance to the existing land use. As the project advances to the next stages with minimal disruption to the environment, the closure objective is to rehabilitate the areas affected by prospecting so that they may be used for grazing and other existing land uses.

### **6.3 Confirmation of consultation.**

The post-prospecting land use has been discussed with the land owner and the aim is to continue with commercial farming (grazing of game or livestock) on the property, unless an application for a mining right is to be made. The land owner and neighbours did not report any other plans for developing the land use.

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

Please note that the full report on public participation was submitted in September 2013 and is attached again. The information submitted in the full report is repeated below for ease of reference. All supporting documentation forms part of the attached full report.

### **7.1 Identification of interested and affected parties.**

All affected and interested parties were consulted and involved during the process with regard to the proposed prospecting activities.

#### **7.1.1 Identification of community.**

There is no community present on or adjacent to the site. This was confirmed by asking the farm owners.

#### **7.1.2 Community as landowner.**

There is no community present; this was confirmed by asking farm owners.

#### **7.1.3 Land Affairs notification.**

A letter was sent to Land Affairs by registered mail. No response has been received to date.

#### **7.1.4 Land claims.**

A letter was sent to the Land Claims Commissioner by registered mail. Mrs Makaringe replied by fax on 15 August 2013. They stated that there is no current land claim and notification will be made if a new claim is lodged on applied farms. No land claims were reported by the existing surface owners.

#### **7.1.5 Traditional Authority.**

There is no traditional authority identified as there is no community onsite and adjacent areas.

#### **7.1.6 Landowners.**

Izak Bartholomeus Fourie - owner of farm Pretoriusdam 550

#### **7.1.7 Lawful occupiers of the land.**

Izak Bartholomeus Fourie - owner of farm Pretoriusdam 550

#### **7.1.8 Whether other persons' socio-economic conditions will be affected.**

All the neighbours were contacted. Main Access to the farms is by means of public road, then private farm tracks which pass through gates in the fences, so there is no reason for the proposed prospecting to directly impact on their socio-economic conditions. Prospecting operations may create a limited amount of noise and dust, but this will be limited to parts of the properties where drilling and pitting/trenching takes place. Provided that the usual precautions are taken to avoid disruption to ground water and to prevent fires, there should be no impact by the prospecting on their socio-economic conditions.

#### **7.1.9 Local Municipality.**

Letsemeng Local Municipality; Fauresmith District of Free State Province. Itumeleng Edward replied on behalf of Letsemeng Local Municipality by fax on 2 September 2013. They had no comments.

#### **7.1.10 Relevant government departments, agencies and institutions.**

Department Tourism Environment & Conservation

Department land Affairs

South African Heritage Resources Agency

Department Water Affairs

Land Claims Commissioner  
Letsemeng Local Municipality  
Principal Inspector of Mines

#### **7.1.11 Proof of notification.**

Please refer to the attached report on consultation, which includes copies of the letters and responses (if received).

#### **7.2. The details of the engagement parties.**

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

An introductory letter was sent to all parties and responses requested. A meeting was held on 10 September 2013 with landowners only, at Hugo and Terblanch Attorneys in Petrusburg. The minutes of this meeting and the presentation given are attached on the full consultation report.

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

All landowners listed in 7.1.6.

Neighbours contacted are:

- Isak Stephanus Venter - Owner of Farm Patryfontein No. 70
- Trustees of Gert Deysel Kinders Trust - Owner of remaining extent and portion 1 and 2 of the farm Welgedacht 296
- Johannes Petrus Odendal - Owner of portion 3 of the farm Welgedacht 296
- Trustees of ACB Trust - Owner of the farm Pretoriuskop 596

- Johannes Simon van der Westhuizen - Owner of the remaining extent and portion 3 of the farm Arbeid 60 and the remaining extent of the farm Ongelukskop A 586
- Johannes Bitzer - Owner of portion1 of the farm Arbeid 60
- The Directors of Transnet Ltd - Owner of portion 5 of the farm Arbeid 60 and portion 1 of the farm Ongelukskop A 586
- John Moir Fraser - Owner of the farm Garenkop 921
- The Directors of Eskom Holdings Ltd - Owners of the remaining extent of the farm Kotzeeskop AB 585 and the remaining extent of the farm Kopjealleen 545
- The Municipal Manager, Letsemeng Local Municipality - Owner of the remaining extent of the farm KOTZEESKOP AB 585
- Du Preez, Hermanus Albertus - Owner of portion 1 of the farm KOPJEALLEEN 545 and the farm WEENEN 317

All Government departments listed above (7.1.10) were notified. Land Claims Commissioner has not responded on any land claims to date.

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

No concerns were raised directly relating to the prospecting, but the main concerns are generally around safety/security. The Farmers were concerned about possible field fires, security and the effect prospecting might have on current farming activities. Security concerns will be addressed by controlling access through appointments and by providing the names and ID numbers of staff coming to work on the farms.

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

See 7.2.3 above, these same concerns apply to impacts of prospecting activities.

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

The farmers are concerned about the issue of access to the farms and security and impacts of prospecting on the current farming activities and that they should be notified prior to coming to the farms. Security concerns will be addressed by controlling access through appointments and by providing the names and ID numbers of staff coming to work on the farms.

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

Consultation letters were sent during September 2013 to:

- Farm owners
- Adjacent farm owners
- Government parties

A meeting was held on Monday 10 September 2013 (All minutes and presentation are also appended to the full consultation report as annexures D to F). Minutes of the meeting attached as Appendix VIII.

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

No specific objections were raised to date although the surface owners are concerned about their safety and impacts of prospecting activities on their farm.

#### **7.2.8 The manner in which the issues raised were addressed.**

In terms of the security/ access concerns, De Beers will send the names and ID numbers of all the people beforehand and inform the surface owners of the exact dates they will be present on the farm.

The procedures referred to in this Environmental Management Plan aim to minimise the impact on the environment. These include measures to avoid pollution of the local water supply.

Use of water from the farms will only be considered should approval be obtained from Water Affairs and only if there is sufficient supply to allow the normal farming activities to continue.

Other aspects to be addressed in all our prospecting work (although not raised directly) through the Environmental Management Plan include:

- Avoiding soil pollution - preventing and controlling oil or hydraulic fluid spills.
- Avoiding grass fires - no fires to be used when prospecting, precautions and controls in place for machinery.
- Avoiding littering - proper waste removal and disposal to be practiced.
- Minimising vegetation destruction - by limiting the creation of new tracks, clearing minimal areas for drilling and rehabilitating effectively. Disturbed areas may need to be fenced off to allow vegetation recovery.
- Avoiding excessive noise & dust - this will require specific measures depending on the nature of work. Prospecting is mostly restricted to daylight hours so noise will be limited to these periods. Dust suppression measures can be taken where this is a problem.
- Impact on fauna - as prospecting takes place in a limited area for a relatively short duration, impacts on fauna will be minimal.

Access and use of contracts will be provided to owners on request.

## **8 SECTION 39 (3) (c) of the Act: Environmental awareness plan.**

### **8.1 Employee communication process.**

All employees and contractors must be inducted in the environmental management system, which explains the potential risks associated with the

various prospecting activities. This is a requirement of the system itself (ISO 14001 certified). The material is provided in paper form but also discussed verbally to ensure clarity.

## **8.2 Description of solutions to risks.**

Each activity and associated risks is linked in the baseline risk assessment to relevant mitigation measures to prevent pollution and other significant impacts. The compliance to procedures is the duty of all staff and contractors. This is monitored by supervisors and reported to the management team as well as the environmental officer.

## **8.3 Environmental awareness training.**

The training comprises of the following:

- General induction to the environmental management system including the aspects and impacts register.
- Activity specific induction, based on procedures, including emergency response on spill handling (use of spill kits etc.).
- On site confirmation of these procedures, with demonstrations of requirements.
- Periodic awareness sessions (toolbox talks) on safety, health and environmental topics.

## **9 SECTION 39 (4) (a) (iii) of the Act: Capacity to rehabilitate and manage negative impacts on the environment.**

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

There is no a fixed annual amount. The amount is calculated to address the rehabilitation needed at each phase. This can only be estimated at this stage –



with a fair degree of accuracy for the first three years only. If all work is conducted according to the planned timeframe, this will equate as follows:

- Year 1 to Year 2: R 19,433 (determined as per section 4.3 above)
- Year 3: R 37,844 (determined as per section 4.3 above)
- Year 4: R 200,000 (Rough estimate assuming 1 pit/trench)
- Year 5: R 200,000 (Rough estimate assuming 1 pit/trench continued from year 4)

**9.2 Confirmation that the stated amount correctly reflected in the Prospecting Work Programme as required.**

The amounts stated in the work programme include the above costs of such rehabilitation work as part of each phase of work. The approach taken is to include such rehabilitation and the cost thereof as part of the planned work and thus as part of the budget submitted.


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

Herewith I, the person whose name and identity number is stated below, confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application, and confirm that the above report comprises EIA and EMP compiled in accordance with the guideline on the Departments official website and the directive in terms of sections 29 and 39 (5) in that regard, and the applicant undertakes to execute the Environmental management plan as proposed.

Full Names and Surname	Anette Basson
Identity Number	5807310083087

**-END-**

# Appendix I: Baseline Risk Assessment

De Beers Group Exploration														
Baseline Risk Assessment														
Venture / RSA Exploration														
Section / Field Operations														
*Circumstances that exist before the introduction of any means of mitigation (risk prior the consideration of controls)														
**A future view of the risk remaining assuming that the intended risk mitigating strategy/controls have been implemented successfully														
FAPES: Facility, Activity, Product, Equipment or Service														
Area	Activity / Operation (*FAPES)	Routine/ Non Routine	Energy	Hazard	Consequences Impact of the unwanted event/ loss	Cause / Threat	Inherent Risk Rating	Critical Controls	Recovery	Effectiveness of Control	Monitoring	Residual Risk Rating	Action Plan or Monitoring	Legal Reference
Field	Vehicle use, drilling, mechanised excavations, generator use	Routine	Environment impact	Use of petrol or diesel	Potential for wasteful use of a nonrenewable natural resource.Potential for wasteful use of power through not applying conservative use. air	Inefficient or poorly maintained engines; poor usage habits; unnecessary use	16	Equipment selection & maintenance; driver/operator training, project planning. EXP-PR-02		Partially Effective		8		
Field	Trenching and pitting	Routine	Environment impact	Dust emissions	Potential impact on the natural vegetation/biodiversity) heritage site, water and air	Excessive digging and improper trenching	16	Training and use of appropriate equipments	Rehabilitation of excavated areas	Effective		6		
Field	Drilling	Routine	Environment impact	Use of drilling agent (oil & "rodcoam")	Potential pollution of soil and ground water by drilling agent if not handled properly.	Use of non-environmentally friendly agents; excessive use of agents	17	Use of env. friendly products; minimal use of oils. EXP-PR-03		Partially Effective		5		
Field	Vehicle use, drilling, mechanised excavations, generator use	Routine	Environment impact	Engine emissions	Potential pollution of air (above legal limits).	Heavily polluting or poorly maintained engines	16	Equipment selection & maintenance, EXP-02-PR		Effective		5		
Field	Vehicle use, drilling, mechanised excavations, generator use	Routine	Environment impact	Spillage of fuel, oil, grease, hydraulics and tubes.	Potential pollution of soils and water if not handled correctly	Equipment malfunction/misuse; Improper storage, use and disposal of fuel, oil, grease, hydraulics and tubes, including containers, filters & seals, resulting in spillage	20	Equipment inspections & maintenance, drip trays if needed, proper waste control. EXP-PR-02, 03, 04, 05	Spill cleanup	Effective		9		
Field & office	All prospecting activities	Routine	Environment impact	Use of electricity (office, sanitation, kitchen)	Potential for wasteful use of power through not applying conservative use & air pollution	Inefficient or poorly maintained equipment; poor usage habits; unnecessary use	20	Equipment selection & maintenance; user training, awareness, project planning.		Partially Effective		8		
Field	All prospecting activities	Routine	Environment impact	Fire	Potential pollution of air, impact on vegetation, animals, IAP activities & property.	Fire started by equipment (faults), vehicles (faults) or camp fires	17	Procedures on avoiding fires regarding equipment & vehicles (checks & maintenance), restrictions/controls on camp fires. Fire break around areas. Firebreak Plan	Fire fighting equipment, First Aid; Emergency Response Plan	Partially Effective		5		
Field	Manual & mechanised excavations, drilling	Routine	Environment impact	Site clearing, digging into soil (sumps & excavations) and drill tailings dispersion	Potential impact on soil, natural vegetation, biodiversity, heritage sites, water and air.	Excessive clearing/excavating; working without integrated rehab aimed at preserving topsoil, preventing erosion, drill tailings/water running into streams, minimising dust.	20	Correct excavation & site clearance procedures, rehab done properly, erosion controls as needed, dust suppression as needed. EXP-PR-02, 03, 04, 06. Monitoring of sites over following year at least.		Effective	Effective	8		
Field	Soil, rock and stream sampling	Routine	Environment impact	Clearing vegetation, digging into soil and stream beds	Potential impact on natural vegetation, biodiversity, soil (erosion) and stream courses	Excessive clearing; working without integrated rehab aimed at preserving topsoil, preventing erosion.	12	Correct sampling procedures, rehab done properly. EXP-PR-02.		Effective		2		
Field	Access to site	Routine	Environment impact	Vehicles driving on tracks or off tracks; heavy use of footpaths	Potential to cause soil erosion, impact on natural vegetation, biodiversity, heritage issues and on I&AP	Heavy use of tracks that are not built up to handle traffic; off-road driving crushing/breaking vegetation, compacting or rutting soil; trampling vegetation. Any disturbance of heritage sites or IAP activities/property.	16	Access limited to existing tracks as far as possible. Rehab of tracks. EXP-PR-02 and 06.		Partially Effective		5		
Field	Use of temporary field camps	Non-routine	Environment impact	Clearing of vegetation for camp area; vehicle access and parking	Potential to cause soil erosion, damage natural vegetation, biodiversity, heritage issues and on I&AP	Clearing vegetation for camp area, crushing vegetation at tent sites and parking areas, compacting or rutting soil in camp. Any disturbance of heritage sites or IAP activities/property.	16	Limit clearing to what is required for safe use of camp area. Rehab of camp area and tracks. EXP-PR-02 and 06.		Partially Effective		5		
Field	Field sanitation - prospecting sites and temporary camps	Routine	Environment impact	Sewerage	Potential to pollute soil, ground and surface water.	No proper toilets provided; pit toilets used too near watercourses	17	Chemical toilets to be used at prospecting sites; pit toilets only to be used away from watercourses. EXP-PR-02		Effective		5		
Field	Field waste generation - all prospecting sites and temporary camps	Routine	Environment impact	Waste (general)	Potential pollution of soil and water. Potential visual impact if not disposed of correctly. Possible harm to animals if they eat waste or become entangled/trapped	Improper or no control on waste disposal.	12	Waste collected & separated, disposed of at approved sites, especially hazardous waste. EXP-PR-02.		Effective		5		
Field	Vehicle use, drilling, mechanised excavations, generator use	Routine	Environment impact	Storage and disposal of hazardous waste: primarily tyres and batteries, oil rags/ loose fibre for spill clean-up	Potential for fire and pollution of air, water and soil if not handled correctly.	Improper storage and disposal of hazardous waste	17	Proper waste control, storage minimised and drip trays for batteries. EXP-PR-02	Spill cleanup; fire fighting	Effective		5		

## Risk inventory

ENERGY/ UNWANTED EVENT/ HAZARD INVENTORY	
Biological	Contact with contaminated/ infected body fluids or blood, Bites/stings, Ingestion of plants, Alcohol and drugs
Body mechanics	Ergonomics, manual lifting
Chemical	Explosion, Lack of oxygen, inhalation, fumes, contact with chemicals, inhalation, etc
Community impact	Reputation, community disturbance
Electrical	electrical shock, electrical fire
Environmental impact	Waste management, Pollution, resource use, erosion, etc.
Gravity	Falling objects, slip and fall, slope failure
Mechanical	Caught by, vehicle, friction, moving parts, nip points
Noise	Noise exposure, fatigue, nuisance
Pressure	Sudden release, exposure
Radiation	Visibility, UV, Ionising radiation, heat

FAPE S	
F	Facility
A	Activity
P	Product
E	Equipment
S	Service


HIERARCHY OF CONTROL
Eliminate
Substitute
Engineering
Administrative
PPE

PERMIT REQUIREMENTS
Permit to Work
Confined Spaces
Electrical
Fire Water
Hot Work
Hot/Cold
Isolation
Trenching/Excavation
Working at Heights
Legal permit/licence/notification/exemption
Not applicable

## Risk matrix

Impact	Hazard Effect / Consequence					
	(Where an event has more than one "Loss Type), choose the "Consequence" with the highest rating)					
(Additional "Loss Types" may exist for an event; identify & rate accordingly)	1 Insignificant	2 Minor	3 Moderate	4 Major	5 Catastrophic	
Supply, Demand and Financial (Business Interruption / Material Damage & OTHER Consequential Losses) (Footnote 1)	No disruption to operation / < 0.5% materiality (<US\$250k)	Brief disruption to operation / >0.5% - < 5% materiality (>US\$250k – US\$2.5m)	Partial shutdown / > 5% - < 20% materiality (>US\$2.5m – US\$10m)	Partial loss of operation / > 20% - < 100% materiality >US\$10m - < US\$50m)	Substantial or total loss operation / US\$50.0M – previous year assessed materiality by Ext Auditor	
People – Delivery of Results	Slight impact on delivery of the business plan due to skills shortage, poor succession & talent management and inability to meet legislative requirements	Minor impact on delivery of business plan due to skills shortage, poor succession & talent management and inability to meet legislative requirements	Moderate impact on delivery of the business plan skills shortage, poor succession & talent management and inability to meet legislative requirements	Significant impact on delivery of the business plan due to a shortage of skills, poor succession & talent management and inability to meet local legislative requirements	Extreme impact on delivery of the business plan due to a shortage of skills, poor succession & talent management planning and inability to meet local legislative requirements	
People - Safety and Health	First aid case/ Exposure to minor health risk	Medical treatment case/ exposure to major health risk	Lost time injury/ Reversible impact on health	Single fatality or loss of quality life/ irreversible impact on health	Multiple fatalities/ impact on health ultimately fatal	
People – Occupational Health *	Non-conformance e.g. single exposure to over OEL with minor health risk	Non-clinically apparent decline in medical surveillance parameter or exposure on routine monitoring	Treatable or non compensatable impact on health or exposure discovered on investigation of medical incidents	Compensatable impact on health or single death resulting from accidental exposure of occupational disease.	Multiple fatalities or epidemics of disease resulting from workplace exposure	
Legal (Include Regulatory)	Low level legal issue	Minor legal issue; non compliance and breaches of the law	Serious breach of law; investigator/ report to authority, prosecution and /or moderate penalty possible	Major breach of the law; considerable prosecution and penalties	Very considerable penalties and prosecutions. Multiple law suits and jail terms	
Reputational (Impact on Reputation / Social / Community)	Slight impact – public awareness may exist but no public concern	Limited impact – local public concern	Considerable impact – regional public concern	National impact – national public concern	International impact – international public attention	
(Environmental)	Minimal Environmental Harm no effect on environment or negative public perception – L1 incident	Minor environmental harm, an incident limited to the immediate area of occurrence and can be remedied in the short term – L2 environmental incidence	Moderate environmental harm, an incident associated with widespread ecological or social impact and risk of legal liability, reversible in the medium term – L3 environmental incident	Significant environmental harm, an incident associated with widespread ecological or social impact and the risk of legal liability, reversible in the long term – L3 environmental incident	Extreme environmental harm, an incident associated with widespread, long term, irreversible negative or social impacts and high risk of legal liability – L4 environmental incident	
Likelihood	Risk Rating					
5 (Almost Certain)	The unwanted event has occurred frequently; occurs in order of one or more times per year & is likely to reoccur within 1 year	11 (M)	16 (M)	20 (H)	23 (H)	25 (E)
4 (Likely)	The unwanted event has occurred infrequently; occurs in order of less than once per year & is likely to reoccur within 5 years	7 (L)	12 (M)	17 (H)	21 (H)	24 (H)
3 (Possible)	The unwanted event has happened in the business at some time; or could happen within 10	4 (L)	8 (L)	13 (M)	18 (H)	22 (H)
2 (Unlikely)	The unwanted event has happened in the business at some time; or could happen in 15 years	2 (L)	5 (L)	9 (M)	14 (M)	19 (H)
1 (Rare)	The unwanted event has never been known to occur in the business; or it is highly unlikely that it will occur within 20 years	1 (L)	3 (L)	6 (L)	10 (M)	15 (M)

## Appendix II: Existing operational procedures

<b>De Beers Group Exploration RSA Based Operations</b> <b>RSA Exploration</b>		
<b>The Implementation of Operating Procedures During Prospecting</b>		
<b>EXP-02-PR_PropectingOperatingProcedures</b>		

## 1 SCOPE AND PURPOSE

The purpose of this procedure is as follows:

- To ensure that the operating procedures at the prospecting sites are adhered to at all times by field staff, casual workers and also by drilling and excavation contractors that may be contracted by De Beers from time to time.
- To define the responsibilities of staff and/or contractors and /or casual workers in terms of the above purpose.

## 2 RESPONSIBILITIES

- Senior Project Manager
- Project Manager
- Geologists
- Contractors
- All employees are obliged to report safety, health and environmental incidents or non-conformances on the incident reporting system available on Isometrix or report it to the Project Geologist.

## 3 RELATED DOCUMENTS

- SANS ISO 14001:2004 - Clause 4.4.6: Operational Control
- OHSAS 18001:2007 - Clause 4.4.6: Operational Control
- GE RSA ECOHS Policy

- GE RSA Legal Register, including other requirements
- Environmental Management Plans (EMPlans) for specific prospecting rights
- EXP-PR-03\_To Manage Significant Impacts Related to Exploration Drilling Including Mandatory Code of Practice for the Prevention of Flammable Gas Explosions in Mines Other Than Coal Mines
- EXP-PR-04\_To Manage Significant Impacts Related to Exploration Pitting
- EXP-PR-05\_Emergency Preparedness and Response Procedure
- EXP-PR-06\_To Ensure Appropriate Rehabilitation of all Prospecting Activities and Minimise any Residual Impacts.
- Standard Industrial Classification of All Economic Activities (5<sup>th</sup> Edition), published by the Central Statistics Service, 1993

#### **4 Legal Requirements**

- NHRA: National Heritage Resources Act, 1999 (Act 25 of 1999)
- MPRDA: Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002), specifically Section 29 and Regulation 52 (EMPlans)
- NEMA: National Environmental Management Act
- OHSAct: Occupational Health and Safety Act
- MHSA: Mine Health and Safety Act
- LEMA: Limpopo Environmental Management Act, 2003 (Act 7 of 2003)
- NEMA: EIA Regulations
- Hazardous Substances Act
- ECA: Environment Conservation Act
- NEM: Waste Act

#### **5 PROCEDURE**

##### **5.1 TRAINING**

- a. It is the responsibility of the Project Geologist to be aware of the different operating procedures pertaining to each phase of exploration and to

ensure that they are properly adhered to. The operational procedures are listed under Related Documents.

- b. The Project Geologist is responsible to ensure that staff and casual workers are inducted and informed of their environmental responsibilities and the relevant operational procedures; this must be recorded.
- c. It is the Senior Project Manager's responsibility to ensure that tender documents sent to potential contractors contain all the relevant operating procedures that the contractor will have to adhere to in order to complete the work for which the tender is being given. Once the tender is accepted and signed by the contractor, the contractor is then legally bound to adhere to these operating procedures.
- d. It is the Project Geologist's responsibility to ensure that the contractor adheres to the operating procedures.
- e. Contractors and casual labour will undergo an induction which will cover the following:
  - Basic explanation of SHE and EMS approach
  - ECOHS policy commitment and requirements
  - Basic legal requirements
  - Sections 4.3 – 4.10 of this procedure as applicable to their responsibilities
  - Related procedures if relevant to their responsibilities
  - Conditions of employment and UIF matters
  - Occupational health screening
  - Possible security check

## **5.2 Water use, other DWAF PERMITS and other legal requirements**

### **5.2.1 Riparian areas**

If prospecting is to take place within a riparian area the relevant application form (DW781/DW775 supplemental must be completed and handed in to DWAF for approval prior to the commencement of activities in these areas, even if no water is being taken from the resource for use in the project.

Proof that the forms were submitted to DWAF and copies of the forms submitted must be kept.

### **5.2.2 Water supply**

It must never be assumed that water for prospecting will be obtained from the site unless discussions with the landowner indicate that he/she has sufficient and is happy to supply from their source. A local bulk water supplier, authorised to issue water will be approached to ascertain if the required volume of water would be available. A reply from this body is to be attached to the application when it is submitted to DWAF, if required. Copies of the reply from the relevant authority and the application forms submitted to DWAF must be kept.

In terms of the Standard Industrial Classification of All Economic Activities (5<sup>th</sup> Edition), published by the Central Statistics Service, 1993 as amended and supplemented, "small industrial users" means water users who qualify as work creating enterprises that do not use more than twenty cubic metres per day and there are the following categories:-

- (a) 1: food processing
- (b) 2: prospecting, mining and quarrying
- (c) 3: manufacturing
- (d) 4: construction

Even if it is not anticipated that a permit will be required as the water would be obtained from a bulk water services provider, the permit application to DWAF (forms DW758, DW760 and DW788), giving all details of the project, will be available if required.

### **5.2.3 Removal of Vegetation (Limpopo Province)**

In the Limpopo Province, (Limpopo Department of Economic Development, Environment and Tourism) LEDET will be approached for the permit in terms of LEMA for the removal of indigenous vegetation during the course of prospecting.

#### **5.2.4 Cultural and historical sites**

Confirmation from the South African Heritage Resources Agency (SAHRA) that no items of cultural or historical significance have been identified on the site is necessary if major disturbances (extensive trenching, bulk sample pits, large diameter drilling) are planned, as per the National Heritage Resources Act. This requires a Phase 1 Heritage Impact Assessment to be carried out by a registered archaeologist.

Staff and contractors must be briefed on the following course of action if any artefacts or structures or remains of buildings are encountered during the course of their prospecting work:

- Stop work in the vicinity of the discovery and report to the Project Geologist.
- If the Project Geologist cannot be sure that the structure is modern (< 50 years old) then the Senior Project Manager must be contacted to organise a Phase 2 Heritage Impact Assessment.
- The outcome of this assessment will determine whether and how prospecting may proceed in the vicinity of the discovery.

#### **5.2.5 Availability of documentation**

A copy of the signed prospecting right and approved EM Plan is to be kept in the field project office.

### **5.3 BEHAVIOUR ON PROSPECTING RIGHTS**

- a. Cigarette butts should be well extinguished and placed in a rubbish bag and disposed of at the waste disposal site. No smoking will be allowed in high risk fire areas during the dry season.
- b. The following are prohibited at sites:
  - Littering
  - Horseplay
  - Lighting of fires



- c. All De Beers employees are expected to conduct themselves in a manner that projects our values and to impart this behaviour onto contractors and casuals.

#### **5.4 SANITATION FACILITIES**

- a. A portable toilet will be provided at drilling or mechanised pitting sites.
- b. Environmentally friendly agents will be used in the toilets to biodegrade the contents.
- c. The toilet contents will be disposed of at a registered water treatment works / sewerage works.
- d. A copy of the registration of the treatment works / sewerage works should be obtained, if possible.
- e. The toilet will be maintained so that it remains in an acceptable condition.

#### **5.5 Waste management on prospecting sites**

- a. Hazardous waste will be kept separate from general waste.
- b. There will be appropriate receptacles with lids at convenient places for each of these.
- c. Containers and spades will be available to collect and store any soil contaminated with hydrocarbons.
- d. No waste will be disposed of on-site and no littering is allowed.
- e. Before taking waste to the nearest municipal landfill a copy of the license issued by the Department of Environmental Affairs and Forestry should be asked for and kept on file.
- f. General waste will be removed from the site on a weekly basis and disposed of at an authorised disposal site.
- g. Hazardous waste will be removed from the site on a daily basis and placed in a safe place; precautions should be taken to avoid any additional spillage when stored, until it can be disposed of at a licensed hazardous waste site.
- h. Records will be kept of the disposal of all hazardous waste.

## 5.6 Access to site and Track / path construction

- a. The landowner must be consulted in order to gain access to the site.
- b. As far as possible existing tracks and roads shall be used.
- c. In cases where off-road driving is unavoidable, the shortest possible route will be taken (unless it is a steep slope in which case a zig-zag will be optimal) and the effects to vegetation will be minimised by sticking to fence lines as far as possible, trimming trees and bushes only where necessary and only removing bushes and small trees (<3m) if absolutely necessary.
- d. Off-road access by this means will be for short periods only (< 3 months).
- e. Off-road access will be restricted to a single track.
- f. The landowner will be consulted as to the position of the off-road route.
- g. The route will be demarcated (use rocks or stones along the edge if possible) and there will be no driving outside this footprint so as to prevent the disturbed area from getting any wider.
- h. If a footpath is made, it will be demarcated in the same way such that the footprint cannot be increased.
- i. If the track traverses an area where it is known there are red data species, the route will be checked with a botanist prior to being confirmed.
- j. If the area is very steep a slope stability test will be conducted prior to the track being established.
- k. If the track is such that traversing it is likely to cause erosion, consideration will be given to cementing two strips, making use of water breaks and mitre drains to take the water off the road, reduce velocity of water and silt traps to allow sediment to settle out before the water flows into an area where there is least chance of erosion or damage to a wetland. The cement will be removed during rehabilitation, unless landowners request that it be left in place.
- l. In very steep areas or where the habitat is very sensitive or prone to erosion, the services of an appropriate engineer will be used to design and build the track.
- m. Any rocks or stones removed will be stored for replacement during rehabilitation, as will any topsoil if it necessary to remove any soil.

- n. The open or closed status of gates shall be clarified with the landowner/tenant and maintained throughout the prospecting period.
- o. Reasonable speeds must be observed to avoid accidents, excessive noise, dust and injury to livestock.
- p. Tracks should not be used during very wet weather as the impact of compaction and chances of incidents and accidents and impacts on the environment will be much higher.
- q. For rehabilitation of tracks and footpaths – See Rehabilitation procedure EXP-PR-06.

## **5.7 WALKING IN THE FIELD**

- a. Plan the walk and consider location, degree of difficulty, environmental sensitivity of the site and duration of the walk.
- b. Walkers should ensure they have appropriate navigational equipment e.g. GPS maps and compass.
- c. Avoid where possible hazards such as cliff edges, slippery tracks, rocks, dangerous trees, extreme weather and be informed on the nature of the terrain to be travelled over.
- d. Water/Clothing/Equipment – walkers should ensure they carry adequate water, dress appropriately and wear suitable hiking footwear.
- e. Be aware of the following risks while walking in the field:
  - Dehydration, sunburn and sun/heat stroke
  - Shock arising from injury
  - Ankle sprain
  - Bone fracture
  - Symptoms suggesting the onset of hypothermia
  - Asphyxiation and smoke inhalation
  - Burns
  - Snake bites
  - Smoke and foreign matter in eyes
- f. Supervisors of teams walking should be trained in first aid to cope with the above risks.

- g. Bush Walkers code – aim for minimal impact bush walking. Take only photographs and leave only footprints!
- h. Additional equipment to be carried in a hands free back pack: sun hat and sunscreen (essential, even in winter). The following additional equipment items may also be considered: a lighter or waterproof matches, penknife, identification, money, survival bag/blanket, spare boot laces, gaiters, mobile phone, sun glasses, whistle, torch and warm top.
- i. Observe - Each member of the group should keep in sight the walkers immediately ahead and behind to reduce the risk of the group becoming split.
- j. Do not rely on others for your welfare. Bring the correct equipment, clothing, food and water so that you are fully prepared.
- k. Be careful – avoid walking alone into unknown terrain.

### **5.8 Vehicles, Equipment, Fuels and oils**

- a. It is the duty of each driver to perform a daily and weekly pre-start check on his/her vehicle to ensure that the all components of the vehicle are in a good state of repair and that it has no oil or hydraulic leaks which may causes damage to our environment if it leaks onto the ground. These checks are documented
- b. It is not planned to do any maintenance of vehicles on prospecting sites. Only emergencies will receive attention.
- c. Other equipment used in the prospecting process must also be adequately maintained to minimise spillage of fuel and oils during operations which cause pollution of the environment.
- d. Drip trays will be used to collect oils and fluids from any emergency on-site servicing and repair of machinery and vehicles. Drip trays or PVC sheeting will be placed under any machinery on site that has the potential to develop an oil leak. All oil containers kept on site must be kept in drip trays.
- e. The contents of drip pans / PVC linings must be soaked up with oil biodegrading loose fibre and disposed of at a registered hazardous waste facility (e.g. Interwaste).

- f. Any spill onto the ground should be cleaned up immediately by removing the spill together with the polluted soil and disposed of at a register hazardous waste facility (e.g. Interwaste).
- g. Waste disposal must be done according to 4.5 above.
- h. A spill kit with all items up to date must be kept on site at all times. The content of the spill kits should be checked regularly.
- i. Ensure all heavy items are raised off the ground to limit compaction where practicable.
- j. Preparation and procedure in the event of fire is covered under the Emergency Preparedness and Response Procedure (EXP-PR-05).
- k. A log book is kept for each vehicle.
- l. The amount of fuel used and kilometres travelled per month are calculated from the log book.
- m. These are forwarded to the Senior Project Manager who checks the consumption of fuel against kilometres travelled. This highlights problems of excessive fuel usage.
- n. Should there be a problem; vehicles are sent in for maintenance by outside contractors, as is the case with routine preventative maintenance.
- o. Old tyres are retained by the suppliers for retreating or disposal.
- p. Battery servicing should be done by outside contractors; De Beers' staff should only top up distilled water to the indicated level.
- q. Battery charging, if required, will be done in a well-ventilated area, with a drip tray underneath the battery.
- r. If the battery does not take a charge due to damaged cells a replacement battery will be obtained on an exchange basis from outside contractors.

## **5.9 SOIL AND STREAM SAMPLING**

- a. Soil sampling entails the collection of the top 1- 30 cm of soil from an area not exceeding 10 m<sup>2</sup> in total at each site. Sites are usually located in a grid pattern.
- b. Soil sample sites must be rehabilitated by re-covering the site with cleared debris and vegetation.

- c. Stream sampling entails the collection of 30 – 210 litres of material from a heavy mineral trap site within a stream.
- d. Stream sample sites must be refilled with oversize material (pebbles, cobbles and boulders) so as to minimise the potential for erosion.

#### **5.10 GEOPHYSICAL SURVEYS**

- a. Ground geophysical surveys usually require operators of geophysical instruments to walk along straight lines collecting data.
- b. Line cutting shall be limited to the trimming of branches and undergrowth; no cutting down of trees or large bushes is permitted.
- c. Some surveys require the marking of positions along each survey line; this is done by using biodegradable flagging tape. Occasionally wooden stakes are used to mark the ends of lines; these should be removed on completion
- d. Occasionally, a permanent marker will be required to mark the position of a survey for future reference. A steel fence dropper, cemented to the ground if required, will be used for this purpose. The position of the permanent marker will be cleared with the landowner.

#### **5.11 Drilling**

See EXP-PR-03\_Drilling Procedure and EXP-PR-06\_Rehabilitation Procedure

#### **5.12 PITTING AND TRENCHING**

See EXP-PR-04\_Pitting Procedure and EXP-PR-06\_Rehabilitation Procedure.

#### **5.13 MONITORING AND REPORTING**

- a. It is the Project Geologist's responsibility to maintain ongoing monitoring of significant impact sites (drilling, trenching and pitting) in his area of responsibility.
- b. This will involve before, during and after photographing of drilling and excavation sites from set perspectives (see EXP-PR-03, 04 & -06). "After"

photographing will take place as close as possible to six monthly intervals commencing after the completion of activity at the site.

- c. If any invasive plants are observed on sites disturbed by De Beers for the purposes of prospecting, they must be removed according to the agreed method (see EXP-PR-06).
- d. If any signs of erosion on prospecting sites or prospecting tracks are noted, action must be taken immediately to correct this.
- e. If rehabilitation is not proceeding according to plan, a relevant competent person must be consulted as to what action should be taken.
- f. This will continue until the site is considered to have returned as close as possible to its natural state or until a closure permit has been granted.
- g. The Project Geologist will include a report on environmental compliance in the project report after major activities such as drilling or trenching.
- h. This should include photographs and written descriptions of all significant impact sites currently under observation, i.e. drill and trench sites.
- i. If water quality is monitored, the accurate location of monitoring points must be recorded and the samples must be collected in bottles, with the site identified on these (sterile bottles if for bacteriological analysis). All samples must be kept cool (fridge and coolbox) and must be delivered to the registered laboratory for testing within 24 hours of collecting. Results must be checked against the limits for compliance and action taken if there are non-conformances. This information can be incorporated in the closure report when the Prospecting Right is relinquished.
- j. An internal EMS audit will be conducted annually and the external audit could include one or a number of field sites. These audits will check compliance with the EM Plan.
- k. DME do ad hoc inspections to check compliance with the EM Plan.
- l. The Project Geologist must monitor and report as required by regulation 55 of the Minerals and Petroleum Resources Development Act.

## **6 Non-Conformances**

Failure to comply with this procedure will be viewed as a non-conformance and should be reported on the Incident Reporting System on Isometrix.

## 7 RECORDS

Original paper records relating to the prospecting rights (as legal entities) are kept in Kimberley, with copies in the field file. Other paper records should be kept in the prospecting right field file and scanned copies should be stored under the relevant folder on the RSA Exploration server

The following records should be kept:

Records	Where	Responsibility	Retention Time
Copy of signed prospecting right and approved EMPlan	Original in Kimberley Copy in field file.	DBCM Mining Titles Project Geologist	Indefinite Until closure obtained
Record of observations of any signs of erosion on prospecting sites or caused directly by prospecting activities and the action taken.	Original in Kimberley Copy in field file.	DBCM Mining Titles Project Geologist	Indefinite Until closure obtained
Record of water monitoring points.	Original in Kimberley Copy in field file.	DBCM Mining Titles Project Geologist	Indefinite Until closure obtained
Record of water quality results and checks for compliance.	Original in Kimberley Copy in field file.	DBCM Mining Titles Project Geologist	Indefinite Until closure obtained
Hazardous waste disposal.	Field file	Project Geologist	Until closure obtained
Register of hazardous	Field file	Project Geologist	Until closure



substances on site.			obtained
Project reports	Field file EDMS	Project Geologist	Indefinite
Audits reports – internal, external and DME.	Field file	Project Geologist	Until closure obtained
Annual report to DME on performance assessment and EM Plan compliance.	Original in Kimberley Copy in field file. Digitally on server	DBCM Mining Titles Project Geologist DBCM Mining Titles	Indefinite Until closure obtained Indefinite
The closure report when the Prospecting Right is relinquished.	Original in Kimberley Copy in field file. Digitally on server	DBCM Mining Titles Project Geologist DBCM Mining Titles	Indefinite Until closure obtained Indefinite
The closure permit once obtained.	Original in Kimberley Digitally on server	DBCM Mining Titles	Indefinite
Induction / training records of staff, contractors and casual workers	Field file	Project Geologist	Until closure obtained
Response from local bulk water supplier authorised to issue water, if applicable	Original in Kimberley Copy in field file.	DBCM Mining Titles Project Geologist	Indefinite Until closure obtained
Copy of permit application to DWAF for water use, if applicable.	Original in Kimberley Copy in field file.	DBCM Mining Titles Project Geologist	Indefinite Until closure obtained

Permit from LEDET in terms of LEMA for the removal of indigenous vegetation, if applicable	Original in Kimberley Copy in field file.	DBCM Mining Titles Project Geologist	Indefinite Until closure obtained
Confirmation from SAHRA that no items of cultural or historical significance have been identified on site, if required	Original in Kimberley Copy in field file.	DBCM Mining Titles Project Geologist	Indefinite Until closure obtained
Copy of registration / permit of approved facility for disposal of contents of portable toilets	Field file	Project Geologist	Until closure obtained
Copy of waste landfill permit / license	Field file	Project Geologist	Until closure obtained
Record of slope stability test, when required	Field file	Project Geologist	Until closure obtained
Vehicle log books	Vehicle files RSA Exp office	Senior Project Manager	1 year?
Vehicle service records	Vehicle files RSA Exp office	Senior Project Manager	Until disposal of vehicle (at least 1 year)
Spill kit checks	Field file	Project Geologist	Until closure obtained
SHE incident / non-conformances	Isometrix	Responsible Persons	Indefinitely on Isometrix

## **8 REVIEW AND CHANGE**


- This procedure is to be reviewed every two years by the Responsible Person for that area with input from the ECOHS section.
- The control of all departmental/site specific safety, health and environmental documentation is the responsibility of the Responsible Person for that area.

## **9 Definitions**

### **Riparian Areas**

As per the National Water Act (36 of 1998), these include the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas.

## Appendix III: Rehabilitation Procedure

<b>De Beers Group Exploration RSA Based Operations</b> <b>RSA Exploration</b>		
<b>To Ensure Appropriate Rehabilitation of all Prospecting Activities and Minimise any Residual Impacts.</b>		
<b>EXP-PR-06_Rehabilitation</b>		

## 10 SCOPE AND PURPOSE

The purpose of this procedure is as follows:

- To implement and maintain procedures to manage potential significant impacts / significant impacts related to appropriate rehabilitation of all prospecting activities.
- This procedure includes removal of invasive alien species from sites significantly disturbed by De Beers for prospecting purposes (newly created access roads, large diameter drilling and mechanised excavation).

## 11 RESPONSIBILITIES

- Senior Project Manager
- Senior Project Geologist
- Project Manager
- Geologists
- Drilling and Mechanised Pitting Contractors
- Staff and Casual Workers
- All employees are obliged to report safety, health and environmental incidents or non-conformances on the incident reporting system available on Isometrix or report it to the Project Geologist.

## 12 RELATED DOCUMENTS

- SANS ISO 14001:2004 - Clause 4.4.6: Operational Control
- OHSAS 18001:2007 - Clause 4.4.6: Operational Control
- GE RSA ECOHS Policy
- GE RSA Legal Register, including other requirements
- Guideline DME Ref. No. DME 16/3/2/1 - A2 issued by the Chief Inspector of Mines – deals with flammable gas.
- EXP-PR-02\_The Implementation of Operating Procedures During Prospecting
- EXP-PR-03\_To Manage Significant Impacts Related to Exploration Drilling Including Mandatory Code of Practice for the Prevention of Flammable Gas Explosions in Mines Other Than Coal Mines
- EXP-PR-04\_To Manage Significant Impacts Related to Exploration Pitting
- EXP-PR-05\_Emergency Preparedness and Response Procedure
- MSDS for Eco-T (microbe - ensuring successful rehabilitation of prospecting sites) and copy of registration.

## 13 Legal Requirements

## 14 PROCEDURE

### 14.1 MANUAL PITTING

- Backfill pit using subsoil first and ending with topsoil, all of which has been stored on tarpaulins (see procedure EXP-PR-04). The final surface should resemble pre-pitting form as much as possible.
- Replace all sticks, stones, rocks, logs etc. which had been removed and stored over the site to hold soil down, serve to collect windblown soil and seeds, help retain moisture and create microhabitats for plants and fauna.
- If quartz or other light coloured pebbles were collected separately (in arid areas), these must be scattered evenly over the area – causing heat to be reflected and thus cooling the surface, creating microhabitats.

- Determine if slope warrants placing berms over pit site on the contour so as to reduce velocity of rainwater halt soil movement and minimise chances of erosion.
- If it does ensure these are placed and anchored as firmly as possible and that gaps below branches are filled with smaller twigs or stones.
- If vegetation was removed and stored, scatter this over the pit site as a mulch to hold soil and seeds, and help prevent erosion.
- Check with project geologist if a) seeding is to be done and if b) Eco-T is to be used. If so follow the steps in 4.5.
- Remove all tarpaulins from the site.
- Photograph the pit; file information with date and note when first monitoring is due.

#### **14.2 MECHANISED PITTING**

- If fill for the pits (rock) is brought in to replace samples taken from the pit, it must be brought in on the trucks that come to collect the sample bags in order to reduce the number of trips to the site.
- Fill must be sourced from the nearest registered facility.
- It must be ensured that no parts or seed of invasive alien plant species are included in the fill brought to the site.
- Place fill in pit, replace stored subsoil (see procedure EXP-PR-04)
- Depending on surrounding rock or soil, compress soil to compact it so that increased porosity of the fill will not result in accumulation of water which could lead to erosion when it decants.
- Replace topsoil, restoring land form as close as possible to original form.
- Tamp down gently, but leave slightly domed to allow for subsidence.
- If any soil (e.g. around the edge of the pit) has been severely compacted, it must be loosened / scarified to allow water and seed penetration. If the slope is very steep the advice of a competent person must be obtained on rehabilitation measures, so as to ensure minimal chance of erosion.

- Replace all sticks, stones, rocks, logs etc. which had been stored, over the site to hold soil down, catch windblown soil and seeds, help retain moisture and create microhabitats for plants and fauna.
- If quartz or other light coloured pebbles were collected separately (in arid areas), these must be scattered evenly over the area – causing heat to be reflected and thus cooling the surface, creating microhabitats.
- If vegetation was removed and stored, scatter this over the pit site as a mulch to hold soil and seeds, and help prevent erosion.
- Determine if slope warrants placing berms over pit site on the contour so as to reduce velocity of rainwater halt soil movement and minimise chances of erosion.
- If it does ensure these are placed and anchored as firmly as possible and that gaps below branches are filled with smaller twigs or stones.
- Check with project geologist if a) seeding is to be done and if b) Eco-T is to be used. If so follow the steps in 4.5.
- All equipment, fencing, fuel etc. must be removed from site.
- All waste must be removed from site and disposed of at the appropriately licenced facilities.
- Portable toilets must be removed and the contents disposed of at an approved facility.
- Remove all tarpaulins from the site.
- Photograph the pit and file information with date and note when first monitoring is due.

### **14.3 SMALL AND LARGE DIAMETER DRILLING**

- Any drill holes which have intersected water are to be left open at the request of the landowner, may only be left open if the landowner takes responsibility for completion of the necessary forms and lodging these with DWAF in order to obtain their approval.
- These will be capped as described in the drilling procedure.
- The areas around the hole will be cleared of all drilling chips.

- Drill holes not be used in the future are to be grouted with bentonite as described in the drilling procedure (EXP-PR-03) so as to reduce the possibility of the formation of any acid leachate and the possibility of the transfer of any pollutants to ground water, where this has been identified as a concern.
- Other drill holes must be closed as per the drilling procedure.
- Remove the lining of the sump.
- Fill the sump with the material originally moved to make the excavation, and which has been stored on a tarpaulin.
- Restore profile of site to fit in with adjacent ground.
- Loosen compacted ground.
- Replace any topsoil that has been removed.
- Replace stored rocks and stones evenly over site to prevent wind and water erosion, trap seeds and aid water retention.
- If quartz or other light coloured pebbles were collected separately (in arid areas), these must be scattered evenly over the area – causing heat to be reflected and thus cooling the surface, creating microhabitats.
- If any soil on the site has been severely compacted, it must be loosened /scarified to allow water and seed penetration. If the gradient is steep, this loosening / scarifying should be done in bands on the contour, leaving some undisturbed sections between the loosened sections.
- If the slope is very steep the advice of a competent person must be obtained regarding rehabilitation measures so as to ensure minimal chance of erosion.
- Determine if the gradient requires berms to be constructed across the site from natural materials (stones, rocks, branches) to reduce the velocity of rain water and catch soil and reduce the chances of erosion.
- If vegetation was removed and stored, scatter this over the pit site as a mulch to hold soil and seeds, and help prevent erosion.
- Check with project geologist if a) seeding is to be done and if b) Eco-T is to be used. If so follow the steps in 4.5.
- All equipment, fencing, fuel etc. must be removed from site.



- All waste must be removed from site and disposed of at the appropriately licenced facility.
- Portable toilets must be removed and the contents disposed of at an approved facility.
- All tarpaulins must be removed from the site.
- Photograph the pit; file information with date and note when first monitoring is due.

#### **14.4 REHABILITATION OF FOOTPATHS, ROADS AND TRACKS**

- Ensure all equipment, fuel, waste, tarpaulins etc. have been removed from site.
- Place a natural barrier at the junction to the footpath/track/road being rehabilitated e.g. rocks to prevent further access.
- Remove any cemented strips on steep / loose slopes but create contour barriers in their place.
- Loosen compacted soil on tracks when track not needed again.
- If on a slope, reduce potential water erosion with contour barriers
- Check with project geologist if a) seeding is to be done and if b) Eco-T is to be used. If so follow the steps in 4.5.
- Photograph rehabilitated footpath, track / road and update record.

#### **14.5 USE OF ECO-T IN REHABILITATION OF DRILL AND PIT SITES AND OF PATHS / TRACKS.**

##### **14.5.1 General**

- The use of a microbe called Eco-T can be beneficial in ensuring successful rehabilitation of prospecting sites. Eco-T will control root diseases, increase root side shoots and root hairs and also enhance plant growth. This effect is particularly noticeable under stress conditions. Eco-T is tried and tested and works well. It will help the seeds get established slightly faster and help the young seedlings handle any stresses such as drought (by a stronger root system).

- Eco-T must be stored in cool conditions preferably in the fridge. It has a shelf life of 6 months.
- When taken into the field it should be taken in a coolbox, and should **NOT** be left standing in the sun.
- Eco-T may be used as a drench or a seed treatment.
- The optimum time to apply seed and microbes would be between October and December which is after the first rains and during the active growing season. If rehabilitation is done outside this time, seeding and the use of Eco-T should be postponed and done during the first monitoring period which falls between October to December.
- Discuss with botanist as to which seeds should be used for re-seeding.

#### **14.5.2 As a Drench:**

- Read General (4.5.1) above.
- Mix 1 heaped teaspoon (5g) of Eco-T in 20 litres of water.
  - a. Manual pit:
    - Apply 10 litres of mixture over 1 manual pit area (9m<sup>2</sup>) using 5 / 10 litre watering can.
  - b. Small diameter drill site:
    - Use 3 to 4 x 20 litre mixes per 64m<sup>2</sup> site using 5 / 10 litre watering can.
  - c. Footpath:
    - 1 x 20 litre of drench mixture will do about 20m of a 1m wide path; double or triple the mixture for a vehicle track depending on width.
  - d. Large Diameter Drill Site or Mechanised Pit Site:
    - A water cart filled with 700 litres of water to which 1 cup (175g) Eco-T is added will be adequate for a large diameter drill site or a mechanised pit site.( 625-750m<sup>2</sup>)
    - Use spray attachment and wet site as evenly as possible.
    - Photograph the site and update records.

### 14.5.3 As a Seed Treatment:

- Read General (4.5.1) above
  - a. Manual Pit :
    - Apply one heaped teaspoon (5g) of Eco-T to 1kg mixed seed in a plastic bag.
    - Shake the bag to allow the Eco-T to stick to the seed.
    - Carefully remove any stones, rocks or logs on the site and place to one side.
    - Scatter 27g seed over disturbed ground of 1 manual pit as evenly as possible. Rake it over with a small rake or a branch with leaves on it to get some soil over the seed.
    - Replace the stones, rocks and logs.
    - Photograph the site and update records.
    - 1 kg treated seed will be sufficient for 37 manual pits.
  - b. Small diameter drill Site (64m<sup>2</sup>) : Use 200g treated seed per site.
  - c. Large Diameter Drill Site or Mechanised Pit Site (625 – 750m<sup>2</sup>): Use 2 kg treated seed per site.

## 14.6 INVASIVE SPECIES CONTROL

- Newly created access roads, large diameter drilling and/or mechanised excavation sites will be monitored 12 monthly after rehabilitation, until prospecting right closure is obtained, to check for the appearance of invasive alien species.
  - Any species present will be recorded and photographed.
  - Some of the more common species likely to be encountered are *Acacia dealbata* & *mearnsii* (Black & Silver Wattle), *Pinus* species, *Eucalyptus* species, *Solanum mauritianum* (Bugweed), *Cestrum* (Inkberry)
- Control of species should be as follows:

<b>Species</b>	<b>Below Knee High</b>	<b>Waist High</b>	<b>Tall</b>
Pines	Pull out, tramp flat with feet.	Slash / ringbark or use tree popper depending on situation.	
Gums	Hand pull if possible	Cut down/slash and paint stem stump with recommended herbicide.	
Bugweed	Hand pull	Cut down /slash and paint stem stump with recommended herbicide.	Cut down and paint with recommended herbicide.
Inkberry (Cestrum)	Hand pull	Slash and Paint stem stump with recommended herbicide.	Cut down and paint stem stump with recommended herbicide.
Wattles	Hand pull if possible	Spray seedlings with recommended herbicide.	

- Other species present will be identified and the appropriate control determined, with input from a person competent in invasive alien plant control. Concentrations of herbicide for control of each species and the need for wetting agents will be established.
- Training will be done for the persons who will undertake this work. This will include health and safety and environmental measures.
- The specific methods and products used will be updated / amended if this is in the interests of the environment and reaching the desired goal.
- If herbicide is taken into the field, it must be taken in a basin (drip tray) and will be painted onto the species.
- Brush and basin must be rinsed out where water goes into a French drain and not into a stream or wetland.
- There are restrictions on using herbicides near wetlands and waterways.
- Any spillage of herbicide must be collected up and taken back to be disposed of at recognised facility as hazardous waste.

- Only registered herbicides should be used and herbicide concentrations must be followed carefully.
- Herbicides must be stored where access is restricted and where containers cannot be damaged to cause spilling of contents.
- A register must be kept to account for use of herbicides.
- Clean water must be used to ensure good uptake of herbicides.
- Careful records must be kept of areas treated, chemicals or other methods used, dates of operations, quantities, and monitoring of these areas following treatment.

## **15 MONITORING**

- Monitoring will be done every 6 months to take a photographic record, to check for signs of erosion, progress in rehabilitation and to see if the invasive plants have come onto the site.
- Following discussions with the landowners, consideration could be given to a co-operative monitoring and treatment of an area larger than just the prospecting sites, for the presence and treatment of invasive species.
- Invasive plants will be removed, cut down or treated with the appropriate herbicide.
- Pioneer species on prospecting sites will also be cut down to give the grasses an increased chance and in this way hasten the progress of succession, if so advised by a botanist.
- Appropriate action will be taken to correct any signs of erosion.
- In cases where potential impacts on water quality are a major concern, monitoring of water quality will be undertaken. A number of sites will be monitored to get baseline information. Thereafter appropriate sites will be selected and will be monitored six monthly until closure.
- Analyses will be compared with limits and action taken where necessary.
- Records of monitoring will be filed and used in the annual report to DME.

## 16 Closure and Landowner Letter

- When sites have reached a satisfactory level of rehabilitation according to the set goals (F.4.1 & F.4.2 in EM Plan) and future use of the land, sites are inspected by DME prior to approval for closure of the permit being granted.
- Prior to closure being applied for, a final performance assessment and an environmental risk assessment will be carried out and submitted to DME together with the closure application.
- If any post closure maintenance is necessary, this will be documented and arrangements made for the responsible person to continue with and report on this according to F5.3 below.
- Consideration will be given to discussing certain post closure monitoring with the landowner, and if agreement can be reached, environmental responsibility will be transferred to the landowner to continue with some monitoring such as invasive alien species, and the control of these
- Approach landowners to sign the closure letter.

## 17 Non-Conformances

Failure to comply with this procedure will be viewed as a non-conformance and should be reported on the Incident Reporting System on [Isometrix](#).

## 18 RECORDS

Most original paper records should be kept in the prospecting right field file and scanned copies should be stored under the relevant folder on the RSA Exploration server

The following records should be kept:

Records	Where	Responsibility	Retention Time
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Photographic records of each site after rehabilitation and updated after each 6 monthly monitoring until closure.	Field file On server (digitally)	Project Geologist	Until closure obtained Indefinitely
Rehabilitation monitoring.	Field file On server (digitally)	Project Geologist	Until closure obtained Indefinitely
Erosion monitoring.	Field file On server (digitally)	Project Geologist	Until closure obtained Indefinitely
Invasive alien plant control.	Field file On server (digitally)	Project Geologist	Until closure obtained Indefinitely
Training records of the person removing alien vegetation.	Field file	Project Geologist	Until closure obtained
When Eco-T should be applied to sites.	Field file	Project Geologist	Until closure obtained
When Eco-T was applied to sites.	Field file	Project Geologist	Until closure obtained
Water quality monitoring.	Field file	Project Geologist	Until closure obtained
Hazardous waste disposal records.	Field file	Project Geologist	Until closure obtained
Closure letter from land owner	Kimberley Copy in Field file	DBCM Mining Titles Project Geologist	Indefinite Until closure obtained
Copy of registration of facility where fill (rock) is sourced	Field file	Project Geologist	Until closure obtained
Copy of waste landfill permit	Field file	Project Geologist	Until closure


/ license			obtained
Copy of registration / permit of approved facility for disposal of contents of portable toilets	Field file	Project Geologist	Until closure obtained
Copy of Eco-T registration.	Field file	Project Geologist	Until closure obtained
MSDS of Eco-T	Field file	Project Geologist	Until closure obtained
Register for the use of herbicides.	Field file	Project Geologist	Until closure obtained
Records of areas treated chemicals or other methods used, dates of operations, quantities, and monitoring of these areas following treatment.	Field file On server (digitally)	Project Geologist	Until closure obtained Indefinitely
SHE incident / non-conformances	Isometrix	Responsible Persons	Indefinitely on Isometrix

## 19 REVIEW AND CHANGE

- This procedure is to be reviewed every two years by the Responsible Person for that area with input from the ECOHS section.
- The control of all departmental/site specific safety, health and environmental documentation is the responsibility of the Responsible Person for that area.



Appendix IV: Pitting procedures.

<b>De Beers Group Exploration RSA Based Operations</b>		
<b>RSA Exploration</b>		
<b>To Manage Significant Impacts Related to Exploration Pitting</b>		
<b>EXP-PR-04_Pitting</b>	Page 73 of 6	

## 1. SCOPE AND PURPOSE

The purpose of this procedure is as follows:

- To implement and maintain environmental procedures / safe working procedures to manage potential significant / significant impacts related to exploration pitting. This includes site preparation, manual pitting and mechanised pitting/trenching.

## 2. RESPONSIBILITIES

- Senior Project Manager
- Senior Project Geologist
- Project Manager
- Geologists
- Contractors
- All employees are obliged to report environmental incidents or non-conformances on the incident reporting system available on Isometrix or report it to the Project Geologist.

## 3 RELATED DOCUMENTS

- SANS ISO 14001:2004 - Clause 4.4.6: Operational Control
- OHSAS 18001:2007 - Clause 4.4.6: Operational Control
- GE RSA ECOHS Policy
- GE RSA Legal Register, including other requirements
- EXP-PR-02\_The Implementation of Operating Procedures During Prospecting

- EXP-PR-05\_Emergency Preparedness and Response Procedure
- EXP-PR-06\_To Ensure Appropriate Rehabilitation of all Prospecting Activities and Minimise any Residual Impacts.

#### 4 LEGAL REQUIREMENTS

- MHSA: Mine Health and Safety Act
- MPRDA: Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002), specifically Section 29 and Regulation 52 (EMPlans)
- NEMA: National Environmental Management Act
- OHSAct: Occupational Health and Safety Act
- ECA: Environment Conservation Act
- NEM: Waste Act
- National Environmental Management: Air Quality Act
- APPA: Atmospheric Pollution Prevention Act
- NWA: National Water Act

#### 5 PROCEDURE

Exploration pitting has been identified as an aspect which has the potential of causing a significant impact on the environment. Potential significant impacts associated with this aspect are:

- Potential impact on soil and vegetation from disruption of natural topsoil boundary and impact on soil structure, causing a decline in threatened or protected species and disruption of the integrity of the ecosystem.
- Potential compaction of soil which also impacts on structure and reduces the ability of the soil to support plant growth.
- Potential for contributing to subsidence if doing mechanised pitting on steep slope, with possible resulting scar on landscape.

- Potential erosion from track / footpath to site or from site itself, if inadequate care is taken in preparation, implementation of anti-erosion measures and rehabilitation of both site and tracks / footpath on a steep slope.
- Removal of indigenous vegetation could lead to the opening of niches which could act as nuclei from where invasive species could spread into the surrounding indigenous vegetation.
- Potential impact on fauna caused by alteration in habitat, human activity, vibrations impacting on communication of insects, dust impacting on plants and the animals that feed on these plants.

## 5.1 MANUAL PITTING

### 5.1.1 Access and siting:

- a) In areas containing red data plant species, the planned pitting locations will be checked in the field by the project geologist together with a botanist; any planned locations adjusted if necessary and then confirmed.
- b) Where pitting is necessary in thickly vegetated area, tree cutting is limited to small trees (< 3m height) only.
- c) Vehicular movement will be confined to existing roads as much as possible. No fences will be cut without the permission of the surface owner.
- d) The vehicle must be left on the nearest existing road / track and the workers must proceed on foot to the manual pit.
- e) Use 3-point turns when turning around in the field, not large turning circles.

### 5.1.2 Preparation and excavation:

- a) The pit site must be photographed before sampling starts, after rehabilitation is complete and then every six months or as near to this as possible. Records must be filed.

- b) Ensure all appropriate PPE is worn during excavation.
- c) Ensure adequate training and induction of all casual labour. Prior to a worker beginning excavation work, the employer must instruct each worker in proper work procedures, both in terms of safety and environmental matters.
- d) Ensure an effective system of supervision is in place. This is to ensure the required work procedures are followed.
- e) The footprint area must be carefully demarcated so that it is not exceeded during sampling activities.
- f) Any vegetation, stones, rocks or logs on the pit site must be removed and stored nearby for re-use.
- g) In arid areas, remove all plus centimetre size quartz or other light coloured float, if present, and store in a drum.
- h) Top soil must be removed and stored on a tarpaulin/plastic sheet, not directly on the adjacent vegetation or soil.
- i) Subsoil should be stored separately, also on a tarpaulin, upslope of the pit so as to divert rain water around the pit. Piles will not exceed 2m in height.
- j) The stored topsoil and subsoil should be covered with a tarpaulin so as to prevent wash during rainstorms if the pit is to be left open and unattended.
- k) In both manual and mechanised pitting, the samples must be placed directly into sample bags and not placed on the surrounding vegetation or soil at all.
- l) Fence off the pit to keep people and large animals out if it is going to be left open for the night, and put up warning signs.
- m) On steep slopes, if the pit is going to be left open for the night, shade netting should be attached to metal stakes on the downslope side of the pit to prevent erosion from sudden storms filling the pit and causing runoff.
- n) Rehabilitation must be done according to the rehabilitation procedure EXP-PR-06.
- o) At the end of the pitting programme the land owner is to be asked to sign the closure letter provided once satisfied with the rehabilitation.

## 5.2 MECHANISED PITTING

Larger pits may require the use of mechanised equipment. The following mechanised equipment may be used in excavations:

- Backhoe (TLBs –Tractor/Loader/Backhoe)
- Bucket wheel excavator
- Cable Excavator
- Motor scraper
- Shovel
- Trencher
- Wheel loader

Of the above list the more common machines used in pitting and trenching are the backhoes and excavators. When using the above equipment the project geologist will:

- Ensure that the operator is suitably qualified with appropriate documentation
- Ensure appropriate use of PPE's
- Ensure that all documentation (permits, licences, service records, etc) for the equipment is possessed by the owner and valid.
- Ensure that the equipment is free from obvious oil leaks
- Ensure in the event of oil spills that procedure EXP-PR-05 is followed for suitable clean up.
- Ensure that warning signs for working equipment are posted and the excavation site/equipment use site is demarcated with danger tape.

#### 5.2.1 Access and siting:

- a. Vehicular movement will be confined to existing roads as much as possible. If off road driving is unavoidable, the landowner will be consulted as to the position of the off road route and only a single track will be used.
- b. No fences will be cut without the permission of the surface owner.
- c. Where pitting is necessary in thickly vegetated area, tree cutting is limited to small trees (< 3m height) only. No large indigenous trees will be removed. The cleared bushes will be stored on a tarpaulin for rehabilitation.
- d. Use 3-point turns when turning around in the field, not large turning circles.
- E .Plan tracks to impact as little as possible on the most sensitive areas.
- f. "Fence" or define the edge of track(s) to avoid unnecessary widening of the road by placing stones along tracks and roads (including existing roads from

previous prospecting campaigns of other companies). This will prevent the disturbed surface from getting wider due to repeated use.

g. In areas containing red data plant species, the planned pit sites and access routes are to be checked with a botanist to see if any RD species are present. If there are, the grid positions need to be adjusted so as not disturb the plants if at all possible, prior to the positions being confirmed.

h. If the slope is steep, a slope stability test must be done prior to the construction of the track and preparation of the site.

#### 5.2.2 Preparation and excavation:

a. The pit site must be photographed before sampling starts, after rehabilitation is complete and then every six months or as near to this as possible. Records must be filed.

B .Contractors must ensure that earth moving equipment to be used on site is in good condition and has been adequately maintained in order to limit any accidental spillages of fuel or oil.

c. The potential impacts caused by oil leaks from machinery used at surface are covered by EXP-PR-02\_Site Operational Procedure.

D .Ensure that all equipment at the pitting site that can leak is in drip trays or on tarpaulins to avoid leaks or spills onto the ground. Repair any leaks as soon as possible.

e. A record must be kept of all hazardous waste generated and disposed of from the pitting site.

f. Ensure that all heavy items are raised off the ground to limit compaction, where practicable.

g. Plans must be made to implement adequate drainage and anti-erosion berms on steep slopes. Shade netting should be attached to metal stakes on the downslope side of the pit to prevent erosion from sudden storms filling the pit and causing runoff.

h. The footprint area must be carefully demarcated so that it is not exceeded during pitting activities.

i. Any vegetation, stones, rocks or logs on the pit site must be removed and stored nearby for re-use.

- j. In arid areas, remove all plus centimetre size quartz or other light coloured float, if present, and store in a drum.
- k. Topsoil must be removed and stored on a tarpaulin, not placed directly on the adjacent vegetation or soil, and covered with a tarpaulin so as to prevent wash during rainstorms. Subsoil should be stored separately also on a tarpaulin, upslope of the pit so as to divert rain water around the pit.
- l. One wall of the excavation to be left at a 60°angle so as to allow any small animals that may fall in to escape.
- m. Fence off the pit to keep people and large animals out and put up warning signs.
- n. If it is necessary to bring in fill, it must be ensured that there are no plant parts or seed of invasive alien plants in the fill.
- o. Fill should be brought in on the trucks coming to collect the samples so as to limit the number of trips to the pit.
- p. Rehabilitation must be done according to the rehabilitation procedure EXP-PR-06.
- q. At the end of the pitting programme the land owner is to be asked to sign the closure letter provided once satisfied with the rehabilitation.

### 5.3 CONTRACTORS

- It is the Senior Project Manager's responsibility to ensure that tender documents sent to potential contractors contain all the relevant operating procedures that the contractor will have to adhere to in order to complete the work for which the tender is being given. Once the tender is accepted and signed by the contractor, the contractor is then legally bound to adhere to these operating procedures.
- It is the Senior Project Manager's responsibility to ensure that a site specific risk assessment is carried out with the contractor, prior to work commencing.
- It is the Project Geologist's responsibility to ensure that the contractor adheres to the operating procedures.

### 5.4 MONITORING AND REPORTING

- a. It is the Project Geologist's responsibility to maintain ongoing monitoring of significant impact sites in his area of responsibility.
- b. This will involve before, during and after photographing of sites from set perspectives. "After" photographing will take place as close as possible to six monthly intervals commencing after the completion of activity at the site.
- c. This will continue until the site is considered to have returned as close as possible to its natural state or until a closure permit has been granted.
- d. The Project Geologist will include a report on environmental compliance in the project report after major activities such as drilling, pitting or trenching.
- e. This should include photographs and written descriptions of all significant impact sites currently under observation.
- f. This information can be incorporated in the closure report when the Prospecting Right is relinquished.
- g. The Project Geologist must monitor and report as required by Regulation 55 of the Minerals and Petroleum Resources Development Act.

## 6 REHABILITATION OF PITTING SITES

- See Rehabilitation Procedure EXP-PR-06

## 7 NON-CONFORMANCES

Failure to comply with this procedure will be viewed as a non-conformance and should be reported on the Incident Reporting System on Isometrix.

## 8 RECORDS

Most original paper records should be kept in the prospecting right field file and scanned copies should be stored under the relevant folder on the RSA Exploration server.

The following records should be kept:



Records	Where	Responsibility	Retention Time
Record on decision regarding anti-erosion measures necessary.	Field file	Project Geologist	Until closure obtained
Slope stability test results, if applicable.	Field file	Project Geologist	Until closure obtained
Record of site inspection with botanist, if applicable	Field file	Project Geologist	Until closure obtained
Photographic records (before, during and after)	Field file On server (digitally)	Project Geologist	Until closure obtained Indefinitely
Hazardous waste disposal records	Field file	Project Geologist	Until closure obtained
Recommendations of any specialist consulted.	Field file	Project Geologist	Until closure obtained
Training / induction records of employees, casual labourers and contractors	Field file	Project Geologist	Until closure obtained
Training documentation proving competency of person operating machinery (backhoes & excavators)	Field file	Project Geologist	Until closure obtained
Permits, licenses, service records for equipment	Field file	Project Geologist	Until closure obtained
Closure letter from land owner	Kimberley Copy in Field file	DBCM Mining Titles Project Geologist	Indefinite Until closure obtained
SHE incident / non-conformances	Isometrix	Responsible Persons	Indefinitely on Isometrix

## 9 REVIEW AND CHANGE

- This procedure is to be reviewed every two years by the Responsible Person for that area with input from the ECOHS section.
- The control of all departmental/site specific safety, health and environmental documentation is the responsibility of the Responsible Person for that area.

## Appendix V: Drilling procedures

**De Beers Group Exploration RSA Based Operations****RSA Exploration****To Manage Significant Impacts Related to Exploration Drilling****EXP-03-PR\_Drilling**

Page 82 of 111

**SCOPE AND PURPOSE**

The purpose of this procedure is as follows:

- To implement and maintain environmental procedures / safe working procedures to manage potential significant impacts / significant impacts related to exploration drilling. This includes site preparation, large diameter drilling and small diameter drilling.
- To include the procedure for prevention of flammable gas explosions when drilling in areas of high to medium risk e.g. where Karoo rocks or other potential sources of flammable gas are present.

**RESPONSIBILITIES**

- Senior Project Manager
- Senior Project Geologist
- Project Manager
- Geologists
- Drilling Contractors
- All employees are obliged to report safety, health and environmental incidents or non-conformances on the incident reporting system available on [Isometrix](#) or report it to the Project Geologist.

**RELATED DOCUMENTS**

- [SANS ISO 14001:2004 - Clause 4.4.6: Operational Control](#)
- OHSAS 18001: 2007 - Clause 4.4.6: Operational Control
- [GE RSA ECOHS Policy](#)
- GE RSA Legal Register, including other requirements
- Guideline DME Ref. No. DME 16/3/2/1 - A2 issued by the Chief Inspector of Mines – deals with flammable gas

- EXP-PR-02\_The Implementation of Operating Procedures During Prospecting
- EXP-PR-06\_To Ensure Appropriate Rehabilitation of all Prospecting Activities and Minimise any Residual Impacts.

### **legal requirements**

- MHSa: Mine Health and Safety Act
- MPRDA: Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002), specifically Section 29 and Regulation 52 (EMPlans)
- NEMA: National Environmental Management Act
- OHSAct: Occupational Health and Safety Act
- ECA: Environment Conservation Act
- NEM: Waste Act
- National Environmental Management: Air Quality Act
- APPA: Atmospheric Pollution Prevention Act
- NWA: National Water Act

### **PROCEDURE**

Exploration drilling has been identified as an aspect, which has the potential of causing a significant impact on the environment. Potential significant impacts associated with this aspect are:

- Pollution to soils, surface water and ground water due to the use of lubricating oils and drilling agents during drilling.
- Potential impact on soil and vegetation from spillage of fine sediment which retards plant growth.
- Potential generation of acidic leachate which could pollute soil and water.
- Potential for contributing to subsidence if drilling on steep slope, with possible resulting scar on landscape.
- Potential erosion from track to site or from site itself, if inadequate care in preparation and rehabilitation of site on a steep slope.
- Potential risk of fire because of presence of generators and fuel on site.
- A potential safety risk to staff associated with the operation of the drill rig.
- A potential safety risk to staff, contractors and possibly other I&AP's associated with possible emissions of flammable gases from the hole.

- Potential impact on vegetation integrity and biodiversity from compaction, direct damage to vegetation and creation of a nucleus from where invasive plants could spread.
- Potential impact on fauna caused by alteration in habitat, noise, human activity, vibrations impacting on communication of insects, dust impacting on plants and the animals that feed on these plants.

Procedures are outlined below to deal with these significant impacts.

### **GENERAL SAFETY AT DRILLING SITE**

- a. An area of control is to be demarcated (with danger tape and/or painted stakes) in consultation with the drill contractor/operator, within which relevant PPE must be used (hard hats, overalls, safety shoes/boots, eye protection, dust and hearing protection). This area will correspond with the “No smoking” area defined where there is a risk of flammable gas being encountered (see below).
- b. Dust and eye protection should also be provided to all staff outside the area of control as the wind may blow dust in different directions.
- c. All staff and contractors must obey safety instructions issued by the appointed responsible person (usually the drill manager / foreman).
- d. Only qualified persons (usually the drill contractor’s staff) are allowed to operate the drill rig itself.
- e. Do not drill during an electric storm. Lightning striking the drill mast is a very real danger. Terminate drilling for the day or wait out the storm inside vehicles parked away from the drill rig.

### **The use of drilling agents and lubricants**

- The potential impacts caused by oil leaks from machinery used at surface are covered by EXP-PR-02\_Operating Procedures during prospecting.
- The 16 point Material Safety Data Sheets containing all relevant data pertaining to all substances used by the drilling contractor should be obtained.

- Wherever possible and available, environmentally friendly drilling agents and drill bit lubricants should be used.

## **Code of Practice for the prevention of flammable gas explosions**

### **STATUS OF CODE OF PRACTICE (COP):**

- a. Inland occurrences of natural gas are restricted to the sediments of the Karoo Supergroup in South Africa. When drilling through rocks belonging to the Karoo Supergroup, the following Code of Practice (COP) will be adhered to.
- b. This mandatory COP was drawn up in accordance with Guideline DME Ref. No. DME 16/3/2/1 - A2 issued by the Chief Inspector of Mines.
- c. This is a mandatory COP in terms of sections (2) and (3) of the MHSA.
- d. This COP may be used in accident investigations to ascertain compliance and also to establish whether the COP is effective and fit for the purpose.
- e. This COP supercedes all previous relevant COP's.
- f. All managerial instructions or recommended procedures (voluntary COP's) and standards on the prevention of flammable gas explosions must comply with this COP and must be reviewed to ensure compliance.

### **GENERAL INFORMATION AND TERMS AND DEFINITIONS**

- This COP is to be used by De Beers Consolidated Mines Limited during exploration for diamonds within the RSA. As such, the words "mine" or "mining" should be read as indicating prospecting as there is no distinction between prospecting and mining in the Minerals Act.

### **PROPERTIES AND DANGERS OF METHANE**

- a. Methane is often mixed with other flammable gases (hydrogen, butane, etc.)
- b. Methane gas is lighter than air (S.G. 0.55).
- c. Colourless, odourless and tasteless and can only be detected by an instrument.
- d. Combustible below 5%.

- e. Explosive between 5% and 15%.
- f. Over 15% it replaces the oxygen in the air and can cause suffocation in confined spaces.

## **RISK ASSESSMENT**

- a. Inland occurrences of natural gas are only known to occur within the RSA in rocks belonging to the Karoo Supergroup and therefore this COP is only relevant when these rocks are likely to be intersected.
- b. The occurrence of gas pocket intersections whilst drilling surface boreholes is fairly rare. This combined with the relatively shallow holes drilled (normally less than 100m) makes the hazard a fairly low risk one.
- c. However due to the high probability of serious injury should such a gas pocket be intersected unnoticed or without taking due precautions, the need to monitor gas emissions by implementation of the COP exists.
- d. The main risk therefore exists in non-detection of possible gas emissions from the hole and the COP therefore concentrates on detection procedures.
- e. It is not envisaged that any drilling shall be conducted whilst detected gas emissions are flowing from the hole and therefore procedures around spark and flame suppression are not looked at.

## **IDENTIFICATION OF FLAMMABLE GAS SOURCES**

- Pockets of gas trapped by impermeable strata underground.
- These pockets of gas are likely to be under pressure, resulting in sudden release of gas once the borehole penetrates the impermeable strata.

## **DETECTION OF FLAMMABLE GAS**

### **PROCEDURE PRIOR TO COMMENCING WITH DRILLING OPERATIONS:**

- The geologist at the drill site will be trained in the use of the flammable gas measuring instrument used on site.

- The flammable gas measuring instruments will be fully charged and calibrated prior to a drilling project and at least every three months during a drilling project (if the drilling project lasts longer than 3 months).

## **PROCEDURE AT DRILL SITE**

- a. An area of 30 (thirty) metres around the drill site will be fenced off with chevron tape.
- b. Symbolic signs, such as “No Smoking, No Open Flames, Danger Keep Out”, will be posted.
- c. No smoking will be allowed in the demarcated area.
- d. Fire extinguishers will be placed at strategic points within and without the demarcated area.
- e. Prior to commencing any work each day, a flammable gas reading must be taken at the top of the drill hole and in the drill rods.
- f. During drilling, gas readings are taken at the hole during the changing of rods. The meter should not be further than 1m from the hole but care should be taken in that a danger is posed by swinging rods if the reading is taken too close to the hole.
- g. Always ensure that the operator is aware that you are taking the reading and always keep an eye on the drill rods that they are not being moved whilst the reading is being taken. The reading should not take less than 30 seconds.
- h. Results for all tests, whether negative or positive, must be recorded in a book kept for this purpose.
- i. Maintenance on the drill equipment will only be done if the flammable gas reading is negative and during maintenance, periodic readings will be taken at intervals not exceeding 1 hour.
- j.

## **CONTROL OF GAS EMISSIONS**

### **PROCEDURE WHEN FLAMMABLE GAS EXCEEDS 1% BY VOLUME**

- a. Stop all work and immediately shut down all engines.

- b. Withdraw all personnel to outside of the 30 m barricade and fully inform them of potential dangers.
- c. Inform the Exploration Manager, the appointed Manager under section 3 of the Mine Health and Safety Act and the Principal Inspector of Mines of the Region.
- d. Continue monitoring and if the explosive mixture drops to less than 1% by volume for a period exceeding 1 hour, the rods may be removed from the hole to allow the free flow of gas.
- e. If the explosive mixture remains above 1%, the hole must be monitored for a minimum of 24 hours. If the mixture remains constant at 4% or less, the rods may be removed under the direct supervision of a person in position of authority. With the rods removed, the hole must again be left with free flow for a minimum period of 24 hours. If gas remains constant the entire hole must then be cemented.
- f. If the explosive mixture remains in excess of 4% for a period of 1 week, any work to be done will be in close consultation with the Principal Inspector of Mines of the Region.

## **EMERGENCY PREPAREDNESS FOR FIRE**

See EXP-PR-05 Emergency Preparedness and Response Procedure.

## **EMERGENCY PREPAREDNESS FOR SPILLS**

- a. During drilling there must be a large spill kit on site as well as the normal small one which is on site during the other activities. The spill kits must be inspected regularly.
- b. See EXP-PR-05 Emergency Preparedness and Response Procedure.

## **DRILLING PROCEDURE**

It is always extremely difficult to rehabilitate an environment adequately. It is therefore very important to plan work in such a way that as little damage as possible is caused.



**Access and siting:**

- a. Vehicular movement will be confined to existing roads as much as possible. If off road driving is unavoidable, the landowner will be consulted as to the position of the off road route and only a single track will be used.
- b. No fences will be cut without the permission of the surface owner; these must be repaired on completion of work.
- c. Where drilling is necessary in thickly vegetated area, tree cutting is limited to small trees (< 3m height) only. No large trees will be removed, except if accessing exotic timber plantations, in consultation with the plantation owner and with due compensation being agreed to. The cleared bushes will be stored on a tarpaulin for rehabilitation.
- d. Use 3-point turns when turning around in the field, not large turning circles.
- e. Plan tracks to impact as little as possible on the most sensitive areas, where these have been defined.
- f. If practicable, design drill holes to avoid having to set up on the most sensitive area e.g. by planning hole direction, drilling more than one hole from a single cleared site
- g. In areas containing red data plant species, the planned drill sites and access routes are to be checked with a botanist to see if any RD species are present, and if these positions need to be adjusted so as not disturb these if at all possible, prior to the positions being confirmed.
- h. "Fence" or define the edge of track(s) to avoid unnecessary widening of the road by placing stones along tracks and roads (including existing roads from previous prospecting campaigns of other companies) to prevent the disturbed surface from getting wider due to repeated use.
- i. When visiting rigs, park vehicle on existing road and walk to rig where practicable.
- j. If on very steep ground a slope stability test must be done.
- k. If water is gravity fed via a hose from an off-site tank, plan the water pipe routes to follow existing roads where practicable.

## Preparation and Drilling

- a. The Project Geologist must complete the drill site check provided at the back of this procedure for each drill hole completed.
- b. Photograph the drill site before clearing and record
- c. Determine what anti-erosion measures are necessary and implement these.
- d. Restrict drill site to the minimum size of cleared area.
- e. In arid areas, remove all plus centimetre size quartz or other light coloured float, if present, and store in a drum.
- f. Remove all vegetation, logs, stones and rocks on surface and store separately.
- g. Level only required area for safe and effective operation of the drill rig or as required for truck to move safely to rig.
- h. Topsoil to be removed and stored on tarpaulin and covered with tarpaulin to protect against wind and rain.
- i. Water coming out of the hole whilst drilling will be directed away from the rig and left to flow in a controlled manner into the sump so as not to cause erosion. This will be recycled.
- j. Plan the sump to be dug in less sensitive area if possible and line the sump to ensure that there is no pollution by fine sediment forming a layer over the soil in which very little vegetation grows.
- k. Ensure the capacity of the sump is adequate so as to avoid pollution of the surrounding area by fine sediment
- l. The same approach to the sump must be taken as with other excavations.
- m. The only chemicals to be used down the hole are the detergent based drilling foam which is not hazardous and is not toxic to ground water or drilling muds which must also not be toxic. These are used only when sidewall stabilisation is required.
- n. On some rigs, small amounts of rock drill oil are used to lubricate the compressed air system. The amount of this rock drill oil used will be recorded by the drilling contractor and documented by the project geologist.
- o. Ensure that all equipment at the drill site that can leak is in drip trays or on tarpaulins to avoid leaks or spills onto the ground. Repair any leaks as soon as possible.

- p. Ensure that all heavy items are raised off the ground to limit compaction, where practicable.
- q. Where practicable, core is placed directly into core boxes and stored on scaffolding/racks (below 1.2m in height) to reduce impacts from compaction.
- r. Large diameter drill samples are placed directly into bulk bags which should be removed directly from site and not placed elsewhere on the ground.
- s. On completion the areas around the drill hole will be cleared of all percussion chips.
- t. Holes intersecting water may be left open but only at the request of the landowner who is responsible for completing the necessary forms and submitting these to DWAF. Copies of all relevant documentation must be kept.
- u. Generally boreholes shall be covered and made safe by means of a 1m<sup>2</sup> steel plate placed over the hole at a depth of not less than 50cm (1m in cultivated land), and covered with topsoil.
- v. In cases where there are concerns over disruptions to groundwater flow, or potential contamination of groundwater by acidic leachate from particular rocks encountered during drilling, boreholes will be grouted as specified in this procedure.
- w. At the end of the drilling programme the land owner is to be asked to sign the closure letter provided once satisfied with the rehabilitation.

## **GROUTING OF BOREHOLES**

- a. Confirm with landowner if borehole is required in the future. If it is, the landowner must complete the necessary forms to confirm, obtain signature and hand in to DWAF for authorisation. Relevant documentation must be kept.
- b. If not, make preparations for grouting of borehole where required.
- c. Remove any hydrocarbon from surface of drill water in sump and dispose of to registered hazardous waste facility.
- d. Submit sample of drill water for testing and confirm with standard that all hydrocarbon and chemical concentrations fall within limits.
- e. Use remaining drill water and fine sludge in the mixing of the bentonite.

- f. A grout mix for cementing the small diameter exploration boreholes which contains a synergistic blend of bentonite and drill sludge / fines and building sand of up to 55% by weight of cement (BWOC) along with Portland cement is suggested.
- g. The cement mix, when combined with mix water in the cementitious slurry having a density less than or equal to 1378 kg/m<sup>3</sup>, the amount of mix water in the cementitious slurry being between from about 200 to about 560 percent by weight of cement (BWOC). Such a mix using the water left in the sump that has been circulating the hole (max 1.5m<sup>3</sup>) as well as the fine cutting sludge from the well also in the sump (max 0.2m<sup>3</sup>), which have been checked and skimmed for any oils and grease would respectively provide roughly double to one and a half of the mixture needed to grout a small diameter hole ( +/- 0.8m<sup>3</sup> per 100m hole), thus allowing for possible outwash of the unconsolidated zone as well as formation loss. Mixture hardens to 110 Psi within 72 hours.
- h. For grouting large diameter boreholes, a dry fill consisting of gravel, sand and bentonite is suggested for the bulk of the fill, while the top 10m of the hole can be grouted in the same way as the narrow diameter boreholes, incorporating any leftover drilling circulation water and cutting sludge.

## **Contractors**

- a. It is the Senior Project Manager's responsibility to ensure that tender documents sent to potential contractors contain all the relevant operating procedures that the contractor will have to adhere to in order to complete the work for which the tender is being given. Once the tender is accepted and signed by the contractor, the contractor is then legally bound to adhere to these operating procedures.
- b. It is the Senior Project Manager's responsibility to ensure that a site specific risk assessment is carried out, with the involvement of the contractor.
- c. It is the Project Geologist's responsibility to ensure that the contractor adheres to the operating procedures.

## **MONITORING AND REPORTING**

- m. It is the Project Geologist's responsibility to maintain ongoing monitoring of significant impact sites in his area of responsibility.
- n. This will involve before, during and after photographing of sites from set perspectives. "After" photographing will take place as close as possible to six monthly intervals commencing after the completion of activity at the site.
- o. This will continue until the site is considered to have returned as close as possible to its natural state or until a closure permit has been granted.
- p. The Project Geologist will include a report on environmental compliance in the project report after major activities such as drilling, pitting or trenching.
- q. This should include photographs and written descriptions of all significant impact sites currently under observation.
- r. This information can be incorporated in the closure report when the Prospecting Right is relinquished.
- s. The Project Geologist must monitor and report as required by Regulation 55 of the Minerals and Petroleum Resources Development Act.

### **Rehabilitation of drill sites**

- See Rehabilitation Procedure. EXP-PR-06.

### **Non-Conformances**

Failure to comply with this procedure will be viewed as a non-conformance and should be reported on the Incident Reporting System on [Isometrix](#).

## **RECORDS**

In most cases, the original paper records should be kept in the prospecting right field file and scanned copies should be stored under the relevant folder on the RSA Exploration server.

The following records should be kept:

Records	Where	Responsibility	Retention Time
Record on decision regarding anti-erosion measures necessary	Field file	Project Geologist	Until closure obtained
Record of site inspection with botanist, if applicable	Field file	Project Geologist	Until closure obtained
Photographic records (before, during and after)	Field file On server (digitally)	Project Geologist	Until closure obtained Indefinitely
Slope stability test results if required	Field file	Project Geologist	Until closure obtained
Drill site check list	Field file	Project Geologist	Until closure obtained
Calibration certificates	Field file	Project Geologist	Until closure obtained
MSDSs for drill oil and drilling agent used	Field file	Project Geologist	Until closure obtained
Hazardous waste disposal records	Field file	Project Geologist	Until closure obtained
Position of boreholes grouted.	Field file	Project Geologist	Until closure obtained
Recommendations of any specialist consulted.	Field file	Project Geologist	Until closure obtained
Competency training records of Geologist making use of the flammable gas measuring instrument.	Field file	Project Geologist	Until closure obtained
Test results of flammable gas monitoring	Field file	Project Geologist	Until closure obtained

Records of spill kit checks	Field file	Project Geologist	Until closure obtained
Closure letter from land owner	Kimberley Copy in Field file	DBCM Mining Titles Project Geologist	Indefinite Until closure obtained
Confirmation letter from landowner for borehole to be left open, documentation submitted to DWAF and copy of authorisation obtained.	Kimberley Copy in Field file	DBCM Mining Titles Project Geologist	Indefinite Until closure obtained
SHE incident / non-conformances	Isometrix	Responsible Persons	Indefinitely on Isometrix

## 20. REVIEW AND CHANGE

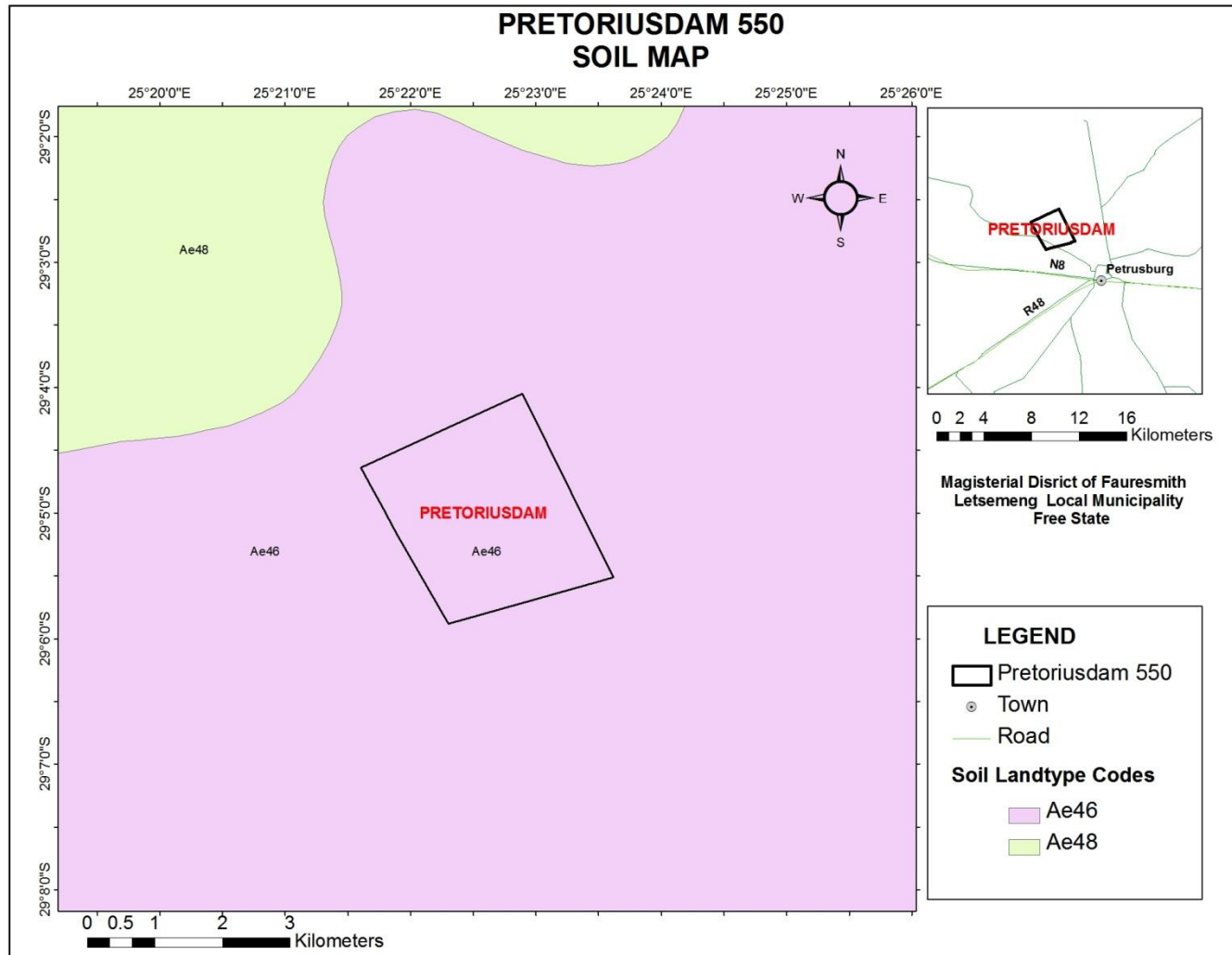
- This procedure is to be reviewed every two years by the Responsible Person for that area with input from the ECOHS section.
- The control of all departmental/site specific safety, health and environmental documentation is the responsibility of the Responsible Person for that area.
-

**DRILL SITE CHECKLIST**

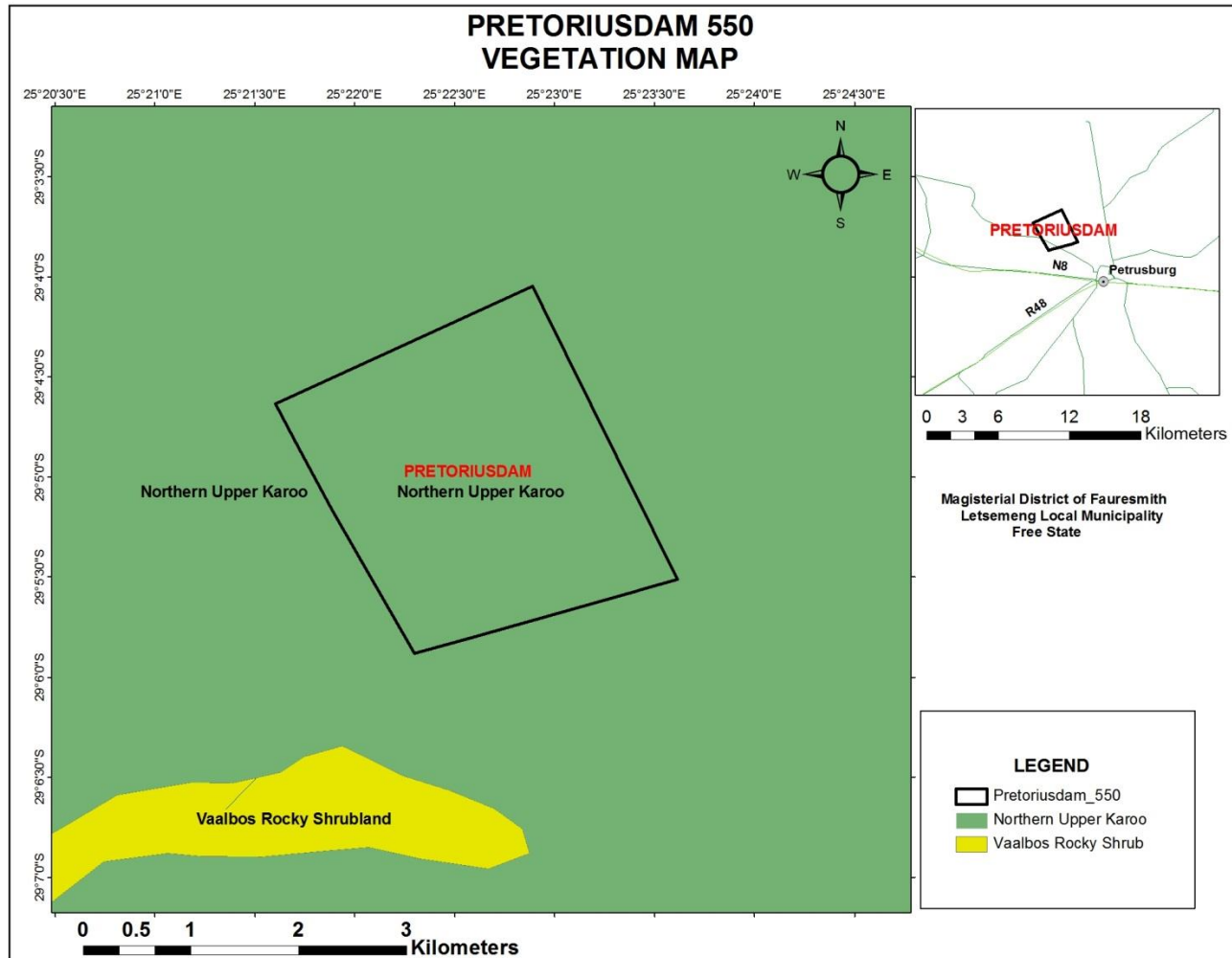
DATE / TIME START HOLE ____/____/____ DATE / TIME END HOLE ____/____/____			
DATE / TIME REHAB COMPLETE ____/____/____			
HOLE POSITION (cape datum) LAT _____ LONG _____			
FARM NAME _____ NUMBER _____ DISTRICT _____			
DRILL HOLE REFERENCE NO: _____			
CASING METRES _____ CASING RETRIEVED? Y/ N			
PERCUSSION METRES DRILLED _____ METRES CORED _____			
GEOLOGIST: _____ DRILLING FOREMAN _____			
ITEM	Y	N	COMMENTS
GAS METER CALIBRATED PRE START			
BEFORE PHOTOGRAPH			
CHEVRON TAPE AROUND SITE			
NO SMOKING SIGN			
FIRE EXTINGUISHER AVAILABLE			
PVC SHEETING UNDER DRILL TRUCKS			
SAFETY SHOES, HARD HATS, EAR PLUGS, DUST MASKS WORN BY ALL			
RECORD GAS METER READINGS			
MSDS FOR OF OIL DRILLING FOAM & OIL			
ANY LOOSE FIBRE USED			
HOLE FILLED WITH DRILL CHIPS			
1M STEEL PLATE COVERING HOLE AT 50cm / 1m DEPTH VIRGIN/CULTIVATED			
NO DRILL CHIPS LEFT AT SURFACE			
AFTER REHABILITATION PHOTOGRAPH			
HOLE GROUTED WITH BENTONITE			
SIGNATURE: _____			
Project Geologist			





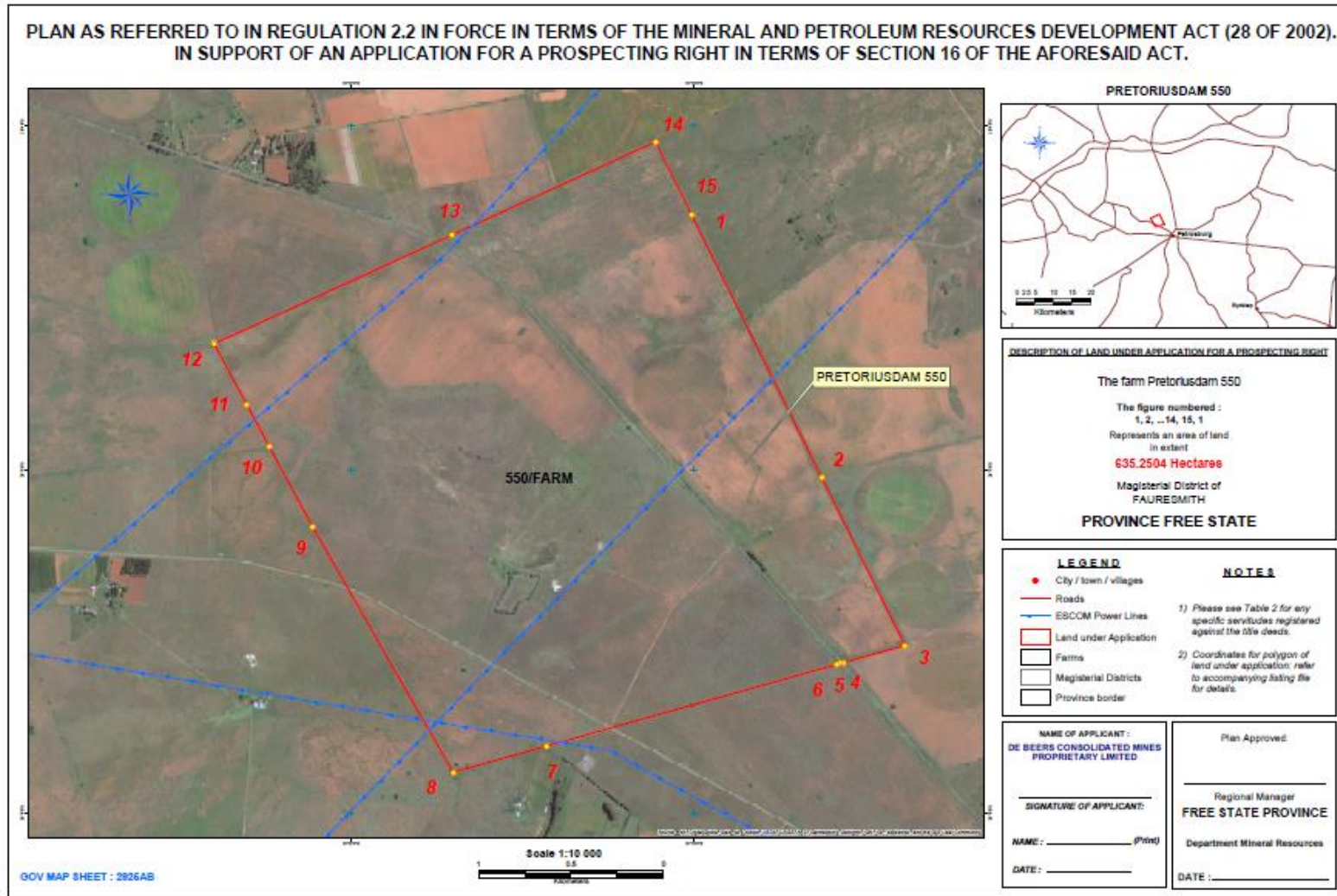


Appendix VI: Soil map.



Appendix VII: Vegetation map.

Appendix VIII: Spatial Map



Appendix IX: Minutes of the consultation meeting

**MINUTES OF A MEETING  
HELD ON TUESDAY 10 SEPTEMBER 2013 @ 10:00  
AT HUGO AND TERBLANCH ATTORNEYS, PETRUSBURG  
BETWEEN DE BEERS CONSOLIDATED MINES LIMITED AND THE FARM  
OWNERS AND MR D TERBLANCHE**

**PRESENT:**

D Terblanche (Attorney)

**(FS 30/5/1/1/2/10191 PR APPLICATION)**

Mr J H Oosthuizen (owner of Portion 1 of the farm Van Heerden's Dam 369)

Mrs J H Oosthuizen (wife of owner of Portion 1 of the farm Van Heerden's Dam 369)

Carien Buitendach (Trustee of Randjies Veld Trust which is the owner of the remaining extent of the Tafelkop 1154)

**(FS 30/5/1/1/2/10190 PR APPLICATION)**

Mr I B Fourie (Owner of the farm Pretoriusdam 550))

**(FS 30/5/1/1/2/10198 PR APPLICATION)**

Mrs A C H Venter (Owner of the farm Eben-Haezer 1040)

**DE BEERS CONSOLIDATED MINES – (DE BEERS)**

Gabisile Simelane (Exploration Programmes Manager RSA Exploration – **GS**  
De Beers Group Services)

Anette Basson (Exploration Administrator – **AB** De Beers Consolidated Mines Limited)

**ABBREVIATIONS**

De Beers = De Beers Consolidated Mines Proprietary Limited

DMR = Department Mineral Resources

**GS** gave a presentation on the application process, phases of prospecting activities, safety and environmental measures in place to mitigate successful execution of the work during prospecting activities for diamonds. Also the farmers were encouraged to ask questions and raise concerns, as summarized below:

**The farmers** wanted to know how the specific properties were chosen.

**GS** explained that it was the outcome of the airborne surveys which was done earlier this year. She also showed the farmers pictures of anomalies found during the survey.



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**The farmers** was interested to know what kimberlites look like

**GS** showed the farmers photos of previous kimberlites which were drilled.

**The Farmers** wanted to know if it will help to object to the DMR.

**Mr D Terblanche** explained that the mineral right now belongs to the government and that they farmers cannot refuse a holder of a right permission on their farm. .

**The Farmers** confirmed that they have received De Beers' consultation letters and therefore have the correct contact information of De Beers if there are further questions or objections. Mr Fourie and Oosthuizen submitted their replies and Mrs Venter and Buitendach promised to send back within the next week

**The Farmers** wanted to know if De Beers will buy the whole farm or only a part of the farm if they want to start mining.

**AB** said that it will be a negotiation process where the farmer will be consulted. She also mentioned that in the case of Voorspoed the affected farm and all the adjacent farms were bought.

**The farmers** wanted to know how they will be able to identify the De Beers employees. The wanted to know if they drive in a vehicle with a De Beers Logo and have De Beers id cards?

**GS** said that De Beers, for security reasons, does not put De Beers logo on their vehicles. She assure the farmers that they will be informed timeously before they start working. The farmers will quickly learn who the geologist is and if needed we can forward all the worker's IDs to them. She also mentioned that no worker will overnight on the farm.

**The attorney** said that fires are a big problem in that area and wanted to know if De Beers will take responsibility if they are responsible for a fire.

**GS** said that De Beers workers adhere to many rules and may not light a fire on the farm. De Beers, however, will take responsibility for all damages it causes.

**The attorney** said that one of his concerns is that De Beers will sell the Mine to small miners who are not as responsible and considerate as De Beers.

**GS** said that normally De Beers would have bought the property by that stage.

**AB** also mentioned that the successful applicant must be financial and technical competent in order to receive a prospecting or mining right.

**Mrs Buitendach** wanted to know how many De Beers employees can be expected on each stage.

**GS** said that with geophysics the maximum people will be 5 and with drilling, the drill crew can be 5 and can be assisted with 2 De Beers employees.

**The farmers** want to know if they will be informed if De Beers find water when they drill.

**AB** said that if the farmers want to use the borehole, they will have to take responsibility for it in writing, because De Beers is responsible to rehabilitate everything they disturb.

**The Attorney asked** if the farmers can expect compensation from De Beers if they will not be able to proceed with their farming activities, livestock or irrigation, as normal.

**GS** emphasized that De Beers will compensate for access to the properties at an agreed fee when drilling activities are conducted. De Beers has agreements with farm owners on other prospecting right within the vicinity of Darlestone. And of course if any damage resulting in damage outside of prospecting caused by De Beers will be rectified.

**Meeting adjourned**



.....  
**DE BEERS CONSOLIDATED MINES**

**DATE:**.....

.....  
**THE FARMERS**

**DATE:**.....

MEETING, TUESDAY 10 SEPTEMBER 2013 PETRUSBURG PROSPECTING RIGHTS , FREE STATE PROVINCE						
FARM	PTN	Prospecting Right Number	SURFACE OWNER	ADDRESS	TELEPHONE	SIGNATURE
VAN HEERDEN'S DAM 369	1	FS 10191 PR	Jacobus Hendrikus (Koos) OOSTHUIZEN	Posbus 143 Petrusburg 9932	051 5750 670 083 2166 886	<i>J.H. Cathy</i>
			Johanna Helena Oosthuizen	"	-	<i>J.H. Oosthuizen</i>
TAFELKOP 1154	RE	FS 10191 PR	RANDJIES VELD TRUST (IT832/1998) Carier Buitendach mydogsd@vodamail.co.za	082 5504 713	Posbus 300 Petrusburg 9932	<i>Buitendach</i>
			RANDJIES VELD TRUST (IT832/1998) ALBERTUS JACOBUS SAAYMAN	0828261152		
PRETORIUSDAM 550	FARM	FS 10190 PR	Izak Bartholomeus Fourie	P O Box 26 PETRUSBURG 9932	0834401445	<i>IB2</i>
EBEN-HAEZER 1040	FARM	FS 10190 PR	Willem Christiaan Venter	P O Box 20141 WILLOWS 9320	(Cell) 084 2092 447 (H) 053 574 0029	<i>W. Venter</i>
			Antoinette Carolina Hendrina Venter	Posbus 299 Petrusburg 9932	082 6675461 ebenha@absa mail.co.za	<i>Antoinette</i>
ATTORNEY			D Terblanche	053 574 0228 083 409 7730	prok@ditsim.co.za	<i>D Terblanche</i>



FARM OWNER PROSPECTING RIGHT ,FAURESMITH DISTRICT, FREE STATE PROVINCE FS 30/5/1/1/2/10190 PR					
	FARM	SURFACE OWNER	ADDRESS	TELEPHONE	
1	PRETORIUSDAM 550	Izak Bartholomeus Fourie  zak.ibf@gmail.com	P O Box 26 PETRUSBURG 9932	0834401445	Sent letter by registered mail and e-mail on 14 August 2013 He replied on 9 September 2013.  He has no comments. He attended the meeting

\NEIGHBOURS , FAURESMITH DISTRICT, FREE STATE PROVINCE FS 30/5/1/1/2/10190 PR						
	FARM	PTN	SURFACE OWNER	ADDRESS	TELEPHONE	REPLIES
1	COTTAGE NO 40 70 (Name changes to Patryfontein No. 70)	FAR M	Isak Stephanus Venter	69 George Duff Street, Vanderbijlpark,1911 OR P O Box 196 JAGERSFONTEIN 9974	H 016-933-2319	A letter was sent by registered mail on 16 August 2013. To date no response has been received.
2	WELGEDACHT 296	1	Gert Deysel Kinders Trust	Farm Welgedacht Petrusburg 9932 OR P O Box 86	053 574 0060 083 3104 771 Father	A letter was sent by registered mail on 16 August 2013. He replied on 3 September 2013 and has no comment.
3	WELGEDACHT 296	RE				

	WELGEDACHT 296	1		PETRUSBURG 9932	084 55777 91 W 0137730337	
4	WELGEDACHT 296	3	Johannes Petrus Odendal	Address as above P O Box 15 PETRUSBURG 9932	(W) 0137730337	A letter was sent by registered mail on 16 August 2013. To date no response has been received.
5	Aansluiting 596	FAR M	ACB Trust IT 303/1999	Cannot find an address		.
6	ARBEID 60	RE	van der Westhuizen, Johannes Simon	Address correct P O Box 48 PETRUSBURG 9932	H 053 574 0043 082 381 7062 F 051-437 2161 F 086 515 7760	A letter was sent by registered mail on 16 August 2013. He replied on 22 Aug 2013 and has No comment
	ARBEID 60	3 (RE)				
7	ONGELUKSKOP A 586	RE				
	ARBEID 60	1 (RE)	Johannes Bitzer, ID 780128	* 89 Andries Pretorius Street, Naval View, Bloemfontein	051-430-5777	A letter was sent by registered mail on 16 August 2013. To date no response has been received.
	ARBEID 60	5	Transnet Ltd (Property Management) Email: enquiries@transnet.net	P.O. Box 72501 Parkview South Africa 2122	(T) 051-408-3774 T: +27 11 308 3000 F: +27 11 308 2638	A letter was sent by registered mail on 16 August 2013. To date no response has been received.
8	ONGELUKSKOP A 586	1				
10	GARENKOP 921	FAR M	John Moir Fraser	P O Box 204 PETRUSBURG 9932	H 053-574-1013 w 053-571-0103 082 455 9442	A letter was sent by registered mail on 16 August 2013. To date no response has been received.
11	KOTZEESKOP AB 585	2	Eskom Holdings Ltd	P O Box 356 BLOEMFONTEIN 9300	w 051-404-2111 F: 051 404 2627	A letter was sent by registered mail on 16 August 2013. To date no response has been received.
9	KOTZEESKOP AB 585	RE	Letsemeng Local Municipality	Box 7 Koffiefontein 9986		A letter was sent by registered mail on 16 August 2013. To date no response has been received.
12	KOPJEALLEEN 545	RE				
13	KOPJEALLEEN 545	1	Hermanus Albertus Du Preez	P O Box 11681 Universitas 9321	H 051-446-1045 W 051-409-5031 082 6540 780	A letter was sent by registered mail on 16 August 2013. To date no response has been received. Spoke to him on 5 Sept 2013
14	WEENEN 317	FAR M				

**GOVERNMENT PARTIES , FAURESMITH DISTRICT, FREE STATE PROVINCE  
FS 30/5/1/1/2/10190 PR**

	<b>SURFACE OWNER</b>	<b>NAME</b>	<b>Postal Address</b>	<b>ADDRESS</b>	<b>TELEPHONE</b>	<b>REPLIES</b>
1	Land Claims Commissioner	Matimba Glacia Makaringe <a href="mailto:mgmakaringe@ruraldevelopment.gov.za">mgmakaringe@ruraldevelopment.gov.za</a>	PO Box 4376, BLOEMFONTEIN, 9300	SA Eagle Building, 136 Maitland Str, BLOEMFONTEIN	051 403 0700 F 051 430 3930	A letter was sent by registered mail. Fax and e-mail on 16 August 2013. Mr Makaringe replied 15 Aug 2013 and confirmed that there is no land claim on the properties
2	Department of Land Affairs	Peter Brislin Job@dla.gov.za e-mail did not go through	Private Bag X20546 or Private Bag X20803 Bloemfontein 9300	SA Eagle Building 136 Maitland Str Bloemfontein	T: 051 400-4200 F: 051 430-2392	A letter was sent by registered mail. Fax and e-mail on 16 August 2013. To date no response has been received.
3	The Provincial Manager South African Heritage Resources Agency	The Chief Executive Officer Ms Mmabatho Ramagoshi - <a href="mailto:mramagoshi@sahra.org.za">mramagoshi@sahra.org.za</a> <a href="mailto:nfo@sahra.org.za">nfo@sahra.org.za</a> <a href="mailto:ksmuts@sahra.org.za">ksmuts@sahra.org.za</a>	StandardBank House9300 15 West Burger Str BLOEMFONTEIN 9301	P.O. Box 9743 BLOEMFONTEIN 9300	T: 012 320 8490 F: 012 320 8486 T:051 430 4139 F: 051 448 2536	A letter was sent by registered mail. Fax and e-mail on 16 August 2013. SAHRA informed that all correspondence must be placed on the SAHRIS website
4	Department Tourism Environment & Conservation	Head of Department: Economic Development, Tourism and Environmental Affairs Mr Thabo Khunyeli <a href="mailto:mulabam@dtea.fs.gov.za">mulabam@dtea.fs.gov.za</a>	Private Bag X20801, BLOEMFONTEIN, 9300	Bojanala Building, 3rd Floor, 34 Markgraaf Street, BLOEMFONTEIN	T: 051 400 4910 F: 051 400 4732 T: 051 400 4904 F: 051 400 4709	A letter was sent by registered mail. Fax and e-mail on 16 August 2013. To date no response has been received.
5	The Municipal Manager Letsemeng Local Municipality	Mr Itumeleng Edward Cell: 0823044397 <a href="mailto:letse@mweb.co.za">letse@mweb.co.za</a>	Private Bag X3, Koffiefontein 9986		T:053 205 9210 F: 053 205 0144 079 494 8988	A letter was sent by registered mail. Fax and e-mail on 16 August 2013. Itumeleng Edward replied on 2 Sept 2013 Contact details correct No Comment
6	Department: Water affairs	Mr TP Ntili <a href="mailto:ntilit@dwaf.gov.za">ntilit@dwaf.gov.za</a>	Mr TP Ntili PO Box 528 BLOEMFONTEIN 9300	Mr TP Ntili PO Box 528 BLOEMFONTEIN 9300	T: 051 405 9000 F: 051 430 8146 082 803 3204	A letter was sent by registered mail. Fax and e-mail on 16 August 2013. Mr Melato replied on 3 Sept 2013 . He said that no mining operations must take place within 100m of a water course and all lubricants must be stored in sealed containers
7	Principal Inspector of Mines	Mnr N Grobler <a href="mailto:Nick.Grobler@dmr.gov.za">Nick.Grobler@dmr.gov.za</a>	Departement Mineral resouces, Free State Private Bag X33 Welkom 9460			A letter was sent by registered mail. Fax and e-mail on 16 August 2013. To date no response has been received.

Appendix X: Photographs











