

AMENDED ENVIRONMENTAL MANAGEMENT PLAN

Submitted as Appendix G of a Basic Assessment in support of an application for an environmental authorisation for Ndwana Two Exploration's Advanced Prospecting Programme in terms of the NEMA EIA regulations (promulgated in terms of Chapter 5 of the National Environmental Management Act (NEMA), Act 107 of 1998 in Government Notice No. 385, considering Government Notices Nos. 386 and 387 of 2006)

AND

In support of application for an amended Environmental Management Plan for Ndwana Two Exploration's Advanced Prospecting in terms of an existing prospecting right dated January 2007, according to Section 39 and Regulation 52 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)



Applicant: Ndwana Exploration Two (Pty) Ltd.

Prepared by: J. Phelan. Plan-it with Envirocare

Farms: The farm Bloemhoek 1074 LS and others in the Haenertsburg area.

(File Reference LP 30/5/1/1/2/06/PR, Prospecting Right: 332/2007)

Current study area on portions of the following properties within this area:
Paeroa 1083LS, Paardevlei 201KS and Colberg 1169LS

District: Polokwane

Mineral: Diamonds

Date: 21 April 2009.

(Original authorisation granted in January 2007)

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ADDENDUM 1 OF EM PLAN
Procedures applicable to Prospecting Activities

ADDENDUM 2 OF EM PLAN
The scoring and calculations appropriate to DME.

ADDENDUM 3 OF EM PLAN
Baseline water analyses.

ADDENDUM 4 OF EM PLAN
Previous EM Plan 2005.

MAPS
Maps 1-9 in previous EM Plan 2005 show larger area
Maps 1-5 in Basic Assessment Report illustrate this specific study area.

APPENDICES OF BASIC ASSESSMENT
Appendices as itemised in the Basic Assessment.

A. INTRODUCTION

A.1 BACKGROUND

This amendment to the Environmental Management Plan for prospecting in the Haenertsburg area follows the general format of the DME Environmental Management Plan document (EMPlan, version 1.3.1, dated 1 May 2004), but includes additional information obtained from a detailed study of the area and consultations with interested and affected parties during 2008/2009. Thus although broad section headings correspond to those of the previous EMPlan, individual chapter numbers do not.

This amended EM Plan does not stand alone, but is to be read in conjunction with the EM Plan submitted for the original prospecting authorisation dated May 2005 (see Addendum 4).

This current EMPlan (2009) will therefore often refer to the previous EM Plan (referred to as EMPlan05) as it is not intended to repeat information already contained in the aforementioned document.

Section C is replaced by the Basic Assessment which has been undertaken in terms of Chapter 5 of the National Environmental Management Act, Act No. 107 in accordance with the Environmental Impact Assessment Regulations published in Government Notice No. R 385, considering Government Notice No. 386 and 387 of 2006. of 2006.

According to the draft new NEMA regulations which have been released for public comment, all prospecting will be subjected to a Basic Assessment (and mining to Scoping and full EIA) and it was therefore decided to follow this lead. However, in many respects the study included a number of the Scoping and full EIA components in that nine specialist studies have been undertaken to obtain information necessary to allow for an informed decision to be made on the application.

It was considered best practice by the proponent, Ndowana Exploration Two, to follow the NEMA process in amending their EM Plan for the advanced phase of prospecting, although the original authorisation had been under the DME impact assessment process, for the following two reasons:

1. there is currently a Memorandum of Agreement between the Department of Minerals and Energy and the Department of Environmental Affairs and Tourism with the goal of having a single EIA process in the country, so this is to be the practice in the future and
2. because most people are more familiar with the NEMA process followed by DEAT.

It is to be noted that the study area covered by the earlier EM Plan covered an area of 8824 ha (See EMPlan05), of which authorisation was granted for 4146 ha. The current EM Plan deals with 57 hectares within the 4146 ha (Maps 1 and 2 in the Basic Assessment).

There will therefore be regular reference to:

- (a) EMPlan05 and
- (b) the Basic Assessment (BA) for which this EMPlan constitutes Appendix G.

This EMPlan (2009) gives the details of how all aspects and impacts of the proposed advanced prospecting will be managed and the mitigatory measures that should be put in place to prevent, reduce or minimise any actual or potential negative impacts on the environment that could result from these activities.

A.2 LEGISLATION / REGULATIONS

The relevant sections of the **Mineral and Petroleum Resources Development Act** and its supporting Regulations are summarised in the EM Plan05. The onus is on the proponent to familiarise him/herself with the provisions of the full version of the Mineral and Petroleum Resources Development Act and its Regulations.

A.3 OTHER RELEVANT LEGISLATION

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

1. National Environmental Management Act , Act No.107 of 1998 .
2. National Environmental Management Biodiversity Act, Act No.10 of 2004.
3. National Heritage Resources Act, Act No. 25 of 1999.
4. Environment Conservation Act, Act No. 73 of 1989.
5. Atmospheric Pollution Prevention Act, Act No.45 of 1965.
6. The National Water Act, Act No. 36 of 1998.
7. Mine, Health and Safety Act, Act No. 29 of 1996.
8. The Conservation of Agricultural Resources Act, Act No. 43 of 1983.
9. The Hazardous Substances Act, Act No.15 of 1973.
10. Occupational Health and Safety Act, Act No. 85 of 1993.
11. National Environmental Management Protected Areas Act, Act No. 57 of 2003.
12. Limpopo Environmental Management Act, Act No. 7 of 1993.
14. Mountain Catchment Areas Act, Act No. 63 of 1970.
15. NEM Air Quality Act , Act No. of 39 of 2004.

A.4 WORD DEFINITIONS

These are as per the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002). Refer also to the EM Plan 2005

EAP An Environmental Assessment Practitioner.

EMPlan An Environmental Management Plan as contemplated in Regulation 52 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) and as contemplated in Section 39 of the Act.
Section 23 2(i) of the NEMA Regulations (R386 of 2006), also requires the documentation of any environmental management and mitigation measures proposed by the EAP, inputs by specialists, and any practices that have been developed by the competent authority in respect of the kind of activity which is the subject of the application, and as such all prospecting applications must have an approved EM Plan.

A.5 ACKNOWLEDGEMENTS

The following contributions are acknowledged in participating in discussions or contributing in a specialist study during the detailed study in 2008 / 2009 to help ascertain and understand potential concerns with regard to the envisaged advanced prospecting programme. Their involvement provided insight into formulating the best solutions or mitigatory measures to deal with these concerns:

The nine specialists who undertook specialist studies (See Basic Assessment Appendix D), in particular those who were asked to revise and amend portions of their studies. Steven Evans and James Wakelin (prior to his untimely death) for information relating to the status and potential impact on the Blue Swallow.

Cathy Dzerefos for advice on numerous logistical and people related aspects in Haenertsburg as well as ecological and botanical concerns and input.

Thusanang Centre for hosting the Initial Public Meeting.

Friends of the Haenertsburg Grasslands for their input and continued vigilance on the area and activities.

All interested and affected parties and organs of state who attended meetings and who registered concerns.

Deon Marais for his tireless efforts through the DEAT GIS office and conservation department contacts in trying to establish the protection status of Colberg, and the authorised person to sign the landowner consent document.

John Lategan for explaining some of the background issues and providing documents

Johan de Witt for allowing and facilitating access to allow for baseline water monitoring.

Willie Human for facilitating access to his property and the springs.

Stevens Lumber Mills and Silicon Smelters for co-operation in finding routes to the sites.

Roads Department for research into district and municipal roads.

Friends, associates and colleagues who assisted with computer expertise, reviewing, editing and research.

Simon Mabolani who facilitated the field trips of some of the specialists where logistics prevented the EAP from being present

Andrew Macdonald who provided all the information on the prospecting project, facilitated the field trips, gave input on many computer technological aspects, produced the maps, liaised with Ndwana, De Beers and the team in the field where necessary, made contact with specialists where logistics prevented the EAP from being present and provided other ancilliary information as requested.

B. BIOGRAPHIC DETAILS OF THE APPLICANT

B.1 APPLICANT DETAILS

- B.1.1 Full name of person or company applying for permit or right**
Ndwana Exploration Two (Pty) Ltd.
(being a joint venture company between De Beers Consolidated Mines Limited and Mvelaphanda Resources)
- B.1.2 ID number of person or company / cc registration number**
Registration No. 2005/025075/07
- B.1.3 Postal address**
P.O. Box 616,
Kimberley.
8300.
- B.1.4 Physical / residential address**
36 Stockdale Street,
Kimberley
8300.
- B.1.5 Applicant's telephone number**
053 839 4111
- B.1.6 Applicant's cellular phone number**
n/a
- B.1.7 Alternative contact's name**
Michelle Bossenger (Company Secretary)
- B.1.8 Alternative contact's telephone / cell phone numbers**
053 839 4421

B.2 PROPERTY DETAILS

B.2.1 Full name of the property prospecting operations will be conducted
Paeroa 1083LS, Paardevlei 201KS and Colberg 1169LS

B.2.2 Name of the subdivisions
A total of 3 portions. See Map 2.in the Basic Assessment.
a) Portion 1 of Paardevlei 201 KS
b) Remaining Extent Paeroa 1083 LS and
c) Colberg 1169 LS.

B.2.3 Approximate center prospecting area
Latitude 23° 59' 43" S
Longitude 29° 55' 29" E

B.2.4 Magisterial district
Polokwane / Pietersburg

B.2.5 Name of the registered owner of the property
a) Paardevlei Portion 1 -Steve Schoeman Beherend – represented by Colin Morgan.
b) Paeroa 1083 LS – Silicon Smelters (Pty) Ltd.- represented by B. Barnard.
c) Department of Public Works - represented by Yuza Thomas Siweya

B.2.6 His / her telephone number
a) 015 276 6200
b) 015 276 4784
c) 015 291 6415.

B.2.7 His / her postal address
a) P.O. Box 27, Haenertsburg, 0730
b) P.O. Box 28, Haenertsburg, 0730
c) P. Bag X9469, Polokwane, 0700

B.2.8 Current land uses on study area and land surrounding the study area.
The land use of the study area itself comprises mainly afforestation (25 ha of the 57ha) and open grassland areas which are informally conserved owing to limitations to agriculture, and which play an important role in conserving natural biodiversity resources. These are subjected to informal grazing by goats but otherwise kept in a natural state except that burning is restricted.

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In the adjacent areas there is more forestry and a charcoal manufacturing enterprise, There is very limited planting of a few crops on a small part of 10 ha owned by a little community in the lower lying areas, whilst further away livestock farming and recreational activities such as hiking, photography, fishing etc. take place.

The current uses of the 57 ha of land in the study area land are summarised in the table below:

Current land use	Area (in hectares)
Alien timber plantations & previously afforested	25
Natural Vegetation (including land fairly heavily infested by alien plants).	32
Land grazed by goats (overlaps above areas)	57
Total	57 ha

Error estimated at 10% of each statistic. The total of the above adds up to more than the total land because some land falls in more than one category e.g. some plantation and conservation area is also used for grazing (by goats).

In the area as a whole, plantations now cover much of what was mountain grassland in the past. Although the carrying capacity of an area is variable (e.g. rainfall and management) and needs to be assessed each year, the present grazing capacity for the area is estimated at 1 LU per 6 ha.

The EMPlan05 describes what has lead to the degradation of the grasslands in the area, to soil degradation and loss, the manipulation of fire regimes and also the increase in invasive alien species in natural areas. There is reference to sub-standard roads that have led to unnecessary erosion and loss of soil in certain plantations, which in turn has caused some siltation of water courses / wetlands.

The study area for the advanced prospecting includes portions of three farms; Paardevlei 201 KS Portion 1, the Remaining Extent of Paeroa 1083 LS and Colberg 1169 LS. Paeroa and Colberg show the scars of gold prospecting and mining activities from the past and the old Iron Crown Mine was situated close to here. Within the current study area pits, adits and trenches which have not been rehabilitated, present a considerable hazard to animals and humans, are not conducive to any form of agriculture and have contributed to soil erosion. They do not add to the aesthetics of the area, and there is evidence of invasive alien species at some. Amongst some of the residents of the town, there are thoughts of making some of these safe, and using them as part of the tourist attraction

of the area. There are also some old walls and the remains of an old brickery. These were brought to the attention of the specialist doing the heritage resources study, but were not considered to be significant.

B.2.9 Are there any other, existing land uses that impact on the environment in the proposed prospecting area?

Alien timber plantations, a limited area of cultivation of crops by the small community living on a subsection of Paeroa, grazing of a small herd of goats by this community, a charcoal producing business on Fountainhead and a single quarters hostel on Paeroa.

B.2.10 What is the name of the nearest town?

Haenertsburg.

C. ENVIRONMENTAL IMPACT ASSESSMENT

This section has been replaced by an environmental impact assessment process conducted in terms of the EIA regulations, promulgated in terms of Chapter 5 of the National Environmental Management Act, Act No.107 of 1998, which were promulgated on 19th April 2006 in Government Notice No. 385, considering Government Notices Nos. 386 and 387 of 2006, of application for environmental authorisation in terms of a Basic Assessment. This EMPlan (2009) constitutes Appendix G of the Basic Assessment.

The reason for the undertaking of the Basic Assessment was the commitment given in the EMPlan05. This commitment stated that if it was necessary to go to the next phase of prospecting in any “sensitive” areas (sensitive being defined in the EMPlan 05) specific environmental assessments would be done for these areas. Results indicated that advanced prospecting should take place on 57 ha of the 4146 ha for which the original Prospecting Right granted authorisation. These 57 ha extend over three properties, and include “sensitive” areas (as defined in the EMPlan05), and hence this environmental assessment is being undertaken.

C.1 DESCRIPTION OF THE ENVIRONMENT LIKELY TO BE AFFECTED BY PROPOSED PROSPECTING OPERATIONS (REGULATION 52(2)(A)) IN TERMS OF THE MPRDA.

The Basic Assessment gives a description of the specific receiving environment in a series of tables. The study area comprises portions of three properties (Paardevelei 201 KS Portion 1, Remaining Extent of Paeroa 1083 LS and Colberg 1169 LS). Iron Crown the highest peak in Limpopo, lies above the study area and the area straddles the watershed between the Olifants and the Letaba Rivers, so there are some steep slopes. The highest point is at 1875 masl on the southern side and the lowest point at 1580 masl

in the north eastern corner. Almost half the area is under plantations of eucalypts and pines and the rest of the vegetation is summarised as being part of the grassland biome and comprises moist grassland and a small area of forest.

It is situated about 10km by road from the village of Haenertsburg and although the properties fall within the Lepelle-Nkumpi Local Municipality, all the infrastructure falls within the Greater Tzaneen Local Municipality. Historic gold mining infrastructure is present within the study area in the form of two adits and several pits and trenches. Several existing roads and tracks are present and the road/track density calculates to approximately 7km / km².

A forestry hostel is situated less than 200m away on the north eastern side; there is a fire look-out hut below the firebreak close to the boundary with Doornhoek, two patches of erosion on firebreaks and a charcoal burning operation on the adjacent property of Fountainhead. A small community of less than 20 people lives on the 10ha portion 1 of Paeroa to the north.

There are a number of photographs in the Basic Assessment which show different views of the study area.

**C.2 HOW WILL THE PROPOSED OPERATION IMPACT ON THE NATURAL ENVIRONMENT?
(REGULATION 52(2)(B))**

(NUMBERING DOES NOT FOLLOW DME TEMPLATES)

C.2.1 Description of the proposed project

The advanced exploration project will follow a phased approach as outlined in Tables 1a and 1b below. This advanced phase of prospecting does **not** include bulk sampling (item 4 in table 1 below). This would be the last phase of prospecting to be undertaken, should results so indicate. Bulk sampling triggers activities in terms of NEMA that require a Scoping and full EIA study with further public participation. If the results of bulk sampling were positive and pre-feasibility and feasibility studies for mining were undertaken, the conversion of the prospecting right to a mining authorisation would also necessitate a Scoping and EIA with public participation. At the conclusion of each of phases 1, 2 and 3, the decision is made as to whether results indicate that it is worth proceeding to the next phase. Table 1b gives some of the details of the prospecting project.

Note that the area covered by this EMPlan comprises two sites, "upper" and "lower" as indicated on Map 2 of the Basic Assessment.

Table 1a: Summary of prospecting activities

Activity	Detailed Actions	Relevant Legislation
1a. Shallow Manual Pitting (Not in sensitive area)	<p>This is a cheaper, quicker and lower impact alternative to narrow diameter drilling where soil cover is thin.</p> <p>Pits of 1m x 1m, up to 2m deep; will not exceed 4% disturbance on the site; the area of disturbance is estimated at 360 sq. m in total.</p>	<p>BASIC ASSESSMENT NOT TRIGGERED IF NOT IN SENSITIVE AREA</p> <p>This activity does not trigger any of the Listed Activities for a Basic Assessment in terms of Section 5(54) of NEMA, but still requires the DME EIA and EM Plan.</p>
1b. Shallow Manual Pitting (In sensitive area)	<p>This is a cheaper, quicker and lower impact alternative to narrow diameter drilling where soil cover is thin.</p> <p>Pits of 1m x 1m, up to 2m deep; will not exceed 4% disturbance on the site; the area of disturbance is estimated at 360 sq. m in total.</p>	<p>BASIC ASSESSMENT NECESSARY</p> <p>This activity will need to be included in a Basic Assessment (BA) EIA followed by an EM Plan. If this is a follow-up on an authorized Prospecting Right, then the BA will be followed by an amendment to the existing EM Plan, and not a whole new EM Plan.</p>
2a. Narrow diameter drilling (Not in sensitive area)	<p>Will need a track for drill rig if no suitable existing one. For core drilling a small storage facility like a tank, depression in the ground or temporary porta-pool might be necessary for recirculation of water; water will be brought in by tanker if needed unless arrangements are made with the land owner.</p>	<p>BASIC ASSESSMENT NOT TRIGGERED IF NOT IN SENSITIVE AREA</p> <p>This activity does not trigger any of the Listed Activities for a Basic Assessment in terms of Section 5(54) of NEMA, but still requires the DME EIA and EM Plan.</p>
2b. Narrow diameter drilling (In sensitive area)	<p>Will need a track for drill rig if no suitable existing one. For core drilling a small storage facility like a tank, depression in the ground or temporary porta-pool might be necessary for recirculation of water; water will be brought in by tanker if needed unless arrangements are made with the land owner</p>	<p>BASIC ASSESSMENT NECESSARY</p> <p>This activity will need to be included in a Basic Assessment (BA) EIA followed by an EM Plan. If this is a follow-up on an authorized Prospecting Right, then the BA will be followed by an amendment to the existing EM Plan, and not a whole new EM Plan.</p>
3a. Mini Bulk Sampling. Large diameter drilling	<p>Access tracks for drill rig and trucks; temporary facilities for storage of water for recirculation and for collection of drill tailings whilst drilling;</p>	<p>BASIC ASSESSMENT NECESSARY</p> <p>This will need to be included in a Basic Assessment (BA) EIA followed by an EM Plan. If this is a follow-up on an authorized</p>

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<p>3b. Mini Bulk Sampling. Mechanised pitting</p>	<p>Access tracks for equipment and trucks; Pits up to 15m x 15m x 3m deep = 225 sq. m per pit with one per kimberlite or a few smaller pits to equal this total size; minor earth moving equipment will be used to excavate the pits.</p>	<p>Prospecting Right, then the BA will be followed by an amendment to the existing EMPlan, and not a whole new EMPlan. BASIC ASSESSMENT NECESSARY This will need to be included in a Basic Assessment (BA) EIA followed by an EMPlan. If this is a follow-up on an authorized Prospecting Right, then the BA will be followed by an amendment to the existing EM Plan, and not a whole new EM Plan.</p>
<p>4. Bulk Sampling (Not part of this study – this would be the next phase if results indicated it was warranted.)</p>	<p>Combination of large diameter drilling and mechanized pitting to obtain sample of a between 1,000 and 10,000 tonnes (to be determined based on estimated grade). Treatment plant required on site or in near vicinity.</p>	<p>SCOPING AND FULL EIA NECESSARY This triggers the Listed Activities requiring Scoping and a full EIA in terms of Section5 (54) of NEMA.</p>

N.B. In October 2008, the figures in the above table were updated in the footprint area of some activities. These are reflected in Table 1b below which gives further details of the prospecting activities and should be used as the best estimate of quantities.

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Table 1b: Updated details of prospecting activities

N u m b e r	Activity					Upper site (Paardevelei)			Lower Site (Paeroa)			Combined			Notes on access method	Vehicle Requirements per site	Staff requirements per Activity	Other Comments			
	Description	Unit	Footprint per unit (sq. m)	Duration per unit (days)	Water use per unit (cu. m)	Units	Footprint (sq. m)	Duration (days)	Water use (cu. m or kl)	Units	Footprint (sq. m)	Duration (days)	Water use (cu. m or kl)	Units					Footprint (sq. m)	Duration (days)	Water use (cu. m or kl)
1	Footpath creation	Metre of path	1			600	600	1	0	0	0	0	0	600	600	1	0	On upper site only, from end of existing track.	Light vehicles only, 1 vehicle, 1 return trip	Geologist, field officer/technician Temporary workers x 2	One day to demarcate path; this will become established through use.
2	Manual Pitting	Pit	9	0.5		45	405	22.5	0	45	405	22.5	0	90	810	45	0	Access on foot and on existing tracks, by light vehicle only. Using existing road through village for lower site; Wolkberg road for upper site.	Light vehicles only, 2 vehicles, 1 return trip daily	Geologist, field officer/technician Temporary workers x 6	Increased estimate for footprint allowing for access around pit.
3	Small diameter core drilling	Hole	64	3	6	10	640	30	60	10	640	30	60	20	1280	60	120	Access on foot and on existing tracks by light vehicles only. Demarcated footpath required on upper site. Using existing road through village for lower site; Wolkberg road and forestry tracks for upper site.	Light vehicles only, 4 vehicles, 2 trailers, 3 return trips daily (2 for water with trailer & 1 for staff)	Geologist, field officer/technician, drill operator, driver. Temporary workers x 8	Assuming use of small, man-portable drill rig, water pumped from supply delivered to nearest track. Area of disturbance includes small sump. Estimated footprint increased to allow for movement of staff around rig.
4	Access road creation	Metre of road	6	0.02	0.2	700	4200	14	140	300	1800	6	60	1000	6000	20	200	Extension to existing tracks. Light vehicles to use existing road through village, heavy vehicles to use alternate route for lower site. All vehicles use Wolkberg road and forestry tracks for upper site.	Earthmoving equipment: small bulldozer, scraper, water truck plus 2 light vehicles. 2 return trips daily for water truck, 1 return trip per light vehicle (staff and fuel). Single return trip for earthmoving equipment, on trucks of ~10 tonnes to within close proximity.	Geologist Engineer, contract operators & drivers Temporary workers x 4	Road width 4 metres, but allowing for some additional impact on margins. In preparation for larger diameter drilling and/or mechanised pitting if justified. Longer access road required on upper site (Paardevelei). Includes extra for "spurs" to individual drill or pit positions
5	Large diameter drilling	Hole	750	5	50	6	4500	30	300	6	4500	30	300	12	9000	60	600	Light vehicles to use existing road through village, heavy vehicles to use alternate route for lower site. All vehicles use Wolkberg road and forestry tracks for upper site. Access by vehicles requires road as described in 4) above.	Drill rig and three support trucks (compressor, rods, water bowser), plus 3 light vehicles and trailer. Single return trip for rig, up to 30 tonne, 2 trips per day for 5000l water bowser, 1 trip per day for staff in 2 light vehicles. Max 1 trip per day in light vehicle plus trailer for fuel.	Geologist, field officer/technician Rehabilitation specialist Contract drilling foreman, drill operator, assistants, drivers. Temporary workers x 20	Estimate of footprint increased to reflect partial disturbance around each drill position. Usually a cluster of three holes is drilled, using the same sump, so footprint may be smaller.
6	Mini-bulk sampling (Mechanised pitting)	Pit	625	5		2	1250	10	0	2	1250	10	0	4	2500	20	0	Light vehicles to use existing road through village, heavy vehicles to use alternate route for lower site. All vehicles use Wolkberg road and forestry tracks for upper site. Access by vehicles requires road as described in 4) above.	Earthmoving equipment: 1 small bulldozer / backacter, 2 light vehicles. Single return trip for earthmoving equipment per site, on trucks of ~10 tonnes to within close proximity. 5 tonne trucks to take out samples (4 tonne load) - 25 return trips per site (4 if 2 trucks etc.). 2 trips per day for light vehicles (staff & fuel)	Geologist, field officer/technician Rehabilitation specialist Contract earthmoving foreman, equipment operator, mechanic, drivers. Temporary workers x 12	Increased estimate for footprint allowing for access around pit mainly during landscaping.
Totals							11595	107.5	500		8595	98.5	420		19590	206	920	These totals are maximum figures because: 1) The footprint of activities may overlap, thus the actual footprint is likely to be less. In the case of the footpath, the access road will overlap so the footprint has not been double-counted 2) Some activities may run in parallel, or may run at both sites at once, so that durations should not simply be added. 3) It is unlikely that all the possible large diameter drilling AND mini-bulk sampling would take place.			

Manual pitting is a cheaper, quicker and lower impact alternative to narrow diameter drilling where soil cover is thin. Pits of 1m x 1m, up to 2m deep are done based on a grid plan. The grid points will be checked in the field with a botanist prior to commencement of this phase, and if any red data plants occur at the points, every effort will be made to move the grid point to one side to avoid disturbing these plants. The procedure for pitting is described in EXP-PR-04_Pitting and EXP-PR-06_Rehabilitation in the Addendum to the EMPlan.

If results from manual pitting are favourable, the next phase is narrow diameter drilling. There will be strict adherence to the drilling procedure outlined in EXP-PR-03_Drilling in the Addendum to this EMPlan, so as to minimise the impacts on the environment and to maximise the effectiveness of the rehabilitation. Rehabilitation is described in the Rehabilitation Procedure (EXP-PR-06) in the Addendum. Any contractors employed by Ndownana will also be required to adhere to this work-plan. The drill rig may be truck mounted or trailer mounted and is powered by a separate diesel compressor, again either truck or trailer mounted. No local power will be used.

On Paardevlei, the sensitivity of the grassland and the steep terrain determined that best practice would be to use a modular, portable drill rig which can be carried in sections to the site. This will obviate the need to construct a track to the site before it is known if results indicate that the project should proceed to the next phase, where a track is needed. Water will be taken to the site by gravity feeding through a hosepipe which would follow the edge of the 600m footpath leading to the site.

There will be up to 20 holes drilled in either site, some of these angled in different directions from the same point. Consideration is being given to the drill being platform mounted, but it is essential that it is very secure from a safety point of view. Core will be placed in core boxes stored on scaffolding, and carried out from the site. Any topsoil removed is stored on tarpaulins and covered and subsoil is stored separately. Rehabilitation is described in the Rehabilitation Procedure (EXP-PR-06) in the Addendum.

Mini bulk sampling will follow narrow diameter drilling if results indicate this to be appropriate. Mini bulk sampling can consist of some large diameter drilling and/or some mechanised pitting.

The large diameter drilling involves access to the site for a 30 tonne drill rig and 6 holes will be drilled on either site. A lined sump will be created for the recycling of water and there will be a compressor or generator, and a very limited number of drums of fuel stored on site. Samples will be

loaded directly into sample bags, hoisted onto 5 tonne trucks and taken from site. The bags will be stored at an appropriate depot with access for collection by a larger truck when there is a full load.

Mechanised pitting requires tracks for access for equipment and trucks. The pits are up to 15m x 15m in plan and up to 3m deep. Minor earth moving equipment will be used to excavate the pits. Samples will be loaded directly into sample bags, hoisted onto 5 tonne trucks and taken from site. The bags will be stored at an appropriate depot with access for collection by a larger truck when there is a full load. Procedure EXP-PR-04 Pitting describes the procedures governing the use of this method.

Samples collected will be processed at a facility in Gauteng and not on site. Existing roads and tracks will be used wherever possible. If any additional tracks are required, these will be discussed with the landowner prior to taking in the equipment. In very steep terrain the services of an engineer will be used to assist with the design and structure of the route so as to reduce the risk of erosion. Slope stability tests will be done prior to drilling, mechanised pitting or the construction of tracks on very steep terrain.

The members of the prospecting team will come onto the sites daily and will bring their own supply of drinking water. There will be no buildings, houses or employee facilities erected on the prospecting sites. The transport used by the prospecting team will include trucks and/or 4x4 pick-ups. If drilling is done, transport will include a truck or trailer-mounted diesel compressor, a truck or trailer mounted drill rig (a modular portable one for the narrow diameter drilling on Paardevlei has been proposed) and a water bowser.

There are no envisaged disturbances to water courses although there may be some prospecting within or close to the riparian areas. A permit will be applied for in this regard.

C.2.2 Environmental impact assessment

The rating criteria used in the assessment of the potential impacts of the proposed prospecting on the environment, and the rating of all significant aspects and impacts are given in the table in section 4 of the Basic Assessment. Ratings of all other aspects and impacts may be referred to in the specialist reports. Any aspect rated at 64% and above is considered to be significant.

C.2.2.1 Topography

The development of drilling sites, pitting areas and access tracks will have an impact on the local topography in areas where steep slopes are encountered and levelling of ground is required. Slope stability evaluations are to be performed as and when the specific sites are determined. Mitigations is specified.

The study area occupies a position which straddles the watershed between the Olifants River and the Letaba River and is the source of three seasonal tributaries. The subject area falls within the quaternary catchment area, B81A on Paeroa 1083LS and Colberg 1169LS, while the small portion of Paardevlei 201KS lies on the southern side of the watershed in quaternary catchment B52H. The highest topographic point which has an elevation of 1875 masl occurs on the southern side of the study area, while the lowest topographic point, roughly 1580 masl, coincides with the drainage line on the north eastern corner. The topographic gradient ranges between 28.8% (steep mountain slope over a distance of 765m along the western boundary) and 42.4% (very steep mountain slope along the boundary between Paeroa 1083 LS and Colberg 1169 LS). Below the 1700m contour line the slope is roughly 20.5% (Geohydrology specialist study).

C.2.2.2 Soil

In steep areas the construction of roads and levelling for drilling or mechanised pitting could result in erosion. Soils on the south western side of the divide appeared to be sandier than those on the other side of the study area. There is also the risk of subsidence, and slope stability tests will need to be done before activities are undertaken in areas with steep gradients. Both the geohydrological study and the wetland study indicated risks associated with steep gradients, erosion susceptibility and undertaking activities during wet conditions. Compaction caused by heavy axle loads during wet conditions can have significant impacts and should be guarded against.

In the photographs in the Geohydrological study report, two existing areas of erosion can be seen in the form of outwash of the embankment of the dirt road at its intersection with the firebreak on Colberg and another area of erosion on the firebreak east of the look-out hut.

C.2.2.3 Vegetation

A specialist study was undertaken to determine the potential impacts on the vegetation in the study area. The main impacts on vegetation are listed on the table in section 4 of the Basic Assessment and are summarised in Table 2 in this report. These include the impact on the threatened Woodbush Granite Grassland on the lower site and the vulnerable Quartzite grassland on the upper site; the potential impact on

threatened and protected plant species in these vegetation types which will impact on biodiversity and the integrity of these communities.

These impacts could include:

- the vegetation could be trampled, coated with dust or the ground compacted,
- valuable or rare endangered species could be destroyed or their populations made unviable and this would mean an impact on biodiversity,
- loss of vegetation increases the possibility of soil erosion,
- altered vegetation immediately impacts on all forms of animal life e.g. blue swallow feeding area, herpetofauna, butterfly larvae.
- a disturbance to vegetation often results in an increase in the occurrence of invader plants, which are opportunistic in colonising disturbed areas.
- Although the total area likely to be disturbed is small (<20ha), there is concern regarding the cumulative impact because so much of the vulnerable and critically endangered grasslands have been lost to afforestation.

C.2.2.4 Animal life

The main impacts on fauna are listed in the Assessment Table in section 4 of the Basic Assessment and are summarised in Table 2 of this report. There will be very limited impact on aquatic fauna.

Animal life would be affected by the noise of the drilling and the communication of ants, on which certain butterfly species are dependent, are disrupted by vibrations of the drilling. The drilling and pitting themselves and the presence of people and vehicles could disturb animals. The trampling and compaction of the grasslands (if vehicles leave roads and tracks) and alteration of the habitat could have an impact on herpetofauna, insects and small mammals. Dust created by vehicles and/or drilling which settles on plants will affect the feeding of butterflies.

The critically endangered Blue Swallows have not nested in the area for the past three seasons but contact will be maintained with the Blue Swallow Working Group (BSWG) to keep abreast with the situation. This group has indicated verbally that at present it is not necessary for prospecting to only take place between May and August as previously agreed. This needs to be confirmed in writing. There is agreement that the collection of soil samples will not be done from inside antbear holes, historic prospecting pits, sink holes, trenches or any other type of hole in which blue swallow may build their nests, and that these will not be damaged during prospecting, still stands. (For further details on the Blue Swallow see EMPlan05).

The Bird Specialist study indicated that workers should be trained to recognise the Grass Owl, and should its nest be encountered whilst they are working, this area should be left alone until the young have left the nest. This will be included in the training material.

The same study also suggested that some of the manual pits could be modified to create appropriate and suitable nesting sites for the Blue Swallow in certain areas to be identified.

The impact of prospecting on mammals and other animals in the area is not considered to be significant as the activities are very transient and the area of land disturbed is relatively small. When it comes to mechanised pitting the site will be checked by a specialist for the presence of the two species of Golden Mole which may occur in the area.

In the specialist study on herpetofauna it was identified that it is the alteration of the habitat that is most critical consideration for herpetofauna. Some species are so specialised that if the habitat is altered this impacts on their ability to catch their prey and their being able to escape their predators. The steep, rocky grassy habitat above the fire look-out tower is one of the most sensitive for herpetofauna.

The Butterfly specialist study did not find the Wolkberg zulu on the site, but did find another Red Data butterfly, *Dingana clara*, on Paardevlei (the upper site). The main habitat area has been mapped. One of the chief problems is that the food plant of the larvae is not yet known. Another is that some butterfly species have a close association with certain ants and the communication of insects is impacted on by the vibrations caused during drilling.

C.2.2.5 Sensitive Areas

Sensitive areas on the 57ha of the study area are the remaining threatened Woodbush Granite Grasslands, the vulnerable Quartzite Grasslands and the specialised endangered, vulnerable and protected species which occur here, the limited areas of wetland, patches of afro-montane forest, the specific marked habitat of the red data butterfly *Dingana Clara*, the steep, rocky, grassy slope above the look out hut, which is the habitat of some of the rare herpetofauna, nesting sites of the grass owl if encountered, potential nesting sites of the Blue Swallow and steep areas susceptible to erosion or subsidence which could then create a scar on the landscape.

C.2.2.6 Geology

Pitting and drilling will have a very limited impact on the geology of the area, and it is not anticipated that this will be of any significance on the general scale of the area.

C.2.2.7 Water

Water from the properties will not be used in prospecting. The wetland specialist study identified all the wetlands and riparian areas on site. Provided there is no prospecting in the stream courses or the wetlands themselves, it did not appear that the impacts of the prospecting activities on wetlands would be significant. What is of more concern is the access routes and it was advised that the use of heavy vehicles should be restricted when the roads were wet so as to reduce the possibility of compaction, erosion, loss of soil from roads, siltation of wetlands and impact on the ecology.

The geohydrological study indicated that prospecting should not have any impact on the water quality of the area. Kimberlite mineralogy does not lend itself to acid rock drainage. However pyrite and chalcopyrite is common in portions of the quartz lodes (veins) historically mined for gold. Any acid generation due to the proposed prospecting activities is however highly unlikely and the risk in terms of groundwater pollution is deemed insignificant. Prospecting boreholes that are not to be used in future will be grouted (Geohydrological Specialist Study).

The limited hydro-census indicated that the possibility of impacting on the water production of neighbouring properties was very limited. None of the surveyed spring flows fall within either of the study area's groundwater flow regimes. The water quality was found to generally be very good. The use of drilling agent or "rocfoam" and drilling oil is carefully monitored to ensure minimal pollution to groundwater, on-site sanitation is controlled and contamination of soils and groundwater by hydrocarbon or sanitation facilities is considered to be a moderate to low risk. According to the classifications, the study area aquifer system comes out as a minor aquifer system. The aquifer vulnerability, aquifer susceptibility and aquifer protection classification are all medium (see Geohydrological Specialist study report).

Drilling or mechanised pitting on steep slopes could lead to subsidence if the stability of the slope was not known, or in erosion, and the potential of a scar on the landscape. This has been addressed in the mitigatory measures.

C.3 TIME FACTOR

The prospecting operation takes a phased approach. The grid lay-out for manual pits will be checked in the field with a botanist in the grassland areas and the positions will be amended if any red data species occur at sites. It is envisaged that the manual pitting will take a maximum time of 1.5 months. When results are received it will then be determined if the programme should proceed to narrow diameter drilling. This could take up to two months. If the project matures to large diameter drilling and pitting, it will take a further six

months. The entire work programme on site over the study area, including periods of inactivity, will possibly extend over a 2 year period.

C.4 HOW WILL THE PROPOSED OPERATION IMPACT ON THE SOCIO-ECONOMIC ENVIRONMENT?

The impact on the socio-economic structure of the region will be minimal. This is because the prospecting is done by a small team of the company's own employees, and a few contractors to do the drilling and mechanised pitting. A small number of local casual staff (12-20) may be required at times. These would normally be recruited locally. The prospecting team operate from self catering, B&B's or municipal or private established camping facilities.

Tourists may be able to see some of the prospecting activities for short periods from the public roads. If any drilling is necessary, this could have a visual impact on tourist or recreational activities (not the accommodation) but will be of short duration. Details of the impacts of the prospecting on some socio economic aspects are covered in the specialist study on tourism which is part of the Basic Assessment. Information is also given on income from tourism and from business tourism which includes the prospecting itself.

C.5 HOW WILL THE PROPOSED OPERATION IMPACT ON THE CULTURAL HERITAGE ENVIRONMENT??

EMPlan05 refers to cultural and historical aspects of the greater region.

Specialist studies on the cultural resources and the historical aspects of the study area have been undertaken and no specific significant aspects were encountered. Adits, shafts and trenches from early gold prospecting and mining days present a hazard to people walking through the area, and to game, stock and small forms of animal life. A low wall and an old brickery have been identified. Some stakeholders are of the view that there is potential to make some of these structures safe for viewing and that if this was done they could be added to the tourism activities of the area. The heritage resources specialist study concludes that because the bulk of the early prospecting and mining features occurred on areas adjacent to the study area, examples of this type of cultural remains are "preserved" in other non-threatened areas. Therefore the mining features do not represent a fatal flaw in terms of proceeding with the prospecting on condition that the under-mentioned mitigation and management measures are implemented.

The cultural resources report has indicated that in the event of proposed prospecting activities posing a threat to the recorded historical mining features in the demarcated area, a Phase 2 assessment should be conducted to record and document these remnants of the mining history. The details of what this

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Phase 2 assessment would consist of are listed on page 12 of the Heritage Resources report.

With regard to contemporary culture, most villagers agree that Haenertsburg should keep its small town image and retain the frontier cum early gold-mining town image and there is concern that “prospecting with the possibility of mining in the area might spoil that image completely.”

SAHRA have indicated that the prospecting activities could proceed. The mitigation in place would be that if any items / remains of cultural or historical interest are discovered during the prospecting activities, work will stop, it will be reported to SAHRA and a competent person will be sent to assess the situation and recommend appropriate action, possibly the Phase 2 assessment.

C.6 SPECIFIC REGULATORY REQUIREMENTS

C.6.1 Air quality management and control (Regulation 64 MPRDA)

There will be minimal impact on the air quality. The only possible air pollution that could occur is dust from accessing the site and from the use of equipment, and emissions from vehicles. Dust will be reduced through wetting access roads when and if necessary. A procedure, part of the ISO14001 certified Environmental Management System, is already in place whereby vehicle emissions are tested on a regular basis to ensure that these are below the limit listed in the Atmospheric Pollution Prevention Act.

Any fires in afforested areas would generate significant amounts of smoke.

C.6.2 Fire prevention (Regulation 65 MPRDA)

Not applicable in as far as the prospecting activity does not involve coal or bituminous rock.

The prevention of veld fires due to the risk of having generators, compressors and fuel on site is addressed in EXP-PR-02 the Operational Site Procedure, and in EXP-PR-05, the Emergency Preparedness and Response Procedure in Addendum 1 to the EMPlan.

C.6.3 Noise control (Regulation 66 MPRDA)

There will be noise from drilling, and although it will be short-lived it will exceed the allowable limit for workers in the single quarters hostel which is situated near to one of the prospective drilling sites. The noise could impact temporarily on any tourists in the area on the hiking trail but is not near any accommodation facilities. Drilling will not be undertaken at night.

C.6.4 Blasting, vibration and shock (Regulation 67 MPRDA)

The vibration from the drilling will impact on the communication of ants on which certain butterfly species depend. Ameliatory mechanisms will be necessary when drilling on the site near the hostel. No blasting operations will be conducted.

C.6.5 Disposal of waste material (Regulation 69 MPRDA)

Waste will be managed according to the proponent's ISO 14001 Waste Management Procedure, Procedure EXP-PR-02_Operational Site Procedure in the Addendum to the EMPlan.

C.6.6 Soil pollution and erosion control (Regulation 70 MPRDA)

Soil pollution could be caused by leakages or spills or oil from vehicles or heavy machinery in the field, or from fuels and lubricants on the site.

Soil pollution is prevented and managed through four procedures:

- 1) EXP-PR-02_ Operational Site Procedure
- 2) EXP-PR-03_ Drilling Procedure,
- 3) EXP-PR-04_ Pitting Procedure
- 4) EXP-PR-05_ Emergency Preparedness and Response

Erosion control will be addressed through doing a slope stability test prior to any drilling on very steep slopes or to the construction of access tracks on very steep slopes. Expertise will be obtained for the construction of tracks or roads to the sites where there is a steep gradient to ensure drainage and storm water flow measures are adequate to prevent erosion. The proponent will contribute to the maintenance of roads used for prospecting, and to the upgrading of roads to cope with vehicles and equipment where necessary. The details are outlined in EXP-PR-06 Rehabilitation Procedure.

C.6.7 If significant impacts on any element of the environment have been identified, summarise all of them here (Regulation 52(2)(c))

The determination of the significance of the impacts of the prospecting activities can be seen in each of the specialist reports. The most significant impacts are summarized in the table in section 4 of the Basic Assessment Report.

These aspects and impacts are listed in the Table 2 below.

C.6.8 How will the negative impacts on the environment be mitigated or managed (Regulation 57(2)(c))

The suggested management and control of aspects causing these significant impacts on the environment is summarised in Table 2 below. An Environmental Control Officer (ECO) will be appointed to assist the

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project staff in managing the negative impacts on the environments, by ensuring that procedures and mitigatory measures are adhered to.

Table 2: Summary of Management of Significant Impacts

Environmental Element Affected.	Activity (Aspect) Causing Impact / Potential Impact	Significant Impact	Suggested Management
1a).Soil and / or erosion	Loss of soil resource through erosion on roads or tracks and through lack of adequate care in preparation of drilling or pitting sites	Erosion of roads, tracks or sites; siltation of wetlands and impact on biodiversity.	1.Ensure slope stability tests are done prior to construction of tracks on very steep slopes or preparation of sites on very steep slopes; 2. Avoid soils with high erosion potential if at all possible 3. Use appropriate erosion control measures if it is essential to access slopes with a risk of erosion; 4. Leave vegetation in place where feasible to protect soils. 5. Where vegetation clearance cannot be avoided, storm water management measures to be put in place; 6. Access roads should follow contours where possible; 7. Drainage from pits to be included in storm water drainage measures. EXP-PR-03_Drilling procedure. EXP-PR-04_Pitting procedure. EXP-PR-02_Operational Site procedure. EXP-PR-06_Rehabilitation procedure.
1b).Soil and / or erosion	Mechanised pitting on Paeroa in indigenous vegetation with the potential lack of adequate control of storm water run-off at the pit site.	There is the potential for erosion, siltation of water bodies (with resulting disruptive impact on aquatic biodiversity) ; potential unsightly scar on the landscape; difficulty in rehabilitation if on steep gradients and loss of land with conservation potential.	1. Do slope stability test prior to start of pitting. 2. Store topsoil on tarpaulin on upslope side of drill site to divert rainwater around pit and cover topsoil with tarpaulin. 3.. On steep slopes use shade netting and droppers to construct anti-erosion barriers on the downslope of the pit. 4. Rehabilitate as per procedure including measures to dissipate energy / reduce velocity of run-off water before it reaches surrounding areas. 5. Backfill excavations ending with original material and topsoil. 6. Use non-climax vegetation to bind soil. 7. Monitor and remediate as soon as any erosion is evident.

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Environmental Element Affected.	Activity (Aspect) Causing Impact / Potential Impact	Significant Impact	Suggested Management
			EXP-PR-06_Rehabilitation procedure. EXP-PR-02_Operational Site Procedure
1c).Soil and / or erosion	Levelling of drill and mechanised pit sites and / or road and track creation	Potential for subsidence and / or erosion	1. Limit footprint area. 2. Access roads to follow slope contours where possible. 3. Cut slope gradients must not exceed angle of repose for the particular soil type. 4. In general slopes should not exceed 1(V): 3(H) 5. Where steeper slopes are necessary they must be established using the most appropriate method and technology specified by a qualified engineer.6. Finished cut and fill slopes must be finished as roughened surfaces which emulate the natural surroundings and accumulate soil. 7. Soils removed for rehabilitation must be stockpiled and protected against rain wash. 8. Rehabilitation must have the original landform as the goal. EXP-PR-03_Drilling Procedure. EXP-PR-06_Rehabilitation Procedure. EXP-PR-02_Operational Site Procedure.
1d).Soil and / or erosion	Mechanised pitting causing a loss of geological strata	This has the potential to result in the creation of a void or depression in the ground. If water accumulates here, there is the possibility that when it overflows it will result in erosion.	1. Pits to be "landscaped" with acceptable fill material brought in from outside the area and rehabilitated to close to original form, or if previous slope very steep, then to simulate slumped form. EXP-PR-06_Rehabilitation Procedure. EXP-PR-04_Pitting procedure.
1e).Soil and / or erosion	Depot site for bulk bags causing compaction of soil, erosion, destruction of vegetation and potential siltation from erosion.	Potential loss of topsoil; compaction of soil; impact on vegetation; potential siltation of wetlands.	Identify appropriate depot sites on land that is already disturbed / compacted and where the potential; for erosion and siltation is low.

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Environmental Element Affected.	Activity (Aspect) Causing Impact / Potential Impact	Significant Impact	Suggested Management
1f). Soil and / or erosion	Use of unpaved roads, in general, by heavy vehicles and creation of new access roads could result in erosion along existing roads or new access roads due to heavy trucks and earth moving equipment and storm water run-off.	Loss of soil from access road causing siltation of wetlands and water courses (with resulting aquatic biodiversity disruptive impact) and potentially erosion dongas.	<ol style="list-style-type: none"> 1. Identify suitable access roads and limit heavy traffic to these. 2. Where necessary unpaved roads to be upgraded to a level that can handle expected load. 3. Drainage to be optimised i.t.o. getting rain water off the roads as quickly as possible and keeping it off. 4. Silt traps to be implemented where necessary in order to dissipate energy / reduce velocity of water flow. 5. Trips by heavy vehicles to be limited to dry periods (and in this way also avoid accidents that could impact on the environment e.g. fuel or oil spills) 6. Assessment of erosion and siltation to be undertaken monthly or following heavy rain, and weekly during drilling programme, and necessary action taken. <p>EXP-PR-02_Operational Site procedure. EXP-PR-06_Rehabilitation procedure. EXP-PR-05_Emergency Preparedness and Response procedure.</p>
2a). Natural Vegetation	Shallow manual pitting – 45 pits of 1mx1m (3mx3m allowed for footprint) up to 2m deep will result in the physical disturbance and removal of vegetation.	This will result in the loss of vegetation and consequent disturbance of ecosystems and impact on biodiversity.	<ol style="list-style-type: none"> 1. Vegetation should be re-instated or the succession process initiated in the most effective way. <p>EXP-PR-06_Rehabilitation procedure.</p>
2b). Natural Vegetation (and surface and ground water)	Large diameter drilling, mini-bulk sampling; potential seepage of fuels, oils and lubricants from drilling and pitting machinery as well	<p>The pollution would result in impairment of biochemical cycles in fauna and flora.</p> <p>Potential pollution of surface and ground water.</p>	<ol style="list-style-type: none"> 1. Activities should be conducted during periods of dry weather; 2. A tarpaulin must be in place under the drill rig at all times, contaminated soil collected; 3. Contractors and own staff will be trained on handling spills and know about the disposal of contaminated soil. 4. Procedures for

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Environmental Element Affected.	Activity (Aspect) Causing Impact / Potential Impact	Significant Impact	Suggested Management
	as from vehicles which would result in the pollution of water and soil. Spillages, leaks of fuels, oils, lubricants, drilling sludge.		the storage, use and disposal of oils and grease will be in place; activities will be monitored daily. 5. Activities monitored daily and any incidents must be reported according the EMS system. EXP-PR-02_Operational Site Procedure EXP-PR-05_Emergency Preparedness and Response Procedure. EXP-PR-06_Rehabilitation Procedure.
2c). Natural Vegetation	Small or Large diameter drilling in natural vegetation on Paeroa or on Paardevlei necessitating the levelling of the drill site, removal of vegetation and/or an access road on steep slopes.	This could result in the soil profile over several square meters being irreversibly disturbed, all present plant communities on that spot being lost, and the loss of this land which has considerable conservation merit. There is also the potential of a scar on the mountain being created which would be visible from a long distance away.	1. Slope stability tests would need to be undertaken prior to the start of any drilling activity. 2. Check for RD species before site position is confirmed. 3. Best practice rehabilitation to be undertaken and mitigation against erosion to be put in place if slopes are steep. The advice of experts to be sought in both these measures. 4. On moderate slopes rehabilitate the soil profile. On steeper slopes simulate post landslip or scree colonisation. 5. Use non-climax vegetation to bind soil; monitor and remediate as soon as erosion is evident. Monitoring as well as invasive species eradication will continue after implementing the rehabilitation measures, as required to accelerate restoration of natural fire climax communities, for 10 years or until closure of the prospecting right is obtained from DME, whichever comes first. 6. Take measures as advised by botanist to speed succession e.g. slashing of pioneer species once a year to promote growth of grasses where appropriate. 7. Progress in rehabilitation and signs of erosion to be monitored regularly. EXP-PR-06_Rehabilitation procedure.

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Environmental Element Affected.	Activity (Aspect) Causing Impact / Potential Impact	Significant Impact	Suggested Management
			EXP-PR-02_Operational Site procedure.
4d). Natural Vegetation	Drilling or Mechanised pitting on Paardevlei or in the indigenous vegetation of Paeroa, will result in disturbances to indigenous vegetation which will lead to the opening of niches that can act as nuclei from where invasive species can spread.	Disruption of existing indigenous plant communities and ecosystem integrity(biodiversity) and decline in populations of threatened or protected plant species; increased fuel load with increased fire hazard; increased water useage; decreased productivity.(natural food value)	<ol style="list-style-type: none"> 1. Minimise footprint of activities through planning and control. 2. Rehabilitate according to rehabilitation procedure. 3. Stockpile overburden on tarpaulins and not directly on vegetation and topsoil. 4. Samples from pits to go directly into sample bags. 5. Monitoring as well as invasive species eradication will continue after implementing rehabilitation measures, as required to accelerate restoration of natural fire climax communities for 10 years or until closure of the prospecting rights is obtained from DME, which ever comes first. 6. Take measures advised by the botanist to speed succession e.g. slashing of pioneer species once a year to promote growth of grasses where appropriate. <p>EXP-PR-06_Rehabilitation procedure</p>
4e). Natural Vegetation	Mechanised pitting in indigenous vegetation on Paeroa, or on Paardevlei, will cause clearing of indigenous vegetation or trampling of indigenous vegetation or stockpiling of soil / vegetation and disruption of natural topsoil boundary.	This will result in a decline in populations of threatened or protected plant species in a threatened grassland and disruption of plant community and ecosystem integrity ; loss of land with conservation potential.	<ol style="list-style-type: none"> 1. Minimise footprint of activities through planning and control. 2. Rehabilitate according to rehabilitation procedure. 3. Stockpile overburden on tarpaulins and not directly on vegetation and topsoil. 4. Samples from pits to go directly into sample bags. 5. Monitoring as well as invasive species eradication will continue after implementing rehabilitation measures, as required to accelerate restoration of natural fire climax communities for 10 years or until closure of the prospecting rights is obtained from DME, which ever comes first. 6. Take measures advised by the botanist to speed succession e.g. slashing of pioneer species once a

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Environmental Element Affected.	Activity (Aspect) Causing Impact / Potential Impact	Significant Impact	Suggested Management
			year to promote growth of grasses where appropriate. EXP-PR-04_Pitting procedure EXP-PR-06_Rehabilitation procedure.
4f). Natural Vegetation	The construction of a new access road across the grassland on Paardevlei for drilling (small diameter and/or large diameter) or mechanised pitting will result in the trampling of vegetation and the compaction of soil.	This will impact on plant biodiversity; there will be a potential impact on fauna; potential erosion on steep sections; potential destruction of the soil profile and impact on vegetation communities; increased chance of invasive alien species encroaching. Attempts would be made to cordon off the track for rehabilitation but the remote situation makes success of keeping vehicles off track very difficult; without close monitoring and control to ensure rehab. , abuse of track could cause permanent scar on landscape.	Limit activities to manual pitting and narrow diameter drilling using the portable, modular drill only: 1. Careful checking of fauna and flora prior to construction. 2. A portable, modular small diameter drill has been sourced for the small diameter drilling – this can be carried to the site by people so avoids the construction of a track for this activity. 3. A footpath will be constructed instead of a road. It will be clearly demarcated and use will be controlled. 4. All activities will be confined to limit the footprint. 5. Careful planning, construction and rehabilitation of the footpath / road (if project had to go to the next phase of large diameter drilling and in this case using specialist input for further studies prior to undertaking). Ensure rehabilitation as soon as possible. 6. Train employees on acceptable standard of rehabilitation. 8. Ensure secure cordoning off of access path / (road if going to next phase) across grassland to exclude vehicular access and so facilitate optimum rehabilitation. EXP-PR-02_Operational Site procedure. EXP-PR-06_Rehabilitation procedure..
5a). Animal Life - Butterflies	Noise, vibrations and disturbance caused by any of the prospecting activities esp.– access road	Vibrations affect invertebrate communications and may even result in them moving; Permanent ant	1. Drilling will be done to obtain specific information and will be done for a minimum period; 2. Drilling will not be done at night; 3. Equipment used is required to be in good condition to allow for effective functioning with

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Environmental Element Affected.	Activity (Aspect) Causing Impact / Potential Impact	Significant Impact	Suggested Management
	creation, large diameter drilling and mechanised pitting on the upper site.	colonies requiring specific soil conditions are only able to migrate during specific climatic conditions such as after rains. Ants play an important role in the larval stages of many of the Lyceanidae butterflies. Some Lepidoptera pupae and larvae are able to emit sounds – reasons and effects not yet understood.	minimum noise and emissions. 4. Rehabilitation according to the rehabilitation procedure will be undertaken as soon as the drilling is complete. The ratings indicate that the vibrations from large diameter drilling and mechanised pitting on the upper site will remain very significant despite current mitigatory measures. EXP-PR-03_Drilling Procedure. EXP-PR-06Rehabilitation Procedure. EXP-PR-02_Operational Site procedure.
5b). Animal Life - Butterflies	Large Diameter drilling, small diameter drilling, manual pitting or access road creation – the actual siting of track, drill holes and pits in the <i>Dingana clara</i> habitat which is on the upper site.	Destruction of habitat for this species. Each drill hole will destroy a lot of vegetation – of concern in the critical area because butterflies need plants for nectaring and secure places to hide overnight; and some plants are the larval food plants.	1. Keep footprints of all activities as small as possible; it is viewed that large diameter drilling, mechanised pitting and the construction of a track will have residual impacts that are still very significant despite all current mitigatory plans; manual pitting and a footpath and the undertaking of small diameter drilling will have less impact. EXP-PR-03_Drilling Procedure EXP-PR-06_Rehabilitation Procedure EXP-PR-02_Operational Site procedure.
5c). Animal Life - Butterflies	Dust from access road creation or any other activities.	Dust settling on foodplants means small butterfly larvae or insects cannot utilise the dusty plants.	1. Limit amount of dust created as far as possible. 2. Implement road wetting if dust becomes a serious problem. EXP-PR-02_Operational Site procedure. EXP-PR-06_Rehabilitation Procedure
5f). Animal Life - Butterflies	Exhaust emissions; emissions from refuelling.	Butterflies find food by smell and find mates by smell of pheromones; if these are masked by other emissions or gasses, it can lead to them moving out of the area.	1.Ensure equipment is in good working order to keep emissions to a minimum; 2. Take care in handling of fuels. EXP-PR-02_Operational Site EXP-PR-05_Procedure Emergency preparedness and Response Procedure.
5g). Animal Life -Butterflies.	Footpath creation and daily footpath	Potential erosion of path and gully	1. Ensure paths do not become erosion gullies; ensure paths to prospecting

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Environmental Element Affected.	Activity (Aspect) Causing Impact / Potential Impact	Significant Impact	Suggested Management
	use.; moving rocks, damage to plants and footpath getting compacted and getting "deeper".	creation; Paths are often used by animals and insects as they are open areas and humans may come across these along the path; deep paths can become traps for insects and destroyed by .	sites "zig-zag" up inclines and do not go vertically; 2. Avoid moving rocks where possible as these are microhabitats for insects, mostly ants and pupae which have their nests under rocks. EXP-PR-02_Operational Site procedure. EXP-PR-06_Rehabilitation Procedure
5h). Animal Life –Herpetofauna	Movement of rocks and stones in rocky grassveld area – i.e.alteration of habitat structure.	Makes specially adapted species of herpetofauna highly vulnerable to predation , and reduces ability to capture prey.	1. Return habitat to its original condition as soon as possible after completion of prospecting activity, including returning rocks and stones. 2. Photograph any herpetofauna for herpetologist if possible. 3. Avoid steep rocky grassy slope above fire hut if possible. EXP-PR-06_Rehabilitation Procedure.
5i). Animal Life - Birds	Any physical disturbance of site.	a)If grass owl nest is present this could disturb breeding. b)Potential to disturb foraging area of Blue Swallows. c)Possible impact on Striped Flufftails.	1. Field workers trained to ID grass owls. If nest is located, avoid area until breeding is complete. 2. Prospecting pits to be rehabilitated. Selected pits in suitable habitat could be engineered to provide possible new nesting sites for Blue Swallow. 3. Prospecting pits to be rehabilitated. EXP-PR-02_Operational Site Procedure.
6a)Surface Water and Ground Water.	Footpath and road creation, drilling and manual and mechanised pitting causing compaction of the footprint area.	Reduction in water levels.	1. Implement acceptable protection zone around wetlands and riparian areas, unless the required permit has been obtained from DWAF to operate in these areas. 2. Implement access control. 3. Plan and regulate vehicle movement 4. Pipe (gravitate) water from central elevated area along existing footpath / road where possible e.g. on upper site. 5. Protect natural vegetation where possible 6. Compacted areas to be ripped / scarified (shallowly) in bands manually or mechanically, on contour if any slope. 7. Replace topsoil, vegetation (if

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Environmental Element Affected.	Activity (Aspect) Causing Impact / Potential Impact	Significant Impact	Suggested Management
			any removed and stored), stones, rocks. 8. Implement erosion protection on sites and tracks. EXP-PR-06_Rehabilitation Procedure EXP-PR-02_Operational Site procedure.
6b). Surface Water and Ground Water.	On site sanitation and the disposal of contents of portable toilets.	Potential surface and groundwater pollution.	1. Contents of environmentally friendly Porta Loos to be regularly emptied and Loos maintained. 2. Contents to be disposed of at approved water treatment works. EXP-PR-02_Operational Site procedure.
6.c) Surface Water and Ground Water.	Drilling resulting in loss of geological strata and the creation of a conduit between geological strata.	This could result in the mixing of water from different aquifers. If this water differs in quality this could be problematic.	Prospecting boreholes that will not be used in the future will be grouted with bentonite. EXP-PR-03_Drilling procedure.
6d). Surface Water and Ground Water	Oxidisation of sulphides associated with gold bearing quartz veins.	Acid generation and increased concentration of metals and sulphate.	1. There is a limited distribution of veins. 2. Rich mineralised zones probably historically mined out. 3. Oxidised zone already leached. 4. Fresh mineralization below water table. 5. Prospecting boreholes that will not be used in the future will be grouted. EXP-PR-03_Drilling procedure.
6e) Surface Water and Ground Water	Construction of access routes to sites in wetlands and riparian areas will result in physical disturbance and changes to the shape or form of the land. Localised compaction has the potential to cause increased run-off and increase sedimentation .	There is the potential for the quality of the water to deteriorate for example through transfer of phosphate bound to soil, into streams; there could be a change in vegetation characteristics owing to a substrate change ; there could be a change in stream profile. The significance of this is rated as fairly low.	1. Access routes should be a right angles to the direction of flow ; gradients should be low; 2. Appropriate erosion control measures should be implemented aimed at reducing the velocity of water flowing down the slope before it enters the wetland. EXP-PR-06_Rehabilitation procedure. EXP-PR-02_Operational Site procedure.

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Environmental Element Affected.	Activity (Aspect) Causing Impact / Potential Impact	Significant Impact	Suggested Management
6f). Surface Water and Ground Water - Wetlands	Shallow manual pitting, narrow diameter drilling; minibulk sampling by large diameter drilling or mechanised pitting could cause increased exposure of soil and therefore increase the risk of erosion.	There is the potential for the quality of the water to deteriorate for example through transfer of phosphate bound to soil, into streams ; there could be a change in vegetation characteristics owing to a substrate change or a change in stream profile. The significance of this is rated as fairly low.	1. Activities should be confined to periods of dry weather or scheduled during winter; 2. Vegetation should be re-instated in the most appropriate way. EXP-PR-06_Rehabilitation procedure. EXP-PR-02_Operational Site procedure. EXP-PR-03_Drilling procedure. EXP-PR-04_Pitting procedure.
6g) Surface Water and Ground Water	Use of drilling machines and vehicles (emergency situation where mitigation is not effective) can result in possible leaks or spills of fuel or oil.	The potential pollution of soil, surface water and ground water, directly or indirectly causing disruption of existing indigenous plant communities and ecosystem integrity and biodiversity.	1. Tarpaulins to be in place under drill; 2. Appropriate spill kits on site and workers trained in use of these. 3. Vehicles and equipment used on site to be in good order to minimise possibility of malfunctioning and resulting pollution.4. Emergency preparedness and response procedure well briefed. EXP-PR-02_Operational Site procedure. EXP-PR-05_Emergency Preparedness and response procedure.
7a).Air Quality	Prospecting vehicles driving through village causing dust and noise.	Disturbance to tranquillity of village, and reduction in quality of experience	1.Heavy vehicles to use alternative roads to sites; 2. Roads to be wet to reduce dust if it becomes problematic; EXP-PR-06_Rehabilitation procedure. EXP-PR-02_Operational Site procedure.
8a). Visual	Roads, drilling or mechanised pitting disturbing the vegetation or soil structure causing a visually altered structure and texture, particularly on	Direct or indirect (via erosion or alteration of plant communities) degradation of cultural ecosystem services (aesthetic value, sense of pristine landscape, spiritual value, sense of place).	1. Ensure all precautions are taken to limit possibility of slip or erosion – slope stability tests to be undertaken. 2. Adequate measures to prevent erosion to be put in place during rehabilitation. 3. Regular monitoring of rehabilitation and erosion to be undertaken and corrective action to be taken timeously if any negative impacts detected.

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Environmental Element Affected.	Activity (Aspect) Causing Impact / Potential Impact	Significant Impact	Suggested Management
	steep slopes.	Local stakeholders place a high value on natural landscapes. Scale varies from local to international tourism.	EXP-PR-02_Operational Site procedure. EXP-PR-06_Rehabilitation procedure.
9a) Socio-Economic Structure	There is some concern that the development of informal settlement for prospecting workers within the village could lead to workers having unsupervised access within the village.	It was viewed that this could lead to a change in the character of the village or an increase in crime.	1.Workers will be transported from home to work and will use existing accommodation such as B&B's and camping and self catering facilities. EXP-PR-02_Operational Site procedure.
10a). Socio-Economic Structure	Prospecting activities taking place 6km from a quiet village.	Potential for perception of attractiveness of village as tourism destination to be reduced.	Keep impact of prospecting activities on tourism to a minimum by: 1. Transporting workers to site from homes / camping facilities etc. 2. Wetting roads if dust becomes a problem, 3. Not using road through village for large vehicles, 4. Considering visual impact of activities from hiking trails and screening if possible/feasible, 5. Implementing good waste management ; 6.Using best practice rehabilitation of sites; 7. Ensure all workers and contractors are inducted and well briefed on responsibilities. EXP-PR-02_Operational Site procedure. EXP-PR-06_Rehabilitation procedure.
10b) Socio-Economic Structure	Prospecting activities (manual pitting, small diameter drilling, large diameter drilling, mini bulk sampling) will result in	Concern that this would leave unsightly holes in the ground that would be visible from hiking areas.	1. Manual pits will be closed over and rehabilitated within two days. Drill holes will not be seen by hikers although they will be able to see the drill rig from certain places. If the drill rig is in place for a month, screening will be considered. 2.Rehabilitation of vegetation will be ongoing throughout

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Environmental Element Affected.	Activity (Aspect) Causing Impact / Potential Impact	Significant Impact	Suggested Management
	vegetation being cleared and holes made in the ground.		the prospecting programme. Drilling procedure. Rehabilitation procedure.
11. Archaeological / historical/ Cultural	Excavations or diggings of any sort which unearth or prove to be on top of or near remains of early structures , sites, etc	Potential disturbance of items of cultural or historical significance	1. Ndowana workers and contractors will be briefed in their induction to report any signs of buildings, structures or evidence of cultural sites of any sort that they come across during the course of their work. 2. Work will cease until the site has been investigated by a competent person to make an assessment and recommend appropriate action, possibly Phase 2 assessment. 3. SAHRA confirmation of acceptance of prospecting project going ahead. EXP-PR-02_Operational Site procedure.

Another issue raised under the botanical section, but dealing more with a principle, is the concern that approval of a project in an area of conservation / biodiversity value, could result in cumulative impacts in the future having a serious consequences for the threatened Granite Woodbush Grasslands, biodiversity and ecosystems services. Whilst applications should be considered on their merit and the overall need for good governance and sound rationale between departments is critical, the contribution of the proponent towards management and mitigation in this instance is limited.

C.7 FINANCIAL PROVISION

A financial guarantee for R100 000 (reference number M463288 with Standard Bank, Kimberley) was obtained by De Beers on behalf of Ndowana Exploration, as financial provision for rehabilitation of areas affected by the first of the four listed phases of the prospecting activities which is the manual pitting. If results indicate that the activities should proceed beyond this point, the financial guarantee will be reviewed with DME and they will determine what increase is justified to be adequate for the next phase. The same principle will apply for progression to successive phases.

C.8 MONITORING AND PERFORMANCE ASSESSMENT

C.8.1 Monitoring and performance assessment

During decommissioning, the only activities will be the monitoring of drill and pitting sites and possible monitoring of any new tracks constructed to

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get a drill rig into one of the areas. Water quality will be monitored twice a year at two points until closure, or until DWAF indicates that no further monitoring is necessary, whichever ever comes first. See Addendum 3 for the results of the baseline analyses. This monitoring will form the basis of the progress reports on rehabilitation to be submitted to the Department of Minerals and Energy. Once the rehabilitation is concluded to the satisfaction of the interested and affected parties and the Department of Minerals and Energy, application will be made for closure.

Table 8: Table showing assessments necessary prior to prospecting and monitoring necessary following rehabilitation activities.

Action and No. of Relevant Environmental Element	Frequency	Method	Period
Assessments prior to activities commencing.			
1. Slope stability tests prior to undertaking a) drilling or b) mechanised pitting on very steep slopes; and prior to c) the construction of new tracks on steep slopes.	Prior to commencement of activity.	To be conducted by competent engineer and /or technologist. Document results and decisions.	Before commencement of each of these activities on steep slopes.
2. Assessment of planned grid for manual pitting positions	Prior to commencement of manual pitting in sensitive areas.	Inspect all proposed pit sites with project manager and /or geologist and botanist and check for presence of RD species and any signs of endangered faunal species. If RD fauna suspected, arrange for appropriate faunal specialist to visit position. Adjust grid position if possible to avoid RD species. Document decisions.	Once off at start of activity.
3. Assessment of position of narrow diameter drill site.	Prior to confirmation of position of drill site.	Inspect position with botanist and check for any RD species of plants or signs of any RD faunal species. If any faunal species suspected, get	Once off prior to establishment of narrow diameter drill sites.

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		<p>specialist on site. Determine best place for storing drill rods and for compressor etc. Document decisions.</p>	
4. Assessment of position of large diameter drill site.	Prior to confirmation of position of drill site.	<p>Inspect position with botanist and check for any RD species of plants or signs of any RD faunal species. If any faunal species suspected, get specialist on site. Determine best place for sump, for compressor storing sample bags etc. Document decisions.</p>	Once off prior to start of large diameter drilling.
5. Assessment of position of mechanised pitting.	Prior to confirmation of position of mechanised pitting site.	<p>Inspect position with botanist and check for any RD species of plants or signs of any RD faunal species. If any faunal species suspected, get specialist on site. Determine best place for sample bags, fill when it is brought in etc. Document decisions.</p>	Once off prior to start of mechanised pitting.
6. Assessment of route for new track or road. Assessment of route for footpath on Paardevlei.	Prior to confirmation of route.	<p>Project geologist and / or senior project manager walk route for footpath on Paardevlei with botanist prior to confirmation. For any new roads use services of competent engineer to design route and give advice on construction. Document decisions.</p>	Prior to construction of footpath or road.
Monitoring necessary during / after rehabilitation			
1. Monitoring of alien plants at manual pits, drill sites and mechanised pitting sites; monitoring along paths and along any new tracks created for access.(potential to	Every 6 months.	<p>Visual inspection. Note presence of invasive plants. Control any invasive alien species according to procedure. Photographs. Document decisions.</p>	On-going until closure.

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include bigger area in collaboration with land owners if discussions indicate that this is a possibility)			
2. Monitoring of rehabilitation at all prospecting sites and along footpath and any new tracks or roads created for access.	Every 6 months.	Visual inspection. Photograph. If re-vegetation does not progress adequately, it may be necessary to re-seed with indigenous grass seed Contact local botanist about this. Document decisions.	On-going until closure.
3. Monitoring of erosion on all prospecting sites and along footpaths or roads / tracks created for access.	Following heavy rains; every week during times of drilling and then every 6 months.	Visual inspection. Action taken to prevent erosion if any signs of erosion noted. Photographs. Records kept.	On-going until closure.
4. Monitoring of water quality at two points.	Every 6 months – once during summer and once during winter.	Samples taken according to specifications and submitted to registered laboratory for analysis. Comparison with limits to check for non-conformances.	On-going until closure or until DWAF agrees no further sampling is necessary. See Addendum 3 for baseline analyses.

C.8.2 Describe how the adequacy of this programme will be assessed and how any inadequacies will be address (regulation 55(1) and 52 (2)(e))

- As part of the ISO14001 Environmental Management System (EMS) all employees and contractors receive environmental induction. Environmental awareness is reinforced through regular SHE meetings.
- The EMS includes monitoring and reporting requirements, the purpose being to monitor the impact on the environment.
- The geologist responsible for the project will check all aspects of the operation against both the requirements of the EMS and the requirements specified in the Environmental Management Plan document (Version 1.3.1 dated 1 May 2004), this Environmental Management Plan and the operational procedures.
- A non-conformance reporting system is in place as part of the EMS, and non-conformances will be reported and the appropriate corrective and preventive actions taken.

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- Internal audits are conducted annually and the EMS is audited annually and this field operation or one of the other field operations may be included in the audit.
- An annual performance assessment report is submitted to DME on the prospecting.

C.9 CLOSURE AND ENVIRONMENTAL OBJECTIVES

When the proponent intends closing the advanced prospecting operations, an environmental risk report (as per requirements of Regulation 60 of the regulations promulgated in terms of the MPRDA) shall accompany the application for closure.

The intended end use for the prospecting area after closing of operations is to continue with the same land use as before the prospecting programme started. Where impacted upon, the environment will be rehabilitated and returned to its original / natural state, or as close to this as possible bearing in mind that succession takes time.

Closure objectives

Closure objectives form part of the EMPlan and are as follows:

- (a) To return the land to the condition it was in prior to the start of prospecting (or as close to this condition as possible, allowing for the fact that succession in grasslands can take time) and to the pre-prospecting land use.
- (b) In this instance the predominant land use is afforestation. Grasslands and other vegetation units on the properties have high biodiversity value, in particular the Woodbush Granite Grasslands and the habitats where the RD butterfly *Dingana clara* was identified, and where the *Tetradactylus sp.* may occur. Many stakeholders in the area hope that regional conservation and biodiversity frameworks will include these areas as some form of protected area, and that they will be managed with the goal of conserving biodiversity. The proponent supports these views, should there be no indication that the prospecting programme should go into the final phase of bulk sampling.
- (c) To ensure that the risk of invasive alien plants on the areas affected by prospecting is as low as possible.
- (d) The estimated closure cost is estimated to be less than R100 000 for the first phase – to be reviewed with DME if prospecting progresses to the next phase.

C.10 CLOSURE

Closure will be as per Regulations 56 to 62 of the Mineral and Petroleum Resources Development Act as outlined in Section F5 of the Environmental Management Plan document (version 1.3.1 dated 1 May 2004).

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

- (a) All manual pits will be rehabilitated as soon as they are closed. This will be done according to the rehabilitation procedure.
- (b) All drill sites (small diameter and large diameter) will be rehabilitated as soon as the drilling programme is complete. This will be done according to the rehabilitation procedure.
- (c) Mechanised pits will be rehabilitated as soon as they have been back-filled. Fill will be brought in with the trucks that come to fetch samples in order to reduce the number of vehicle trips to the pit site. Rehabilitation will be done according to the rehabilitation procedure.
- (d) Roads / tracks which have been constructed in order to access sites will be rehabilitated as soon as work on the site is complete. This will be done according to the rehabilitation procedure.
- (e) Monitoring of the prospecting sites and the specific access roads / tracks, for signs of erosion and presence of invasive alien species (IAS) of plants will be undertaken six monthly. Should signs of either of these be detected, corrective action will be taken to halt the erosion and IAS will be controlled according to the rehabilitation procedure.
- (f) Water quality was monitored at 5 points initially to obtain baseline data, and will now be monitored at two points twice a year, once during summer and once during winter. All results will be documented, compared with limits and action taken if there are non-conformances resulting from prospecting activities.
- (g) Progress of re-vegetation will also be monitored six monthly and if it does not appear to be proceeding according to plan, a competent person will be consulted to determine the appropriate action.
- (h) Reporting on the progress of rehabilitation will form part of the performance assessment submitted to DME on an annual basis. Copies of these reports will be made available in the Haenertsburg library following submission.
- (i) Prior to closure, a final performance assessment and an environmental risk assessment will be carried out and submitted together with the closure application. This will identify any residual or latent impacts.
- (j) 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. The financial provision at closure will make provision for this.
- (k) The Basic Assessment contains the list of interested and affected parties consulted.
- (l) The nine specialist studies conducted during the course of the Basic Assessment are contained in Appendix D of the Basic Assessment Report.

C.11 PUBLIC PARTICIPATION

Consultation with stakeholders in terms of the Basic Assessment for the advanced prospecting programme will take place twice. The first information session / public

meeting was during May 2008 when the process of the Basic Assessment was initiated and to ascertain any concerns about potential impacts to the environment from the proposed prospecting activities. All concerns were recorded and a response was given to each. Some responses on the table were amended as a result of the specialist studies. These have been indicated on the table in the Appendix E of the Basic Assessment dealing with Public Participation. The second will be held during April 2009 on completion of the Basic Assessment and amendment of the EM Plan, to inform on how the specialist studies had informed decisions and relevant mitigation put in place in the EM Plan.

The comments and response table, interested and affected parties register, comments received and minutes of meetings held with focus groups are all included in Appendix E of the Basic Assessment.

D. SCORING

The scoring of the aspects and impacts were undertaken by the specialists undertaking the various specialist studies according to the rating used by the proponent in their ISO 14001 environmental management system. This rating system was used because the aspects and impacts will be controlled as part of this system, and the EM Plan will be audited by this system so it did not make sense to use a different rating system. A summary of the more significant aspects and impacts can be seen in the table in section 4 of the Basic Assessment.

The DME Scoring and calculations are included as Addendum 2 of this EMPLan.

E. UNDERTAKING

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

Signed on thisday of 2009.....at(Place)

.....
Signature of applicant

.....
Designation

H. UNDERTAKING

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

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

Signed atthis.....day of.....2009

.....
Signature of applicant

.....
Designation

.....
Signature of applicant

.....
Designation

Agency declaration: This document was completed by Janet Phelan of Plan-it with envirocare.on behalf of Ndwana Exploration Two (Pty) Ltd.

I. APPROVAL

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

Signed at.....this.....day of.....2009

.....
REGIONAL MANAGER

REGION:.....

ADDENDUM 1 - OPERATIONAL PROCEDURES.

The following operational procedures are contained in this addendum:

1. Operational Site Procedure
2. Drilling Procedure.
3. Pitting procedure.
4. Rehabilitation Procedure
5. Waste Management Procedure.
6. Emergency Preparedness and Response.

ADDENDUM 2 – DME SCORING AND CALCULATIONS

C. ENVIRONMENTAL IMPACT ASSESSMENT:

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

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

C.1 DESCRIPTION OF THE ENVIRONMENT LIKELY TO BE AFFECTED BY PROPOSED PROSPECTING/MINING OPERATIONS: (REGULATION 52(2)(a))			
ENVIRONMENTAL ELEMENT/ IMPACTOR	VALUE	TICK	OFFICE USE
C 1.1 What does the landscape surrounding the proposed operation look like? (Open veldt/ valley/ flowing landscape/ steep slopes)			
.			
<i>See section C.1. of the EM Plan.</i>			
C 1.2 Describe the type of soil found on the surface of the site			
<i>See section C.1.2 of EM Plan 2005.</i>	VALUE	TICK	OFFICE USE
C 1.3 How deep is the topsoil?	0 – 300mm	√	8
<i>Differs depending on area.</i>	300 – 600mm		4
<i>See Table 1 in section C.1.2</i>	600mm +		2
C 1.4 What <i>plants, trees and grasses</i> grow naturally in the area around the site?			
Tables 2-5 in the botanical specialist report in the Basic Assessment list all the plants that occur on the study area. Approx.25ha of the 57ha is covered with alien timber plantations of Pines and Eucalypts; two endangered , one vulnerable and four protected species were confirmed on the site.			
C 1.5 What <i>animals</i> naturally occur in the area?			
<i>See section C.1.4 of EM Plan 2005 and C2..2..4 of this report.</i>			
	VALUE	TICK	OFFICE USE
C 1.6 Are there any <i>protected areas</i> (game parks/nature reserves, monuments, etc) close to the proposed operation?	Yes		4
	No	√	0

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C 1.7 What mineral are you going to prospect or mine for?		<i>Diamonds</i>	
C 1.8 Describe the type of equipment that will be used:			
<i>See section C.2.1 and Table 1b in this report.</i>			
C.2 HOW WILL THE PROPOSED OPERATION IMPACT ON THE <i>NATURAL</i> ENVIRONMENT? (REGULATION 52(2)(b))			
ENVIRONMENTAL ELEMENT/ IMPACTOR	VALUE	TICK	OFFICE USE
C 2.1 What will the ultimate depth of the proposed prospecting/mining operations be?	0 – 5m	√	2
	6 – 10m		4
<i>See section C.2.1</i>	10 – 25m		8
	25m +		10
C 2.2 How large will the <i>total</i> area of all excavations be?	.1		ha
<i>See section C.2.1 and Table 1b in this report.</i>			
C 2.3 How large will each excavation be before it is filled up?	<10 X 10m		2
	<20 X 20m	√	4
<i>See section C.2.1 and Tables 1a and 1b in this report.</i>	>20 X 20m		8
C 2.4 How many <i>prospecting</i> boreholes or trenches will there be?	Estimate of 32 boreholes Estimate of 90 1x1m manual pits and 4 15mx15m mechanised pits		
C 2.5 Will employees prepare food on the site and collect firewood?	Yes		4
	No	√	0
C 2.6 Will water be extracted from a river, stream, dam or pan for use by the proposed operation?	Yes		4
	No	√	2
C 2.7 If so, what is the name of this water body?	<i>Not applicable</i>		
C 2.8 If water will not be extracted from an open surface source, where will it be obtained?	<i>The water will be obtained from Lepelle Northern Water with permission – see attached letter in Basic Assessment.</i>		

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C 2.9 How much water per day will the <i>mineral processing</i> operation require?	1000 – 10 000 Liters	√	2
	20 000 – 40 000 L		3
<i>See section C.2.1</i> No mineral processing will take place on site. It will be taken back to base. However, water for drilling, of up to 10,000 litres per day, will be required.	40 000 – 60 000 L		5
	60 000 – 100 000L		8
	More		10
C 2.10 How far is the proposed operation from open water (dam, river, pan, lake)?	0 – 15m		8
	16 – 30m		6
<i>See section C.2.1</i> In a few places there may be some prospecting within 32m of a stream/ riparian area where the 1:50 floodline is not known.	31 – 60m		4
	More than 60 metres	√	2
C 2.11 What is the estimated depth of the water table/ borehole?	Water table variable see 5.7 in Geohydrological Specialist study in Basic Assessment. Boreholes estimated to 66 m average.		metres
<i>See Section 5.7 on page 27 of the geohydrological Specialist study.</i>			
C 2.12 How much water per day will the proposed operation utilize <i>for employees</i> ?	100		Liters
C 2.13 What toilet facilities will be made available to workers?	None		8
	Pit latrine (longdrop)		4
Only if drilling / mechanised pitting	Chemical toilet	√	2
C 2.14 Would it be necessary to construct roads to access the proposed operations?	Yes	√	4
Estimated 1km if project proceeded to large diameter drilling on the upper site;	No		0
C 2.15 How long will these access road(s) be (from a public road to the proposed operations)	0 – 0,5 km		4
Estimated distance from forestry roads	0,6 – 1,5 km	√	2
	1,6 – 3 km		4
C 2.16 Will trees be uprooted to construct these access road(s)?	Yes		4
	No	√	0
C 2.17 Will any foreign material, like crushed stone, limestone, or any material other than the naturally	Yes	√	4

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occurring topsoil be placed on the road surface?			
Some material from the nearest borrow pit used for local road maintenance, may be used if this is necessary. If it seen that the best practice to prevent erosion would be to construct concrete strips over a few metres, this will be done. During rehabilitation this will be removed in any situations off the existing roads. On existing roads these will be left on landowner's request.	No		0
C.3 TIME FACTOR			
C 3.1 For what time period will prospecting operations be conducted on this particular site?	0 – 6 months		2
	6 – 12 months		4
<i>See section C.3.</i>	12 – 18 months		6
	18 – 24 months	√	8
	>24 months		10
C.4 HOW WILL THE PROPOSED OPERATION IMPACT ON THE SOCIO-ECONOMIC ENVIRONMENT? (REGULATION 52(2)(b))			
ELEMENT/ IMPACTOR	VALUE	TICK	OFFICE USE
C 4.1 How many people will be employed?	• 28		
C 4.2 How many men?	• 24		
C 4.3 How many women?	• 4		
C 4.4 Where will employees be obtained? (Own or employed from local communities?)	Own	√	2
Main team is own employees, but contractors will be employed for drilling and mechanised pitting; there will also be times when 12-20 local persons will be employed for temporary work on short term contracts.	Local	√	4
C 4.5 How many hours per day will employees work?	Sunrise → Sunset	√	4
	Less		2
	More		8
C 4.6 Will operations be conducted within 1 kilometer from a residential area .	Yes	√	6
There is a forestry hostel less than 200m away from a point on the lower site where drilling will probably be conducted for 1 month and there is a small community of	No		1

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less than 20 persons within 1km of this same site.			
C 4.7 How far will the proposed operation be from the nearest fence/windmill/house/dam/built structure?	0 – 50 metres		8
There is a fire hut below the firebreak near the fence with the Doornhoek property.	51 – 100 metres	√	4
	150 or more metres		2
C.5 HOW WILL THE PROPOSED OPERATION IMPACT ON THE <i>CULTURAL HERITAGE</i> OF THE SURROUNDING ENVIRONMENT? REGULATION 52(2)(b)			
ELEMENT/ IMPACTOR	VALUE	TICK	OFFICE USE
C 5.1 Are there any graveyards or old houses or sites of historic significance within 1 kilometer of the area?	Yes	√	8
<i>See section C.5 The Cultural Heritage Specialist study was submitted to SAHRA and they have indicated that there are no significant sites and that the prospecting may go ahead with the proposed mitigatory measures. Letter attached to Basic Assessment..</i>	No		0

D SCORING OF EIA– FOR OFFICIAL USE ONLY

Instructions for officials:

In this table, complete the totals of each section indicated below and do the calculation.

Remember to first add all the values of sections C 1,2,4 and 5 and then to multiply it by the time factor in Section C3.

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

D 1.1 CALCULATION TABLE

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

D 1.2 IMPACT RATING SCALE

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

Additional Objectives:

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

Addendum 3: Baseline analyses of water samples

Samples were collected from 5 sites initially in the dry season (winter) of 2008, for biological and chemical analyses. The two main sites (ES2 and PS3) were also sampled for oil, grease and detergent analyses. The two main sites were again sampled for all forms of analysis in the wet season (summer) 2009.

All analyses were performed by the CSIR Consulting and Analytical Services : Water Chemistry unit in Pretoria.

Amendment to Environmental Management Plan

Location		Paeroa Drainage (Letaba basin)					Eastbrook Drainage (Olifants basin)					
Season		Winter			Summer		Winter			Summer		
Flow		Stagnant	Low	Low	Low	High	High	Low	Low	Low	High	High
Site		PS1	PS2	PS3	PS3	PS3	PS3	ES1	ES2	ES2	ES2	ES2
Date Received		2008/08/20	2008/08/20	2008/08/20	2008/10/16	2009/02/06	2009/02/25	2008/08/20	2008/08/20	2008/10/16	2009/02/06	2009/03/06
Sample number		PS1	PS2	PS3	PS3HC	A 7h35 am	Watersample	ES1	ES2	ES2HC	B 8h30 am	ES206/03/09
Lab number		68060	68061	68062		70418	70592	68063	68064		70419	70763
Analysis	Units											
Cadmium	mg/l Cd	<0.09	<0.09	<0.09		<0.01		<0.09	<0.09		<0.01	
Calcium	mg/l Ca	2	4	1		8		3	10		3	
Chloride	mg/l Cl	17	8.4	8.3		<5		<5	8.3		<5	
Colour	mg/l [Pt-Co]	387	335	219		6		7	32		15	
Copper	mg/l Cu	<0.05	<0.05	<0.05		<0.05		<0.05	<0.05		<0.05	
Elect Conductivity	mS/m [25°C]	13.9	12.5	8.04		15.0		5.95	18.3		6.42	
Faecal Coliform	count/100ml	50	0	8		140		3	73		32	
Fluoride	mg/l F	<0.20	0.21	<0.20		<0.20		<0.20	0.24		<0.20	
HPC	count/ml	510000	185000	40000		1840		239000	47000		162	
Iron	mg/l Fe	0.52	1.5	1.1		0.32		<0.06	0.3		3.5	
Lead	mg/l Pb	<0.03	<0.03	<0.03		<0.03		<0.03	<0.03		<0.03	
Magnesium	mg/l Mg	3	5	2		6		2	9		2	
Manganese	mg/l Mn	0.09	<0.05	<0.05		<0.05		<0.05	<0.05		<0.05	
Nitrate nitrogen	mg/l N	<0.20	<0.20	<0.20		<0.20		0.31	<0.20		<0.20	
pH	pH units [25°C]	6.4	6.6	6.5		7.7		7.5	7.6		6.2	
Sodium	mg/l Na	13	8	8		5		2	11		4	
Sulphate	mg/l SO4	<5	28	12		5		<5	<5		22	
Total Coliform	count/100ml	450000	120	390		440		870	3000		170	
Total Hardness	mg/l CaCO3	17	32	10		43		15	60		16	
Turbidity	NTU	21	19	14		1.1		0.2	1.8		23	
Zinc	mg/l Zn	<0.06	<0.06	<0.06		<0.06		<0.06	<0.06		<0.06	
TPH	mg/l					<0.40			<0.40			
Detergent #	mg/l					46			27		166	
Oil & grease #	mg/l					<10			<10		<10	