



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

Name of Applicant: Sparkel Mining (Pty) Ltd

Reference Number: NC 30/5/1/1/2/11487 PR

**Farm: Remaining extent of portion 1 of the farm
Slypklip North No. 32**

District: Warrenton

ENVIRONMENTAL MANAGEMENT PLAN

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

STANDARD DIRECTIVE

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

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ANNEXURE	
A	Copies of the letters sent by registered mail to all relevant interested and affected parties.
B	A copy of the letter addressed to the landowner specifically.
C	A copy of the summarised information (consultation bundle) which was handed to all attendees and discussed at the public consultation meeting on 2 December 2014.
D	A copy of the Minutes of the meeting of 2 December 2014.
E	Letter dated 10 December 2015 received by Dr JP Olivier on behalf of the registered land owner.
F	Letter from Milnex 189 CC to Mrs WM Olivier dated 2 February 2015.
G	Copy of an advertisement which was placed in the Diamond Field Advertiser newspaper dated 13 November 2014.

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

ITEM	COMPANY CONTACT DETAILS
Name	Sparkel Mining (Pty) Ltd.
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Fax no:	053 963 2009
Cellular no	082 574 6960
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Postal address	P.O. Box 228 Wolmaransstad 2630

ITEM	CONSULTANT CONTACT DETAILS (If applicable)
Name	Milnex 189 BK (Mr. Japie Loubser)
Tel no	053-963 1081
Fax no:	0872317021
Cellular no	084 657 3006
E-mail address	info@milnex-sa.co.za
Postal address	P.O.Box 1086, Schweizer-Reneke, 2780

2. DESCRIPTION OF THE ENVIRONMENT LIKELY TO BE AFFECTED

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

2.1. Environment on site relative to the environment in the surrounding area

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

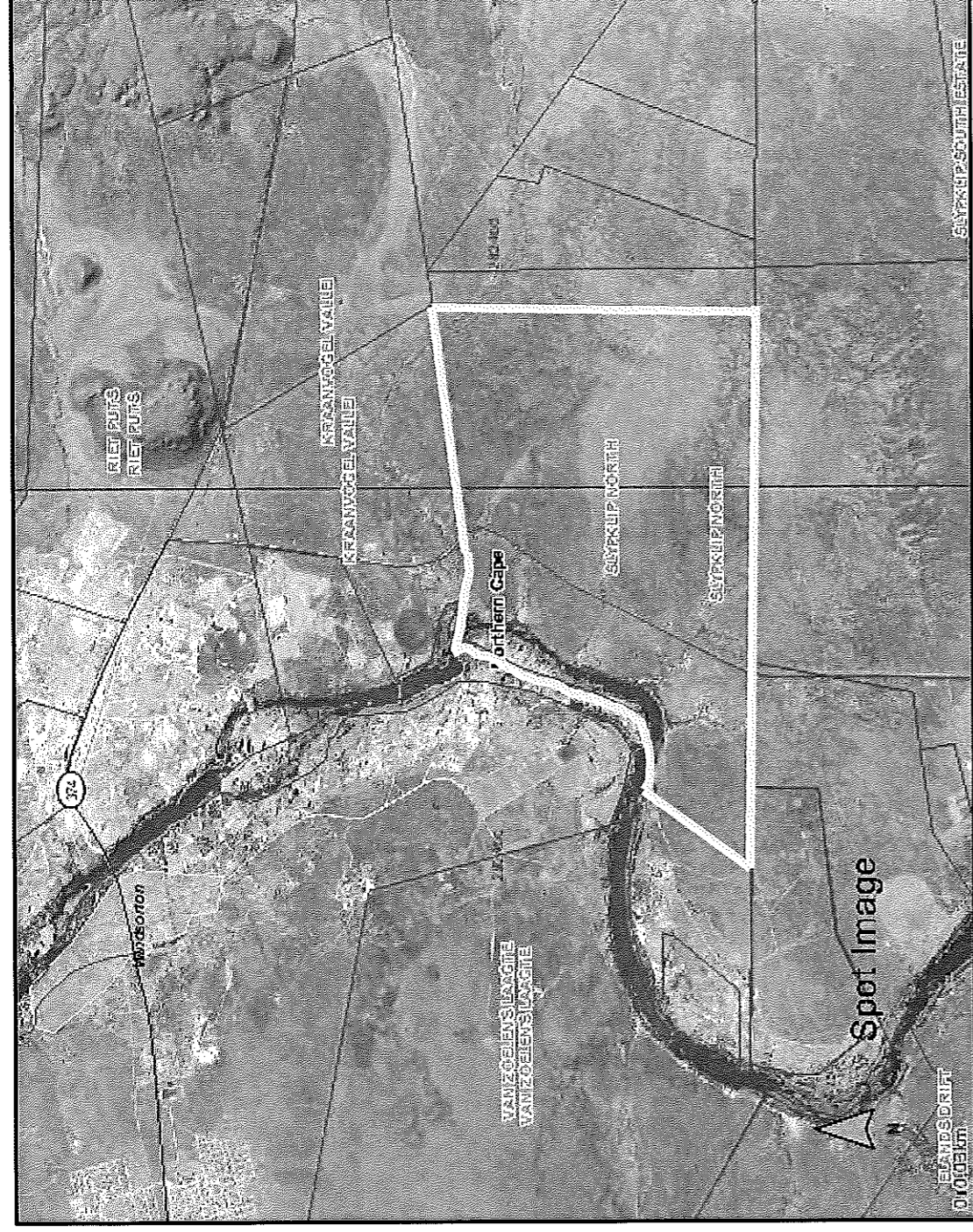
2.1.1. General locality

The general locality of the property on which the application is located in relation to topographic and cadastral features in the landscape is indicated in Figure 1.

<p>Sketch plan no: _____ File no: RDMW (RL) _____ DESCRIPTION OF PROSPECTING AREA The figure lettered A—W represents a prospecting area as follows: 1. The remaining extent of portion 1 of the farm Stypklip North 32, Kimberley (870,7462 hectares)</p> <p>NAME OF APPLICANT: Sparkal Mining (Pty) Ltd P.O. Box 960 Schweizer Reneke 2780</p> <p>SIGNATURE _____ DATE: 16 April 2013</p>		<p>CO-ORDINATES (WGS84)</p> <p>A S28.35583 E24.76501 B S28.38204 E24.76441 C S28.38148 E24.71899 D S28.37299 E24.72542 E S28.37336 E24.72716 F S28.37364 E24.72966 G S28.37268 E24.73110 H S28.37142 E24.73221 I S28.36981 E24.73289 J S28.36833 E24.73351 K S28.36697 E24.73399 L S28.36544 E24.73450 M S28.36428 E24.73488 N S28.36329 E24.73521 O S28.36221 E24.73568 P S28.36149 E24.73609 Q S28.36010 E24.73686 R S28.35889 E24.73741 S S28.35744 E24.73704 T S28.35800 E24.73997 U S28.35824 E24.74135 V S28.35837 E24.74298 W S28.35844 E24.74476</p> <p>SURFACE STRUCTURES None</p> <p>REGISTERED SERVITUDES See Title Deed</p> <p>LOCALITY MAP See annexure</p> <p>TOPOGRAPHY See Topographical Map</p>	<p>SCALE 1:50 000</p> <p>NB! A LOCALITY PLAN MUST ALSO BE ATTACHED TO THIS CO-ORDINATED PLAN</p>	<p>SKETCH PLAN APPROVED</p> <p>REGIONAL MANAGER DEVELOPMENT NORTHERN CAPE REGION KIMBERLEY</p> <p>DATE: _____</p>
<p>COMMENTS:</p> <p>_____</p> <p>_____</p>				

Figure 1: General locality map of the farms on which the Prospecting Right application is located


SPOT IMAGE INDICATING THE PROSPECTING FOCUS AREA

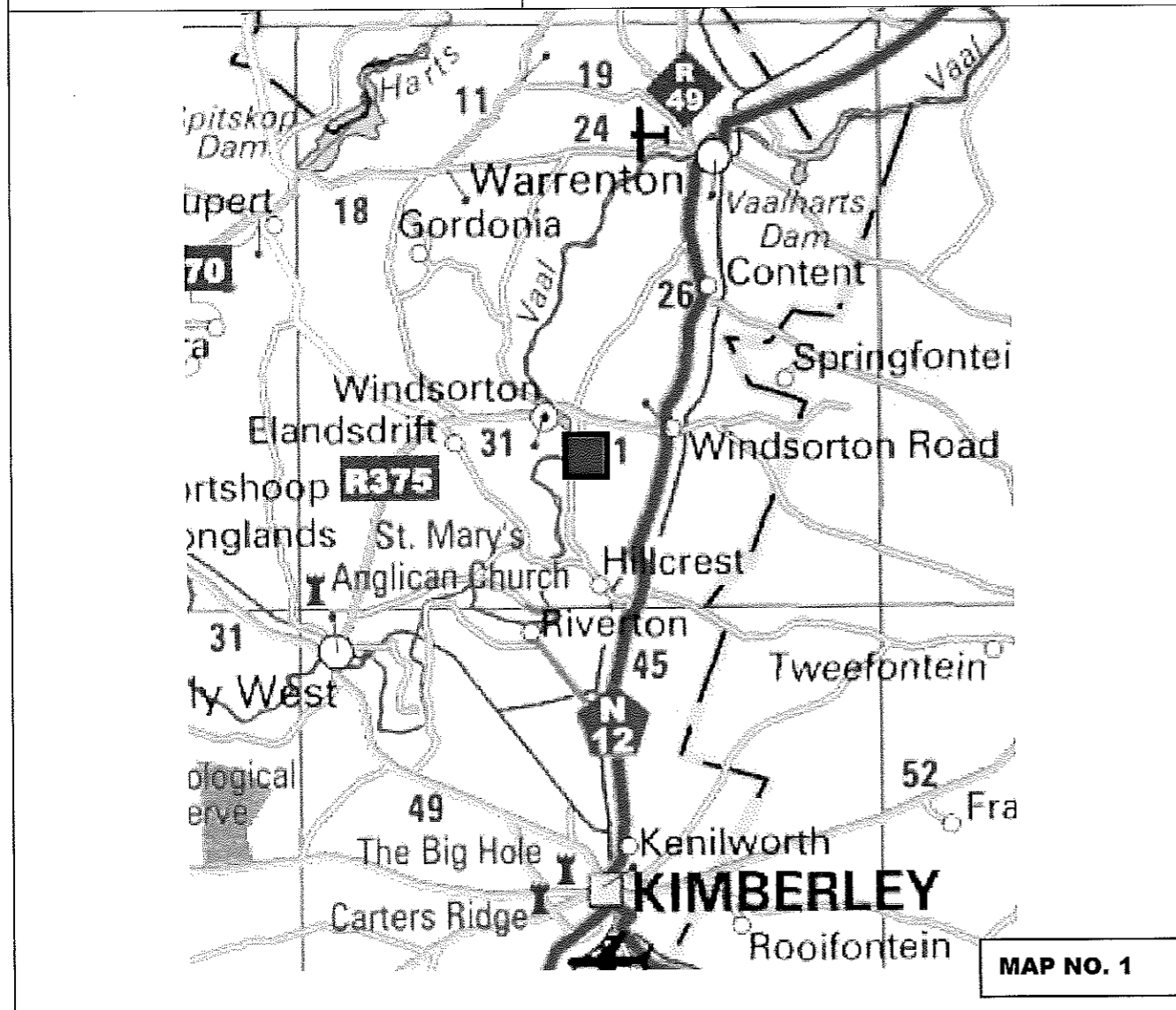


REGULATION 50 (a).

2.1.2. Description of the baseline environment

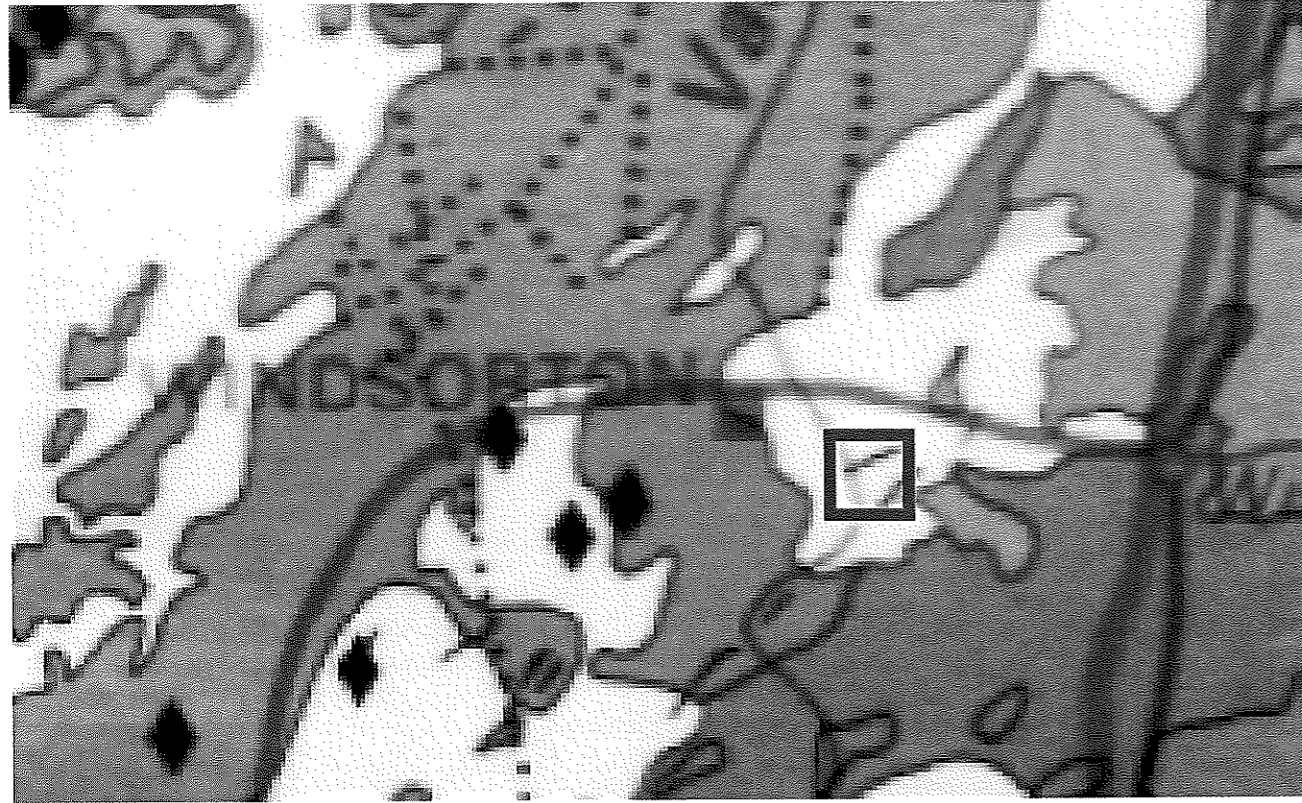
Concise description of the environment on site relative to the environment in the surrounding area.

1.1 MAGISTERIAL DISTRICT	Warrenton
1.2 DIRECTION OF /AND DISTANCE FROM NEIGHBOURING TOWNS	8 km directly south of Windsorton (Map No. 1 for location). 



1.3 LONGITUDE (APPROXIMATE CENTRE OF MINING SITE)	E 24° 45' 15,78"
1.4 LATITUDE (APPROXIMATE CENTRE OF MINING SITE)	S 28° 22' 05,67"
1.5 EXISTING SURFACE INFRASTRUCTURE	The site is an existing farm with farm infrastructure. Access is gained by a gravel road.
1.6 PRESENCE OF SERVITUDES	Eskom power lines, Road.

1.7 GEOLOGY



GEOLOGY LEGEND:

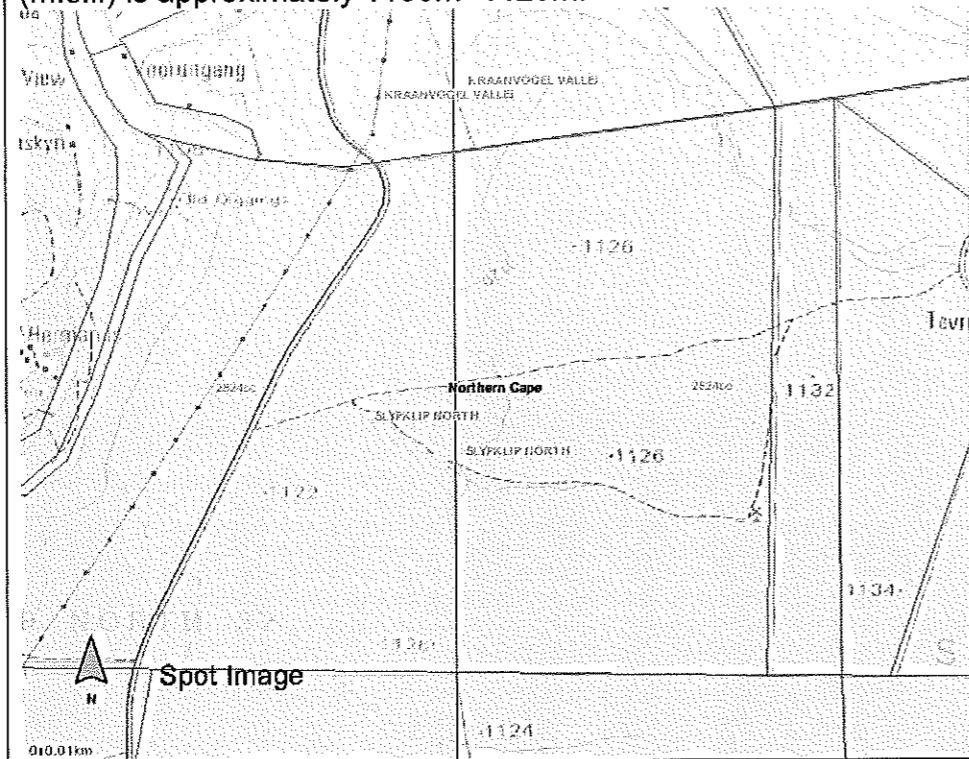
Lithology		STRATIGRAPHY
Qg- diamondiferous in places	Gravel, diamondiferous in places	Quaternary deposits

Source: Source: 1:1000 000 Geology map of R.S.A. 1984

1.8 MINERAL DEPOSIT TO BE PROSPECTED FOR:	The mineral deposit consists of the following: Alluvial Diamonds	
1.9 EXTENT OF PROSPECTING AREA:	See focus area indicated on the Spot image.	The actual focus area will be much smaller, taking into consideration existing farm infrastructure, roads , etc.
	Remaining extent of portion 1 of the farm Slypklip North 32	870.7462 ha
	TOTAL SURFACE AREA	870.7462 ha
1.10 CLIMATE * Climatic region: Sn	<p>This is a semi-arid region receiving on the average about 250 mm of rain in the west to 500mm on the eastern boundary. The rainfall is largely due to showers and thunderstorms falling in the summer months October to March, the peak of the rainy season. On the average up to ten rainy days per month may be expected during the peak of the season, whilst during the usually dry and sunny winter months unsettled weather may occur on one or two occasions per month. Hail is sometimes associated with the thunderstorms and mainly occurs in early summer (November). Air temperatures are subject to large diurnal and seasonal variation; January the average daily maximum lies between 30 and 33 °C and in July it is about 17 °C whilst extremes can attain 41 °C and 28°C respectively. Average daily minimum temperatures are in the order of 15 °C in January and 0 ° C in July, whilst exstremes of 3 °C and -11°C respectively have occurred; these extreme minima are of course largely dependent on local topographical features since the nights are usually calm.</p> <p>The period during which frost can be expected lasts for about 150 days (May to September) in the south of this region and for 100 days (June to August) in the north.</p> <p>Winds are usually north-westerly, attaining their maximum speed in the afternoon; during thunderstorms strong and gusty south-westerly winds of short duration are common feature and occasional cold snaps are accompanied by unpleasantly cold southerly winds for a day or two..</p> <p>Source: South Africa (WB 28), 1982.</p> <p>The mean annual rainfall for Armoedsvlakte weather station (0432/237 3), Lat: 26° 57", Lon 24° 38": , height: 1234m for the period 1919 to 1984 is 455 mm.</p>	

1.11 TOPOGRAPHY

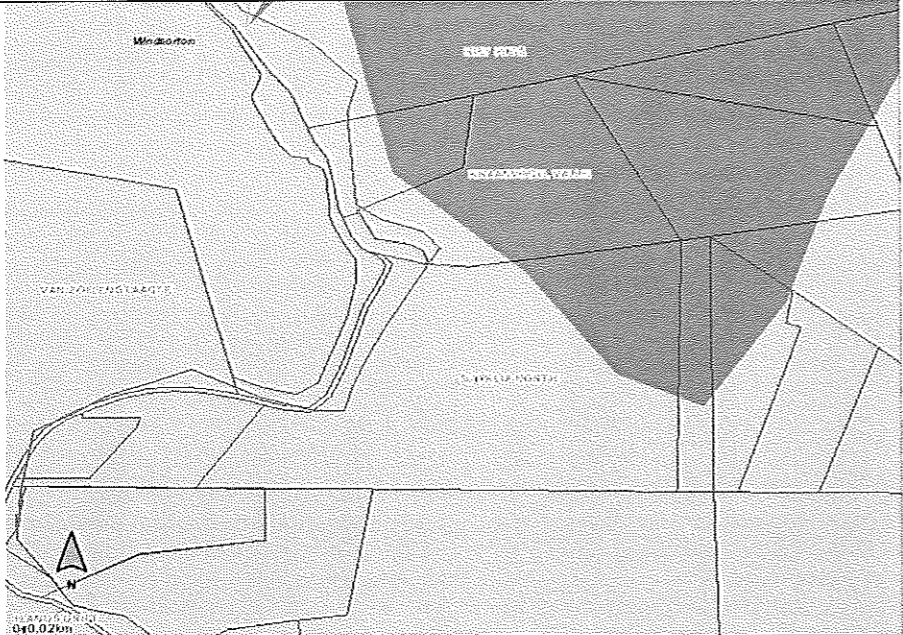
The site is situated on a flat slightly undulating plain sloping east to west, towards the Vaal River. The height above mean sea level (m.s.l.) is approximately 1100m -1120m.



1.12 SOIL

The soils in the whole study area were found to be of the Coega/Mispah soil form. The effective soil depth for the largest part of the study area varies between 0mm and 150mm. Rock outcrops occur with loose stones visible on the surface.

These soils are very shallow and stony and therefore allow very restricted rooting depth to crops. Due to this severe restriction, potential for both dry land and irrigated crop production is low. Rock outcrops can cause mechanical restrictions to cultivation and vehicle mobility. Fertility levels of these soils are low and relatively high amounts of fertilizer would be required for crop production.

	
1.13 PRE-MINING LAND CAPABILITY	This is an existing mine with indication that the surrounding surface area is utilized for grazing purposes (cattle)(See Spot image , page 9).
1.14 LAND-USE	This is an existing mine with indication that the surrounding surface area is utilized for grazing purposes (cattle) (See Spot image, page 9).
1.15 VEGETATION (FLORA)	16-KALAHARI THORN VELD Source (Veld types of South Africa, Acocks (1988))
Typical vegetation cover found in the study area. The majority of the area is already disturbed by agricultural and mining.	The vegetation in the area of the site belongs to the Kalahari Thorn veld of the Savanna Biome (Van Rooyen&Bredenkamp, 1996). Acocks (1980) classified this velttype as Kalahari thornveld (16a). The site can also be classified as Kalahari Plateau bushveld according to Bredenkamp and van Rooyen in Vegetation of South Africa, Lesotho and Swaziland. This biome can be described as a fairly dense bushveld composed of shrubs and sometimes small trees in a mixed grassland. This vegetation type is confined to a plateau, at 1 250m altitude, in the North West Province and Northern Cape, in the Vryburg-Kuruman-Griekwastad area (A.C.Koekemoer, 2005).
1.16 ANIMAL LIFE (FAUNA)	❖ Domestic animals such as cattle.

<p>1.17 SURFACE WATER</p>	<p>Lower Vaal River Catchment</p> <p>The mine falls under the primary drainage region C and in quaternary sub-catchment C91B (<i>WRC Report No 298/1.2/94</i>). The catchment is approximately 429 km² in size.</p> <p>Notwithstanding the above-mentioned facts, it is not expected that prospecting operation will have any effect on the boundaries or the general water flow of the catchment.</p> <p>The Vaal River is the western border of the farm (prospecting area). Any activity conducted near the river could be influenced by the river during flood conditions etc.</p> <p>No wetlands occur on the mine property or in its vicinity.</p>
<p>1.18 GROUND WATER</p> <p>1.18.1 Water use</p>	<p>Ground water (borehole water source) will be used for potable & process water. The Applicant has engaged in a process of consultation with DWS to have the necessary water use licenses and/or authorizations in place prior to prospecting activities commencing.</p>
<p>1.19 AIR QUALITY</p>	<p>The mine will be situated in a rural area where the air quality is only affected by natural fires, dust storms, etc.</p>
<p>1.20 NOISE</p>	<p>Generators, vehicles traveling will generate noise.</p>
<p>1.21 SITES OF ARCHAEOLOGICAL OF AND CULTURAL INTEREST</p>	<p>The majority of surface area is already disturbed by agricultural activities.</p> <p>There are no known sites of archaeological interest on the mine site and the environmental specialist who compiled this EMP could not trace any objects or indications of the presence of such interest. Should same however be discovered a specialist will be appointed to conduct a survey and compile a specialist report.</p>
<p>1.22 SENSITIVE LANDSCAPES</p>	<p>None</p>
<p>1.23 VISUAL ASPECTS</p>	<p>Prospecting workings will not be visible from any major roads.</p>

Specific environmental features on the site applied for which may require protection, remediation, management or avoidance

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

Environmental aspect:		Protection required	Mitigation required	Ref.
1.2.2	Surface water	Yes		See page 15
1.2.2	Topography		Yes	See page 31
1.2.3	Soil		Yes	See page 32-33
1.2.4	Land capability		Yes	See page 34
1.2.5	Land use		Yes	See page 34
1.2.6	Vegetation		Yes	See page 35-36
1.2.7	Animals (Domestic/Wild, etc.)		Yes	See page 36-37
1.2.8	Surface water		Yes	See page 38-39
1.2.9	Ground water		Yes	See page 40
1.2.10	Air quality: Dust		Yes	See Page 41
1.2.11	Noise: Vehicles and equipment		Yes	See page 41
1.2.12	Archaeological and cultural sites		None	See page 42
1.2.13	Sensitive landscapes (Dry-water course)	Yes	Yes	See page 42

2.1.2. Participation of the community, the landowner and interested and affected parties in compilation of the information

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

The description of the environment was arrived at by using publicly available sources of data such as books, data, maps and images available on the internet, data from a specialist agricultural support organisation, as well as the knowledge and experience of the consultants and the applicant's geologist.

The description of the environment was discussed with the community, land owners and other interested and affected parties during the meeting of 2 December 2014 and as part of the ongoing public consultation process it will be updated where and when necessary.

3. Assessment of the potential impacts of the proposed prospecting operation

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

3.1. Description of the proposed prospecting operation

Description of the proposed prospecting or mining operation.

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

The mineral resource and mineral distribution of the prospecting area will be determined in the following manner.

PHASE 1 – DESKTOP STUDIES, IMAGINARY ANALYSING AND GEOLOGICAL MAPPING

1.	GENERAL	Desktop studies will be undertaken after site investigation has been done to determine the target areas including the identification of any infrastructure to be build and any potential problems that may need to be addressed. Arial photographs and satellite images will be studied to determine target areas. This phase will involve the studying of aerial photographs and satellite images to determine target areas. Geological mapping will be done by way of field mapping and map interpretation. Land Sat 7 space maps will be used
2.	TIMEFRAME	6 months
3.	COSTS	R20 000
4.	TECHNICAL SUPPORT	Environmental Consultant – Milnex 189 CC

PHASE 2 – PITTING

1.	GENERAL	The information obtained from the desktop studies, imaginary analyzing and geological mapping will be used to draw up a pitting map. The location and GPS coordinates of where pits will be digged, will be indicated on this map (pitting location map). Pits will then be digged by an excavator on these mapped coordinated points. If gravel is found the applicant will determine the composition and quality of the gravel. It is envisaged that the pits will determine the location and intersection of mineralization.
2.	TIMEFRAME	6 months
3.	NUMBER OF PITS	40
4.	EXTENT	3m x 2m x 3m
5.	CALCULATION	Area: 870.7462 hectares Pit every 21 hectares
6.	COSTS	3m x 2m x 3m x 40 x R25.00 = R18000
7.	TECHNICAL SUPPORT	Environmental Consultant – Milnex 189 CC

PHASE 3 – TRENCHES

1.	GENERAL	The applicant will proceed with this way of prospecting by means of the open cast / trenching method, after pitting. The location of the trenches will be digged after the gravel has been located by conducting the desktop studies, the imaginary analyzing and the geological mapping and the digging of pits. The trenches will be digged on the parts of the property where the gravel is located. Trenches will be sited on the resource map according to the coordinate of
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		each of the trenches made. The trenches will be digged to remove and wash the gravel. It will be washed by a 16 feet washing pan to determine diamond proceeds per 100 ton of gravel. The trenches will be sited to determine the geological representivity. Overburden will be stripped and placed next to the trench as determined in the EMP. Gravel will be removed and transported to the plant to be washed. Tailings will be returned to the excavation to fill it up. Hereafter overburden will be dumped in the excavation where after topsoil will be placed in the excavation.
2.	TIMEFRAME	6 months
3.	NUMBER OF TRENCHES	10
4	EXTENT	20m x 6m x 5m
5.	CALCULATION	Area: 870.7462 hectares Trench every 21 hectares
6.	COSTS	20m x 6m x 4m x 10 x R25.00 = R120 000 20m x 6m x 1m x 10 x R30.00 = R36 000
7.	TECHNICAL SUPPORT	1 x Volvo Excavator 1 x Volvo Front end Loader 1 x Volvo Dumper 1 x DMS flow sort 1 x 16 feet Washing pan 1 x Power plant The applicant is the owner of the equipment.
8.	TONS TO BE WASHED	20m x 6m x 1m x 1.8 x 10 = 2160 tons

PHASE 4 – CONSOLIDATION AND INTERPRETATION

1.	GENERAL	All data will be consolidated and processed to determine the diamond bearing resource on the property. This will be a continuous process throughout the prospecting work. Each phase of prospecting will be followed by desktop studies involving interpretation and modeling of all data gathered and how the applicant will proceed with the work program in terms of activity, quantity, resources expenditures and duration. A pre-feasibility study will be done to determine the preliminary economic assessment of the resource and to determine whether additional evaluation of the deposit will be warranted to increase confidence in the resource estimation. Prospecting work will be conducted by a multi-disciplinary team to determine whether the resource can be viable exploited and if the results can support an application for a mining right.
2.	TIMEFRAME	6 months
3.	COSTS	R20 000
4.	TECHNICAL SUPPORT	Environmental Consultants

PHASE 5: REHABILITATION & CLOSURE

- Remove all prospecting related infrastructure
- Return tailings and overburden to the excavation in order to fill up the excavation.
- Place topsoil on top of the backfilled excavation.
- Rehabilitate disturbed areas appropriately

Duration: 1 months

Resources: Employees, 1 x Excavator, 1 x Front end loader, 1 x Dumper, 1 x 16 feet washing machine & conveyor

Outcomes: Rehabilitated grazing land.

3.1.2. Plan of the main activities with dimensions

See Figure 1.

3.1.3. Description of construction, operational, and decommissioning phases.

In the prospecting process, the impacts during the pitting activities will primarily be operational impacts, as virtually no construction and decommissioning will occur. All activities will use mobile equipment.

Construction and decommissioning impacts will only occur during the pit/Pitting/Trenching/Bulk sampling phase, where a camp site will be established, pits/trenches dug and mobile screening and washing plants established (constructed) and operated at each of a number of trenches. The trenches and camp site/operational area will be decommissioned and rehabilitated after the prospecting activities had been concluded.

Phase 2: Pitting and Phase 3: Trenching

No construction and decommissioning will take place, only operational activities to determine the composition, quality, thickness and nature of the gravel when gravel is found.

Activities:

See activities under each phase as described above under 3.1.1.

Facilities:

Access Roads (Existing and limited temporary roads)

1 x Volvo Excavator
1 x Volvo Front-end Loader
1 x Volvo Dumper
1 x DMS flow sort
1 x 16 feet Washing pan
1 x Power plant
The applicant is the owner of the equipment.

Mobile infrastructure:

- chemical toilet,
- water tanker,
- diesel tank,
- etc.

- **Decommissioning and rehabilitation/closure**

Decommissioning and rehabilitation activities will be limited to:

Decommissioning of the camp site/operational area

Closing (backfilling) of pits/trenches

Rehabilitation of camp site/operational area, pits/trenches.

3.1.4. Listed activities (in terms of the NEMA EIA regulations)

Listing Notice 3, published in GNR. 546, Activity no. 14

The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for:

- (1) the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), in which case the activity is regarded to be excluded from this list.
- (2) the undertaking of a linear activity falling below the thresholds mentioned in Listing Notice 1 in terms of GN 544.

(a) In North West:

- i. Outside urban areas, in:
 - (aa) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve.

3.2. Identification of potential impacts

(Refer to the guideline)

Impacts are the changes in an environmental parameter that result from undertaking an activity. The change is the difference between the effects on the environmental parameter where the activity is undertaken, compared to that where the activity is not undertaken. Impacts occur over a specific period and within a defined area. Different types of impacts may occur from the undertaking of an activity. The impacts may be positive or negative and may be categorized as being direct (primary), indirect (secondary) or cumulative impacts.

3.2.1. Potential impacts per activity and listed activities.

The various prospecting operations and the associated activities can potentially have impacts on the components of the natural and social environments as indicated in Table 1.

Table 1: Impact identification matrix for prospecting operations

PHASE	Components	A	B	C	D	ABIOTIC				BIOTIC				K	L	M	N
		Geology	Topography	Soil	Land capability	Land use potential	Surface water	Ground water	Air quality	Noise	Vegetation	Wildlife	Sensitive landscapes	Visual impact	Archaeological & cultural sites	Socio-economic impacts	Affected parties
7	Activity, Product or Service																
	Travelling to and from site			X			X	X					X		X		X
8	Camp establishment			X			X			X	X		X		X		X
9	Establishment of mobile screening and washing plant		X	X			X	X	X	X	X		X		X		X
10	Pit/Trench digging	X	X	X	X	X	X	X	X	X	X	X	X		X		X
11	Screening and washing			X	X	X	X	X	X		X		X		X		X
12	Trench backfilling	X	X	X	X	X	X	X	X	X	X	X	X		X		X
13	Decommissioning of the camp site/operational area/tailings facility															X	X
14	Rehabilitation of camp site/operational area, trenches & tailings facility	X	X	X	X	X	X	X	X	X	X	X	X		X		X
15	Closure				X	X	X						X		X		X

3.2.2. Potential cumulative impacts

The prospecting activities will be taking place on an area of approximately 1713, 0640 hectares. Although the environmental impacts of the individual prospecting processes may not be significant on their own, the cumulative impacts of the combined impacts may be significant. Examples of such potentially significant cumulative impacts relate to impacts of pit & trenching activities.

3.2.3. Potential impact on heritage resources

Due to challenges with the availability of heritage impact specialists and time constraints, the potential impacts on heritage resources has not been identified through a specialist study.

3.2.4. Potential impacts on communities, individuals or competing land uses in close proximity.

(If no such impacts are identified this must be specifically stated together with a clear explanation why this is not the case.)

It is expected that the community of Reivilo will see a significant increase in economic activity during the 5 year prospecting process. This will be characterised by increasing numbers of people visiting the area and spending money, thereby strengthening the local economy. Should mining become a feasible option in the diversification of the local economy in the future, it is expected that local services will improve and a number of long-term jobs will be created for local residents (in accordance with the requirements of the Social and Labour Plan as stipulated by DMR). On the other hand, a marked increase in people visiting the area may also be associated with social problems such as increased crime, disease, traffic and congestion.

There are also a number of potential impacts that may have direct and indirect effects on local farms and the people who live in farm dwellings. The current land-use of the area is primarily cattle farming. Farms surrounding the proposed prospection area may experience some of the following impacts:

- Loss of potential and actual area for farming-based activities;
- Loss of cattle due to falling in boreholes or trenches that were not backfilled or fenced in line with EMP requirements;
- Personal safety on farms may be an issue as temporary dwellings are erected on each farm to house prospection workers and managers;
- Illegal refuse dumped on-site and fires may be of concern to local farmers and inhabitants;
- The visual and aesthetic effects of the prospection is expected to be very low; and

- Should viable deposits of minerals be discovered, it will significantly increase the value of surrounding properties.

Negative impacts on the area are expected to be temporary and can be mitigated to a large extent if the recommendations of the EMP are adhered to e.g. rehabilitation of boreholes and trenches, safety training for workers on-site etc.

3.2.5. Participation of the community, the landowner and interested and affected parties in compilation of the information

The list of potential environmental impacts description of the environment was discussed with the community, land owners and other interested and affected parties during the meeting of 2 December 2014 and as part of the ongoing public consultation process it will be updated where and when necessary.

The list of potential environmental impacts was further arrived at by using publicly available sources of data such as books, data, maps and images available on the internet, data from a specialist agricultural support organisation, as well as the knowledge and experience of the consultants and the applicant's geologist.

Confirmation of specialist report appended. (Refer to guideline)

The specialist heritage and cultural impact report is not appended, as the environmental specialist who compiled this EMP has not traced any significant monsters to necessitate such study. Should any traces be discovered however a heritage specialist will be instructed to conduct Phase 1 study.

3.3. Assessment of the significance of the potential impacts

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

Impact assessment involves the consideration of physical, biological, socio-economic and cultural information to estimate the likely characteristics and parameters of the impact. The aim of impact assessment is to provide a basis for determining the likely significance of each impact with sufficient accuracy to develop appropriate mitigation measures.

3.3.1. Criteria of assigning significance to potential impacts

The assessment of impacts was done according to a synthesis of the following assessment criteria:

Nature of the impact

Extent (spatial scale)

Duration

Magnitude or intensity of the impact (severity)

Probability

The criteria were used to determine significance as described below.

- **Nature of the impact**

This is an appraisal of the type of effect the activity would have on the affected environment. The description includes what is being affected and how, whether it is positive or negative, as well as whether it is direct or indirect.

- **Extent (spatial scale)**

Extent of impact	Explanation of extent
Site specific	Direct and indirect impacts limited to site of impact only.
Local	Direct and indirect impacts affecting environmental elements within the Windsorton area.
Regional	Direct and indirect impacts affecting environmental elements within the south-eastern Northern Cape Province.
National	Direct and indirect impacts affecting environmental elements on a national level.
Global	Direct and indirect impacts affecting environmental elements on a global level.

- **Duration**

Duration of impact	Explanation of duration
Very short	Less than 1 year
Short	1 to 5 years
Medium	6 to 12 years
Long	13 to 50 years
Very long	Longer than 50 years
Permanent	Permanent

- **Magnitude or intensity of the impact (severity)**

Here it was established whether the impact would be destructive or benign and rated as:

- **Low** – where the impact affects the environment in such a way that natural, social and cultural functions and processes are not affected;
- **Moderate** - where the affected environment is altered, but natural, social and cultural functions and processes continue albeit in a modified way; or
- **Severe** - where natural, social and cultural functions or processes are altered to the extent that it will temporarily or permanently cease.

- **Probability**

Probability of impact occurrence	Explanation of probability
Very low	<20% sure of particular fact or likelihood of impact occurring.
Low	20 to 39% sure of particular fact or likelihood of impact occurring.
Moderate	40 to 59% sure of particular fact or likelihood of impact occurring.
High	60 to 79% sure of particular fact or likelihood of impact occurring.
Very high	80 to 99% sure of particular fact or likelihood of impact occurring.
Definite	100% sure of particular fact or likelihood of impact occurring.

- **Impact significance**

Impact significance	Explanation of significance
No impact	There would be no impact at all - not even a very low impact on the system or any of its parts.
Very low	Impact would be negligible. <ul style="list-style-type: none"> • In the case of negative impacts, almost no mitigation and/or remedial activity would be needed, and any minor steps, which might be needed, would be easy, cheap and simple. • In the case of positive impacts, alternative means would almost all likely to be better, in one or a number of ways, than this means of achieving the benefit.
Low	Impact would be of a low order and with little real effect. <ul style="list-style-type: none"> • In the case of negative impacts, mitigation and/or remedial activity would be either easily achieved or little would be required, or both. • In case of positive impacts, alternative means for achieving this benefit would likely be easier, cheaper, more effective, less time-consuming, or some combination of these.
Moderate	Impact would be real but not substantial within the bounds of those which could occur. <ul style="list-style-type: none"> • In the case of negative impacts, mitigation and/or remedial activity would be both feasible and fairly easily possible. • In the case of positive impacts, other means of achieving these benefits would be about equal in time, cost and effort.
High	Impacts of a substantial order. <ul style="list-style-type: none"> • In the case of negative impacts, mitigation and/or remedial activity would be feasible but difficult, expensive, time-consuming or some combination of these. • In the case of positive impacts, other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.
Very high	Of the highest order possible within the bounds of impacts which could occur. <ul style="list-style-type: none"> • In the case of negative impacts, there would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which it was predicted. • In the case of positive impacts, there is no real alternative to achieving the benefit.

3.3.2. Potential impact of each main activity in each phase, and corresponding significance assessment

Geology	Impacts		
Activity causing the impact	Prospecting operation (A) & (B) that will destroy the original geology.		
Nature of the impact	<p>Geology will be destroyed during the (A) pitting and (B) trenching operations.</p> <p>During operation which for the next 48 months (physical prospecting work on site) the mineral resource's thickness, nature, quality and composition of the gravel will be determined to facilitate the process of resource calculation.</p> <p>Drill further holes on grid (mapped coordinate points) for proper evaluation of the composition and the quality of the gravel.</p> <p>Dig trenches/pits after the gravel has been located by the desktop studies, imagery analysis and geological mapping and the pitting of holes on the parts of the property where the gravel is located.</p> <p>Strip and place overburden next to the trench as determined in the EMP. Remove the gravel from the trenches and transport to the plant to be washed.</p> <p>Wash the gravel in a 16 foot washing machine to determine diamonds proceeds per 100 ton of gravel. Deposit of tailings in back into trench.</p> <p>Return overburden to the excavation in order to fill up the excavation.</p> <p>Waste gravel/overburden material is disposed of/backfilled in existing excavations as part of the prospecting process.</p>		
Extent	Site		
Duration	Short		
Magnitude	Moderate		
Probability	Definite		
Significance	High		
Phase where the impact will occur		Pitting//Trenching/Bulk sampling	Rehabilitation & Closure
		X	X

Topography	Impacts			
Activity causing the impact	Disturbance of the surface drainage by trenching operation.			
Nature of the impact	<ul style="list-style-type: none"> • Change in landform: The existing topography is described as variations from almost flat to gently undulating. The elevation of this area varies between 1320 and 1360 m. No new permanent landscape features will be created, other than topsoil, overburden and gravel dumps in the direct vicinity of the pits or trenches that are of temporary storage until the pit/trench is backfilled and compacted. • Disturbance of the surface drainage: Surface drainage will not be disturbed by pitting. During these operation the gravel will be evaluated a small sample taken and directly thereafter backfilled again. During the trenching operation (B) the removal of the topsoil, overburden and gravel layer will take some time to be excavated and eventually to be backfilled (100 tons of gravel). The prospecting operation will result in the creation of deep excavations (up to 5 m). This will act as depressions in the environment that captures surface water run-off. The amount of trenches/pits that will be excavated will depend on the mineral resource evaluation during operation (A). 			
Extent	Site			
Duration	Short			
Magnitude	Moderate			
Probability	Definite			
Significance	High			
Phase where the impact will occur			Pitting/Trenching/ Bulk sampling	Rehabilitation & Closure
			X	X

Soil	Impacts			
Activity causing the impact	In the process of removing topsoil the soil layers are mixed and the structure may be disturbed.			
Nature of the impact	<p>This is a new prospecting operation (A & B). The surface area is characterized by a thin layer of topsoil and some parts rock outcrops.</p> <p>During the pitting operation (A) the topsoil, overburden and gravel layers will be removed separately and stockpiled separately.</p> <p>During trenching operation (B) the excavations should be preceded by the separate removal and stockpiling of all available topsoil. Overburden and gravel layers will be removed separately and stockpiled separately.</p>			
Extent	Site			
Duration	Short			
Magnitude	Moderate			
Probability	High			
Significance	High			
Phase where the impact will occur			Pitting/Trenching/Bulk sampling	Rehabilitation & Closure
			X	X

Soil	Impacts			
Activity causing the impact	Prospecting operation (A) & (B)			
Nature of the impact	<p>The site establishment, pitting operation (A) and trenching operation (B) and eventually rehabilitation of listed structures such as the access roads, stockpiles, dumps, trenches, cause compaction of soil.</p> <p>At the same time a certain surface area is therefore alienated (although only temporarily). The active prospecting surface area (alienated) would be restricted to the indicated (mapped coordinate points of trenches/pits after initial mineral resource evaluation) at any given time (in relation to area of application of the prospecting right of 1713,0640 ha) for the next 5 years. The physical work phase will take ± 48 months.</p>			
Extent	Site			
Duration	Short			
Magnitude	Moderate			
Probability	High			
Significance	High			
Phase where the impact will occur			Pitting/Trenching/Bulk sampling	Rehabilitation & Closure
			X	X

Soil	Impacts		
Activity causing the impact	When removing topsoil during site preparation, few storm water control structures are in place. If a severe storm hits the area, it may lead to erosion on site. Topsoil stockpiles may be prone to erosion due to lack of vegetation cover. Water control structures may fail or severe rainstorms may cause excessive run-off. Surface compaction due to activities taking place.		
Nature of the impact	Soil erosion: Due to the fact that certain surface areas would become compacted and this would lead to lesser infiltration of rainwater and more run-off that could cause erosion on bare disturbed surfaces. Erosion would always be possible until such time a vegetation cover is provided during rehabilitation phase.		
Extent	Site		
Duration	Very short		
Magnitude	Moderate		
Probability	Very low		
Significance	Low		
Phase where the impact will occur		Pitting/Trenching/Bulk sampling	Rehabilitation & Closure
		X	X

Soil	Impacts		
Activity causing the impact	Vehicle/pitting equipment breakages and oil/lubricant /diesel spills may contaminate soil.		
Nature of the impact	Potential of soil contamination		
Extent	Site		
Duration	Long		
Magnitude	Severe		
Probability	Moderate		
Significance	Moderate		
Phase where the impact will occur		Pitting/Trenching /Bulk sampling	Rehabilitation & Closure
		X	X

Land Capability	Impacts			
Activity causing the impact	Prospecting operation (A) & (B)			
Nature of the impact	<p>Temporary loss of land capability to support agricultural activity such as grazing.</p> <p>The small area (occupied by pits & trenches) where the active prospecting activities occur (A & B) will thus be temporary alienated, until the area is rehabilitated.</p> <p>No excavations will remain. All excavations will be rehabilitated (Backfilling in reverse order). Natural re-vegetation will probably take place on properly backfilled sites, allowing some grazing to take place.</p>			
Extent	Site			
Duration	Short			
Magnitude	Moderate			
Probability	Definite			
Significance	High			
Phase where the impact will occur			Pitting/Trenching /Bulk sampling	Rehabilitation & Closure
			X	X

Land Use	Impacts			
Activity causing the impact	Prospecting operation (A) & (B)			
Nature of the impact	<p>Temporary change in land use in particular areas impacted by prospecting operation (A):</p> <p>The small area (occupied by pits & trenches) where the active prospecting activities will occur (A & B) will thus be temporary alienated, until the area is rehabilitated.</p> <p>No excavations will remain. All excavations will be rehabilitated (Backfilling in reverse order). (Backfilling in reverse order). Natural re-vegetation will probably take place on properly backfilled sites, allowing some grazing to take place.</p>			
Extent	Site			
Duration	Short			
Magnitude	Moderate			
Probability	Definite			
Significance	High			
Phase where the impact will occur			Pitting/Trenching/Bulk sampling	Rehabilitation & Closure
			X	X

Vegetation	Impacts		
Activity causing the impact	Prospecting operation (A) & (B)		
Nature of the impact	Vegetation clearance, disturbance and trampling. Destruction of habitats for vegetation. Due to a disturbed ecosystem, bare ground and spreading of exotics can follow. Surface areas possible disturbed is only restricted to prospecting sites (occupied by prospecting operational activities A & B). The majority of the surface area is already disturbed by existing agricultural activities.		
Extent	Site:		
Duration	Long		
Magnitude	Moderate		
Probability	Definite		
Significance	High		
Phase where the impact will occur		Pitting/Trenching/Bulk sampling	Rehabilitation & Closure
		X	

Vegetation	Impacts		
Activity causing the impact	The change in the current habitat will be mitigated during final rehabilitation.		
Nature of the impact	Habitat change, loss of species, spread of alien and invasive species		
Extent	Site		
Duration	Permanent		
Magnitude	Moderate		
Probability	High		
Significance	Moderate		
Phase where the impact will occur		Pitting/Trenching /Bulk sampling	Rehabilitation & Closure
		X	

Vegetation	Impacts			
Activity causing the impact	Prospecting equipment such as trucks and other vehicles on dirt roads, excavation of trenches, stockpiling, dumping of material are mainly responsible for this impact.			
Nature of the impact	Dust coverage of plants			
Extent	Site			
Duration	Short			
Magnitude	Low			
Probability	High			
Significance	Low			
Phase where the impact will occur			Pitting/Trenching /Bulk sampling	Rehabilitation & Closure
			X	

Wildlife	Impacts			
Activity causing the impact	The flora which normally serves as habitat for animals would be destroyed during site preparation. The increase in activity will temporarily scare other animals. The area will serve as a new habitat after rehabilitation.			
Nature of the impact	Wildlife or wildlife habitat destruction /change / disturbance			
Extent	Site			
Duration	Short			
Magnitude	Moderate			
Probability	Definite			
Significance	High			
Phase where the impact will occur			Pitting/Trenching/Bulk sampling	Rehabilitation & Closure
			X	X

Wildlife/ domesticated animal life	Impacts		
Activity causing the impact	The movement of vehicles may kill certain insects, rodents and possibly birds. Most of the remaining animal life will however move away due to noise.		
Nature of the impact	Injury and death to wildlife.		
Extent	Site		
Duration	Short		
Magnitude	Low		
Probability	Definite		
Significance	High		
Phase where the impact will occur		Pitting/Trenching/ Bulk sampling	Rehabilitation & Closure
		X	

Wildlife	Impacts		
Activity causing the impact	As rehabilitation progresses the habitat of certain species will be restored/created (Closure objective). Animals will probably only move back when human movement is limited.		
Nature of the impact	Restoration of habitat.		
Extent	Site		
Duration	Short		
Magnitude	Moderate		
Probability	Definite		
Significance	High		
Phase where the impact will occur		Pitting/Trenching/Bulk sampling	Rehabilitation & Closure
		X	X

Surface Water	Impacts			
Activity causing the impact	The clearance of vegetation and the traffic on access roads will all contribute to an increase in the silt load.			
Nature of the impact	Increased silt load			
Extent	Local			
Duration	Short			
Magnitude	Low			
Probability	Moderate			
Significance	Moderate			
Phase where the impact will occur			Pitting/Trenching /Bulk sampling	Rehabilitation & Closure
			X	X

Surface Water	Impacts			
Activity causing the impact	"Dirty / Clean" water systems at facilities like the overburden dumps, roads, excavations, etc. may impact on the quality of the surface water. The water should be contained in the surface runoff control measures provided therefore.			
Nature of the impact	<p>Change in surface water quality.</p> <p>Spillages from vehicles, mobile drill rig, excavator and also surface water run-off that is not adequately diverted away from the prospecting borehole/ trenches could end-up in the borehole/trenches creating problems regarding water quality and hindering the prospecting operation.</p> <p>Surface run-off from active prospecting sites (A, B) (overburden dumps) if not adequately contained on site could end-up in the adjacent undisturbed natural veld.</p>			
Extent	Local			
Duration	Short			
Magnitude	Moderate			
Probability	Moderate			
Significance	Moderate			
Phase where the impact will occur			Pitting/Trenching /Bulk sampling	Rehabilitation & Closure
			X	X

Surface Water	Impacts			
Activity causing the impact	It is an operational objective to contain or divert all surface run-offs from the active excavation (prospecting operation (B) area mainly due to pollution (sediment) potential. This will reduce the run-off quantity, although small in comparison with the drainage area in total.			
Nature of the impact	<p>Change in surface water quantity:</p> <p>Notwithstanding the above-mentioned facts, it is not expected that prospecting operations (A & B) will have any effect on the boundaries or the general water flow of the catchment.</p> <p>The possibility exists that prospecting pits or trenches could be influenced by flood peaks if any is located within the floodplain area of the Vaal river. The majority of the farm (prospecting focus area) will not be effected.</p> <p>The Vaal River (perennial) is the western border of the farm (prospecting area). The prospecting activities will use water supplied from the Vaal River.</p> <p>Prospecting activities will retain the legally prescribed distance from any wetlands.</p> <p>Standing water in excavations may occur as the result of rain/ surface run-off ending up in these man-made depressions. An additional source of standing water in excavations will be shallow groundwater.</p>			
Extent	Site			
Duration	Long			
Magnitude	Moderate			
Probability	High			
Significance	High			
Phase where the impact will occur			Pitting/Trenching /Bulk sampling	Rehabilitation & Closure
			X	X

Ground Water	Impacts			
Activity causing the impact	Prospecting operation (A) & (B)			
Nature of the impact	<p>Reduction of groundwater quality</p> <p>Prospecting operations (A & B) and associated activities are not likely to impact on local ground-water quality. A chemical pitting fluid that is environmentally friendly will be used during the pitting operation (A & B).</p> <p>Possible spillages from diesel or oil from pitting rig, earth moving equipment, truck, etc. could become a source of groundwater pollution, if not handled responsibly. Any filling-up of equipment and is restricted to the temporary storage area.</p> <p>If possible, maintenance of vehicles and equipment will also be restricted to the temporary storage area.</p> <p>Spillages from oil/diesel (used oil drums also) at the storage area could possible become a source of contamination over a long period of time if not contained within bunded (drip pans, container) facilities and not cleaned-up as per site procedure.</p>			
Extent	Site			
Duration	Long			
Magnitude	Moderate			
Probability	Definite			
Significance	High			
Phase where the impact will occur			Pitting/Trenching /Bulk sampling	Rehabilitation & Closure
			X	

Ground Water	Impacts			
Activity causing the impact	Prospecting operation (A) & (B)			
Nature of the impact	<p>Reduction of groundwater quantity, lowering of groundwater level.</p> <p>The prospecting activities will use water supplied by the farm owner or a borehole drilled specifically for this purpose. This additional use of water from boreholes will impact on the existing ground water level. The use will take place over a 48 month period.</p>			
Extent	Site			
Duration	Short			
Magnitude	Severe			
Probability	Definite			
Significance	High			
Phase where the impact will occur			Pitting/Trenching /Bulk sampling	Rehabilitation & Closure
			X	

Air Quality	Impacts			
Activity causing the impact	Prospecting operation (A) & (B)			
Nature of the impact	Dust will be generated during the prospecting operation (pitting, excavating & loading with an excavator on to a dump truck) and transportation to the plant (conveyor, drum screen & 16 feet pan) and on gravel/dirt/farm roads. The processing of the gravel and deposition of tailings are both wet processes and therefore no dust will be generated.			
Extent	Short			
Magnitude	Low			
Duration	Long			
Probability	Moderate			
Significance	Low			
Phase where the impact will occur			Pitting/Trenching /Bulk sampling	Rehabilitation & Closure
			X	X

Noise	Impacts			
Activity causing the impact	Prospecting operation (A) & (B)			
Nature of the impact	Noise will be generated during the prospecting operation (A & B) (pitting, excavating & loading with an excavator on to a dump truck) and transportation to the plant (conveyor, drum screen & 16 feet pan). The prospecting itself is located in rural landscape. Some farm dwelling is located in the nearby vicinity. The impact would be of more importance regarding the direct worker environment that should adhere to the requirements in terms of the Mine Health and Safety Act.			
Extent	Local			
Duration	Short			
Magnitude	Low			
Probability	Definite			
Significance	Low			
Phase where the impact will occur			Pitting/Trenching /Bulk sampling	Rehabilitation & Closure
			X	X

Archaeological and Cultural Sites	Impacts			
Activity causing the impact	Prospecting operation (A) & (B)			
Nature of the impact	No evidence could as yet be found of any such sites and/or objects. Should any heritage features and/or objects be located or observed, a heritage specialist will be contacted immediately. Observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that a heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. This is true for graves and cemeteries as well.			
Extent	Site			
Duration	Permanent			
Magnitude	Low			
Probability	Definite			
Significance	High			
Phase where the impact will occur			Pitting/Trenching /Bulk sampling	Rehabilitation & Closure
			X	

Sensitive Landscape	Impacts			
Activity causing the impact	Prospecting operation (A) & (B)			
Nature of the impact	None			
Extent				
Duration				
Magnitude				
Probability				
Significance				
Phase where the impact will occur			Pitting/Trenching /Bulk sampling	Rehabilitation & Closure
			X	X

Visual Aspects	Impacts			
Activity causing the impact	Prospecting operation (A) & (B)			
Nature of the impact	None. The prospecting operations will not be visible from any national or provincial road, except maybe from farm dwellings. The physical prospecting operation (A & B) will take 48 months to complete.			
Extent	Site			
Duration	Short			
Magnitude	Low			
Probability	Low			
Significance	Low			
Phase where the impact will occur			Pitting/Trenching /Bulk sampling	Rehabilitation & Closure
			X	X

Socio Economics	Impacts			
Activity causing the impact	Additional employment opportunities created.			
Nature of the impact	<p>Increase in Socio – economic activity at local level</p> <p>The project in itself would ensure that approximately 10workers would be assured of a job for some time. The projected prospecting operations will proceed until 2017. Job creation plays a major role in increasing the economic well-being of employees and their dependants.</p> <p>Once all prospecting operations have ceased it would definitely have a negative impact.</p>			
Extent	Local			
Duration	Short			
Magnitude	Medium			
Probability	Definite			
Significance	Medium			
Phase where the impact will occur			Pitting/Trenching/Bulk sampling	Rehabilitation & Closure
			X	

Socio Economics	Impacts		
Activity causing the impact	The economic benefits in terms of investment and the delivery of services in the North West province will get an additional benefit from the project.		
Nature of the impact	Socio – economic activity at regional level		
Extent	Regional		
Duration	Very Long		
Magnitude	Low		
Probability	High		
Significance	Medium		
Phase where the impact will occur			Pitting/Trenching /Bulk sampling
			X
			Rehabilitation & Closure
			X

Interested & Affected Parties	Impacts		
Activity causing the impact	Prospecting operation (A) & (B)		
Nature of the impact	<ul style="list-style-type: none"> • Temporary losses of utilization of the gravel focus areas for agricultural purposes. • Loss of cattle due to falling of animals in boreholes/trenches/ pits if not backfilled or fenced without delay as part of the prospecting exercise. • Most of the expected negative impacts can be appropriately mitigated, such as the eventual rehabilitation of the boreholes and excavations. 		
Extent	Site		
Duration	Short		
Magnitude	Moderate		
Probability	High		
Significance	High		
Phase where the impact will occur			Pitting/Trenching /Bulk sampling
			X
			Rehabilitation & Closure
			X

3.3.3. Assessment of potential cumulative impacts.

Potential cumulative impacts will increase the extent and magnitude of the potential impacts, but not affect the duration and probability thereof. Consequently, the significance of the impacts will in many instances be increased by one or more categories, i.e. from very low to low, low to moderate, moderate to high or high to very high.

3.4. Proposed mitigation measures to minimise adverse impacts.

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

All prospecting operations (A & B) and associated activities have sufficiently significant impacts to require mitigation (Table 2).

Table 2: Summary of the significance of the identified environmental impacts.

PHASE	Components										Affected parties					
	A	B	C	D	E	F	G	H	I	J		K	L	M	N	
Impacts	ABIOTIC					BIOTIC					SOCIO-ECONOMIC					
	Geology	Topography	Soil	Land capability	Land use potential	Surface water	Ground water	Air quality	Noise	Vegetation	Wildlife	Sensitive landscapes	Visual impact	Archaeological & cultural sites	Socio-economic impacts	
7						L		L	L	M			L	L	M+	M
8		L	M	M	M	L	L	M		M	H		L	L	M+	H
9		M	M	M	M	L	L	M	L	M	H		L	L	M+	H
10	H	H	H	H	H	M	M	M	M	M	H		L	L	M+	H
11		L	M	M	M	H	H	L	L	L	H		L	L	M+	H
12	H	H	H	H	H	M	M	M	M	L	H		L	L	M+	H
13		M	M	M	M	L		L	L	L	M		L	L	M+	H
14		L	L	L	L	M	L	L	L	L	M		L	L	M+	H
15		L	L	L	L	L	L	L	L	L	L		L	L	M+	M

3.4.2. List of appropriate technical or management options chosen and a concomitant list of options chosen to modify, remedy, control or stop any action, activity, or process which will cause significant impacts on the environment, socioeconomic conditions and historical and cultural aspects

(Chosen to modify, remedy, control or stop any action, activity, or process which will cause significant impacts on the environment, socio-economic conditions and historical and cultural aspects as identified. Attach detail of each technical or management option as appendices)

Environmental Component	Geology
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<p><u>No mitigation exists except to backfill (in reverse order) the prospecting trenches/pits with the separately stored gravel material/tailings from overburden/and topsoil piles.</u></p> <p>As prospecting progresses and the pits/trenches have been back-filled, a certain amount of gravel, tailings, overburden material and topsoil would be placed on these sites. This will not restore the geology, but will mitigate the impact.</p> <p>Planned, systematic and thorough prospecting of the mineral resource (alluvial deposits containing diamonds) should take place. As prospecting progress it should be indicated on a plan. Ensure that the prospecting plan (mapped coordinate points) is adhered to at all times.</p> <p>Optimal utilization of the mineral resource should take place within the boundaries of the prospecting terrain. Determined the border of the mineral resource earmarked for prospecting and demarcate on site by definite beacons/painted poles.</p> <p>Strip, remove and store topsoil, overburden and gravel as far as practical in an orderly fashion and replace as far as possible on back-filled areas, in the reverse order once decision have been taken that no further prospecting would take place in a particular area.</p> <p>Care must be taken that the removal of alluvial deposits by means of earthmoving equipment is restricted to what is really necessary to achieve the objective of prospecting. Wash the gravel in a 16 foot washing machine to determine diamonds proceeds per 100 ton of gravel. Return tailings and overburden to the excavation in order to fill up the excavation.</p> <p>The 16 foot washing machine will be located next to the trench(es) (2-3 weeks spent on site). Return of "dry" tailings (after dewatering) and overburden back into the trench(es) in order to fill up the excavation.</p> <p>Waste gravel rock material/tailings material/overburden/topsoil should be returned/backfilled and compacted in reverse order in existing excavations as part of the prospecting process.</p>	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
Optimal exploitation of the mineral resource in order to ensure to facilitate better rehabilitation planning. The overburden and topsoil (where available) must be replaced in a responsible and planned manner in order to achieve some conformity with the surrounding undisturbed area.	

Environmental Component	Topography
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<ul style="list-style-type: none"> • Other than topsoil, overburden, gravel dumps in direct vicinity of the pits or trench that are of temporary storage until the pit/trench are backfilled and compacted. • During the trenching operation the removal of the topsoil, overburden and gravel layer will take some time to be excavated and eventually to be backfilled. The prospecting operation will result the creation of deep excavations (12m or less) (temporary depressions). • All trenches/pits should be back-filled with tailings & gravel material (returned from washing plant) and eventually overburden material, covered with a layer of topsoil. • Access to all active prospecting areas should be controlled. Deep pit/excavations should be fenced off. The necessary warning signs should be put in place. All prospecting activities should be restricted to the fenced-off area. • Surface run-off control (trench with berm wall) should be put in place at active prospecting excavations (preventing water from entering). <p>Prospecting would be done according to a definite prospecting plan (only disturbing an area that is really necessary). As part of the prospecting process the handling of tailings material, overburden material and back-filling of excavations should also form part of it.</p> <p>Rehabilitation of the new topographical landscape in such a way that it would blend in with the surrounding landscape and allow normal surface drainage to continue. As soon as a site would not be excavated anymore it should be rehabilitated (planned and phased manner).</p>	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
<p>Rehabilitation of the new topographical landscape in such a way that it would blend in with the surrounding landscape and allow normal surface drainage to continue. Rehabilitation in such a way that the new landscape features would be stable and would not pose any safety hazard to human and animal anymore.</p>	

Environmental Component	Soil (topsoil & access roads)
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<p>Handling of topsoil as a natural resource:</p> <ul style="list-style-type: none"> • During the pitting operation the topsoil, overburden and gravel layers will be removed separately and stockpiled separately. • During the trenching operation the excavations should be preceded by the separate removal and stockpiling of all available topsoil. Overburden and gravel layers will be removed separately and stockpiled separately. • The surface of any site to be disturbed must be kept to a minimum. All available topsoil/overburden material should be removed and stockpiled for rehabilitation purposes. <p>Access roads, etc.:</p> <ul style="list-style-type: none"> • In the case of pitting/trenching (short-term operation), existing tracks and roads shall be used, where practicable. • Should the access road or a portion thereof have to be newly constructed, the following must be adhered to: <ul style="list-style-type: none"> ○ The route shall be so selected that no trees, or a minimum number of trees, are felled for this purpose and fence lines be followed as far as possible. ○ Water courses and steep gradients shall be avoided as far as is practicable. ○ Adequate drainage and erosion protection in the form of cut-off berms or trenches shall be provided where necessary. ○ In cases where a road needs to cross a water course, the crossing must be designed to satisfaction of the regional director and in consultation with the landowner/tenant. • The erection of gates in fence lines and the open or closed status of gates in new and existing positions shall be clarified with the land owner/tenant and maintained throughout the prospecting period. 	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
The topsoil removed in the site preparation process should be replaced during the rehabilitation exercise.	

Environmental Component	Soil (soil compaction)
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<p>Soil compaction:</p> <ul style="list-style-type: none"> • The active prospecting surface area (alienated) would be restricted to the indicated (mapped coordinate points of pits/ trenches after initial mineral resource evaluation). The physical work phase will take ± 48 months. • Access roads towards the sites would be restricted only to the roads (existing farm roads & roads established in consultation with the surface owner). No land would be disturbed unnecessarily. • Prospecting & rehabilitation should be done in a well-planned manner (according to a prospecting plan) and in the process ensuring that activities are only restricted to surface areas really required. • Compaction of soil surface areas would be alleviated once rehabilitation of certain area starts. Certain roads will probably remain for access (in consultation with the surface owner). Those that would not be required would be ripped and rehabilitated. 	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
Alleviation of compaction of soils would be done during rehabilitation of the prospecting site, including roads.	

Environmental Component	Soil (Soil erosion)
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<p>Soil Erosion:</p> <ul style="list-style-type: none"> • To take preventive steps against land disturbance like erosion. • Implement and maintain cut-off trenches/berms to prevent erosion at trenches. • Re-vegetation of exposed soil surfaces (man-made surfaces on disturb surfaces in excavated sites, roads, etc.) should happen as soon as a particular activity has ceased in order to act as a sufficient erosion prevention measure. 	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
No soil erosion must be visible and no potential for soil erosion must be present at closure.	

Environmental Component	Soil (Soil contamination)
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<p>Potential for soil contamination:</p> <ul style="list-style-type: none"> • All vehicles/ mobile drill rig to be inspected to ensure no oil and hydraulic fluid leaks occur. • All oil spills on soil to be removed and bio-remediate immediately (certain commercial products are available such as Terrasorb or it could be rehabilitated by means of the application of fertilizer and turn with a spade from time to time in order to enhance the natural occurring soil microbial activity). • No servicing of vehicles must occur on the prospecting site itself. Training with regard to pollution hazards and their impact on the environment must be given as part of induction training. • An incidence register for this purpose must be kept. • Drip trays must be available and used where emergency repairs is done. • The contents of pits and drip pans must be disposed of at a licensed or recognised facility. • Mobile Chemical toilet facilities (preferred) shall be used to ensure that these are always within 50m from the pitting site/trenching site. One chemical toilet will be located at the camp site. All toilet facilities will be established and maintained in such a way that it does do not cause soil or surface water pollution. 	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
No soil contamination must be visible or known before closure can be given.	

Environmental Component	Soil (Soil structure)
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<p>Change in Soil structure:</p> <ul style="list-style-type: none"> • Ensure that all available topsoil is carefully removed at prospecting sites. • The soil must also be compacted as backfilling is done. • No unnecessary driving outside the active mining area is allowed due to soil compaction that may occur. • Use organic material e.g. manure to restore the soil structure during rehabilitation. • Ensure that the rehabilitation plan makes provision for ripping of roads and spreading of organic material and that this is used during rehabilitation. 	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
No compaction of any roads or any other area must be present during closure. If the soil structure is disturbed mitigation measures e.g. the use of organic material, lime and fertilisers must be implemented to restore the soil structure.	

Environmental Component	Soil (Soil fertility)
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<p>Soil fertility:</p> <ul style="list-style-type: none"> • Little can be done to preserve the moisture status of the soil once it is exposed. The soil must be used for rehabilitation as quickly as possible. • The soil on the rehabilitated area must be analysed to determine the deficiencies and fertilizer and lime must be ploughed into the soil to restore its fertility. • Ensure that stockpiled soil is kept clean and where possible ensure that the topsoil is treated with organic material and fertilized. • Do not use stockpiled soil for any other purpose but for rehabilitation. • Do not use topsoil to construct roads. • Ensure the rehabilitation plan makes provision for fertiliser. • Make sure rehabilitated topsoil is analysed in a laboratory. The type of fertilizer would depend on a soil analyses and fertilizer recommendation. 	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
The soil must be fertile enough to sustain vegetation.	

Environmental Component	Land Capability
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<p>The disturbance of agricultural land must be restricted (kept to a minimum) to the planned, active prospecting sites only. Remove topsoil where it is available. Take care that roads needed are restricted to 1 entry to the area for prospecting purposes. If new land is used for roads to enter the area it must be done in consultation with the surface owner.</p> <p>All prospecting sites will be rehabilitated as part of the ongoing prospecting operations (A & B). Topsoil will be placed in areas where it was removed and the areas will be re-vegetated accordingly. Ensure that the rehabilitation plan is implemented.</p>	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
Rehabilitated to the state that it is suitable for the predetermined and agreed land capability.	

Environmental Component	Land Use
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<p>The disturbance of agricultural land must be restricted (kept to a minimum) to the planned, active prospecting sites only. One camp site will only be located at one designated site in consultation with the land owner.</p> <p>Remove topsoil where it is available. Take care that roads needed are restricted to 1 entry to the area for prospecting purposes. If new land is used for roads to enter the area it must be done in consultation with the surface owner.</p> <p>All prospecting sites will be rehabilitated as part of the ongoing prospecting operations (A & B). Topsoil will be placed in areas where it was removed and the areas will be re-vegetated accordingly. Ensure that the rehabilitation plan is implemented.</p>	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
The proper replacement of gravel material, overburden and topsoil would ensure that the land is able to support some agriculture activity again.	

Environmental Component	Vegetation
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<p>No mitigation exists except to replace the vegetation by reseeding of grasses.</p> <p>Prospecting should be done in a well-planned manner (according to a prospecting plan) and in the process ensuring that activities are only restricted to surface areas really required.</p>	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
During rehabilitation indigenous vegetation cover comprising of local plant species should be established in order to ensure a well- adapted sustainable plant cover that would be able to prevent erosion of the replaced topsoil on the disturbed prospecting site exposed surfaces, etc.).	

Environmental Component	Vegetation
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<p>Ensure that all roads (utilized by prospecting vehicles) are daily sprayed with water tanker to control dust.</p> <p>Site inspections to ensure the spraying are done.</p>	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
No excessive dust must be present during the normal growth season after closure	

Environmental Component	Vegetation
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<p>Habitat change, loss of species, spread of alien and invasive species:</p> <ul style="list-style-type: none"> • No mitigation exists except to replace the vegetation by reseeded (in the case of grazing land, areas where natural vegetation cover still occur, especially sites associated with prospecting operation). • Prospecting should be done in a well-planned manner (according to a prospecting plan) and in the process ensuring that activities are restricted to surface areas required. • Develop and implement an invasive and alien control programme to control the spread of weeds and other invasive species. • Eradicate exotic weeds and invader species if it invades the prospecting sites (especially sites associated with prospecting operation (C)). All illegal invader plants and weeds shall be eradicated as required in terms of Regulation 15 & 16 of the Act on Conservation of Agricultural Resources, 1983 (Act no. 43 of 1983) which list the plants. • An invasive and alien control programme must be drafted and implemented by the company. 	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
No invasive and alien species must be present after closure. A post-closure control program must also be implemented.	

Environmental Component	Wildlife (habitat)
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<p>Wildlife or wildlife habitat destruction /change / disturbance :</p> <ul style="list-style-type: none"> • To take care that no new or unnecessary destruction of habitats, other than the demarcated prospecting site should take place. • Ensure the rehabilitation plan is implemented to restore damage to wildlife habitats. 	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
<ul style="list-style-type: none"> • Wildlife habitats must be restored after decommissioning. Success will be measured against the extent to which the animals return to the area. • The post-closure phase must be suitable for further restoration of the newly man-made animal habitat. The area must be stable and acceptable for the return of animal- and plant life. 	

Environmental Component	Wildlife (Injury and death)
Environmental Management/Mitigation Measures/Action Plans/Commitments	
Injury and death to animals/wildlife:	
<ul style="list-style-type: none"> • Re-establish trees and grass cover as soon as possible during and after prospecting. • Fence area off to ensure that no person can enter without permission in the case of prospecting operation that involves trenches/pits. • Ensure that the rehabilitation plan is compiled and executed. • Keep incidence register on killings and disturbances. • Make game catching, traps, snares, poaching and any other unnecessary disturbance of animals a disciplinary offence. • Keep an environmental incidence register to log all kills of birds and mammals. • All staff must undergo basic environmental awareness training as part of induction training. • Machine operators and drivers to undergo appropriate level of environmental impact training to ensure they understand their impact on the environment. • Speeding of vehicles on access roads will not be allowed to take place. 	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
<p>The animal life habitat must be restored after decommissioning.</p> <p>The area must be stable and acceptable for the return of animal- and plant life.</p>	

Environmental Component	Surface Water (quality)
Environmental Management/Mitigation Measures/Action Plans/Commitments	
Change in surface water quality:	
<p>Storm water control measures must be implemented to divert clean water away from the active prospecting site (trenches/pits) and keep contaminated water contained.</p> <p>The prospecting plan must be strictly adhered to.</p> <p>Vegetation disturbance must be as little as possible.</p> <p>Revegetation with at least <i>Eragrostis tef</i> (or as agreed to by the landowner) to be done as soon as possible. Final re-vegetation to be done as per rehabilitation plan.</p>	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
The post closure water run-off may in no circumstance impact negatively on the water quality.	

Environmental Component	Surface Water (quantity)
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<p>Change in surface water quantity:</p> <ul style="list-style-type: none"> • Once the prospecting sites are rehabilitated the surface run-off will be restored and normal clean water run-off will end-up in the drainage system. • Once the area is rehabilitated the normal surface run-off drainage will be restored according to rehabilitation plan. The disturbed surface area must be rehabilitated to ensure some normal drainage. Minimal run-off should end-up in trenches /pits. • As in the case of Vaal River, any future prospecting activity should be restricted (100m as required in terms of the Mine Health & Safety Act) in order to prevent any impact onto the surface drainage landscape feature. 	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
Ultimately rehabilitation of the disturbed prospecting site and the construction of run-off control structures in a planned and phased manner would ensure normal drainage and stability of rehabilitated site.	

Environmental Component	Ground Water (quality)
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<p>Reduction of groundwater quality:</p> <ul style="list-style-type: none"> • Storm water control measures must be implemented to divert clean water away from the site and keep (silt) contaminated water contained. • Vehicles to be inspected to ensure no oil and hydraulic fluid leaks occur. All oil spills on soil to be removed and bio-remediate immediately. No servicing of vehicles must occur on the prospecting site. Training with regard to pollution hazards and their impact on the environment must be given as part of induction training. • Any filling-up of equipment and maintenance of vehicles are restricted to the temporary storage area. The necessary drip pans/trays need to be provided for oil/ diesel tanks. • An incidence register must be kept for this purpose. • Drip trays must always be available and used where emergency repairs is done. 	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
Post prospecting water quality to be the same as pre prospecting water quality	

Environmental Component	Ground Water (quantity)
Environmental Management/Mitigation Measures/Action Plans/Commitments	
Reduction of groundwater quantity, lowering of groundwater level:	
<ul style="list-style-type: none"> • Storm water control measures must be implemented to divert clean water away from the site and keep (silt) contaminated water contained. • Vehicles to be inspected to ensure no oil and hydraulic fluid leaks occur. All oil spills on soil to be removed and bio-remediate immediately. • No servicing of vehicles must occur on the site. • Training with regard to pollution hazards and their impact on the environment must be given as part of induction training. • An incidence register for this purpose must be kept. Drip trays must be available and used where emergency repairs is done. • It is important that the backfilling of boreholes/trenches/pits take place in reverse order and that different layers be compacted as backfilling progresses. 	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
Post mining water quality to be the same as pre mining water quality	

Environmental Component	Air Quality
Environmental Management/Mitigation Measures/Action Plans/Commitments	
Dust:	
<p>The prospecting method will serve as mitigation measure because prospecting will limit dust to the active prospecting site (area where the drill rig, excavator and the trucks are operating).</p> <p>Daily spraying of gravel roads with water tanker (regularly traversed by vehicles). Inspection should be done on a daily basis.</p> <p>If new roads are constructed, in co-ordination with surface owner, dust pollution must be mitigated by means of spraying the roads with water.</p>	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
Rehabilitation of the prospecting sites will ensure that no dust is generated from exposed surfaces.	

Environmental Component	Noise
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<p>Ensure the required silencers are placed on all engines and compressors. No mitigation to reverse hooters is allowed due to safety standards.</p> <p>Inspection of vehicles and machinery to ensure silencers are fitted.</p> <p>Ensure that a complaints register is created, managed and maintained. Vehicles and earthmoving equipment should be equipped with the necessary silencers and regularly maintained in a good working condition.</p>	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
No noise attributed to prospecting will be generated from the site after closure anymore. During decommissioning and closure phase some earth moving equipment and trucks would be utilized for rehabilitation.	

Environmental Component	Archaeological and Cultural Sites
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<ul style="list-style-type: none"> • Should any grave, old building, klip kraal, etc. be found in the course of the prospecting operation, such sites need to be avoided. • Such find should also be indicated on a map with coordinates. • Photographs need to be taken of such sites and kept on record. • SAHRA needs to be notified by the proponent of such find. • If such find needs to be destroyed, permission must be applied for from SAHRA. 	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
No site of archaeological importance should be disturbed or damaged until the necessary permit from SAHRA has been issued.	

Environmental Component	Sensitive Landscapes
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<ul style="list-style-type: none"> As in the case of Vaal River, any future prospecting activity should be restricted (100m as required in terms of the Mine Health & Safety Act) in order to prevent any impact onto the surface drainage landscape feature. The water courses flowing through the area should be regarded as sensitive areas in terms of not influencing/impeding any natural flow that might happen from time to time by any prospecting activity. 	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
Prevent harm as far as possible and leave unharmed.	

Environmental Component	Visual Aspects
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<p>Visual impact would be addressed by means of:</p> <ul style="list-style-type: none"> revegetation of disturbed areas with grasses; removal of any scrap, domestic waste, etc. that would otherwise contribute to a negative visual impact. <p>Concurrent rehabilitation should be happening.</p>	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
No residual visual impacts will remain after closure. The terrain should blend in with the surrounding landscape.	

Environmental Component	Socio-Economics
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<ul style="list-style-type: none"> Increase investment in socio- economic activity at local level Appoint people in-line with requirements of social and labour plan. An amicable land use agreement is being negotiated between the Applicant and the registered land owner as mitigation of the socio-economical impact on the latter's use of the land. 	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
The economic development must deliver a multiplier effect that will contribute to the local economy long after closure	

Environmental Component	Interested and Affected Parties
Environmental Management/Mitigation Measures/Action Plans/Commitments	
<ul style="list-style-type: none"> • Access control should always be a priority. • Active prospecting site (trenches/pits) as part of the prospecting operation should be fenced-off. • If any problem should arise, meetings will be held with the landowners and affected parties to consult them on certain matters like permission to mine and pollution. • No prospecting should be conducted under or near the Eskom power line (50 m distance should be kept) <i>(Permission of Inspector of Mines should be obtained.)</i> • No prospecting operation (pitting (A & B)) will be done closer than 5 m from any road or fence <i>(Permission of Inspector of Mines should be obtained)</i> • The erection of gates in fence lines and the open or closed status of gates in new and existing positions shall be clarified with the land owner/tenant and maintained throughout the prospecting period. • Reasonable speeds must be observed to avoid accidents, excessive noise, dust and injury to livestock. • Camp sites shall be sited and fenced (where necessary) in consultation with the landowner/tenant. No site shall be located closer than 50 metres from a stream, spring, dam or pan. The area required for the site must be kept to a minimum. No worker will be allowed to walk around the farm. • No trees or shrubs will be felled or damaged for the purpose of obtaining firewood, unless otherwise agreed to by the landowner/tenant. • Food preparation will only allowed at the temporary storage site. • The making of fires will not be allowed on site. • All types of refuse such as glass bottles, plastic bags, metal scrap, etc., shall be stored in a container at a collecting point and collected on a regular basis and disposed of at a recognised refuse site. 	
EMP Performance Assessment & Monitoring Reporting	
See section 5	
Closure Objective	
Not to be an economic, social or environmental liability to the local community or the state now or in the future. The company will ensure that the interest of all interested and affected parties will be considered.	

3.4.3. Review of the significance of the identified impacts

(After bringing the proposed mitigation measures into consideration).

See Table 3.

Table 3: Review of the significance of the identified impacts after consideration of the proposed mitigation measures.

PHASE	Components	ABIOTIC										BIOTIC			VISUAL		SOCIO-ECONOMIC		Affected parties
		A	B	C	D	E	F	F	E	F	G	H	I	J	K	L	M	N	
	Impacts	Geology	Topography	Soil	Land capability	Land use potential	Surface water	Ground water	Air quality	Noise	Vegetation	Wildlife	Sensitive landscapes	Visual impact	Archaeological & cultural sites	Socio-economic impacts			
7	Travelling to and from site						L		L	L	L	L		L	L	M+	L		
8	Camp establishment		L	L	L	L	L	L	L	L	L	L		L	L	M+	L		
9	Establishment of mobile screening and washing plant		M	L	L	L	L	L	L	L	L	L		L	L	M+	M		
10	Pit/Trench digging	M	M	M	M	M	M	M	L	L	L	L		L	L	M+	M		
11	Screening and washing		M	M	M	M	M	L	L	L	L	L		L	L	M+	M		
12	Trench backfilling	M	M	M	M	M	M	M	L	L	L	L		L	L	M+	M		
13	Decommissioning of the camp site/operational area/tailings facility		M	M	M	M	L		L	L	L	L		L	L	M+	M		
14	Rehabilitation of camp site/operational area, trenches & tailings facility		L	L	L	L	L	L	L	L	L	L		L	L	M+	M		
15	Closure		L	L	L	L	L	L	L	L	L	L		L	L	M+	M		

4. Financial provision

REGULATION 52 (2) (d): Financial provision. The applicant is required to-

4.1. Disturbance for which financial provision must be made

Phase	Disturbance:	Number
All	Access Roads (using existing as far as possible)	
Pitting	Prospecting Pits	40
Trenching	Trenches	10
Trenching	Camp Site	1

(Show the location and aerial extent of the aforesaid main mining actions, activities, or processes, for each of the construction operational and closure phases of the operation).

See Figure 4 for location of Planned Prospecting Operations.

4.2. Alignment of rehabilitation with the closure objectives

(Describe and ensure that the rehabilitation plan is compatible with the closure objectives determined in accordance with the baseline study as prescribed).

See Rehabilitation Plan (Section 6.1)

4.3. Quantum calculations.

(Provide a calculation of the quantum of the financial provision required to manage and rehabilitate the environment, in accordance with the guideline prescribed in terms of regulation 54 (1) in respect of each of the phases referred to).

The quantum was calculated using the optional route for Class C mines as described in the Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provision Provided by a Mine.

According to the document (Table B12), small diamond and precious stone mines (less than 10 000 tonnes per month) are classified as having a class C (low) risk, i.e. a low probability of occurrence with a negligible consequence.

According to the Guideline Document, the quantum for such mines can be determined by:

- Determining the minimum rate per hectare for closure of the mining operations, using information on the environmental sensitivity of the mine location and the prescribed rates per hectare;

- Determining the overall area of the mining/prospecting operation; and
- Calculating the closure costs by multiplying the overall area with the minimum rate per hectare.

The mining operation can be located in either a Low, Medium or High sensitivity area in terms of its biophysical, social and economic setting. Table B.3 provides criteria to aid with the determination of the sensitivity of the area within which the mine is located. This step thus involves the following:

- Assessing and ranking the sensitivity of the area by individually assessing the biophysical situation, then the social situation and then the economic situation,
- Establishing the overall sensitivity of the area, by accepting the most sensitive of the three individual assessments, e.g. if the area has a Medium biophysical sensitivity, a High social sensitivity and a Low economic sensitivity, the overall sensitivity will be High.

Table B.3: Criteria used to determine the area sensitivity

Sensitivity	Sensitivity criteria		
	Biophysical	Social	Economic
Low	<ul style="list-style-type: none"> • Largely disturbed from natural state, • Limited natural fauna and flora remains, • Exotic plant species evident, • Unplanned development, • Water resources disturbed and impaired. 	<ul style="list-style-type: none"> • Local communities are not within sighting distance of the mining operation, • Lightly inhabited area (rural). 	<ul style="list-style-type: none"> • Area is insensitive to development, • Area is not a major source of income to the local communities.
Medium	<ul style="list-style-type: none"> • Mix of natural and exotic fauna and flora, • Development is a mix of disturbed and undisturbed areas, within an overall planned framework, • Water resources are well controlled. 	<ul style="list-style-type: none"> • The local communities are in the proximity of the mining operation (within sighting distance), • Peri-urban area with density aligned with a development framework, • Area developed with an established infrastructure. 	<ul style="list-style-type: none"> • The area has a balanced economic development where a degree of income for the local communities is derived from the area, • The economic activity could be influenced by indiscriminate development.
High	<ul style="list-style-type: none"> • Largely in natural state, • Vibrant fauna and flora, with species diversity and abundance matching the nature of the area, • Well planned development, • Area forms part of an overall ecological regime of conservation value, • Water resources emulate their original state. 	<ul style="list-style-type: none"> • The local communities are in close proximity of the mining operation (on the boundary of the mine), • Densely inhabited area (urban/dense settlements), • Developed and 	<ul style="list-style-type: none"> • The local communities derive the bulk of their income directly from the area, • The area is sensitive to development that could compromise the existing economic activity

		well-established communities.	
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The prescribed rates (per hectare) to determine the quantum for financial provision (Class C mines) are as follows:

- Low – R 20 000
- Medium – R 50 000
- High – R 80 000

For calculation purposes cropland was assessed to have a high sensitivity rating, while the remaining farmland has been assessed as having a medium sensitivity rating.

- **Table 4:** Optional route assessment of the quantum for financial provision for Class C mines

CALCULATION OF THE QUANTUM							
Applicant:		Sparkel Mining (Pty) Ltd					
Location:		Slypklip North No 32 Remaining Extent of Portion 1		Date: 02 - 02- 2015			
No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and pow erlines)	m3	100	11.57	1	1	1157
2 (A)	Demolition of steel buildings and structures	m2	0	161.17	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	237.51	1	1	0
3	Rehabilitation of access roads	m2	150.00	28.84	1	1	4326
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	279.92	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	152.68	1	1	0
5	Demolition of housing and/or administration facilities	m2	20	322.33	1	1	6446.6
6	Opencast rehab.incl. final voids&ramps(Pls 0.276 Trenches 0.6)	ha	0.876	164050.5	0.52	1	74728.27009
7	Sealing of shafts adits and inclines	m3	0	86.52	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0	112646.9	1	1	0
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	140299.6	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	407496.6	1	1	0
9	Rehabilitation of subsided areas	ha	0	94324.78	1	1	0
10	General surface rehabilitation	ha	0.1	89235.31	1	1	8923.531
11	River diversions	ha	0	89235.31	1	1	0
12	Fencing	m	0	101.79	1	1	0
13	Water management	ha	0	33929.78	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0.5	11875.42	1	1	5937.71
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum				1	0
Sub Total 1							101519.1111
1	Preliminary and General		12182.29333		weighting factor 2 1		12182.29333
2	Contingencies				10151.91111		10151.91111
Subtotal 2							123853.32
VAT (14%)							17339.46
Grand Total							141193

4.4. Undertaking to provide financial provision

(Indicate that the required amount will be provided should the right be granted).

Sparkel Mining (Pty) Ltd undertakes to provide the required financial provision for rehabilitation in the form of a Bank Guarantee. The amount that will be guaranteed is R 141 193-00 in total.

5. Planned monitoring and performance assessment of the EMP

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

Monitoring of different environmental aspects/impacts shall take place by means of quantitative and qualitative evaluation techniques in order to determine whether the requirements of the environmental management programme are being complied with. Monitoring is a continuous data-gathering and control procedure. It may range from routine visual inspections to in-depth investigative monitoring. Information/data thus obtained will be used in the EMP Performance Assessment.

5.1. Environmental Monitoring

5.1.1. Monitoring of Environmental parameters

Monitoring for the Prospecting Operation will be done as indicated in Table 5.

5.1.2. Reporting

An annual monitoring report must be compiled covering the following topics:

- Background
- Conditions of approval
- Results of the monitoring program
- Interpretation of the data
- Proposed remedial actions
- Action plan
- Review of the current monitoring plan
- Conclusions

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

5.2. EMP Monitoring and Performance Assessment

5.2.1. Monitoring and performance assessment parameters

EMP monitoring and performance assessments, compliant with Regulation 55 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) will be conducted until closure. This will include the requirements specified in Table 6.

5.2.2. Reporting

An EMP Performance Assessment Report will be submitted to the Management and the DMR on annual bases.

Table 5: Planned environmental monitoring

Environmental Component	Objectives	Parameters	Monitoring points	Frequency
Vegetation	To obtain a self-sustaining well-established indigenous vegetation cover on each disturbed area and to eradicate all illegal invaders & weed species in a controlled way.	<ul style="list-style-type: none"> Plant cover Species diversity Vitality of vegetation 	All rehabilitated areas	During and after the raining season
Soil Erosion	To obtain stable overburden and soil stockpiles, without erosion. To ensure that roads are maintained in good condition.	<ul style="list-style-type: none"> Visual signs of erosion, bare patches, dongas, etc. and stability of surface run-off containment structures. 	All roads, prospecting sites and rehabilitated areas	During and after the raining season
Surface Water (Excavations)	To adhere to DWA water quality requirements (Standing water).	<ul style="list-style-type: none"> A complete analysis will be done (if standing water is found in the excavations)¹. 	All active excavated sites (Standing water, if present)	6 monthly
Ground Water (Borehole)	To adhere to DWA water quality requirements	<ul style="list-style-type: none"> Water level in borehole (Water Supply) A complete analysis will be done every 6 months². 	All boreholes utilized for process and potable water	6 monthly

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¹ Parameters analysed for will include the following: Calcium (mg/l), Sulphate, Fluoride, Chloride, Magnesium (mg/l), Potassium, Sodium, Phosphate, Nitrate, EC (mS/m), pH, Suspended solids/turbidity

² The parameters analysed for will include the following: Calcium (mg/l), Sulphate, Fluoride, Chloride, Magnesium (mg/l), Potassium, Sodium, Phosphate, Nitrate, EC (mS/m), pH, Iron, Aluminium, Manganese, Copper, Zinc

• Table 6: Planned monitoring and performance assessment of the EMP components

Environmental Component	Identified impact that requires monitoring (Section 2.1)	Functional Requirements (Section 2.2)	Responsibility (Section 2.3)
Geology	<ul style="list-style-type: none"> The pitting of boreholes on indicated mapped coordinate points. Strip and placement overburden next to the trench. 	<ul style="list-style-type: none"> Weekly update of prospecting plan. Visual inspections in order to verify if stripping and stockpiling is done as stipulated in the EMP. 	<ul style="list-style-type: none"> Geologist Project manager
Topography	<ul style="list-style-type: none"> The prospecting operation will result in the creation of deep excavations (12m or less). This will act as depressions in the environment that captures surface water run-off. 	<ul style="list-style-type: none"> Visual inspection after every rain event to verify if there is standing water in the trench/pit and to implement action plan as stipulated in the EMP. 	<ul style="list-style-type: none"> Geologist Project manager
Soil	<ul style="list-style-type: none"> During the pitting/trenching operation all topsoil, overburden and gravel layers will be removed separately and stockpiled separately. The stockpile area is therefore alienated (although only temporarily) and will be compacted. Soil erosion from compacted sites In the process of removing topsoil the soil layers are mixed and the original structure may be disturbed. Vehicle/pitting equipment breakages and oil/lubricant/diesel spills may contaminate soil. Loss of soil fertility 	<ul style="list-style-type: none"> Daily visual inspection to verify if the placement of the material is as stipulated in the EMP and surface areas compacted is kept to a minimum. Diesel/oil/lubricant spillages are handled as stipulated in the EMP. 	<ul style="list-style-type: none"> Geologist Project manager

Environmental Component	Identified impact that requires monitoring (Section 2.1)	Functional Requirements (Section 2.2)	Responsibility (Section 2.3)
Land Capability	Temporary loss of land capability to support agricultural activity such as crop production and grazing.	<ul style="list-style-type: none"> Weekly update of prospecting Plan (progress on operation & rehabilitation of sites). Visual inspections in order to verify that the EMP is implemented. 	<ul style="list-style-type: none"> Geologist Project manager
Land Use	Temporary loss of land capability to support agricultural activity such as crop production and grazing.	<ul style="list-style-type: none"> Weekly update of prospecting Plan (progress on operation & rehabilitation of sites). Visual inspections in order to verify that the EMP is implemented. 	<ul style="list-style-type: none"> Geologist Project manager
Vegetation	<ul style="list-style-type: none"> Vegetation clearance, disturbance and trampling. Destruction of habitats for vegetation. Due to a disturbed ecosystem, bare ground and spreading of exotics can follow. Surface area disturbance must be restricted to prospecting sites (occupied by prospecting operational activities A & B & C). Dust coverage of plants 	<ul style="list-style-type: none"> Daily visual inspections to verify that the surface area disturbance is always kept to a minimum as required in the EMP. Daily visual inspection of the active prospecting area to verify if dust suppression is done on the roads on a daily basis. 	<ul style="list-style-type: none"> Geologist Project manager
Wildlife/Animals	<ul style="list-style-type: none"> Injury and death to wildlife & domesticated animals (cattle/sheep, etc.) Animals may fall in boreholes/trenches. 	<ul style="list-style-type: none"> Daily visual inspection on the roads travelled and prospecting site. 	<ul style="list-style-type: none"> Geologist Project manager

Environmental Component	Identified impact that requires monitoring (Section 2.1)	Functional Requirements (Section 2.2)	Responsibility (Section 2.3)
Surface Water	<ul style="list-style-type: none"> The clearance of vegetation and the traffic on access roads will contribute to an increased silt load. Spillages from vehicles, mobile drill rig, excavator and also surface water run-off that is not adequately diverted away from the prospecting borehole/ trenches. Surface run-off from active prospecting sites (A & B) (overburden dumps) if not adequately contained on site could end-up in the adjacent undisturbed natural veld. 	<ul style="list-style-type: none"> Daily visual inspection of potential spillages that may end-up in the borehole/trench and also to determine if sufficient containment structures have been constructed. See Surface Water Monitoring 	<ul style="list-style-type: none"> Geologist Project manager
Ground Water	<ul style="list-style-type: none"> Possible spillages from diesel or oil from pitting rig, earth moving equipment, truck, etc., if not handled responsibly, could become a source of groundwater pollution. Avalon soil form: In the process of removing topsoil the soil layers are mixed and the original structure may be disturbed (also important for water retention for plant growth in certain soils). The additional use of water from boreholes (from farmer or newly drilled dedicated borehole) over a 36 month period will impact on the existing groundwater level. 	<ul style="list-style-type: none"> Visual inspection of the roads, prospecting sites for any indication of oil/diesel/lubricant spillages on a daily basis. The water use (daily amount) utilized should be recorded. The borehole quality and level should be recorded on a monthly basis. 	<ul style="list-style-type: none"> Geologist Project manager

Environmental Component	Identified impact that requires monitoring (Section 2.1)	Functional Requirements (Section 2.2)	Responsibility (Section 2.3)
Dust	<ul style="list-style-type: none"> Dust will be generated during the prospecting operation (A&B) pitting, excavating & loading with an excavator on to a dump truck) and transportation to the plant (conveyor, drum screen & 16 feet pan) and also movement on gravel/dirt/farm roads. 	<ul style="list-style-type: none"> Visual inspection of the active prospecting area should be done and also verify if dust suppression is done on the roads on a daily basis. 	<ul style="list-style-type: none"> Geologist Project manager
Noise	<ul style="list-style-type: none"> Noise will be generated during the prospecting operation (A &B) (pitting, trenching, excavating & loading with an excavator on to a dump truck) and transportation to the plant (conveyor, drum screen & 16 feet pan). 	<ul style="list-style-type: none"> Visual inspection of all equipment, trucks on a daily basis in order to determine if maintenance is required. 	<ul style="list-style-type: none"> Geologist Project manager
Sensitive landscapes	<ul style="list-style-type: none"> The water courses flowing through the area should be regarded as a sensitive area in terms of not influencing/impeding any natural flow that might happen from time to time by any prospecting activity (A & B & C). 	<ul style="list-style-type: none"> Visual inspection on a daily basis when a sensitive area is possible traversed. 	<ul style="list-style-type: none"> Geologist Project manager
I & APs	<ul style="list-style-type: none"> Temporary loss of utilising the prospecting areas for agricultural purposes. Loss of cattle due to falling of animals in boreholes/ trenches/pits if not backfilled or fenced without delay as part of the prospecting exercise. Temporary impact (48 months) on available water on farm as required for the prospecting operations (A&B&C). 	<ul style="list-style-type: none"> Daily visual inspection when a sensitive area is possibly traversed. Daily visual inspection to ensure that boreholes are adequately covered and the trenches/pits are fenced and not damaged. See requirements with regard to Groundwater Monitoring. 	<ul style="list-style-type: none"> Geologist Project manager

Environmental Component	Identified impact that requires monitoring (Section 2.1)	Functional Requirements (Section 2.2)	Responsibility (Section 2.3)
	<ul style="list-style-type: none"> • Loss of crops/grazing land due to accidental fires caused by the workers/equipment/food preparation in the camp site. • Speeding of vehicles (accidents/killing animals) • Safety on farm (burglaries, theft, etc.) 	<ul style="list-style-type: none"> • Daily visual inspection of prospecting site and surrounding environment with regard to any fire danger or damage. • Drivers should be given specific instructions on driving and regularly reminded on the movement on the farm during the day and night. 	<ul style="list-style-type: none"> • Geologist • Project manager
	EMP implementation	<ul style="list-style-type: none"> • Compile a site checklist (based on the EMP requirements). • Regularly verify that EMP requirements are implemented. • Regularly appoint an independent third party to assess EMP performance. 	<ul style="list-style-type: none"> • Geologist • Project manager

6. Closure and environmental objectives

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

6.1. Rehabilitation plan

(Show the areas and aerial extent of the main prospecting activities, including the anticipated prospected area at the time of closure).

See Figure 1 for the location of the planned prospecting sites.

In order to obtain a self-sustainable and stable post-closure rehabilitated environment, the following will be done where natural grassland had been disturbed during the prospecting process.

6.1.1. Rehabilitation:

The clearing of soil surface areas would be restricted to what is really necessary for the construction of infrastructure. During rehabilitation of these sites, or where vegetation is lacking or compacted, the areas would be ripped or ploughed and levelled in order to re-establish a growth medium and if necessary appropriately fertilised to ensure the regrowth of vegetation and the soil ameliorated based on a fertilizer recommendation (soil sample analysed).

Rehabilitation of access roads

Whenever a prospecting right is suspended, cancelled or abandoned or if it lapses and the holder does not wish to renew the permit or right, any access road or portions thereof, constructed by the holder and which will no longer be required by the landowner/tenant, shall be removed and/or rehabilitated to the satisfaction of the Regional Manager.

Any gate or fence erected by the holder which is not required by the landowner/tenant, shall be removed and the situation restored to the pre-prospecting situation.

Roads shall be ripped or ploughed, and if necessary, appropriately fertilised (based on a soil analysis) to ensure the regrowth of vegetation. Imported road construction materials which may hamper regrowth of vegetation must be removed and disposed of in an approved manner prior to rehabilitation.

If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the prospecting operation, be corrected and the area be seeded with a seed mix to the Regional Manager's specification.

Rehabilitation of the surface trench/pitting site

On completion of operations, all buildings, structures or objects on the camp/office site shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), which states:

- (1) *When a prospecting right, mining right, retention permit or mining permit lapses, is cancelled or is abandoned or when any prospecting or mining operation comes to an end, the holder of any such right or permit may not demolish or remove any building, structure, object -
(A & B) which may not be demolished in terms of any other law;
(C) which has been identified in writing by the Minister for purposes of this section; or
(c) which is to be retained in terms of an agreement between the holder and the owner or occupier of the land, which agreement has been approved by the Minister in writing.*
- (2) *The provision of subsection (1) does not apply to bona fide mining equipment which may be removed*

After all the foreign matter has been removed from the prospecting sites, the excavations shall be backfilled with subsoil, compacted and levelled with previously stored topsoil. No foreign matter such as cement or other rubble shall be introduced into such backfilling.

On completion of prospecting operation, the above areas shall be cleared of any contaminated soil. The surface shall then be ripped or ploughed to a depth of at least 300mm and the topsoil previously stored adjacent the site, shall be spread evenly to its original depth over the whole area. The area shall then be fertilised if necessary (based on a soil analysis). The site shall be seeded with a vegetation seed mix (section C) adapted to reflect the local indigenous flora. Where the site has been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.

Photographs of the camp and office sites, before and during the prospecting operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the Regional Manager.

Photographs of the different trench/pitting sites, before and during prospecting and after rehabilitation, shall be taken at selected fixed points and kept on record for the regional manager's information.

Rehabilitation of the new topographical landscape in such a way that it would blend in with the surrounding landscape and allow normal (controlled) surface drainage to continue.

Implement water control systems in order to prevent erosion. Seed the area (see C. (below) for recommended seed mixture).

Visual impact would be addressed by means of;

- re-vegetation (grasses);

- removal of any building, scrap, domestic waste, etc. that would otherwise contribute to a negative visual impact.

Fertilising of Areas to be Rehabilitated

If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the prospecting operation be corrected and the area be seeded with a seed mix to his or her specification.

Seeding of Grass Seed Mixture and planting of Woody Species

The eventual seed mixture takes into account the availability of seed, different soil situations and the prevailing climatic conditions of the area. The following mixture will be applicable to the borehole prospecting site:

Cenchrus ciliaris
Cynodon dactylon
Digitaria eriantha
Heteropogon contortus
Panicum maximum

6.1.2. Demolition of infrastructure/buildings

On completion of operations, all buildings, structures or other on the prospecting terrain shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).

6.1.3. Invasive and alien control programme

Develop and implement an invasive and alien control programme to control the spread of weeds and other invasive species. Eradicate exotic weeds and invader species if it invades the terrain. All illegal invader plants and weeds shall be eradicated as required in terms of Regulation 15 & 16 of the Act on Conservation of Agricultural Resources, 1983 (Act no. 43 of 1983) which list the plants.

6.2. Closure objectives and their extent of alignment to the pre-prospecting environment.

6.2.1. Closure

The main closure objective of for the prospecting site is to rehabilitate the whole prospecting site in such a way to ensure that the new man-made topographical landscape would blend in with the surrounding landscape, not pose a safety hazard to humans and animals, while at the same time allow for alternative land uses. Establish a self-sustaining and stable vegetation cover

in order to mitigate the visual impact, to control erosion and to create some habitat for animals. The rehabilitated environment also needs to be aesthetically acceptable according to the principle of BPEO. Another main objective is to manage the surface water in such way that an acceptable water standard is achieved when a closure certificate is issued.

Sparkel Mining (Pty) Ltd will ensure that the Prospecting Operation/Sites are:

- Neither a danger to public health and safety nor to animal health and safety;
- Not a source of any pollution;
- Stable (ecological and geophysical);
- Rehabilitated to the state that is suitable for the predetermined and agreed land use;
- Compatible with the surrounding biophysical environment;
- A sustainable environment;
- Aesthetically acceptable;
- Not an economic, social or environmental liability to the local community or the state now or in the future.

Sparkel Mining (Pty) Ltd will furthermore:

- ensure that the physical and chemical stability of the rehabilitated prospecting site will be such that risk to the environment is not increased by naturally occurring forces to the extent that such increased risk cannot be contended with by the installed measures;
- subscribe to the optimal exploitation and utilization of South Africa's mineral resources (diamonds);
- ensure that the prospecting site is closed efficiently and cost effectively.
- ensure that the operation is not abandoned but closed in accordance with the relevant requirements;
- ensure that the interest of all interested and affected parties will be considered;
- ensure that the all-relevant legislation regarding mine closure will be adhered to, and all relevant application procedures followed.

6.3. Confirmation of consultation

(Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties).

The environmental objectives in relation to closure was discussed with the community, land owners and other interested and affected parties during the meeting of 2 December 2014 and as part of the ongoing public consultation process it will be updated where and when necessary.

The environmental objectives in relation to closure was further arrived at by using publicly available sources of data such as books, data, maps and images available on the internet, data from a specialist agricultural support organisation, as well as the knowledge and experience of the consultants and the applicant's geologist.

The environmental objectives in relation to closure will be discussed with the community, land owners and other interested and affected parties as part of the ongoing public consultation process and updated where necessary.

7. Record of the public participation

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

7.1. Identification of interested and affected parties.

(Provide the information referred to in the guideline)

The following interested and affected parties were identified:

Group	Individuals
Land owners	Wilhelmina Magrita Olivier, identity number 411209 0016 006.
Neighbours	Freid Delwery CC, Halliwell Pretorius Makelaars CC, Cor Muller Makelaars CC, Kaapweg Motors CC, Keurplant Beleggings (Pty) Ltd, MM Tiger. All of the neighbours were thus identified.
Lawful occupiers	Wilhelmina Magrita Olivier, identity number 411209 0016 006.
Communities	No community was identified, as the land is surrounded by privately owned agricultural and/or commercial farms.
Government institutions	<ul style="list-style-type: none">• Department of Agriculture, Conservation and Environment• Department of Water Affairs and Forestry,• Department of Mineral Resources.• National Department of Agriculture• Department of Mineral Resources• Magareng Local Municipality

7.2. The details of the engagement process.

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

Information was provided to the land owner and interested and affected parties in the registered notification letter, newspaper advertisement as well as a presentation that was delivered at the public consultation meeting. The information covered the following topics: Prospecting Right applications of Sparkel Mining (Pty) Ltd; environmental legal authorisation processes; introduction to the proposed prospecting projects; public consultation/ participation process; potential environmental issues identified and the road ahead. A copy of the Consultation Bundle provided to attendees at the public consultation meeting is attached hereto in annexure "C".

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

All parties were consulted although the consultation process with the land owner was a more extensive and time consuming and still in process at the time of the drafting of this EMP.

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

Limited views were raised by consulted parties regarding the existing cultural or socio-economic environment. All were however in agreement that it constitutes agricultural land most suitable for cattle grazing and maize cultivation.

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

Everybody is of opinion that no material impacts are anticipated.

7.2.5. Other concerns raised by the aforesaid parties.

A letter dated 10 December 2014 on behalf of the registered land owner is attached hereto as annexure "E" as well as the response by Milnex 189 CC dated 2 February 2015 in annexure "F". The Applicant is engaged with negotiations with the land owner in an attempt to reach an amicable land use agreement. The Applicant will not commence with any activities prior to such contract being concluded.

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

Minutes and records of the public consultations are appended as separate Appendices.

7.2.7. Information regarding objections received.

A letter dated 10 December 2014 on behalf of the registered land owner is attached hereto as annexure "E" as well as the response by Milnex 189 CC dated 2 February 2015 in annexure "F". The Applicant is engaged with negotiations with the land owner in an attempt to reach an amicable land use agreement. The Applicant will not commence with any activities prior to such contract being concluded.

7.3. The manner in which the issues raised were addressed.

The issues raised were as far as possible considered in the compilation of this Environmental Management Plan.

The outstanding issues will be discussed with the community, land owners and other interested and affected parties as part of the ongoing public consultation process and the EMP updated where necessary.

8. Environmental awareness plan

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

8.1. Employee communication process

(Describe how the applicant intends to inform his or her employees of any environmental risk which may result from their work).

• Sparkle Mining (Pty) Ltd. believes in seven key principles to achieving effective environmental training and awareness:

- Communication
- Urge
- Leadership
- Teamwork
- Understanding
- Recognition
- Empowerment (Culture).

Also see Table 8

8.2. Description of solutions to risks

(Describe the manner in which the risk must be dealt with in order to avoid pollution or degradation of the environment).

See Table 7.

8.3. Environmental awareness training.

(Describe the general environmental awareness training and training on dealing with emergency situations and remediation measures for such emergencies).

See Table 8.

• **Table 7: Procedures for Environmental Related Emergencies and Remediation**

Possible Environmental Related Emergency	Action plans/Remediation	Time/period	Responsible Person/party
Over turning of trucks on site, roads or undisturbed environment.	Removal of material and transport to original destination.	Immediately	Transport Contractor
Spillage of oil, diesel by vehicles, tankers, etc.	The spillage should be contained (bund earth walls) by all means. Depending on the amount of spillage it could be remediated in situ or in the case of large amount of spillage that is contained, could be removed by Oilkol, etc. Leakage from the vehicle, tanker etc., that caused the emergency, should be stopped and the vehicle removed to the workshop area for repairs.	Immediately	Project Manager
Fires	All fires in the veld, buildings, diesel tanks, chemical fires, etc. should be extinguished and prevented to spread to any other piece of land, building, etc. During the winter months adequate fire breaks should be put in place around the prospecting activities. The necessary equipment should be in place and ready to be used if an accidental fire occurs.	Immediately	Project Manager, Farmers, Reivilo Fire Brigade

• **Table 8:** Mechanisms for raising environmental awareness through communication, information and training

Aspect	Objectives	Description	Time/period	Responsible person/party
Communication	Describe the manner in which the applicant intends to inform his or her employees of any environmental risks which may result from their work and; The manner in which the risks must be dealt with in order to avoid pollution or the degradation of the environment	<p>Method: How do the employees receive the information?</p> <ul style="list-style-type: none"> • Workplace meetings with the Operations Manager • At safety training sessions; • Induction programmes; • Regular publications and information leaflets; • Bulletin boards (posters), • Electronic mail messages, • Forum meetings, which involves the local I & AP's and the DME. <p>Sparkle Mining (Pty) Ltd. engages and communicates with communities, with due regard and respect for local interests, cultures and customs, and contribute meaningfully to the economic, social and educational well-being of the communities in which they operate.</p>	Ongoing	Project Manager Geologist
Information		Information from internal (EMP, etc.) and external sources will be communicated in a language understandable to every worker. Environmental information will be communicated via the methods spelled out above.	Ongoing	Project Manager Geologist
Training		All employees should receive basic environmental awareness training, either as induction training or later at a special training session. Different levels of responsibility in relation to individual's potential impact on the environment must be addressed in the training session. The further motivation of the workforce would be achieved	Ongoing	Project Manager Geologist Environmental consultant

Aspect	Objectives	Description	Time/period	Responsible person/party
		<p>through in-house and training through attending short courses with regard to environmental management, etc.</p> <p>Appropriate training relevant to the implementation of the environmental management plan should be provided to all personnel. Employees should have an appropriate knowledge base. The company should also ensure that the contractors working on site provide evidence that they have the requisite knowledge and skills to perform the work in an "environmentally responsible manner".</p> <p>Education and training is needed to ensure that the employees knowledge of regulatory requirements, internal standards and the mine's policies and objectives is current.</p> <p>Issues to be considered during training:</p> <ul style="list-style-type: none"> • handling of topsoil • prevention of oil/diesel spillages • handling of industrial and domestic waste • dust suppression • rehabilitation • use of chemical toilets • use of water • surface run-off control • invasive and alien control programme <p>Make game catching, traps, snares, poaching and any other unnecessary disturbance of animals a disciplinary offence.</p> <p>Prospecting should be done in a well-planned manner (according to a mining plan) and in the process ensuring that activities are only restricted to surface areas really required.</p>		
Reporting		Every environmental incident that might happen and which the	Ongoing	All

Aspect	Objectives	Description	Time/period	Responsible person/party
		<p>workers become aware off should be reported to the manager.</p> <p>The worker can only report on incidents if he is made aware off the possible environmental risks through the communications methods indicated in section 1.</p> <p>A written reporting format should be put in place.</p> <p>Communication includes establishing processes to report internally and, where desired, externally on the environmental activities of the mine in order to:</p> <ul style="list-style-type: none"> Demonstrate management commitment to responsible environmental management; Deal with concerns and questions about environmental issues (handled within the Forum); Raise awareness of the organization's environmental policies, environmental management program; and Inform internal or external interested parties about the mine's management system; <p>A formal complaints/concerns reporting system to address I &AP's interaction with the mine must be put in place (complaints register);</p> <p>The mine must regulatory communicate with the affected community. This communication must address new developments, problems, achievements and all other relevant aspects of mutual interest.</p>		

9. Capacity to rehabilitate and manage negative environmental impacts

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

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

(Provide a detailed explanation as to how the amount was derived)

Concurrent rehabilitation will be conducted as part of the whole prospecting process. Day to day environmental management is part of the whole operational prospecting project.

Provision is made in the Prospecting Work Programme (PWP) for the Operational cost of every phase of the project (with particular reference to different phases of the project, namely:

ACTIVITY	YEAR 1 Expenditure	YEAR 2 Expenditure	YEAR 3 Expenditure	YEAR 4 Expenditure
PHASE 1				
Desktop Studies, Imaginary Analyzing, Geological Mapping	R20 000	"	"	"
PHASE 2				
Pitting	"	R18 000	"	"
PHASE 3				
Trenches	"	R120 000	"	"
Labour	R49 500	R51 975	"	"
Rehabilitation	"	"	"	"
Diesel & Maintenance	R15 000	R20 000	"	"
Annual Total	R84 500	R209 975	"	"
			Total Budget	R294 475

- The total amount provided for the project is R294 475. Further details can be obtained from the PWP.

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

The stated amount has been adequately provided for in the Prospecting Work programme.

10 Undertaking to execute the environmental management plan

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

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

Full Names and Surname	Petrus Stephanus Lombard
Identity Number	710123 5030 086


PETRUS STEPHANUS LOMBARD

-END-