

File number: LP30/5/1/3/2/ MP

DEPARTMENT OF MINERALS AND ENERGY

ENVIRONMENTAL MANAGEMENT PLAN

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



RECEIVED

MINERALS AND ENERGY
 PRIVATE BAG X9467
 POLOKWANE 0700
 REGIONAL MANAGER
 LIMPOPO REGION

SIGNATURE.....
 NAME OF OFFICIAL..... DATE: 28/05/09
 (PRINT)..... M. K. H. M. S. A. K.

Application for a:	Prospecting Right	
	Mining Permit	X

Applicant: THE SOUTH AFRICAN NATIONAL ROADS AGENCY LTD (SANRAL)

Farm: TURFSPRUIT 241 KR (BORROW PIT NO: 3)

District: POTGIETERSRUS

Mineral: GRAVEL

Date:

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A.1 INTRODUCTION

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

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

A.2 SCOPE

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

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

A.3 PURPOSE

This document aims to :

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

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

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

A.4 USE OF THE DOCUMENT:

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

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

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

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

A.5 LEGISLATION/ REGULATIONS

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

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

	and actively conduct prospecting operations; comply with requirements of approved EMP, pay prospecting fees and royalties	
20(2)	Holder of prospecting right must obtain Minister's permission to remove any mineral or bulk samples	R 100 000 or two years imprisonment or both
Section of Act	Legislated Activity/ Instruction/ Responsibility or failure to comply	Penalty in terms of Section 99
26(3)	A person who intends to beneficiate any mineral mined in SA outside the borders of SA may only do so after notifying the Minister in writing and after consultation with the Minister.	R 500 000 for each day of contravention
28	Holder of a mining right or permit must keep records of operations and financial records AND must submit to the DG: monthly returns, annual financial report and a report detailing compliance with social & labour plan and charter	R 100 000 or two years imprisonment or both
29	Minister may direct owner of land or holder/applicant of permit/right to submit data or information	R 10 000
38(1)(c)	Holder of permission/permit/right MUST manage environmental impacts according to EMP and as ongoing part of the operations	R 500 000 or ten years imprisonment or both.
42(1)	Residue stockpiles must be managed in prescribed manner on a site demarcated in the EMP	A fine or imprisonment of up to six months or both
42(2)	No person may temporarily or permanently deposit residue on any other site than that demarcated and indicated in the EMP	A fine or imprisonment of up to six months or both
44	When any permit/right/permission lapses, the holder may not remove or demolish buildings, which may not be demolished in terms of any other law, which has been identified by the Minister or which is to be retained by agreement with the landowner.	Penalty that may be imposed by Magistrate's Court for similar offence
92	Authorised persons may enter mining sites and require holder of permit to produce documents/ reports/ or any material deemed necessary for inspection	Penalty as may be imposed for perjury
94	No person may obstruct or hinder an authorised person in the performance of their duties or powers under the Act.	Penalty as may be imposed for perjury
95	Holder of a permit/right may not subject employees to occupational detriment on account of employee disclosing evidence or information to authorised person (official)	Penalty as may be imposed for perjury
All sections	Inaccurate, incorrect or misleading information	A fine or imprisonment of up to six months or both
All sections	Failure to comply with any directive, notice, suspension, order, instruction, or condition issued	A fine or imprisonment of up to six months or both

A.6 OTHER RELEVANT LEGISLATION

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

- National Monuments Act, 1969 (Act 28 of 1969).

- National Parks Act, 1976 (Act 57 of 1976)
- Environmental Conservation Act, 1989 (Act 73 of 1989)
- National Environmental Management Act, 1998 (Act No. 107 of 1998)
- Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965)
- The National Water Act, 1998 (Act 36 of 1998)
- Mine Safety and Health Act, 1996 (Act 29 of 1996)
- The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983).

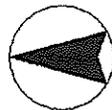
A.7 WORD DEFINITIONS

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

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



● Heritage locations

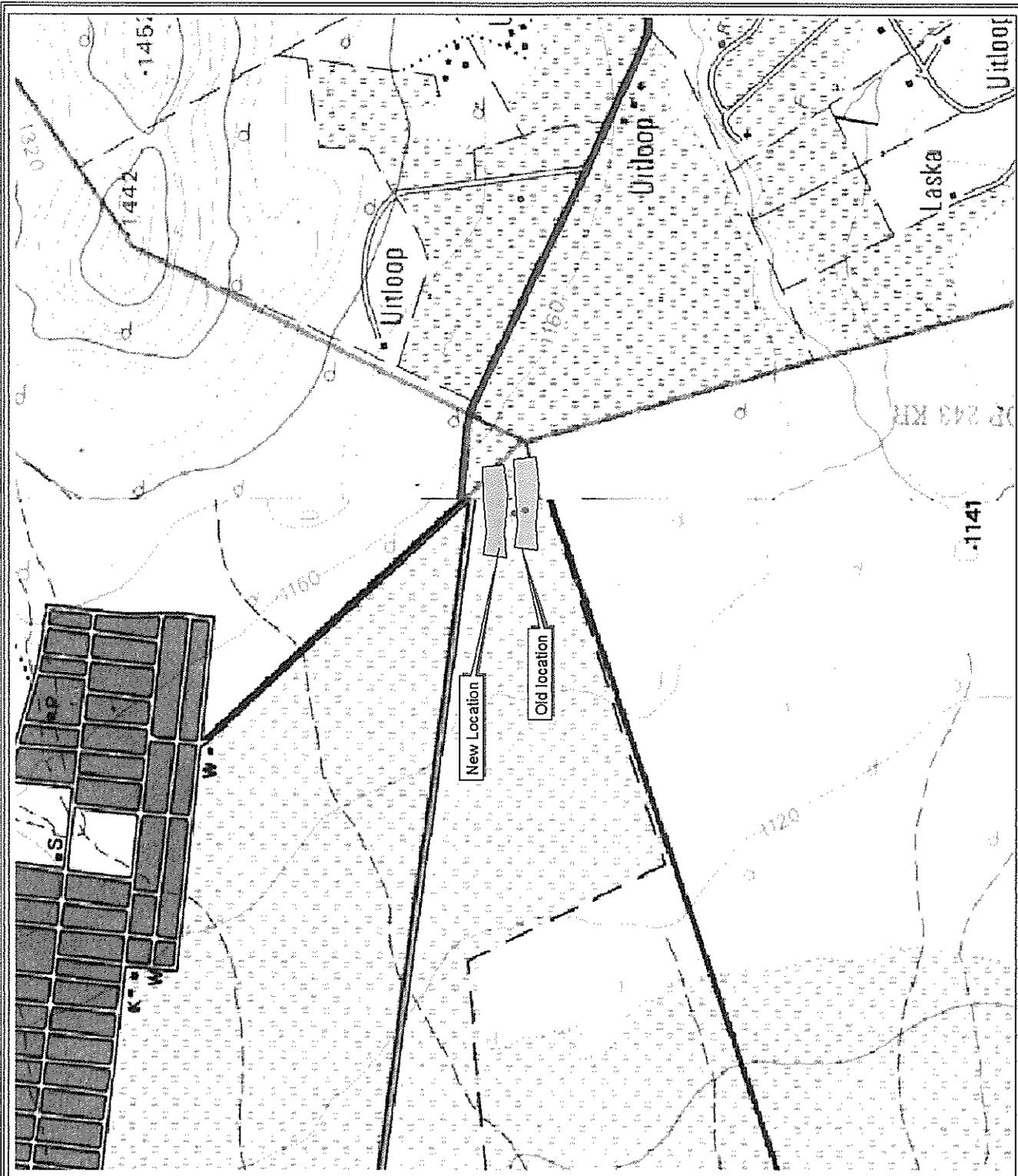


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Borough
2428 BR
2423 AA



B. BIOGRAPHIC DETAILS OF THE APPLICANT:

B 1.1 Full name (and surname) of person or company applying for permit or right	The South African National Roads Agency Ltd (SANRAL)
B 1.2 ID number of person or company/ CC registration number	N/A
B 1.3 Postal address	Private Bag X17 Lynnwood Ridge 0040
B 1.4 Physical/ residential address	38 Ida Street Menlo Park 0040
B 1.5 Applicant's telephone number	012 426 6200
Fax:	012 348 1680
B 1.6 Applicant's cellular phone number	
B 1.7 Alternative contact's name	Ntebogeng Kgomo
B 1.8 Alternative contact's telephone/cell phone numbers	0832836042
B 2.1 Full name of the property on which <u>prospecting</u> operations will be conducted	Turfspruit 241 KR
B 2.2. Name of subdivision	0
B 2.3 Approximate center of prospecting area:	
Latitude	24.10254
Longitude	28.99962
B 2.4 Magisterial district	Potgietersrust
B 2.5 Name of the registered owner of the property	RSA / Tribal Authority Chief Kekana
B 2.6 His/her Telephone number	015 4850187

B 2.7 His/ her Postal address	343 Mo Shate
	Vaaltyn
	0650
B 2.8 Current uses of surrounding areas	
Agriculture – grazing area for cattle and goats	
B 2.9 Are there any other, existing land uses that impact on the environment in the proposed prospecting area?	
No	
B 2.10 What is the name of the nearest town?	
Mokopane	

C. ENVIRONMENTAL IMPACT ASSESSMENT:

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

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

C.1 DESCRIPTION OF THE ENVIRONMENT LIKELY TO BE AFFECTED BY PROPOSED PROSPECTING/MINING OPERATIONS: (REGULATION 52(2)(a))			
ELEMENT/ IMPACTOR	VALUE	TICK	OFFICE USE
C 1.1 What does the landscape surrounding the proposed operation look like? (Open veld/ valley/ flowing landscape/ steep slopes)			
Flowing landscape The area is relatively hilly and comprises of rolling plains and hills			
C 1.2 Describe the type of soil found on the surface of the site	The soil is throughout shallow with impeded drainage. The underlying rocks are granite, sandstone, quartzite and shale, covered by a shallow layer of gritty yellow-grey sandy loam		
	VALUE 0-1 m	TICK	OFFICE USE
C 1.3 How deep is the topsoil?	0 – 300mm	X	8
	300 – 600mm		4
	600mm +		2
C 1.4 What plants, trees and grasses grow naturally in the area around the site?			
A list of plants, trees and grasses occurring in the area is reflected in "Annexure A" herein			

C 1.5 What <i>animals</i> naturally occur in the area?			
No animals were observed during the site visit. Rodents and reptiles (lizards, geckoes, snakes, as well as domestic animals would occur naturally in the area. A list of animals which could occur in the area is reflected in "Annexure B" herein			
	VALUE	TICK	OFFICE USE
C 1.6 Are there any <i>protected areas</i> (game parks/nature reserves, monuments, etc) close to the proposed operation?	Yes		4
	No	X	0
C 1.7 what mineral are you going to prospect for	Gravel		
C 1.8 Describe the type of equipment that will be used			
Excavator			
Front-end-loader			
Tippers			
C.2 HOW WILL THE PROPOSED OPERATION IMPACT ON THE NATURAL ENVIRONMENT? (REGULATION 52(2)(b))			
ENVIRONMENTAL ELEMENT/ IMPACTOR	VALUE	TICK	OFFICE USE
No negative impact. Disturbed land will be rehabilitated			
C 2.1 What will the ultimate depth of the proposed prospecting operations be?	0 – 5m	X	2
	6 – 10m		4
	10 – 25m		8
	25m +		10
C 2.2 How large will the <i>total</i> area of all excavations be?	1,500 ha		
C 2.3 How large will each excavation be before it is filled up?	<10 x 10m		2
	<20 X 20m	X	4
	>20 X 20m		8
C 2.4 How many <i>prospecting</i> boreholes or trenches will there be?	None		
	VALUE	TICK	OFFICE USE
C 2.5 Will employees prepare food on the site and collect firewood?	Yes		4
	No	X	0
C 2.6 Will water be extracted from a river, stream, dam or pan for use by the proposed operation?	Yes		4

	No	X	2
C 2.7 If so, what is the name of this water body?	N/A		
C 2.8 If water will not be extracted from an open surface source, where will it be obtained?	From borehole nearby the site (Farm)		
	VALUE	TICK	OFFICE USE
C 2.9 How much water per day will the <i>mineral processing</i> operation require?	1000 – 10 000 Liters	X	2
	20 000 – 40 000 L		3
	40 000 – 60 000 L		5
	60 000 – 100 000L		8
	More		10
C 2.10 How far is the proposed operation from open water (dam, river, pan, lake)?	0 – 15m		8
	16 – 30m		6
	31 – 60m		4
	More than 60 metres	X	2
C 2.11 What is the estimate depth of the water table/ borehole?	50		metres
C 2.12 How much water per day will the proposed operation utilize for employees?	±1000		Liters
C 2.13 What toilet facilities will be made available to workers?			8
	Pit latrine (longdrop)		4
	Chemical toilet	X	2
C 2.14 Would it be necessary to construct roads to access the proposed operations?	Yes		4
	No	X	0
	VALUE	TICK	OFFICE USE
C 2.15 How long will these access road(s) be (from a public road to the proposed operations)	0 – 0,5 km	X	4
	0,6 – 1,5 km		2
	1,6 – 3 km		4
C 2.16 Will trees be uprooted to construct these access road(s)?	Yes		4
	No	X	0
C 2.17 Will any foreign material, like crushed stone, limestone, or any material other than the naturally occurring topsoil be placed on the road surface?	Yes		4
C.3 TIME FACTOR			
	0 – 6 months		2

C 3.1 For what time period will prospecting/ operations be conducted on this particular site?			
	6 – 12 months		4
	12 – 18 months		6
	18 – 24 months		8
	>24 months	X	10
C.4 HOW WILL THE PROPOSED OPERATION IMPACT ON THE SOCIO-ECONOMIC ENVIRONMENT? (REGULATION 52(2)(b))			
ELEMENT/ IMPACTOR	VALUE	TICK	OFFICE USE
C 4.1 How many people will be employed?	• 8		
C 4.2 How many men?	• 8		
C 4.3 How many women?	• 0		
C 4.4 Where will employees be obtained? (Own or employed from local communities?)	Own		2
	Local	X	4
C 4.5 How many hours per day will employees work?	Sunrise → Sunset	X	4
	Less		2
	More		8
	VALUE	TICK	OFFICE USE
C 4.6 Will operations be conducted within 1 kilometer from a residential area	Yes		6
	No	X	1
C 4.7 How far will the proposed operation be from the nearest fence/windmill/house/dam/built structure?	0 – 50 metres		8
	51 – 100 metres		4
	150 or more metres	X	2
C.5 HOW WILL THE PROPOSED OPERATION IMPACT ON THE CULTURAL HERITAGE OF THE SURROUNDING ENVIRONMENT? REGULATION 52(2)(b)			
ELEMENT/ IMPACTOR	VALUE	TICK	OFFICE USE
C 5.1 Are there any graveyards or old houses or sites of historic significance within 1 kilometer of the area?	Yes		8
See attached Heritage Resources Scoping Report ("Annexure C")	No	X	0

C.6 SPECIFIC REGULATORY REQUIREMENTS

C.6.1 Air quality Management and Control (Regulation 64)	
Describe how the operation will impact on the quality of the air, taking into account predominant wind direction and other affected parties in the downwind zone:	
Only impact envisaged would be normal vehicle emissions from motor vehicles used to enter the mining area.	
Dust generated by the mining activity will be suppressed by means of a water cart. Accordingly the impact on the quality of the air will be negligible.	
C.6.2 Fire Prevention (Regulation 65)	
Applicants for permits, rights or permissions involving coal or bituminous rock must:	
<ul style="list-style-type: none"> • Indicate on a plan where the coal or rock discard dump will be located (If applied for a permit to mine or prospect for coal or bituminous rock, indicate the exact location of the discard dump on the plan and write "EMPlan C6.2" next to it) 	
Earth moving vehicles will be equipped with fire extinguishers.	
C.6.3 Noise control (Regulation 66)	
Indicate how much noise the operation will generate, and how it will impact on the surrounding environment, who might be influenced by noise from your operation.	
Moving equipment will generate noise. All earth mowing equipment vehicles are however well maintained and no significant noise levels will be generated. Operation will only be taking place from sunrise to sunset. Noise levels will not exceed 85d BA	
C.6.4 Blasting, vibration and shock (Regulation 67)	
Please indicate whether any blasting operations will be conducted.	
Blasting:	NO.
	How often?
No Blasting will be required.	
C.6.5 Disposal of waste material (Regulation 69)	
Indicate on your plan where waste will be dumped in relation to the beneficiation works/ washing pans Also indicate below how domestic waste material will be managed.	
Domestic waste will be removed and dumped at a registered domestic waste disposal site at Mokopane.	
C.6.6 Soil pollution and erosion control (Regulation 70)	
6.6.1 Indicate how topsoil will be handled on the area.	
Topsoil will be stockpiled for rehabilitation purposes. Excavated areas will be rehabilitated immediately (Daily basis) in order to prevent erosion. Topsoil shall be re-spread upon completion of construction activities.	

6.6.2 Describe how spills of oil, grease, diesel, acid or hydraulic fluid will be dealt with.

Spillage of oils, grease diesel acid or hydraulic fluid will be dealt with by first of all preventing their occurrence ("precautionary approach") e.g. when working with these substances, this shall be done in specified areas on impermeable protective (e.g. plastic) linings. Provision shall be made to contain spillages or overflows onto adjacent soils at these areas. Material storage yards shall not be sited in sensitive ecological areas. Should any spillage take place, then the area will immediately be cleared and the spillage will be collected and dumped at a registered dumping site. The necessary authority will be notified and a site inspection will be held with an official from that authority. Monitoring will also be done should it be required from the relevant authority.

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

Oil, grease and diesel will be kept in covered receptacles and stored within a secured bunded area. The bunded area will have a containment capacity of 1, 5 times the volume of fluids / chemicals stored there. Leakages will be avoided. All hazardous materials shall be stored in an appointed area that is fenced and has restricted entry. All drums / tanks will be stored in an appointed area. Drums located on concrete plinths, surrounded by bund walls – the bunded area will have a containment capacity of 1, 5 times the volume of fluids / chemicals stored there. Leakages will be avoided. Oil, grease and cleaning materials from maintenance of vehicles shall be collected in a sump and sent back to supplier or otherwise disposed of at a registered site. The leaching of fluids into the underground water will be monitored on a regular basis.

<p>C.6.7 If significant impacts on any element of the environment mentioned in Section C 1 to C 6.6 above have been identified, summarise all of them here: (Regulation 52(2)(c))</p> <p>Example:</p>	<p>C.6.8 How will the negative impacts on the environment be mitigated or managed (as described in C 6.11 to the left)? (Regulation 57(2)(c))</p> <p>Example:</p>
<p>1 Dust generated by the prospecting activity.</p>	<p>1 Dust will be suppressed by means of a water cart.</p>
<p>2 Noise generated by the earth moving equipment.</p>	<p>2 Noise levels will not exceed 85a BA. Mining to be conducted during daylight hours.</p>
<p>3 Heavy vehicle movement will lead to the compaction of soils in the area surrounding the borrow pit</p>	<p>3 Soils compacted by construction activity shall be ripped to loosen compacted layers and graded evenly (this especially applies to material laydown and vehicle movement areas around the borrow pit area). The access of all construction and delivery vehicles(e.g. trucks and cranes) to the borrow pit, and construction areas shall be controlled during wet weather, to avoid compaction and damage to the topsoil structure. Topsoil shall be re-spread upon completion of construction activities.</p>
<p>4</p>	<p>4</p>
<p>5</p>	<p>5</p>
<p>6</p>	<p>6</p>
<p>7</p>	<p>7</p>
<p>8</p>	<p>8</p>

C.7 Financial provision: (Regulation 54)

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

Enter the amount of financial provision required here: R10000.00

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

Cash deposit	
Bank guarantee	X
Trust Fund	
Other: (specify) (Note: other methods must be approved by the Minister)	

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

C.8.1 Monitoring and performance assessment.

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

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

Example: I will, on a bi-monthly basis, check every aspect of my operation against the prescriptions given in Section F of this document and, if I find that certain aspects are not addressed or impacts on the environment are not mitigated properly, I will rectify the identified inadequacies immediately.

The mining operation will be checked against the prescriptions given in Section F of this document. If certain aspects are not addressed or impacts on the environment are not mitigated properly, the identified inadequacies will be rectified immediately.

C.9 Closure and Environmental objectives: (Regulation 52(2)(f))
Clearly state the intended end use for the area prospected after closing of operations
The proposed site will be rehabilitated in such away, according to the DME specification / standard, that the land use of the site stays the same
C.9.1 Describe, in brief terms, what the environment will look like after a closure certificate has been obtained.
All construction material, including concrete slabs and site office areas will have been removed from the site on completion of the contract. The site shall be reinstated as closely as possible to its original condition. All steep side walls at the excavated area shall have been landscaped and top soil shall have been re-spread to the engineer's specifications and at the contractor's cost. The drainage from the slope of the rehabilitated area will be of such nature that the runoff velocity will be reduced to a minimum, in order to prevent the occurrence of any water erosion. The site will be rehabilitated in such away that the area will be safe. No steep walls will be present. It will not be dangerous for people and animals to move around the area.

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

C 10 CLOSURE

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

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

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

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

C 11.1 Any comments lodged by an interested and affected person or persons in terms of section 10(1)(b) of the Act, must be in writing and addressed to the relevant Regional Manager.

C 11.2 Any objections lodged by an interested and affected person or persons against the application for a right or permit in terms of the Act, must set out clearly and concisely the facts upon which it is based and must be addressed to the relevant Regional Manager in writing.

C 11.3 The Regional Manager must make known by way of publication in a local newspaper or at the office of the Regional Manager, that an application for a right or permit in terms of the Act has been received.

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

Name of Interested/ affected party	Contact details: Address & telephone number	How did consultation take place?	What were his/her main concerns about the operation?
Land claim Commissioner	Private Bag X9312 Polokwane 0700 Tel 015 297 3593	Per registered letter	No concerns were raised
Vaaltyn Tribal Authority	343 Mo Shate Vaaltyn 0650 Tel No: 015 4850187	Verbally	No concerns were raised Declaration signed on 15.12.2008
South African Heritage Resources Agency (SAHRA)	P O Box 1600 Polokwan 0700 Tel No: 015 2257075	Report	No concerns were raised. No heritage resources or places of social or religious significant were found within or near the borrow pit site
Department of Agriculture	P O Box 3620 Polokwane 0700 Tel No: 015 295 4175	Will be consulted by DME	Comments are awaited
Department of Water Affairs And Forestry	Private Bag X9506 Polokwane 0700 Tel No: 015 2959417	Will be consulted by DME	Comments are awaited

DECLARATION:

PROPOSED EXTRACTION OF GRAVEL FOR ROAD MAKING PURPOSES (N11 RELOCATION)

It is confirmed herewith that I have been duly informed of the proposed extraction of gravel from an existing borrow pit situated on the farm ...TURFSPRUIT... 241 KR.....

I further declare that I fully understand that the relevant activity will be for the relocation of the N11 road.

Signed: R.E. MOKOPANE
Capacity: SENIOR ADMIN OFFICER
Date: 15/12/08
Address: 343 MOSHASE
VQUALITY
Tel No: MOKOPANE 0154850187

D SCORING OF EIA- FOR OFFICIAL USE ONLY

Instructions for officials:

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

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

D 1.1 CALCULATION TABLE

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

D 1.2 IMPACT RATING SCALE

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

Additional Objectives:

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

E UNDERTAKING:

I, I. M. L. NORMAN ESIA, the applicant for a Mineral permit/ right hereby declare that the above information is true, complete and correct. I undertake to implement the measures as described in Sections F and G hereof. I understand that this undertaking is legally binding and that failure to give effect hereto will render me liable for prosecution in terms of Section 98 (b) and 99 (1)(g) of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002). I am also aware that the Regional Manager may, at any time but after consultation with me, make such changes to this plan as he/she may deem necessary.

Signed on this 5 day of MARCH 2009 at PRETORIA (Place)

J. L. G. G. G.

.....
Signature of applicant

F. ENVIRONMENTAL MANAGEMENT PLAN:

INTRODUCTION

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

F 1 GENERAL REQUIREMENTS

F 1.1 MAPPING AND SETTING OUT

F 1.1.1 LAYOUT PLAN

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

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

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

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

F 1.1.2 DEMARCATING THE MINING/ PROSPECTING AREA

- The mining/ prospecting area must be clearly demarcated by means of beacons at its corners, and along its boundaries if there is no visibility between the corner beacons.
- Permanent beacons as indicated on the layout plan or as prescribed by the Regional Manager must be firmly erected and maintained in their correct position throughout the life of the operation.

- Mining/ prospecting and resultant operations shall only take place within this demarcated area.

F 1.1.3 DEMARCATING THE RIVER CHANNEL AND RIVERINE ENVIRONMENT

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

- Beacons as indicated on the layout plan or as prescribed by the Regional Manager must be erected and maintained in their correct position throughout the life of the operation.
- These beacons must be of a permanent nature during the operations and must not be easily removable, especially those in a river channel. The beacons must, however, be removed at the end of the operations.
- The mining of and prospecting for any mineral shall only take place within this demarcated mining area.
- If riverine vegetation is present in the form of reeds or wetland vegetation, the presence of these areas must be entered in Part C 1.45 of the EMPlan and indicated on the layout plan.
- The holder of the mining permit/ prospecting right will also be required to permanently demarcate the areas as specified in F 1.1.2.

F 1.2 RESTRICTIONS ON MINING/ PROSPECTING

- On assessment of the application, the Regional Manager may prohibit the conducting of mining or prospecting operations in vegetated areas or over portions of these areas
- In the case of areas that are excluded from mining or prospecting, no operations shall be conducted within 5 m of these areas.

F 1.3 RESPONSIBILITY

- The environment affected by the mining/ prospecting operations shall be rehabilitated by the holder, as far as is practicable, to its natural state or to a predetermined and agreed to standard or land use which conforms with the concept of sustainable development. The affected environment shall be maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof.
- It is the responsibility of the holder of the mining permit/ prospecting right to ensure that the manager on the site and the employees are capable of complying with all the statutory requirements which must be met in order to mine, which includes the implementation of this EMP.
- If operations are to be conducted in an area that has already been disturbed, the holder must reach specific agreement with the Regional Manager concerning the responsibilities imposed upon himself/herself pertaining to the rehabilitation of the area and the pollution control measures to be implemented.

F 2 INFRASTRUCTURAL REQUIREMENTS

F 2.1 TOPSOIL

- Topsoil shall be removed from all areas where physical disturbance of the surface will occur.
- All available topsoil shall be removed after consultation with the Regional Manager prior to the commencement of any operations.
- The topsoil removed, shall be stored in a bund wall on the high ground side of the mining/prospecting area outside the 1:50 flood level within the boundaries of the mining area/ prospecting.
- Topsoil shall be kept separate from overburden and shall not be used for building or maintenance of access roads.
- The topsoil stored in the bund wall shall be adequately protected from being blown away or being eroded.

F 2.2 ACCESS TO THE SITE

F 2.2.1 Establishing access roads on the site

- The access road to the mining/prospecting area and the camp-site/site office must be established in consultation with the landowner/tenant and existing roads shall be used as far as practicable.
- Should a portion of the access road be newly constructed the following must be adhered to:
 - The route shall be selected that a minimum number of bushes or trees are felled and existing fence lines shall be followed as far as possible.
 - Water courses and steep gradients shall be avoided as far as is practicable.
 - Adequate drainage and erosion protection in the form of cut-off berms or trenches shall be provided where necessary.
- If imported material is used in the construction or upgrading of the access road this must be listed in C 2.17
- The erection of gates in fence lines and the open or closed status of gates in new and existing positions shall be clarified in consultation with the landowner/tenant and maintained throughout the operational period.
- No other routes will be used by vehicles or personnel for the purpose of gaining access to the site.

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

F 2.2.2 Maintenance of access roads

- In the case of dual or multiple use of access roads by other users, arrangements for multiple responsibility must be made with the other users. If not, the maintenance of access roads will be the responsibility of the holder of the mining permit/ prospecting right.
- Newly constructed access roads shall be adequately maintained so as to minimise dust, erosion or undue surface damage.

F 2.2.3 Dust control on the access and haul roads

- The liberation of dust into the surrounding environment shall be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. The speed of haul trucks and other vehicles must be strictly controlled to avoid dangerous conditions, excessive dust or excessive deterioration of the road being used.

F 2.2.4 Rehabilitation of access roads

- Whenever a mining permit/ prospecting right is suspended, cancelled or abandoned or if it lapses and the holder does not wish to renew the permit or right, any access road or portions thereof, constructed by the holder and which will no longer be required by the landowner/tenant, shall be removed and/or rehabilitated to the satisfaction of the Regional Manager.
- Any gate or fence erected by the holder which is not required by the landowner/tenant, shall be removed and the situation restored to the pre mining/ prospecting situation.
- Roads shall be ripped or ploughed, and if necessary, appropriately fertilised (based on a soil analysis) to ensure the regrowth of vegetation. Imported road construction materials which may hamper regrowth of vegetation must be removed and disposed of in an approved manner prior to rehabilitation.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining/prospecting operation, be corrected and the area be seeded with a seed mix to the Regional Manager's specification.

F 2.3 OFFICE/CAMP SITES

F 2.3.1 Establishing office / camp sites

- Office and camp sites shall be established, as far as is practicable, outside the flood plain, above the 1 in 50 flood level mark within the boundaries of the mining/ prospecting area.
- The area chosen for these purposes shall be the minimum reasonably required and which will involve the least disturbance to vegetation. Topsoil shall be handled as described in F 2.1 above

- No camp or office site shall be located closer than 100 metres from a stream, river, spring, dam or pan.
- No trees or shrubs will be felled or damaged for the purpose of obtaining firewood, unless agreed to by the landowner/tenant.
- Fires will only be allowed in facilities or equipment specially constructed for this purpose. If required by applicable legislation, a fire-break shall be cleared around the perimeter of the camp and office sites.
- Lighting and noise disturbance or any other form of disturbance that may have an effect on the landowner/tenant/persons lawfully living in the vicinity shall be kept to a minimum.

F 2.3.2 Toilet facilities, waste water and refuse disposal

- As a minimum requirement, the holder of a mining permit/ prospecting right shall, at least, provide pit latrines for employees and proper hygiene measures shall be established.
- Chemical toilet facilities or other approved toilet facilities such as a septic drain shall preferably be used and sited on the camp site in such a way that they do not cause water or other pollution.
- The use of existing facilities must take place in consultation with the landowner/tenant.
- In cases where facilities are linked to existing sewerage structures, all necessary regulatory requirements concerning construction and maintenance should be adhered to.
- All effluent water from the camp washing facility shall be disposed of in a properly constructed French drain, situated as far as possible, but not less than 200 metres, from any stream, river, pan, dam or borehole.
- Only domestic type wash water shall be allowed to enter this drain and any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognised facility.
- Spills should be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognised facility.
- Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., shall be stored in a container at a collecting point and collected on a regular basis and disposed of at a recognised disposal facility. Specific precautions shall be taken to prevent refuse from being dumped on or in the vicinity of the camp site.
- Biodegradable refuse generated from the office/camp site, processing areas vehicle yard, storage area or any other area shall either be handled as indicated above or be buried in a pit excavated for that purpose and covered with layers of soil, incorporating a final 0,5 metre thick layer of topsoil (where practicable). Provision should be made for future subsidence of the covering.

F 2.3.3 Rehabilitation of the office/camp site

- On completion of operations, all buildings, structures or objects on the camp/office site shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), which states:
 - (1) *When a prospecting right, mining right, retention permit or mining permit lapses, is cancelled or is abandoned or when any prospecting or mining operation comes to an end, the holder of any such right or permit may not demolish or remove any building, structure, object -*
 - (a) *which may not be demolished in terms of any other law;*
 - (b) *which has been identified in writing by the Minister for purposes of this section; or*
 - (c) *which is to be retained in terms of an agreement between the holder and the owner or occupier of the land, which agreement has been approved by the Minister in writing.*
 - (2) *The provision of subsection (1) does not apply to bona fide mining equipment which may be removed*
- Where office/camp sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
- Areas containing French drains shall be compacted and covered with a final layer of topsoil to a height of 10cm above the surrounding ground surface.
- The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining/prospecting operation be corrected and the area be seeded with a vegetation seed mix to his or her specification.
- Photographs of the camp and office sites, before and during the mining/prospecting operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the Regional Manager.

F 2.4 VEHICLE MAINTENANCE YARD AND SECURED STORAGE AREAS

F 2.4.1 Establishing the vehicle maintenance yard and secured storage areas

- The vehicle maintenance yard and secured storage area will be established as far as is practicable, outside the flood plain, above the 1 in 50 flood level mark within the boundaries of the mining/prospecting area.
- The area chosen for these purposes shall be the minimum reasonably required and involve the least disturbance to tree and plant life. Topsoil shall be handled as described in F 2.1 above.

- The storage area shall be securely fenced and all hazardous substances and stocks such as diesel, oils, detergents, etc., shall be stored therein. Drip pans, a thin concrete slab or a facility with PVC lining, shall be installed in such storage areas with a view to prevent soil and water pollution.
- The location of both the vehicle maintenance yard and the storage areas are to be indicated on the layout plan.
- No vehicle may be extensively repaired in any place other than in the maintenance yard.

F 2.4.2 Maintenance of vehicles and equipment

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

F 2.4.3 Waste disposal

- Suitable covered receptacles shall be available at all times and conveniently placed for the disposal of waste.
- All used oils, grease or hydraulic fluids shall be placed therein and these receptacles will be removed from the site on a regular basis for disposal at a registered or licensed disposal facility.
- All spills should be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognised facility.

F 2.4.4 Rehabilitation of vehicle maintenance yard and secured storages areas

- On completion of mining/prospecting operations, the above areas shall be cleared of any contaminated soil, which must be dumped as referred to in section F 2.4.3 above.
- All buildings, structures or objects on the vehicle maintenance yard and secured storage areas shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002.
- The surface shall then be ripped or ploughed to a depth of at least 300mm and the topsoil previously stored adjacent the site, shall be spread evenly to its original depth over the whole area. The area shall then be fertilised if necessary (based on a soil analysis).
- The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.

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

F 3 OPERATING PROCEDURES IN THE MINING AREA

F 3.1 Limitations on mining/prospecting

- The mining of or prospecting for precious stones shall take place only within the approved demarcated mining or prospecting area.
- Mining/ prospecting may be limited to the areas indicated by the Regional Manager on assessment of the application.
- The holder of the mining permit/ prospecting right shall ensure that operations take place only in the demarcated areas as described in section F 1.1.2 above.
- Operations will not be conducted closer than one and a half times the height of the bank from the edge of the river channel and in such manner that the stability of the bank of the river is effected.
- Precautions shall also be taken to ensure that the bank of the river is adequately protected from scouring or erosion. Damage to the bank of the river caused by the operations, shall be rehabilitated to a condition acceptable to the Regional Manager at the expense of the holder.
- Restrictions on the disturbance of riverine vegetation in the form of reeds or wetland vegetation must be adhered to. The presence of these areas must be entered in Part of the programme and indicated on the layout plan.

F 3.2 Mining/ prospecting operations within the riverine environment

NOTE: The Department of Water Affairs and Forestry may impose additional conditions which must be attached to this EMP. In this regard, please see the Best Practice Guideline for small scale mining developed by DWAF (BPG 2.1)

(available from <http://www.dwaf.gov.za>)

- The mining of or prospecting for precious stones in the river or the banks of the river will be undertaken only after the Regional Manager has consulted with the Department of Water Affairs and Forestry.
- The canalisation of a river will not be undertaken unless the necessary permission has been obtained from the Department of Water Affairs and Forestry. Over and above the conditions imposed by the said Department, which conditions shall form part of this EMPlan, the following will also apply:
 - ❖ The canalisation of the flow of the river over different parts of the river bed shall be constructed in such a manner that the following are adhered to at all times:

- ◆ The flow of the river may not be impeded in any way and damming upstream may not occur.
 - ◆ The canalisation of the flow may not result in scouring or erosion of the river-bank.
 - ◆ Well points or extraction pumps in use by other riparian users may not be interfered with and canalisation may not impede the extraction of water at these points.
- Access to the riverbed for the purpose of conducting excavations in the river-bed, shall be through the use of only one access at a time. The location of the access to the river channel across the river-bank shall be at a point of the river-bank where the least excavation and damage to vegetation will occur and shall not be wider than is reasonably required. The position of the river access together with all planned future access points, must be indicated on the layout plan.

F 3.2.1 Rehabilitation of access to river-bed

- When rehabilitating the access point, the original profile of the river-bank will be re-established by backfilling the access point with the original material excavated or other suitable material.
- The topsoil shall then be returned over the whole area to its original depth and if necessary fertilised and the vegetation allowed to grow.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining/prospecting operation be corrected and the area be seeded with a seed mix to his or her specification.
- In the event of damage from an occurrence where high flood waters scour and erode access points in the process of rehabilitation over the river-bank or an access point currently in use, repair of such damage shall be the sole responsibility of the holder of the mining permit or prospecting right.
- Repair to the river-bank to reinstate its original profile to the satisfaction of the Regional Manager must take place immediately after such event has occurred and the river has subsided to a point where repairs can be undertaken.
- Final acceptance of rehabilitated river access points will be awarded only after the vegetation has re-established to a point where the Regional Manager is satisfied that the river-bank is stable and that the measures installed are of durable nature and able to withstand high river-flow conditions.

F 3.2.2 Rehabilitation of mining/prospecting area in the bed of the river

- The goal of rehabilitation with respect to the area where mining/prospecting has taken place in the river-bed is to leave the area level and even, and in a natural state containing no foreign debris or other materials and to ensure the hydrological integrity of the river by not attenuating or diverting any of the natural flow.
- All scrap and other foreign materials will be removed from the bed of the river and disposed of as in the case of other refuse (see section F 2.3.2 above), whether

these accrue directly from the mining/prospecting operation or are washed on to the site from upstream.

- Removal of these materials shall be done on a continuous basis and not only at the start of rehabilitation.
- Where reeds or other riverine vegetation have been removed from areas, these shall be re-established systematically in the approximate areas where they occurred before mining/prospecting.
- An effective control programme for the eradication of invader species and other exotic plants, shall be instituted on a regular basis over the entire mining/prospecting area under the control of the holder of the mining permit/prospecting right, both during mining/prospecting and at the stage of final rehabilitation.

2. THE WATER USE LICENCE

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

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

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

Applications for a water use licence must be made in good time, such that approval can be granted before a water use activity can begin. The appropriate licence forms for each kind of expected water use should be completed together with supporting documentation. The main supporting document required is a technical report. To make the technical report easier, you can refer to sections in this EMPlan, as most of what the technical report requires has already been done in the EMPlan. If you refer to the EMPlan it must be attached to the technical report.

F 3.3 EXCAVATIONS

F 3.3.1 Establishing the excavation areas

- Whenever any excavation is undertaken for the purpose of locating and/or extracting ore bodies of all types of minerals, including precious stone-bearing gravels, the following operating procedures shall be adhered to:
 - ❖ Topsoil shall, in all cases (except when excavations are made in the river-bed), be handled as described in F 2.1 above.
 - ❖ Excavations shall take place only within the approved demarcated mining/prospecting area.
 - ❖ Overburden rocks and coarse material shall be placed concurrently in the excavations or stored adjacent to the

excavation, if practicable, to be used as backfill material once the ore or gravel has been excavated.

- ❖ Trenches shall be backfilled immediately if no ore or precious stone-bearing gravel can be located.

F 3.3.2 Rehabilitation of excavation areas

The following operating procedures shall be adhered to:

- The excavated area must serve as a final depositing area for the placement of tailings during processing.
- Rocks and coarse material removed from the excavation must be dumped into the excavation simultaneously with the tailings.
- Waste, as described in paragraph F 2.3.2 above, will not be permitted to be deposited in the excavations.
- Once excavations have been refilled with overburden, rocks and coarse natural materials and profiled with acceptable contours and erosion control measures, the topsoil previously stored, shall be returned to its original depth over the area.
- The area shall be fertilised if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining/ prospecting operation, be corrected and the area be seeded with a vegetation seed mix to his or her specification.

F 3.4 PROCESSING AREAS AND WASTE PILES (DUMPS)

F 3.4.1 Establishing processing areas and waste piles

- Processing areas and waste piles shall not be established within 100 metres of the edge of any river channel or other water bodies.
- Processing areas should be established, as far as practicable, near the edge of excavations to allow the waste, gravel and coarse material to be processed therein.
- The areas chosen for this purpose shall be the minimum reasonably required and involve the least disturbance to vegetation.
- Prior to development of these areas, the topsoil shall be removed and stored as described in paragraph F 2.1 above.
- The location and dimensions of the areas are to be indicated on the layout plan and once established, the processing of ore containing precious stones shall be confined to these areas and no stockpiling or processing will be permitted on areas not correctly prepared.
- Tailings from the extraction process must be so treated and/or deposited that it will in no way prevent or delay the rehabilitation process.

F 3.4.2 Rehabilitation of processing areas

- Coarse natural material used for the construction of ramps must be removed and dumped into the excavations.
- On completion of mining/prospecting operations, the surface of the processing areas especially if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 300mm and graded to an even surface condition and the previously stored topsoil will be returned to its original depth over the area.
- Prior to replacing the topsoil the material that was removed from the processing area will be replaced in the same order as it originally occurred.
- The area shall then be fertilised if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining/prospecting operation be corrected and the area be seeded with a seed mix to his or her specification.

F 3.5 TAILINGS DAM(S) (SLIMES DAM)

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

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

Management of residue stockpiles and deposits

56. (1) *The assessment of impacts relating to the management of residue stockpiles and deposits, where appropriate, must form part of the environmental impact assessment report and environmental management programme or the environmental management plan.*
- (2) *Residue characterisation*
- (a) *Mine residue must be characterised to identify any potentially significant health and safety hazard and environmental impact that may be associated with the residue when stockpiled or deposited at the site(s) under consideration.*
- (b) *Residue stockpiles and deposits must be characterised in terms of its –*
- (i) *physical characteristics, which may include –*
- (aa) *the size distribution of the principal constituents;*
- (bb) *the permeability of the compacted material;*
- (cc) *void ratios of the compacted material;*
- (dd) *the consolidation or settling characteristics of the material under its own weight and that of any overburden;*
- (ee) *the strength of compacted material;*
- (ff) *the specific gravity of the solid constituents; and*

- (gg) the water content of the material at the time of deposition, after compaction, and at other phases in the life of the deposit.
- (ii) chemical characteristics, which may include -
- (aa) the toxicity;
 - (bb) the propensity to oxidize and /or decompose;
 - (cc) the propensity to undergo spontaneous combustion;
 - (dd) the pH and chemical composition of the water separated from the solids;
 - (ee) stability and reactivity and the rate thereof; and
 - (ff) neutralising potential.
- (iii) mineral content, which include the specific gravity of the residue particles and its impact on particle segregation and consolidation;
- (3) Classification of residue stockpiles and deposits
- (a) All residue stockpiles and deposits must be classified into one or a combination of the following categories -
- (i) the safety classification to differentiate between residue stockpiles and deposits of high, medium and low hazard on the basis of their potential to cause harm to life or property; and
 - (ii) the environmental classification to differentiate between residue stockpiles and deposits with -
 - (aa) a potentially significant impact on the environment due to its spatial extent, duration and intensity of potential impacts; or
 - (bb) no potentially significant impact on the environment.
- (b) All mine residue stockpiles and deposits must be classified by a suitably qualified person(s).
- (c) The classification of residue stockpiles and deposits shall determine the -
- (i) level of investigation and assessment required;
 - (ii) requirements for design, construction, operation, decommissioning, closure and post closure maintenance; and
 - (iii) qualifications and expertise required of persons undertaking the investigations, assessments, design, construction thereof.
- (d) The safety classification of residue stockpiles and deposits shall be based on the following criteria -

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

- (e) A risk analysis must be carried out and documented on all high hazard residue stockpiles and deposits.
- (f) The environmental classification of residue stockpiles and deposits must be undertaken on the basis of -
- (i) the characteristics of the residue;
 - (ii) the location and dimensions of the deposit (height, surface area);
 - (iii) the importance and vulnerability of the environmental components that are at risk; and
 - (iv) the spatial extent, duration and intensity of potential impacts.

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

(5) *Design of residue stockpile and deposit*

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

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

- (a) *The holder of any right or permit in terms of the Act, must ensure that-*
- (i) *the residue deposits, including any surrounding catchment paddocks, is constructed and operated in accordance with the approved environmental management programme or environmental management plan;*
 - (ii) *the design of the residue deposit is followed implicitly throughout the construction thereof, and that any deviations from the design be approved by the Regional Manager and the environmental manage programme and environmental management plan be amended accordingly;*
 - (iii) *as part of the monitoring system, measurements of all residues transported to the site and of all surplus water removed from the site are recorded;*
 - (iv) *the provision for appropriate security measures be implemented to limit unauthorised access to the site and intrusion into the residue deposit;*
 - (v) *specific action be taken in respect of any sign of pollution;*
 - (vi) *adequate measures be implemented to control dust pollution and erosion of the slopes; and*
 - (vii) *details of rehabilitation of the residue deposit be provided in the draft environmental management programme or environmental management plan.*
- (b) *A system of routine maintenance and repair in respect of the residue deposit must be imlemented to ensure the ongoing control of pollution, the integrity of rehabilitation and health and safety maters at the site.*

(7) *Monitoring of residue stockpiles and deposits:*

- (a) *A monitoring system for residue stockpiles and deposits with respect to potentially significant impacts as identified in the environmental assessment must be included in the environmental management programme or environmental management plan.*
- (b) *In the design of a monitoring system for a residue stockpile or deposit, consideration must be given to -*
- (i) *baseline and background conditions with regard to air, surface and groundwater quality ;*
 - (ii) *the air, surface and groundwater quality objectives;*
 - (iii) *residue characteristics;*
 - (iv) *the degree and nature of residue containment;*
 - (v) *the receiving environment and secifically the climatic, local geological, hydrogeological and geochemical conditions;*
 - (vi) *potential migration pathways;*
 - (vii) *potential impacts of leachate;*
 - (viii) *the location of monitoring points and the prescribed monitoring protocols; and*
 - (ix) *the reporting frequency and procedures.*

(8) *Decommissioning, closure and after care:*

- (a) *The decommissioning, closure and post closure management of residue deposits must be addressed in the closure plan, which must contain the following -*
- (i) *the environmental classification, including assumptions on which the classification were based;*
 - (ii) *the closure objectives, final land use or capability;*
 - (iii) *conceptual descripton and details for closure and post closure management;*
 - (iv) *cost estimates and financial provision for closure and post-closure management; and*
 - (v) *residual impacts, monitoring and requirements to obtain mine closure in terms of the Act.*

F 3.6 FINAL REHABILITATION

- All infrastructure, equipment, plant, temporary housing and other items used during the mining period will be removed from the site (section 44 of the MPRDA)
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognised landfill facility. It will not be permitted to be buried or burned on the site.
- Final rehabilitation shall be completed within a period specified by the Regional Manager.

F 4 MONITORING AND REPORTING

F 4.1 Inspections and monitoring

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

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

Monitoring and performance assessments of environmental management programme or plan

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

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

F 4.2 Compliance reporting / submission of information

- *Layout plans will be updated on a regular basis and updated copies will be submitted on a biennial basis to the Regional Manager*
- *Reports confirming compliance with various points identified in the environmental management programme will be submitted to the Regional Manager on a regular basis and as decided by the said manager .*
- *Any emergency or unforeseen impact will be reported as soon as possible.*
- *An assessment of environmental impacts that were not properly addressed or were unknown when the programme was compiled shall be carried out and added as a corrective action.*

F 5 CLOSURE

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

F 5.1 ENVIRONMENTAL RISK REPORT

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

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

F 5.2 CLOSURE OBJECTIVES

Closure objectives form part of this EMPlan and must-

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

F 5.3 CONTENTS OF CLOSURE PLAN

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

- (a) a description of the closure objectives and how these relate to the prospecting or mine operation and its environmental and social setting;
- (b) a plan contemplated in Regulation 2(2), coordinated according to generally accepted standards, showing the land or area under closure;
- (c) a summary of the regulatory requirements and conditions for closure negotiated and documented in the environmental management programme or plan;
- (d) a summary of the results of the environmental risk report and details of identified residual and latent impacts;
- (e) a summary of the results of progressive rehabilitation undertaken;
- (f) a description of the methods to decommission each prospecting or mining component and the mitigation or management strategy proposed to avoid, minimize and manage residual or latent impacts;
- (g) details of any long-term management and maintenance expected;
- (h) details of financial provision for monitoring, maintenance and post closure management, if required;
- (i) a plan or sketch at an appropriate scale describing the final land use proposal and arrangements for the site;
- (j) a record of interested and affected persons consulted; and
- (k) technical appendices, if any.

F 5.4 TRANSFER OF ENVIRONMENTAL LIABILITIES TO A COMPETENT PERSON

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

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

F 5.5 NOTES ON LEGAL PROVISIONS

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

- * National Monuments Act, 1969 (Act 28 of 1969).
- * National Parks Act, 1976 (Act 57 of 1976)
- * Environmental Conservation Act, 1989 (Act 73 of 1989)
- * National Environmental Management Act, 1998 (Act No. 107 of 1998)
- * Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965)
- * The National Water Act, 1998 (Act 36 of 1998)
- * Mine Safety and Health Act, 1996 (Act 29 of 1996)
- * The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983).

G. SPECIFIC ADDITIONAL REQUIREMENTS DETERMINED BY THE REGIONAL MANAGER.

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

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

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

J. APPROVAL

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

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

.....
REGIONAL MANAGER

REGION:.....

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

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Woody species
<i>Acacia caffra</i>
<i>Acacia tortilis</i>
<i>Clerodendrum glabrum</i>
<i>Combretum apiculatum</i>
<i>Dichrostachys cinerea</i>
<i>Euclea undulata</i>
<i>Flueggia virosa</i>
<i>Grewia bicolor</i>
<i>Grewia flava</i>
<i>Grewia monticola</i>
<i>Peltophorum africanum</i>
<i>Rhus leptodicta</i>
<i>Sclerocarya birrea</i>
<i>Ziziphus mucronata</i>
Grasses
<i>Digitaria eriantha</i>
<i>Digitaria velutina</i>
<i>Enneapogon cenchroides</i>
<i>Eragrostis lehmanniana</i>
<i>Heteropogon contortus</i>
<i>Melinis repens</i>
<i>Panicum maximum</i>
<i>Setaria verticillata</i>
<i>Tragus berteronianus</i>
<i>Tricholanea monachne</i>
<i>Urochloa mosambicensis</i>
Herbs/Forbs / Succulents
<i>Achyranthes aspera</i>
<i>Chamaechrista mimisoides</i>
<i>Coccinia spp.</i>
<i>Commelina africana</i>
<i>Commelina erecta</i>
<i>Crotalaria totooides</i>
<i>Dicerocarum eriocarpum</i>
<i>Evolvulus alsinoides</i>
<i>Gossypium herbaceum</i>
<i>Hirpicium bechuanense</i>
<i>Indigofera daleioides</i>
<i>Schkuria pinnata</i>
<i>Sesamum triphyllum</i>
<i>Solanum panduriforme</i>
<i>Tagetes minuta</i>
<i>Viscum rotundifolium</i>
<i>Waltheria indica</i>
<i>Zinnia peruviana</i>

Avifauna list

English Name	Afrikaans Name	Map Status	General Status
Rufouscheeked Nightjar	Rooiwangnaguil	BM-C	BM-C
Whiterumped Swift	Witkruiswindswael	BM-C	BM-VC
Whitethroated Swallow	Witkeelswael	BM-C	BM-C
Alpine Swift	Witpenswindswael	BM-C	BM-C
Pygmy Kingfisher	Dwergvisvanger	BM-C	BM-LC
Diederik Cuckoo	Diederikkie	BM-C	BM-VC
Redbreasted Swallow	Rooiborsswael	BM-C	BM-C
Yellowbilled Kite	Geelbekwou	BM-C	BM-C
Redchested Cuckoo	Piet-my-vrou	BM-C	BM-C
Jacobin Cuckoo	Bontnuwejaarsvoel	BM-C	BM-C
African Crake	Afrikaanse Riethaan	BM-U	BM-U
Klaas's Cuckoo	Meitjie	BM-U	R/BM-C
Whiskered Tern	Witbaardsterretjie	BM-U	R(n)-LC
Black Swift	Swartwindswael	BM-U	R-C
Black Cuckoo	Swartkoekoek	BM-U	BM-C
Greyhooded Kingfisher	Gryskopvisvanger	BM-U	BM-U
Dwarf Bittern	Dwergrietreier	BM-U	BM-R
Cuckoofinch	Koekoekvink	BM-U	R/BM-U
African Cuckoo	Afrikaanse Koekoek	BM-U	BM-U
Horus Swift	Horuswindswael	BM-U	BM-LC
Harlequin Quail	Bontkwartel	BM-U	R/BM-C
Striped Cuckoo	Gestreepte Nuwejaarsvoel	BM-U	BM-U
Lesser Moorhen	Kleinwaterhoender	BM-U	BM-U
Woodland Kingfisher	Bosveldvisvanger	BM-U	BM-C
Great Spotted Cuckoo	Gevlekte Koekoek	BM-U	NBM-U
Wahlberg's Eagle	Bruinarend	BM-U/C	BM-C
Banded Martin	Gebande Oewerswael	BM-U/C	BM-U
Plumcoloured Starling	Witborsspreu	BM-VC	BM-U
Lesser Striped Swallow	Kleinstreepswael	BM-VC	R/BM-C
Greater Striped Swallow	Grootstreepswael	BM-VC	BM-C
Paradise Flycatcher	Paradysvliecvanger	BM-VC	BM-C
Whitethroated Robin	Witkeeljanfrederik	E-C	E-C
Mountain Chat	Bergwagter	E-C	Er-C
Whitebacked Mousebird	Witkruismuisvoel	E-C	E-C
Grassbird	Grasvoel	E-C	E-LC
Ashy Tit	Akasiagrysmees	E-C	Er-U
Doublebanded Sandgrouse	Dubbelbandsandpatrys	E-C	Er-C
Cape Vulture	Kransaasvoel	E-C	E-LC
Cape Rockthrush	Kaapse Kliplyster	E-C	E-C
Greybacked Finchlark	Gryruglewerik	E-C	Er-VC
Cape Sparrow	Gewone Mossie	E-C/A	Er-VC
Melodious Lark	Spotlewerik	E-U	E-U
Shorttoed Rockthrush	Korttoonkliplyster	E-U	Er-U
Shortclawed Lark	Kortkloulewerik	E-U	E-U
Monotonous Lark	Bosveldlewerik	E-U	Er-C
Cape Weaver	Kaapse Wewer	E-U	E-C
Redheaded Finch	Rooikopvink	E-U	Er-VC
Greater Doublecollared Sunbird	Groot-rooibandsuikerbekkie	E-U	E-C
Blue Crane	Bloukraanvoel	E-U	E-U

English Name	Afrikaans Name	Map Status	General Status
Swee Waxbill	Suidelike Swie	E-U	Er-LC
Cape Shoveller	Kaapse Slopeend	E-U	Er-C
Pale Chanting Goshawk	Bleeksingvalk	E-U	Er-C
Anteater Chat	Swartpiek	E-U	E-C
Jackal Buzzard	Rooiborsjakkalsvoël	E-U	E-C
Desert Barred Warbler	Gebande Sanger	E-U	Er-C
Cape Penduline Tit	Kaapse Kapokvoël	E-U	Er-C
Yellow Canary	Geelkanarie	E-U	Er-C
Larklike Bunting	Vaalstreepkoppie	E-U	Er-VC
Whitebellied Korhaan	Witpenskorhaan	E-U/C	E-U
Natal Francolin	Natalse Fisant	E-U/VC	Er-C
Titbabbler	Bosveldtjeri	E-VC	Er-C
Cape White-eye	Kaapse Glasogie	E-VC	E-VC
Blackchested Prinia	Swartbandlangstertjie	E-VC	Er-C
Whitecrowned Shrike	Kremetartlaksman	E-VC	Er-C
Whitewinged Korhaan	Witvlerkkorhaan	E-VC	E-VC
Sabota Lark	Sabotalewerik	E-VC	Er-C
Southern Black Tit	Gewone Swartmees	E-VC	Er-C
Redcrested Korhaan	Boskorhaan	E-VC	Es-C
Glossy Starling	Kleinglanspreeu	E-VC	Er-C
Burchell's Starling	Grootglanspreeu	E-VC	Er-C
Pied Barbet	Bonthoutkapper	E-VC	Er-C
Kalahari Robin	Kalahariwipstert	E-VC	Er-C
Southern Yellowbilled Hornbill	Geelbekneushoringvoël	E-VC	Er-C
Crimsonbreasted Shrike	Rooiborslaksman	E-VC	Er-C
Scalyfeathered Finch	Baardmanneljie	E-VC	Er-C
Southern Greyheaded Sparrow	Gryskopmossie	E-VC	Er-C
Orangethroated Longclaw	Oranjekeelkalkoentjie	E-VC	E-C
Swainson's Francolin	Bosveldfisant	E-VC	Er-C
Southern Boubou	Suidelike Waterfiskaal	E-VC	E-C
Violeteared Waxbill	Koningbiousysie	E-VC	Er-LC
Shafttailed Whydah	Pylstertrooibekkie	E-VC	Er-C
Fiscal Flycatcher	Fiskaalvlieëvanger	E-VC	E-C
Marico Flycatcher	Maricovlieëvanger	E-VC	Er-C
Yellow Wagtail	Geelkwikkie	NBM-C	NBM-U
Greenshank	Groenpootruiter	NBM-C	NBM-C
White Stork	Witooievaar	NBM-C	NBM-C
Marsh Sandpiper	Moerasruiter	NBM-C	NBM-C
Wood Sandpiper	Bosruiter	NBM-C	NBM-C
Common Sandpiper	Gewone Ruiter	NBM-C	NBM-C
Little Stint	Kleinstrandloper	NBM-C	NBM-C
Curlew Sandpiper	Krombekstrandloper	NBM-C	NBM-VC
Whitewinged Tern	Witvlerksterretjie	NBM-C	NBM-A
Willow Warbler	Hofsanger	NBM-C	NBM-VC
Eurasian Roller	Europese Troupant	NBM-C	NBM-C
Steppe Buzzard	Bruinjakalsvoël	NBM-C	NBM-C
Fairy Flycatcher	Feevlieëvanger	NBM-C	E-C
Lesser Kestrel	Kleinrooivalk	NBM-C	NBM-VC
Northern Hobby Falcon	Europese Boomvalk	NBM-C	NBM-U
Lesser Grey Shrike	Gryslaksman	NBM-C	NBM-C
Spotted Flycatcher	Europese Vlieëvanger	NBM-C	NBM-C

English Name	Afrikaans Name	Map Status	General Status
House Martin	Huisswael	NBM-U	NBM-LC
Peregrine Falcon	Swerfvalk	NBM-U	R/NBM-R
Whimbrel	Kleinwulp	NBM-U	NBM-C
South African Cliff Swallow	Familieswael	NBM-U	Ebm-LC
Green Sandpiper	Witgatruiter	NBM-U	NBM-R
Eurasian Cuckoo	Europese Koekoek	NBM-U	NBM-U
Dusky Lark	Donkerlewerik	NBM-U	NBM-U
Tree Pipit	Boomkoester	NBM-U	NBM-U
Bronzewinged Courser	Bronsvierkdrawwertjie	NBM-U	R/BM-U
Western Redfooted Kestrel	Weselike Rooipootvalk	NBM-U	NBM-R
Ringed Plover	Ringnekstrandkiewiet	NBM-U	NBM-C
Ruff	Kemphaan	NBM-U	NBM-C
Sanderling	Drietonstrandloper	NBM-U	NBM-C
Carmine Bee-eater	Rooiborsbyvreter	NBM-U	NBM-LC
Sand Martin	Europese Oewerswael	NBM-U	NBM-C
Eurasian Marsh Harrier	Europese Vleivalk	NBM-U	NBM-R
Olivetree Warbler	Olyboomsanger	NBM-U	NBM-U
Icterine Warbler	Spotsanger	NBM-U	NBM-C
Eurasian Swift	Europese Windswael	NBM-U	NBM-C
Great Reed Warbler	Grootrietsanger	NBM-U	NBM-C
Eurasian Golden Oriole	Europese Wielewaal	NBM-U	NBM-U
Osprey	Visvalk	NBM-U	NBM-U
Abdim's Stork	Kleinswartoievaar	NBM-U	NBM-C
Honey Buzzard	Wespedief	NBM-U	NBM-U
Yellowbilled Stork	Nimmersat	NBM-U	NBM/R-LC
Eurasian Nightjar	Europese Naguil	NBM-U	R-U
Garden Warbler	Tuinsanger	NBM-U	NBM-C
Whitethroat	Witkeelsanger	NBM-U	NBM-U
Eurasian Marsh Warbler	Europese Rietsanger	NBM-U	NBM-C
Bluecheeked Bee-eater	Blouwangbyvreter	NBM-U	NBM-LC
Eurasian Sedge Warbler	Europese Vleisanger	NBM-U	NBM-C
Montagu's Harrier	Blou vleivalk	NBM-U	NBM-R
Booted Eagle	Dwergarend	NBM-U	R/NBM-C
Ayres' Eagle	Kleinjagarend	NBM-U	R-R
Pallid Harrier	Witborsvleivalk	NBM-U	NBM-R
Comcrake	Kwartelkoning	NBM-U	NBM-U
Black Kite	Swartwou	NBM-U	NBM-LC
Steppe Eagle	Steppe-arend	NBM-U	NBM-U
Stanley's Bustard	Veldpou	NBM-U	R-U
Caspian Plover	Asiatiese Strandkiewiet	NBM-U/C	NBM-U
Eastern Redfooted Kestrel	Oostelike Rooipootvalk	NBM-U/C	NBM-C
Eurasian Swallow	Europese Swael	NBM-VC	NBM-A
Eurasian Bee-eater	Europese Byvreter	NBM-VC	NBM/BM-C
Redbacked Shrike	Rooiruglaksman	NBM-VC	NBM-C
Pied Crow	Witborskraai	R-A	R-A
Puffback	Sneeubal	R-A	R-C
Fiscal Shrike	Fiskaallaksman	R-A	R-C
Laughing Dove	Rooiborsduifie	R-A	R-VC
Grey Lourie	Kwêvoël	R-A	R-C
Blue Waxbill	Gewone Blousysie	R-A	R-C
Cape Turtle Dove	Gewone Tortelduif	R-A	R-VC

English Name	Afrikaans Name	Map Status	General Status
Forktailed Drongo	Mikstertbyvanger	R-A	R-C
Blackeyed Bulbul	Swartoogtiptol	R-A	R-VC
Greenspotted Dove	Groenvlekduifie	R-A	R-C
Great White Egret	Grootwitreier	R-C	R-C
Little Egret	Kleinwitreier	R-C	R-C
Lanner Falcon	Edelvalk	R-C	R-C
Squacco Heron	Ralreier	R-C	R/NBM-U
Black Stork	Grootswartooievaar	R-C	R-U/R
Grey Heron	Bloureier	R-C	R-C
Purple Heron	Rooireier	R-C	R-U
Redbilled Firefinch	Rooibekvuurvinkie	R-C	R-C
Jameson's Firefinch	Jamesonse Vuurvinkie	R-C	R-C
Blackcheeked Waxbill	Swartwangsysie	R-C	R-LC
Whitewinged Widow	Witvlerkflap	R-C	R(n)-LC
Familiar Chat	Gewone Spekvreter	R-C	R-C
Mocking Chat	Dassievoël	R-C	R-C
Golden Bishop	Goudgeelvink	R-C	R(n)-LC
Great Sparrow	Grootmossie	R-C	R-U
Yellowthroated Sparrow	Geelvlekmosie	R-C	R-U
Streakyheaded Canary	Streepkopkanarie	R-C	R-C
Steelblue Widowfinch	Staalblouvinkie	R-C	R(n)-C
Orangebreasted Waxbill	Rooiassie	R-C	R-LC
Quail Finch	Gewone Kwartelvinkie	R-C	R-C
Cutthroat Finch	Bandkeelvink	R-C	R(n)-U
Bluegrey Flycatcher	Blougrysvlieëvanger	R-C	R-C
African Marsh Warbler	Kleinrietsanger	R-C	BM-C
Cape Reed Warbler	Kaapse Rietsanger	R-C	R-C
Yellowbellied Eremomela	Geelpensbossanger	R-C	R-U
African Sedge Warbler	Kaapse Vleisanger	R-C	R-C
Black Cuckooshrike	Swartkakoeroe	R-C	R-U
Brownthroated Martin	Afrikaanse Oewerswael	R-C	R-C
Terrestrial Bulbul	Boskrapper	R-C	R-C
Chestnutbacked Finchlark	Rooruglewerik	R-C	R(n)-C
Pallid Flycatcher	Muiskeurvlieëvanger	R-C	R-C
Black Flycatcher	Swartvlieëvanger	R-C	R-C
Desert Cisticola	Woestynklopkloppie	R-C	R-C
Burntnecked Eremomela	Bruinkeelbossanger	R-C	R-C
Neddicky	Neddikkie	R-C	R-C
Fantailed Cisticola	Landeryklopkloppie	R-C	R-VC
Goldentailed Woodpecker	Goudstertspieg	R-C	R-C
Lappetfaced Vulture	Swartaasvoël	R-C	R-U
Blackbreasted Snake Eagle	Swartborsslangarend	R-C	R-U
Cardinal Woodpecker	Kardinaalspeg	R-C	R-C
Whitefronted Bee-eater	Rooikeelbyvreter	R-C	R-C
Pied Kingfisher	Bontvisvanger	R-C	R-C
Temminck's Courser	Trekdrawwertjie	R-C	R-U
African Goshawk	Afrikaanse Sperwer	R-C	R-C
Greater Honeyguide	Grootheuningwyser	R-C	R-U
Southern Pochard	Bruineend	R-C	R-C
Gabar Goshawk	Witkruissperwer	R-C	R-C
Brown Snake Eagle	Bruinslangarend	R-C	R-U

English Name	Afrikaans Name	Map Status	General Status
Gymnogene	Kaalwangvaik	R-C	R-C
Lizard Buzzard	Akkedisvaik	R-C	R-C
Black Crake	Swartriethaan	R-C	R-C
Whitefaced Owl	Witwanguil	R-C	R-C
African Scops Owl	Skopsuil	R-C	R-C
African Rail	Grootriethaan	R-C	R/BM-C
Feral Pigeon	Tuinduif	R-C	R-A
Fierynecked Nightjar	Afrikaanse Naguil	R-C	R/BM-C
Spotted Eagle Owl	Gevlekte Ooruil	R-C	R-C
Spotted Dikkop	Gewone Dikkop	R-C	R-C
Palm Swift	Palmwindswael	R-C	R-C
Kittlitz's Plover	Geelborsstrandkiewiet	R-C	R-C
Water Dikkop	Waterdikkop	R-C	R-C
Redknobbed Coot	Bleshoender	R-C	R-A
Old World Painted Snipe	Goudsnip	R-C	R-U
Barn Owl	Nonnetjie-uil	R-C	R-C
Black Eagle	Witkruisarend	R-C	R-U
African Hawk Eagle	Grootjagarend	R-C	R-U
Spurwinged Goose	Wildemakou	R-C	R-VC
Black Sparrowhawk	Swartsperwer	R-C	R-C
Shelley's Francolin	Laeveldpatrys	R-C	R-C
Secretarybird	Sekretarisvoël	R-C	R-U
Ostrich	Volstruis	R-C	R-C
Coqui Francolin	Swempie	R-C	R-C
Martial Eagle	Breëkoparend	R-C	R-U
African Black Duck	Swarteend	R-C	R-U
Knobbilled Duck	Knobbeleend	R-C	R-LC
Purple Roller	Groottroupan	R-C/VC	R-U
Pearlspotted Owl	Witkoluil	R-C/VC	R-C
Grass Owl	Grasuil	R-U	R-U
Buffy Pipit	Vaalkoester	R-U	R-U
Longbilled Pipit	Nicholsonse Koester	R-U	R-C
Ayres' Cisticola	Kleinste Klopkloppie	R-U	R-C
Striped Pipit	Gestreepte Koester	R-U	R-LC
Cape Teal	Teeleend	R-U	R-C
Flappet Lark	Laeveldklappertjie	R-U	R-LC
Plainbacked Pipit	Donkerkoester	R-U	R-C
Common Quail	Afrikaanse Kwartel	R-U	R/BM/NBM-C
Cloud Cisticola	Gevlekte Klopkloppie	R-U	R-C
Giant Eagle Owl	Reuse-ooruil	R-U	R-U
Redbilled Teal	Rooibekeend	R-U	R-C
Lazy Cisticola	Luitinkinkie	R-U	R-C
Cape Bunting	Rooivlerkstreepkoppie	R-U	R-C
Greencapped Eremomela	Donkerwangbossanger	R-U	R-C
Hottentot Teal	Gevlekte Eend	R-U	R-C
Cape Eagle Owl	Kaapse Ooruil	R-U	R-U
Bluebilled Firefinch	Kaapse Vuurvinkie	R-U	R-C
Bushveld Pipit	Bosveldkoester	R-U	R-LC
Kurriehane Buttonquail	Bosveldkwarteltjie	R-U	R(n)-U/LC
Yellowbilled Duck	Geelbekeend	R-U	R-A
Tinkling Cisticola	Rooitinkinkie	R-U	R-U

English Name	Afrikaans Name	Map Status	General Status
Fawncoloured Lark	Vaalbruinlewerik	R-U	R-C
Bennett's Woodpecker	Bennetse Speg	R-U	R-U
Redthroated Wryneck	Draaihals	R-U	R-C
Maccoa Duck	Bloubekeend	R-U	R-U
Fulvous Duck	Fluiteend	R-U	R-C
Lesser Masked Weaver	Kleingeelvink	R-U	R-LC
Whitebacked Duck	Witrugeend	R-U	R-U
Thickbilled Weaver	Dikbekwewer	R-U	R-C
Goldenbacked Pytilia	Geelvlerkmelba	R-U	R(n)-C
Lesser Honeyguide	Kleinheuningwyser	R-U	R-LC
Sharpbilled Honeyguide	Skerpbekheuningvoël	R-U	R-U
Purple Widowfinch	Witpootblouvinkie	R-U	R-U
Black Widowfinch	Gewone Blouvinkie	R-U	R(n)-LC
African Pied Wagtail	Bontkwikkie	R-U	R-C
Giant Kingfisher	Reusevisvanger	R-U	R-U
Malachite Kingfisher	Kuifkopvisvanger	R-U	R-C
Swallowtailed Bee-eater	Swaelstertbyvreter	R-U	R-LC
Redcapped Lark	Rooikoplewerik	R-U	R(n)-C
Cape Wagtail	Gewone Kwikkie	R-U	R-C
Redbilled Hornbill	Rooibekneushoringvoël	R-U	R-C
Redbilled Oxpecker	Rooibekrenostervoël	R-U	R-C
Malachite Sunbird	Jangroentjie	R-U	R-C
Halfcollared Kingfisher	Blouvisvanger	R-U	R-U
Fantailed Flycatcher	Waaierstertvlieëvanger	R-U	R-U
Capped Wheatear	Hoëveldskaapwagter	R-U	R/BM-C
Greenbacked Heron	Groenrugreier	R-U	R-U
Ovambo Sparrowhawk	Ovambosperwer	R-U	R-U
Greyheaded Gull	Gryskopmeeu	R-U	R-VC
Blackcrowned Night Heron	Gewone Nagreier	R-U	R-C
Cuckoo Hawk	Koekoekvalk	R-U	R-U
Grey Penduline Tit	Gryskapokvoël	R-U	R-C
Pied Avocet	Bontelsie	R-U	R-LC
Black Egret	Swartreier	R-U	R-LC/R
Yellowbilled Egret	Geelbekwitreier	R-U	R-U
Goliath Heron	Reuserier	R-U	R-U
Tawny Eagle	Roofarend	R-U	R-LC
Whitebacked Night Heron	Witrugnagreier	R-U	R-R
Little Banded Goshawk	Gebande Sperwer	R-U	R-C
Pinkbacked Pelican	Kleinpelikaan	R-U	R-LC/R
Marabou Stork	Maraboe	R-U	R-R/LC
Whitebacked Vulture	Witruugaasvoël	R-U	R-C
African Marsh Harrier	Afrikaanse Vleivalk	R-U	R-C
African Spoonbill	Lepelaar	R-U	R(n)-C
Little Sparrowhawk	Kleinsperwer	R-U	R-C
Little Bittern	Kleinrietreier	R-U	R/NBM-U
Greater Flamingo	Grootflamink	R-U	R(n)-LA
Glossy Ibis	Glansibis	R-U	R-U
Lesser Flamingo	Kleinflamink	R-U	R(n)-LA
African Jacana	Grootlangtoon	R-U	R-VC
Ethiopian Snipe	Afrikaanse Snip	R-U	R-LC
Rameron Pigeon	Geelbekbosduif	R-U	R-LC

English Name	Afrikaans Name	Map Status	General Status
Redchested Flufftail	Rooiborsvleikuiken	R-U	R-C
Purple Gallinule	Grootkoningriethaan	R-U	R-C
Great Crested Grebe	Kuifkopdobbertjie	R-U	R(n)-U
Baillon's Crane	Kleinriethaan	R-U	R-C
Greater Kestrel	Grootrooivalk	R-U	R-C
Rock Kestrel	Kransvalk	R-U	R-C
African Green Pigeon	Papegaaiduif	R-U	R-C
African Finfoot	Watertrapper	R-U	R-U
Pearlbreasted Swallow	Pêrelborsswael	R-U	R/BM-C
Marsh Owl	Vlei-uil	R-U/C	R-C
Bearded Woodpecker	Baardspeg	R-U/C	R-C
Redcollared Widow	Rooikeelflap	R-U/C	R(n)-LC
Darter	Slanghalsvoël	R-U/C	R-C
African Fish Eagle	Visarend	R-U/C	R-C
Redheaded Weaver	Rooikopwewer	R-U/C	R-C
Blackwinged Stilt	Rooipootelsie	R-U/C	R-C
Common Moorhen	Grootwaterhoender	R-U/C	R-C
Levaillant's Cisticola	Vleitinkinkie	R-U/VC	R-C
Wattled Plover	Leikiewiet	R-U/VC	R/BM-LC
Redbilled Quelea	Rooibekkwalea	R-VC	R(n)-LA
Goldenbreasted Bunting	Rooirugstreepkoppie	R-VC	R-U
Dabchick	Kleindobbertjie	R-VC	R-C
Blackcrowned Tchagra	Swartkroontjagra	R-VC	R-C
Rock Bunting	Klipstreepkoppie	R-VC	R(n)-LC
Threestreaked Tchagra	Rooivlerktjagra	R-VC	R-C
Red Bishop	Rooivink	R-VC	R-C
Brubru	Bontroklaksman	R-VC	R-C
Melba Finch	Gewone Melba	R-VC	R-C
Blackheaded Oriole	Swartkopwielewaal	R-VC	R-C
Longtailed Widow	Langstertflap	R-VC	R(n)-C
House Sparrow	Huisbossie	R-VC	R-VC
Whitefaced Duck	Nonnetjie-eend	R-VC	R-C
Pintailed Whydah	Koningrooibekkie	R-VC	R(n)-C
Paradise Whydah	Gewone Paradysvink	R-VC	R-C
Blackheaded Heron	Swartkopreier	R-VC	R-C
Grassveld Pipit	Gewone Koester	R-VC	R-C
Whitebreasted Cormorant	Witborsduiker	R-VC	R-C
Helmeted Guineafowl	Gewone Tarentaal	R-VC	R-VC
Reed Cormorant	Rietduiker	R-VC	R-C
Common Waxbill	Rooibeksysie	R-VC	R-C
Crested Francolin	Bospatrys	R-VC	R-VC
Sacred Ibis	Skoorsteenveër	R-VC	R-C
Hadedda Ibis	Hadedda	R-VC	R-A
Bronze Mannikin	Gewone Fret	R-VC	R-VC
Blackthroated Canary	Bergkanarie	R-VC	R-C
Egyptian Goose	Kolgans	R-VC	R-A
Hamerkop	Hamerkop	R-VC	R-C
Yelloweyed Canary	Geeloogkanarie	R-VC	R-C
Spottedbacked Weaver	Bontrugwewer	R-VC	R-VC
Speckled Mousebird	Gevlekte Muisvoël	R-VC	R-C
Blacksmith Plover	Bontkiewiet	R-VC	R-VC

English Name	Afrikaans Name	Map Status	General Status
Little Bee-eater	Kleinbyvreter	R-VC	R-C
Burchell's Coucal	Gewone Vleiloerie	R-VC	R-C
Threebanded Plover	Driebandstrandkiewiet	R-VC	R-C
Redfaced Mousebird	Rooiwangmuisvoël	R-VC	R-C
Crowned Plover	Kroonkiewiet	R-VC	R-C
Striped Kingfisher	Gestreepte Visvanger	R-VC	R-C
Brownhooded Kingfisher	Bruinkopvisvanger	R-VC	R-C
Blackshouldered Kite	Blouvalk	R-VC	R(n)-C
Groundscraper Thrush	Gevlekte Lyster	R-VC	R-C
Kurrichane Thrush	Rooibeklyster	R-VC	R-C
Longtailed Shrike	Langstertlaksman	R-VC	R-C
Redeyed Dove	Grootringduif	R-VC	R-C
Arrowmarked Babbler	Pyvlakkatlagter	R-VC	R-VC
Namaqua Dove	Namakwaduijie	R-VC	R-VC
Rock Pigeon	Kransduif	R-VC	R-C
Freckled Nightjar	Donkernaguil	R-VC	R-C
Longbilled Crombec	Bosveldstompstert	R-VC	R-C
Rattling Cisticola	Bosveldtinkinkie	R-VC	R-C
Greybacked Bleating Warbler	Grysrugkwêkwêvoël	R-VC	R-C
Little Swift	Kleinwindswael	R-VC	R/BM-VC
Rufousnaped Lark	Rooineklewerik	R-VC	R-C
Rock Martin	Kransswael	R-VC	R-C
Tawnyflanked Prinia	Bruinsylangstertjie	R-VC	R-C
Barthroated Apalis	Bandkeelkleiniantjie	R-VC	R-C
Wattled Starling	Lelspreeu	R-VC	R(n)-LA
White Helmetshrike	Withelmlaksman	R-VC	R-C
Black Sunbird	Swartsuikerbekkie	R-VC	R-C
Greater Blue-eared Starling	Groot-blouoorglansspreeu	R-VC	R-C
Blackcollared Barbet	Rooikophoutkapper	R-VC	R-C
Yellowfronted Tinker Barbet	Geelblestinker	R-VC	R-C
Greyheaded Bush Shrike	Spookvoël	R-VC	R-C
Whitebrowed Sparrowweaver	Koringvoël	R-VC	R-VC
Spectacled Weaver	Brilwewer	R-VC	R-C
Masked Weaver	Swartkeelgeelvink	R-VC	R-C
Whitebellied Sunbird	Witpensuikerbekkie	R-VC	R-C
Marico Sunbird	Maricosuikerbekkie	R-VC	R-C
Orangebreasted Bush Shrike	Oranjeborsboslaksman	R-VC	R-C
Crested Barbet	Kuifkophoutkapper	R-VC	R-C
Stonechat	Gewone Bontrokkie	R-VC	R-VC
Redbilled Woodhoopoe	Rooibekkekelaar	R-VC	R-C
Black Crow	Swartkraai	R-VC	R-C
Cape Robin	Gewone Janfrederik	R-VC	R-C
Whitebrowed Robin	Gestreepte Wipstert	R-VC	R-C
Scimitar-billed Woodhoopoe	Swartbekkekelaar	R-VC	R-C
Grey Hornbill	Grysneshoringvoël	R-VC	R-C
Cape Batis	Kaapse Bosbontrokkie	R-VC	R-C
Redwinged Starling	Rooivlerkspreeu	R-VC	R-VC
Chin-spot Batis	Witliesbosbontrokkie	R-VC	R-C
African Hoopoe	Hoepoep	R-VC	R(n)-C
Lilacbreasted Roller	Gewone Troupant	R-VC/A	R/LM-C
Cattle Egret	Veereier	R-VC/A	R-C

English Name	Afrikaans Name	Map Status	General Status
Spotted Crake	Gevlekte Riethaan	Rare	R-U

Mammal list

Scientific name	Vernacular name	Conservation status	Probability of occurrence
<i>Acomys spinosissimus</i>	Spiny Mouse	Least Concern	High
<i>Aepyceros melampus</i>	Impala	Least Concern	High
<i>Aethomys ineptus</i>	Tete Veld Rat	Least Concern	Moderate
<i>Atelerix frontalis</i>	South African Hedgehog	Near threatened	Moderate-High
<i>Canis mesomelas</i>	Black-backed Jackal	Least Concern	High
<i>Caracal caracal</i>	Caracal	Least Concern	Moderate
<i>Cercopithecus aethiops pygerythrus</i>	Vervet Monkey	Least Concern	High
<i>Civettictis civetta</i>	African Civet	Least Concern	Moderate
<i>Crocidura cyanea</i>	Reddish-grey Musk Shrew	Data deficient	High
<i>Crocidura hirta</i>	Lesser Red Musk Shrew	Data deficient	High
<i>Cryptomys hottentotus</i>	Common Molerat	Least Concern	High
<i>Elephantulus myurus</i>	Rock Elephant-shrew	Least Concern	High
<i>Epomophorus wahlbergi</i>	Wahlberg's Epauletted Fruit Bat	Least Concern	High
<i>Felis silvestris</i>	African Wild Cat	Least Concern	High
<i>Galago moholi</i>	Lesser Bushbaby	Least Concern	Moderate -High
<i>Galerella sanguinea</i>	Slender Mongoose	Least Concern	High
<i>Genetta genetta</i>	Small-spotted Genet	Least Concern	High
<i>Genetta tigrina</i>	Large-spotted Genet	Least Concern	High
<i>Graphiurus murinus</i>	Woodland Dormouse	Least Concern	High
<i>Graphiurus platyops</i>	Rock Dormouse	Data deficient	Moderate-High
<i>Hyaena brunnea</i>	Brown Hyaena	Near threatened	Moderate
<i>Hystrix africaeaustralis</i>	Cape Porcupine	Least Concern	High
<i>Ictonyx striatus</i>	Striped Polecat	Least Concern	Moderate -High
<i>Lemniscomys rosalia</i>	Single-striped Mouse	Data deficient	High
<i>Lepus saxatilis</i>	Scrub Hare	Least Concern	High
<i>Mastomys coucha</i>	Multimammate Mouse	Least Concern	High
<i>Mellivora capensis</i>	Honey Badger	Near threatened	Moderate-High
<i>Miniopterus schreibersii</i>	Schreiber's Long-fingered Bat	Near threatened	Low-moderate
<i>Mungos mungo</i>	Banded Mongoose	Least Concern	Moderate -High
<i>Mus minutoides</i>	Pygmy mouse	Least Concern	High
<i>Myotis welwitschii</i>	Welwitsch's Hairy Bat	Near threatened	Moderate -High
<i>Neoromicia capensis</i>	Cape Serotine Bat	Least Concern	High
<i>Nycteris thebaica</i>	Common Slit-faced Bat	Least Concern	High
<i>Oreotragus oreotragus</i>	Klipspringer	Least Concern	High
<i>Orycteropus afer</i>	Aardvark	Least Concern	Moderate -High
<i>Otomys angoniensis</i>	Angoni Vlei Rat	Least Concern	Moderate
<i>Panthera pardus</i>	Leopard	Least Concern	High
<i>Papio ursinus</i>	Chacma Baboon	Least Concern	High
<i>Paraxerus cepapi</i>	Tree squirrel	Least Concern	High
<i>Phacochoerus africanus</i>	Warthog	Least Concern	High
<i>Pipistrellus hesperidus</i>	Kuhl's Pipistrelle	Least Concern	High
<i>Pipistrellus rusticus</i>	Rusty Bat	Near threatened	Moderate
<i>Potamochoerus porcus koiripotamius</i>	Bushpig	Least Concern	Low-moderate
<i>Procavia capensis</i>	Rock Dassie	Least Concern	Moderate
<i>Proteles cristatus</i>	Aardwolf	Least Concern	Low-moderate
<i>Raphicerus campestris</i>	Steenbuck	Least Concern	High
<i>Redunca fulvorufula</i>	Mountain Reedbuck	Least Concern	High(visual observation)
<i>Rhabdomys pumilio</i>	Striped Mouse	Least Concern	Moderate -High

Scientific name	Vernacular name	Conservation status	Probability of occurrence
<i>Rhinolophus simulator</i>	Bushveld Horseshoe Bat	Least Concern	High
<i>Saccostomus campestris</i>	Pouched Mouse	Least Concern	High
<i>Scotophilus dinganii</i>	Yellow House Bat	Least Concern	High
<i>Staetomys pratensis</i>	Fat mouse	Least Concern	High
<i>Suncus lixus</i>	Greater Dwarf Shrew	Data deficient	Moderate
<i>Sylvicapra grimmia</i>	Common Duiker	Least Concern	High
<i>Tadarida aegyptiaca</i>	Egyptian Free-tailed Bat	Least Concern	High
<i>Taphozous mauritanus</i>	Mauritian Tomb Bat	Least Concern	High
<i>Tatera leucogaster</i>	Bushveld Gerbil	Data deficient	High
<i>Thalomys paedulus</i>	Tree Rat	Least Concern	High
<i>Thryonomys swinderianus</i>	Greater Cane Rat	Least Concern	Moderate
<i>Tragelaphus strepsiceros</i>	Kudu	Least Concern	High

Amphibian list

Scientific name	Vernacular name	Conservation status	Probability of occurrence
<i>Afrana angolensis</i>	Common River Frog	Widespread	High
<i>Breviceps adspersus</i>	Bushveld Rain Frog	Widespread	High
<i>Bufo garmani</i>	Eastern Olive Toad	Common/Widespread	High
<i>Bufo gutturalis</i>	Guttural Toad	Widespread/adaptable	High
<i>Cacosternum boettgeri</i>	Boettger's Caco	Not threatened	High
<i>Hyperolius marmoratus</i>	Painted Reed Frog	Widespread	High
<i>Kassina senegalensis</i>	Bubbling Kassina	Widely distributed	High
<i>Phrynobatrachus natalensis</i>	Snoring Puddle Frog	Abundant	High
<i>Phrynomantis bifasciatus</i>	Banded Rubber Frog	Common/Widespread	High
<i>Ptychadena anchietae</i>	Plain Grass Frog	Widespread	High
<i>Schismaderma carens</i>	Red Toad	Not threatened	High
<i>Tomopterna cryptotis</i>	Tremelo Sand Frog	Widespread/abundant	High
<i>Tomopterna natalensis</i>	Natal Sand Frog	Widespread	High

Herpetofauna list

Scientific name	Vernacular name	Conservation status	Probability of occurrence
<i>Acanthocercus atricollis</i>	Southern Tree Agama	Common	High
<i>Agama aculeata distantii</i>	Ground Agama	Common	High
<i>Aparallactus capensis</i>	Cape Centipede Eater	Common	High
<i>Aspidelaps scutatus</i>	Shield-nose Snake	Common	Moderate
<i>Atractaspis bibronii</i>	Southern or Bibron's Burrowing Asp	Common	High
<i>Bitis arietans</i>	Puff Adder	Common	High
<i>Causus rhombeatus</i>	Common or Rhombic Night Adder	Common	High
<i>Chamaeleo dilepis</i>	Flap-neck Chameleon	Common	High
<i>Crotaphopeltis hotamboeia</i>	Herald/Red-lipped Snake	Common	High
<i>Dasyplectis scabra</i>	Common or Rhombic Egg Eater	Common	High
<i>Dendroaspis polylepis</i>	Black Mamba	Common	High
<i>Dispholidus typus</i>	Boomsiang	Common	High
<i>Geochelone pardalis</i>	Leopard Tortoise	Common	High
<i>Gerrhosaurus flavigularis</i>	Yellow-throated Plated Lizard	Common	High
<i>Gerrhosaurus validus</i>	Giant Plated Lizard	Common	Low-moderate
<i>Hemidactylus mabouia</i>	Moreau's Tropical House Gecko	Common	High
<i>Homopholis wahlbergii</i>	Wahlberg's Velvet Gecko	Common	Moderate
<i>Ichnotropis capensis</i>	Cape Rough-scaled Lizard	Common	High
<i>Ichnotropis squamulosa</i>	Common Rough-scaled Lizard	Common	High
<i>Kinixys lobatsiana</i>	Lobatse Hinged Tortoise	Common	High
<i>Lamprophis fuliginosus</i>	Brown House Snake	Common	High
<i>Leptotyphlops conjunctus</i>	Eastern Thread Snake	Common	High
<i>Leptotyphlops scutifrons</i>	Peters' Thread Snake	Common	High
<i>Lycodonomorphus rufulus</i>	Common Brown Water Snake	Common	High
<i>Lycophidion capense</i>	Cape Wolf Snake	Common	High
<i>Lygodactylus capensis</i>	Cape Dwarf Gecko	Common	High
<i>Mabiya capensis</i>	Cape Skink	Common	High
<i>Mabiya striata</i>	Striped Skink	Common	High
<i>Mabiya varia</i>	Variable Skink	Common	High
<i>Mehelya nyassae</i>	Black File Snake	Protected	High
<i>Monopeltis infuscata</i>	Dusky Spade-snouted Worm Lizzard	Common	Moderate - High
<i>Naja annulifera</i>	Snouted Cobra	Common	High
<i>Naja mossambica</i>	Mozambique Spitting Cobra	Common	High
<i>Nucras holubi</i>	Holub's Sandveld Lizard	Common	High
<i>Panaspis sp.</i>	Spotted-neck Snake-eyed Skink	Common	Moderate
<i>Panaspis wahlbergii</i>	Wahlberg's Snake-eyed Skink	Common	High
<i>Pelomedusa subrufa</i>	Marsh or Helmeted Terrapin	Common	High
<i>Philothamnus hoplogaster</i>	Green Water Snake	Common	Moderate - High
<i>Philothamnus semivariegatus</i>	Spotted Bush Snake	Common	High
<i>Psammophis subtaeniatus</i>	Stripe-bellied Sand Snake	Common	High
<i>Psammophylax tritaeniatus</i>	Striped Skaapsteker	Common	High
<i>Pseudaspis cana</i>	Mole Snake	Common	Moderate - High
<i>Python natalensis</i>	Southern African Python	Vulnerable	High
<i>Rhinotyphlops lalandei</i>	Delalande's Beaked Blind Snake	Common	High
<i>Telescopus semiannulatus</i>	Eastern Tiger Snake	Common	High
<i>Thelotornis capensis</i>	Twig/Vine Snake	Common	High
<i>Varanus albigularis</i>	Rock/White-throated Monitor	Common	High
<i>Varanus niloticus</i>	Nile/Water Monitor	Common	Moderate - High

PHASE 1 HERITAGE RESOURCES SCOPING REPORT

N11 BORROW PITS MOKOPANE, LIMPOPO

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1. INTRODUCTION AND TERMS OF REFERENCE

The application constitutes an activity, which may potentially be harmful to heritage resources that may occur in the demarcated area. The National Heritage Resources Act (NHRA - Act No. 25 of 1999) protects all structures and features older than 60 years (section 34), archaeological sites and material (section 35) and graves and burial sites (section 36). In order to comply with the legislation, the Applicant requires information on the heritage resources, and their significance that may occur in the demarcated area. This will enable the Applicant to take pro-active measures to limit the adverse effects that the development could have on such heritage resources.

In terms of the National Heritage Resources Act (1999) the following is of relevance:

Historical remains

Section 34(1) No person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

Archaeological remains

Section 35(4) No person may, without a permit issued by the responsible heritage resources authority-

(a) destroy, damage, excavate, alter, deface, or otherwise disturb any archaeological or palaeontological site or any meteorite

Burial grounds and graves

Section 36 (3)(a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority-

(c) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or

(b) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in detection or recovery of metals.

Culture resource management

Section 38(1) Subject to the provisions of subsection (7), (8) and (9), any person who intends to undertake a development* ...

must at the very earliest stages of initiating such development notify the responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the proposed development.

****development'** means any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of the heritage authority in any way result in a change to the nature, appearance or physical nature of a place, or influence its stability and future well-being, including-

- (a) construction, alteration, demolition, removal or change of use of a place or a structure at a place;
- (b) carry out any works on or over or under a place*;
- (e) any change to the natural or existing condition or topography of land, and

(f) any removal or destruction of trees, or removal of vegetation or topsoil;

****place** means a site, area or region, a building or other structure* ..."

****structure** means any building, works, device or other facility made by people and which is fixed to the ground, ..."

The author was contracted to undertake a heritage scoping survey of the proposed borrow pits for construction of the N11 re-alignment, Mokopane, Limpopo (Refer to maps, South Africa 1:50 000 – 2428BB and 2429AA). The aim was to determine the presence or not of heritage resources such as archaeological and historical sites and features, graves and places of religious and cultural significance, and to submit appropriate recommendations with regard to the cultural resources management measures that may be required at affected sites / features.

This report thus provides an overview of the heritage resources that may occur in the demarcated area where development is intended. The significance of the heritage resources was assessed in terms of criteria defined in the methodology section. The impact of the proposed development on these resources is indicated and the report recommends mitigation measures that should be implemented to minimize the adverse impact of the proposed development on these heritage resources.

2. METHOD

2.1 Sources of information

The source of information was primarily the field reconnaissance and referenced literary sources.

A pedestrian survey of selected areas and a drive through by vehicle of the demarcated area was undertaken, during which standard methods of observation were applied. As most archaeological material occur in single or multiple stratified layers beneath the soil surface, special attention was given to disturbances, both man-made such as roads and clearings, as well as those made by natural agents such as burrowing animals and erosion. Locations of heritage remains were recorded by means of a GPS (Garmin 60). Heritage material and the general conditions on the terrain were photographed with a Panasonic Lumix Digital camera.

2.2 Limitations

The scoping survey was thorough, but limitations were experienced due to the fact that archaeological sites are subterranean and only visible when disturbed. Vegetation was moderate. It is thus possible that sites have been missed.

2.3 Categories of significance

The significance of archaeological sites is ranked into the following categories.

- No significance: sites that do not require mitigation.
- Low significance: sites, which *may* require mitigation.
- Medium significance: sites, which require mitigation.
- High significance: sites, which must not be disturbed at all.

The significance of an archaeological site is based on the amount of deposit, the integrity of the context, the kind of deposit and the potential to help answer present research questions. Historical structures are defined by Section 34 of the National Heritage Resources Act, 1999, while other historical and cultural significant sites, places and features, are generally determined by community preferences.

A crucial aspect in determining the significance and protection status of a heritage resource is often whether or not the sustainable social and economic benefits of a proposed development outweigh the conservation issues at stake. Many aspects must be taken into consideration when determining significance, such as rarity, national significance, scientific importance, cultural and religious significance, and not least, community preferences. When, for whatever reason the protection of a heritage site is not deemed necessary or practical, its research potential must be assessed and mitigated in order to gain data / information which would otherwise be lost. Such sites must be adequately recorded and sampled before being destroyed. These are generally sites graded as of low or medium significance.

2.4 Terminology

- Early Stone Age:** Predominantly the Acheulean hand axe industry complex dating to + 1Myr yrs – 250 000 yrs. before present.
- Middle Stone Age:** Various lithic industries in SA dating from ± 250 000 yr. - 30 000 yrs. before present.
- Late Stone Age:** The period from ± 30 000-yr. to contact period with either Iron Age farmers or European colonists.
- Early Iron Age:** Most of the first millennium AD
- Middle Iron Age:** 10th to 13th centuries AD
- Late Iron Age:** 14th century to colonial period. *The entire Iron Age represents the spread of Bantu speaking peoples.*
- Historical Period:** Mainly cultural remains of western influence and settlement from AD1652 onwards – mostly structures older than 60 years in terms of Section 34 of the NHRA.
- Phase 1 assessment:** Scoping surveys to establish the presence of and to evaluate heritage resources in a given area
- Phase 2 assessments:** In depth culture resources management studies which could include major archaeological excavations, detailed site surveys and mapping / plans of sites, including historical / architectural structures and features. Alternatively, the sampling of sites by collecting material, small test pit excavations or auger sampling is required.
- Sensitive:** Often refers to graves and burial sites although not necessarily a heritage place, as well as ideologically significant sites such as ritual / religious places. *Sensitive* may also refer to an entire landscape / area known for its significant heritage remains.

3. DESCRIPTION OF THE PROPOSED DEVELOPMENT AND TERRAIN

The proposed N1 borrow pits are to be located as follows:

1. Uitloop 3 KS - S24° 09' 42.5" E29° 03' 28.9"
2. Uitloop 3 KS - S24° 09' 07.7" E29° 01' 31.1"
3. Turfspruit 241 KR - S24° 06' 45.7" E29° 02' 08.6"
4. Tweefontein 238 KR - S24° 06' 08.1" E29° 00' 00.4"
5. Planknek 43 KS - S24° 03' 41.0" E28° 58' 24.6"

Vegetation in most areas was moderate at the time of survey. Borrow pit 2 is an extension to an existing borrow pit. Borrow pit 3 is to be located in old agricultural fields that have been extensively ploughed.

4. RESULTS OF THE SCOPING SURVEY

At the locations of Borrow pits 1, 2, 4 and 5, no heritage resources of any nature was noted.

Borrow pit 3 shows evidence of previous human occupation. This occupation in all likelihood occurred during the recent historical past. Ceramic shards and lower grinding stones were noted throughout the area. A number of stone cairns were also noted which may represent graves. One of special note was stacked using broken lower grinding stones, possibly denoting a female grave. Without more extensive investigation, one cannot definitively state the status or use of the stone cairns.

Near to the stone cairns, two circular stone mounds were noted connected by a half-moon row of stone. This may represent the remnants of a historical dwelling area.

S24° 06' 08.9" E28° 59' 57.7"	Stone cairns (graves)
S24° 06' 07.5" E29° 00' 04.0"	Possible grave packed with lower grinding stones.
S24° 06' 08.3" E28° 59' 57.3"	Dwelling area, possible huts

5. ARCHAEOLOGICAL BACKGROUND INFORMATION

According to the most recent archaeological cultural distribution sequences by Huffman (2007), this area falls within the distribution area of various cultural groupings originating out of both the Urewe Tradition (eastern stream of migration) and the Kalundu Tradition (western stream of migration). The facies that may be present are:

Urewe Tradition: Kwale branch- *Mzonjani facies* AD 450 – 750 (Early Iron Age)
 Moloko branch- *Icon facies* AD 1300 - 1500 (Late Iron Age)

Kalundu Tradition: Happy Rest sub-branch - *Doornkop facies* AD 750 - 1000 (Early Iron Age)
Eiland facies AD 1000 – 1300 (Middle Iron Age)
Klingbeil facies AD 1000 - 1200 (Middle Iron Age)
Letaba facies AD 1600 - 1840 (Late Iron Age)

6. DISCUSSION AND RECOMMENDATIONS FOR MITIGATION AND MANAGEMENT MEASURES

As mentioned earlier, borrow pits 1, 2, 4 and 5 do not impact on any heritage remains that are visible above the ground. Borrow pit 3 demonstrates that past human occupation of the area existed. Without further investigation and social consultation, it is difficult to fully determine if the stone cairns are in fact graves or not.

In view of this fact, two options are recommended for borrow pit 3:

1. Community consultation takes place to verify the existence of graves. The developer would need to have the graves exhumed and reburied in consultation with and consent of the community or family members in an appropriate place as per the descendant's wishes

2. **OR** the proposed borrow pit should be relocated either further towards the gravel road or to a completely new site.
3. If moved towards the gravel road it is recommended that monitoring takes place during the earthworks in order to appropriately manage any heritage remains that may surface during excavation of the area.

This report serves to confirm that *no significant heritage resources* such as archaeological or historical material or places of social or religious significance were found on the sites of the proposed borrow pits 1, 2, 4 and 5. *From a heritage resources management point of view, we have no objection with regard to the development these particular borrow pits.*

Borrow pit 3 requires mitigation and management measures noted above.

The discovery of previously undetected subterranean heritage remains on the terrain must be reported to the Limpopo Heritage Authority or the archaeologist, and may require further mitigation measures.

7. BIBLIOGRAPHY

Huffman, T.N. 2007. *Handbook to the Iron Age. The Archaeology of Pre-colonial Farming Societies in Southern Africa.* University of KwaZulu-Natal Press.



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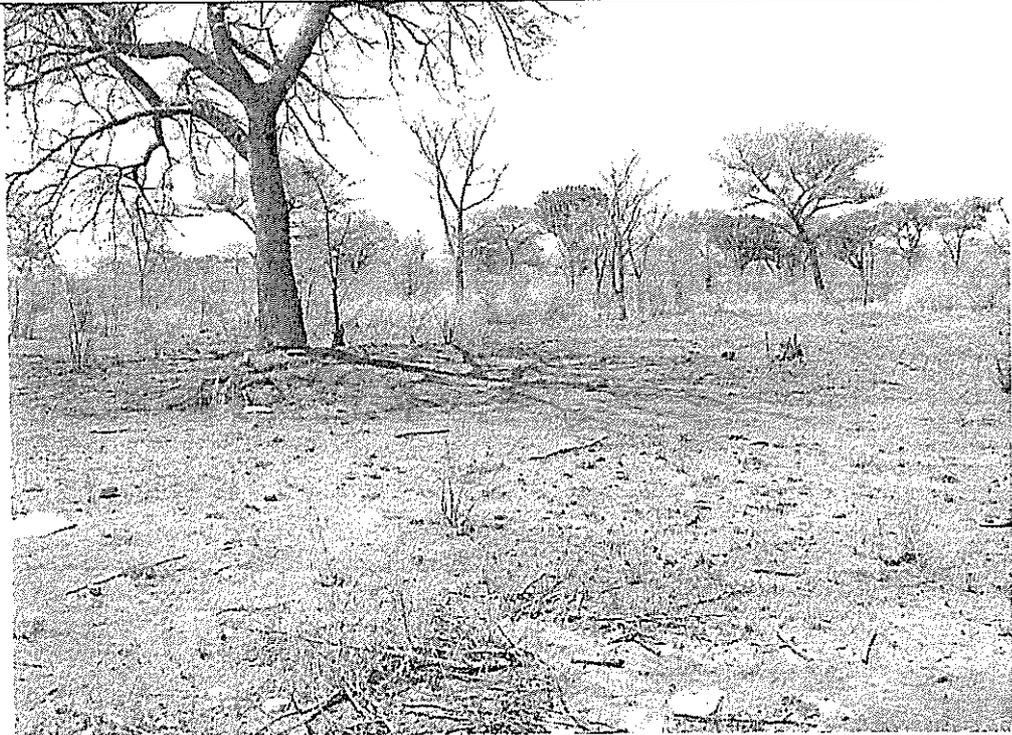


Fig 1. The terrain at Borrow pit 1



Fig 2. The terrain at Borrow pit 2 (existing)

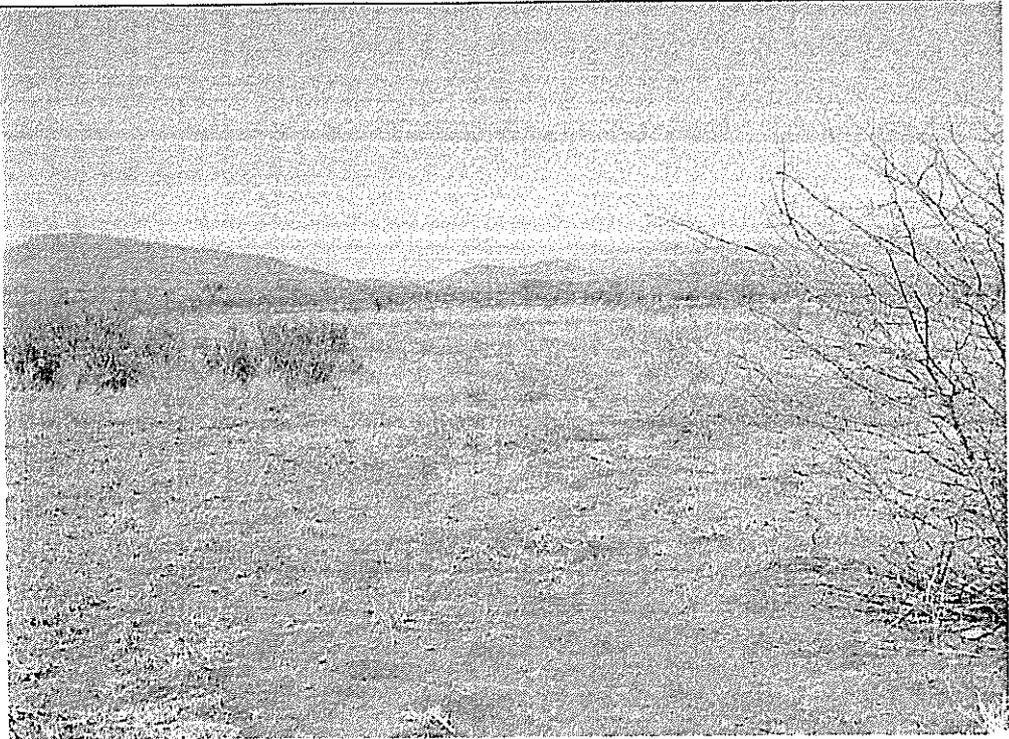


Fig 3. The terrain at Borrow pit 3



Fig 4. The terrain at Borrow pit 4



Fig 7. Possible grave stacked in part with lower grinding stones at borrow pit 3.



Fig 5. The terrain at Borrow pit 5



Fig 6. Possible graves - stone cairns at borrow pit 3.

