

Environmental Management Plan

Proposed Test Pits for the Prospecting of Sand Deposits on the Difusi Land Trust Area, Paterson

Case ID: 2344

Report prepared for
Vulani Coronation Mining (Pty) Ltd.



Report No 411600/4

May 2010

Report prepared by

Environmental Management Plan

Proposed Test Pits for the Prospecting of Sand Deposits on the Difusi Land Trust Area, Paterson

Vulani Coronation Mining (Pty) Ltd.

SRK Report Number 411600/4

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Glossary

Environment	The external circumstances, conditions and objects that affect the existence and development of an individual, organism or group. These circumstances include biophysical, social, economic, historical and cultural aspects.
Environmental Impact Assessment (EIA)	A study of the environmental consequences of a proposed course of action.
Scoping	A procedure to consult with stakeholders to determine issues and concerns and for determining the extent of and approach to an EIA, used to focus the EIA
Transformed habitat / land	Land that has been significantly impacted upon by man’s activities (such as cultivation, urban development, mining, landscaping, severe overgrazing), and where the original structure, species composition and functioning of ecological processes has been irreversibly altered. Transformed habitats are not capable of

being restored to their original states

Degraded habitat / land	Land that has been impacted upon by man's activities (including introduction of invasive alien plants, light-moderate overgrazing, accelerated soil erosion, dumping of waste), but that still retains a degree of its original structure and species composition (although some species loss would have occurred) and where ecological processes still occur (albeit in an altered way). Degraded land is capable of being restored to a near-natural state with appropriate ecological management
Untransformed habitat / land	Land that has not been significantly impacted upon by man's activities. These are ecosystems that are in a near-pristine condition in terms of structure, species composition and the functioning of ecological processes

Abbreviations

ASAPA	Association of South African Professional Archaeologists
BLMC	Biodiversity Land Management Class
CBA	Critical Biodiversity Area
CEMP	Planning, Design, Pre-Construction and Construction Environmental Management Plan
CRM	Cultural Resources Management
DEDEA	Department of Economic Development and Environmental Affairs
DMR	Department of Mineral Resources
DRT	Department of Roads and Transport
DWAF	Department of Water Affairs and Forestry (former name of the department)
DEA	Department of Environmental Affairs (National)
EA	Environmental Auditor
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ER	Environmental Representative
ha	Hectares
HIA	Heritage Impact Assessment
IAP	Interested and Affected Party
IEM	Integrated Environmental Management
masl	meters above sea level
mbsl	meters below sea level
ML	Megalitres (1,000,000 litres)
MPRDA	Mineral and Petroleum Resources Development Act

NEMA	National Environmental Management Act
RoD	Record of Decision
SARTM	South African Rural Traffic Model
SAHRA	South African Heritage Resources Agency
SHE	Safety Health and Environmental
SRK	SRK Consulting
STEP	Subtropical Thicket Ecosystem Programmes
ToR	Terms of Reference
+ve	Positive
-ve	Negative



1 Introduction

The silica sand deposit near Paterson in the Easter Cape Province has been recognized in the literature and is believed to be of relatively good standard. The applicant, Vulani Coronation Mining (Pty) Ltd., identified a site for the potential mining of these sand deposits on the Difusi Land Trust area, if there is a demand for the material. This will only be known after the quality, size and volume of the material has been determined through the process of prospecting.

A prospecting right has been obtained for this property in 2006, but the prospecting activities could not be completed within the time provided in the prospecting right. For this reason, the applicant appointed a project team to conduct the relevant tasks. SRK Consulting was appointed as the independent consultants to assess the environmental impacts and requirements in terms of the National Environmental Management Act (Act 107 of 1998)(NEMA) and the Mineral and Petroleum Resources Development Act (Act 28 of 2002)(MPRDA). SRK Consulting submitted the application for a prospecting right on 24 March 2010 together with the prospecting works programme. Correspondence from the Department of Mineral Resources (DMR) has requested the submission of an Environmental Management Plan (this document) within 60 days of the date of correspondence. This EMP is prepared in accordance with the requirements of the MPRDA and DMR for prospecting.

1.1 Applicant Details

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1.2 Environmental Assessment Practitioner Details

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1.3 SRK Profile and Expertise of Relevant Environmental Assessment Practitioners (EAP's)

SRK Consulting (SRK) has been appointed by Vulanie Coronation Mining (Pty) Ltd. as the independent consultants to undertake the Environmental Management Plan (EMP) process required in terms of the applicable legislation as described below.

SRK Consulting comprises over 600 professional staff worldwide, offering expertise in a wide range of environmental and engineering disciplines. SRK's Port Elizabeth environmental department has a distinguished track record of managing large environmental and engineering projects and has been practicing in the Eastern Cape since 2001. SRK has rigorous quality assurance standards and is ISO 9001 accredited.

The qualifications and experience of the individual practitioners responsible for this project are detailed in Box 1 below.

<p>Project Manager</p> <ul style="list-style-type: none">• Rob Gardiner is an associate at SRK Consulting and the Head of SRK Consulting's Environmental Department in Port Elizabeth. He has over 13 years environmental consulting experience covering a broad range of projects, including Environmental Impact Assessments (EIA), Environmental Management Systems (EMS), environmental management plans (EMP), and environmental auditing. His experience in the development, manufacturing, mining and public sectors has been gained in projects within South Africa, Lesotho, Botswana, Angola and Argentina. <p>Project Co-ordinator</p> <ul style="list-style-type: none">• Nontsikelelo Martel is an Environmental Scientist, with more than 5 years experience in Environmental Impact Assessments, (with particular experience in Public Participation Process) and Environmental Management Plans. Her experience has been gained in projects in Lesotho and South Africa.
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Box 1: Environmental Assessment Practitioner Details

1.4 Legal and Administrative Requirements

There are a number of regulatory requirements at local, provincial and national level with which the proposed development will have to conform. A brief summary is provided below of the acts that are relevant to this study. Some of the key environmental legislation includes:

- Mineral and Petroleum Resources Development Act 28 of 2002 and Mineral and Petroleum Resources Development Amendment Act (Act 49 of 2008);
- The National Environmental Management Act 107 of 1998; and
- The National Heritage Resources Act 25 of 1999.

Note that other legislative requirements may pertain to the proposed development, but identification and interpretation of these is beyond the brief of this study. As such, the summary provided below is not intended to be definitive or exhaustive, and serves to highlight key environmental legislation and obligations only.

The environmental legislation which is applicable to the authorisation of the proposed project is summarised in this section.

1.4.1 Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA) and Amendment Act (Act 49 of 2008)

The MPRDA was promulgated to ensure the sustainable development of South Africa's mineral and petroleum resources within a framework of national environmental policy, norms and standards while promoting economic and social development. The objects of the Act are described as follow:

- a) recognise the internationally accepted right of the State to exercise sovereignty over all the mineral and petroleum resources within the Republic;
- b) give effect to the principle of the State's custodianship of the nation's mineral and petroleum resources;
- c) promote equitable access to the nation's mineral and petroleum resources to all the people of South Africa;
- d) substantially and meaningfully expand opportunities for historically disadvantaged persons, including women, to enter the mineral and petroleum industries and to benefit from the exploitation of the nation's mineral and petroleum resources;
- e) promote economic growth and mineral and petroleum resources development in the Republic;
- f) promote employment and advance the social and economic welfare of all South Africans;
- g) provide for security of tenure in respect of prospecting, exploration, mining and production operations;
- h) give effect to section 24 of the Constitution by ensuring that the nation's mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development; and
- i) ensure that holders of mining and production rights contribute towards the socio-economic development of the areas in which they are operating.

Section 5A of the Amended MPRDA states that:

"5A. No person may prospect for or remove, mine, conduct technical co-operation operations, reconnaissance operations, explore for and produce any mineral or petroleum or commence with any work incidental thereto on any area without—

(a) an environmental authorisation;

(b) a reconnaissance permission, prospecting right, permission to remove, mining right, mining permit, retention permit, technical co-operation permit, reconnaissance permit, exploration right or production right, as the case may be; and

(c) giving the landowner or lawful occupier of the land in question at least 21 days written notice."

Legal requirements for this project

The applicant has a responsibility to obtain environmental authorisation for the relevant prospecting activities by the submission of an Environmental Management Plan (this document) and also to ensure that the proposed activities conform to all objectives and specifications of the MPRDA. Construction activities should then be conducted according to the EMP approved by DMR.

1.4.2 National Environmental Management Act (Act 107 of 1998) (NEMA)

NEMA provides for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of the State, as well as to provide for matters connected therewith. Section 2 of NEMA establishes a set of principles that apply to the activities of all organs of state that may significantly affect the environment. These include the following:

- Development must be sustainable;
- Pollution must be avoided or minimised and remedied;
- Waste must be avoided or minimised, reused or recycled;
- Negative impacts must be minimised; and
- Responsibility for the environmental health and safety consequences of a policy, project, product or service exists throughout its life cycle.

Section 28(1) states that:

“Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring.”

If such degradation/pollution cannot be prevented, then appropriate measures must be taken to minimise or rectify such pollution. These measures may include:

- Assessing the impact on the environment;
- Informing and educating employees about the environmental risks of their work and ways of minimising these risks;
- Ceasing, modifying or controlling actions which cause pollution/degradation;
- Containing pollutants or preventing movement of pollutants;
- Eliminating the source of pollution; and
- Remedying the effects of the pollution.

Legal requirements for this project

The applicant has a responsibility to ensure that the proposed development and construction activities conform to the principles of NEMA. The proponent is obliged to take actions to prevent pollution or degradation of the environment in terms of Section 28 of NEMA.

1.4.3 National Heritage Resources Act (Act 25 of 1999)

The protection and management of South Africa's heritage resources is controlled by the National Heritage Resources Act 25 of 1999. The enforcing authority for this act is the South African Heritage Resources Agency (SAHRA).

In terms of the Act, historically important features such as graves, trees, archaeological artefacts/sites and fossil beds are protected. Similarly, culturally significant symbols, spaces and landscapes are also afforded protection. In terms of Section 38 of the National Heritage Resources Act, SAHRA can call for a Heritage Impact Assessment (HIA) where certain categories of activity are proposed. The Act also makes provision for the assessment of heritage impacts as part of an EIA process and indicates that if such an assessment is deemed adequate, a separate HIA is not required.

The Act requires that:

“...any person who intends to undertake a development categorised as the ... or any development or other activity which will change the character of a site exceeding 5,000 m² in extent or involving three or more existing erven or subdivisions thereof must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development...”

Legal requirements for this project

The Department of Minerals and Energy (DME) requires that a phase 1 heritage specialist study be undertaken as part of the EMP. A specialist Heritage Assessment has been undertaken and is included in Appendix F.

1.5 Approach to the Environmental Assessment

The approach taken in this study is guided by the principles of Integrated Environmental Management (IEM) as described in the IEM guidelines published by the Department of Environmental Affairs and Tourism in 1992. The approach is therefore guided by the principles of transparency which is aimed at encouraging decision-making. The underpinning principles of IEM are:

- Informed decision making;
- Accountability for information on which decisions are made;
- A broad interpretation of the term “environment”;
- Consultation with IAP's;
- Due consideration of feasible alternatives;
- An attempt to mitigate negative impacts and enhance positive impacts associated with the proposed project;
- An attempt to ensure that the social costs of the development proposals are outweighed by the social benefits;
- Regard for individual rights and obligations;
- Compliance with these principles during all stages of the planning, implementation, and decommissioning of the proposed development or activity; and



- Opportunities for public and specialist input in the decision-making process.

The study has also been guided by the requirements of the EIA regulations set out in terms of the National Environmental Management Act (NEMA). However, Section 38A (1) of the MPRDA states that:

“The Minister(of Minerals and Energy) is the responsible authority for implementing environmental provisions in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as it relates to prospecting, mining, exploration, production or activities incidental thereto on a prospecting, mining, exploration or production area.”

Therefore, the assessment and document have mainly been guided by the MPRDA Regulations No 527 as promulgated in Government Gazette 26275 on 23 April 2004 in which the requirements for mining applications are stipulated.

1.6 Contents and Structure of the Report

This report incorporates all the information required in terms of the DME regulations for Environmental Management Plans, namely:

- A description of the environment likely to be affected by the proposed prospecting operation;
- An assessment of the potential impacts of the prospecting operation on the environment, socio-economic conditions and cultural heritage, if any, also including the necessary specialist studies;
- A summary of the assessment of the significance of the potential impacts and the proposed mitigation measures and management measures to minimise adverse impacts and enhance benefits;
- Prospecting work programme and methods;
- Cost analysis for financial provision;
- Rehabilitation plan and rehabilitation schedule;
- Planned monitoring and performance assessment of the environmental management plan;
- Closure objectives;
- A record of the public participation undertaken and the results thereof; and
- An undertaking by the applicant regarding the execution of the environmental management plan.

The specialist studies undertaken during the process were informed by the issues identified in the scoping phase. Results from those studies have been incorporated into the EMP, particularly into the description of the affected environment (Chapter 3), impact assessment (Chapter 5) and mitigation and management measures (Chapter 6).

This report is divided into seven chapters:

Chapter 1 Introduction

Provides an introduction and background to the proposed project, provides details of the project applicant, summarises the qualifications and experience of the EAPs and outlines the approach to the study. Also, provides a brief summary and interpretation of the relevant legislation.

Chapter 2 Description of Activity Proposal

Describe the various elements of, and the motivation for, the proposed activities. This chapter also includes the prospecting works programme and methods as well as the cost analyses for financial provision.

Chapter 3 Nature of the Affected Environment

Briefly describes the biophysical and socio-economic receiving environments that DME will consider in their assessment of the project.

Chapter 4 The Public Participation Process

Describes Public Participation Process followed.

Chapter 5 Assessment of Environmental Impacts

Describes and rates environmental impacts associated with the proposed project. The associated mitigation measures are listed in Chapter 6. The relevant references are made.

Chapter 6 Mitigation and Management of Identified Impacts

Stipulates mitigation measures for the identified significant environmental impacts and provides environmental management guidelines that should be implemented in the construction, operation, rehabilitation and closure stages of the proposed test pits.

Chapter 7 References

Provides references for documents cited in the EMP Report.



2 Description of Activity Proposal

2.1 Activity Motivation

The silica sand deposit near Paterson in the Easter Cape Province has been recognized in the literature and is believed to be of relatively good standard. The applicant, Vulani Coronation Mining (Pty) Ltd., identified a site for the potential mining of these sand deposits on the Difusi Land Trust area, which consists of various properties owned by the applicant.. Whether appropriate silica sand is available on the site will only be known after the quality, size and volume of the material has been determined through the process of prospecting. High quality silica sand is currently in demand worldwide.

For this reason, the applicant appointed SRK Consulting to submit an application for a prospecting right on the relevant property. An application for prospecting was submitted on 24 March 2010 together with the prospecting works programme. Correspondence from the Department of Mineral Resources (DMR) has requested the submission of an Environmental Management Plan (EMP) (this document) within 60 days of the date of correspondence. Therefore the EMP is compiled as part of the prospecting right application in order to minimise the potential impacts of prospecting on the immediate and surrounding environment.

2.2 Activity Description

The proposed activity entails the use of test pits to determine the exact locality and volume of the sand deposit on the property (see Figure 2-1 for the locality plan). Detailed information on the property and the proposed prospecting area is included in Table 2-1.

Table 2-1: Information on proposed prospecting area

Required Information	Available Information
Information on the site	
Full names of the properties on which prospecting operations will be conducted	Portion 4 of the Farm De Bruyns Kraal No. 113 (219.5 ha) Portion 4 of the Farm Doorn Kloof No. 111 (55.5 ha) Portion 3 of the Farm Doorn Kloof No. 111 (104.0 ha) Portion 14 of the Farm De Bruyns Kraal No. 113 (9.5 ha) Portion 12 of the Farm De Bruyns Kraal No. 113 (15.6 ha) Remainder of Portion 5 of the Farm De Bruyns Kraal No. 113 (103.5 ha) Remainder of the Farm Lang Vley No. 118 (68.4 ha)
Name of subdivision	As above
SG 21-Digit Code	C00400000000011300004 C00400000000011100004 C00400000000011100003 C00400000000011300014 C00400000000011300012 C00400000000011300005 C00400000000011800000
Co-ordinates of prospecting area: Latitude & Longitude	See Table 2-2
Magisterial District	Alexandria
Name of registered owner of property	The Trustees of the Difusi Land Trust (Applicant)

Title Deed Number	IT 139/2002
Details of property owner	Mr Speedo Nondumo P.O. Box 14218 Sidwell Port Elizabeth 6061 Tel/fax: 041-466 0104 Mobile: 082 448 4965 Email: speedo@epweb.co.za
Current uses of the property and surrounding areas	Agricultural (grazing) and settlement
Any other, existing land uses that impact on the environment in the proposed mining area	None
What is the name of the nearest town and specify the distance	Paterson – 1 km
Information on the mining activity	
Mineral prospected for	Silica Sand (QD)
Ultimate depth of the proposed prospecting operations	Depending on depth of sand layer
Total area of prospecting activities (ha)	Max. 580.054 ha
Time period of prospecting operations to be conducted on this particular site	One month on site within a one year time frame

2.3 Activity Location

The proposed study site is located on the Difusi Land Trust area which consists of seven properties listed in Table 2-1. This area is situated approximately one kilometre to the north of Paterson in the Eastern Cape Province and is to the east of the National Route 10 towards Cradock. The proposed prospecting site is approximately 580 hectares in extent and consists of seven smaller properties as previously mentioned. Locality plans, showing the proposed prospecting site in relation to surrounding properties, are included in Appendix A of this report. The sand deposit in the area is also clearly visible on the aerial photographs included. The co-ordinates of each corner of the proposed prospecting site are listed in Table 2-2 below. The positions of the listed coordinates can be seen on the Locality Plan in Figure 2-1 which is also included in Appendix A.

Table 2-2: Coordinates of the corners of the proposed prospecting site

Corner Label	X-coordinates	Y-coordinates
A	25° 58' 41.47" E	33° 24' 49.42" S
B	25° 58' 50.13" E	33° 24' 50.11" S
C	25° 59' 26.16" E	33° 24' 27.01" S
D	26° 00' 20.61" E	33° 24' 43.46" S
E	26° 00' 23.36" E	33° 24' 41.88" S
F	26° 00' 24.34" E	33° 24' 31.33" S
G	26° 00' 25.70" E	33° 24' 31.22" S
H	26° 00' 24.71" E	33° 24' 40.91" S
I	26° 00' 34.61" E	33° 24' 37.64" S
J	26° 00' 59.31" E	33° 24' 49.96" S

K	26° 00' 46.34" E	33° 24' 55.77" S
L	26° 00' 43.01" E	33° 25' 36.59" S
M	26° 00' 35.99" E	33° 25' 36.40" S
N	26° 00' 38.05" E	33° 25' 06.99" S
O	25° 59' 32.09" E	33° 24' 56.74" S
P	25° 59' 27.44" E	33° 25' 15.64" S
Q	25° 59' 36.52" E	33° 25' 19.93" S
R	25° 59' 31.20" E	33° 25' 28.37" S
S	25° 59' 22.67" E	33° 25' 35.03" S
T	25° 59' 18.04" E	33° 25' 53.85" S
U	25° 59' 31.46" E	33° 25' 44.28" S
V	25° 59' 35.71" E	33° 25' 51.16" S
W	25° 59' 15.68" E	33° 26' 05.02" S
X	25° 59' 13.67" E	33° 26' 13.04" S
Y	25° 58' 43.17" E	33° 26' 12.82" S
Z	25° 58' 21.38" E	33° 25' 43.20" S

HUME PARK

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PLEASE MENTION YOUR NAME ON DEP REFERENCE AND FAX THE DEPOSIT SLIP TO
ABOVEMENTIONED FAX NUMBER.*

P. A. Channon
.....
REYNHARDT & GESINA RALL
OR PENNY CHANNON

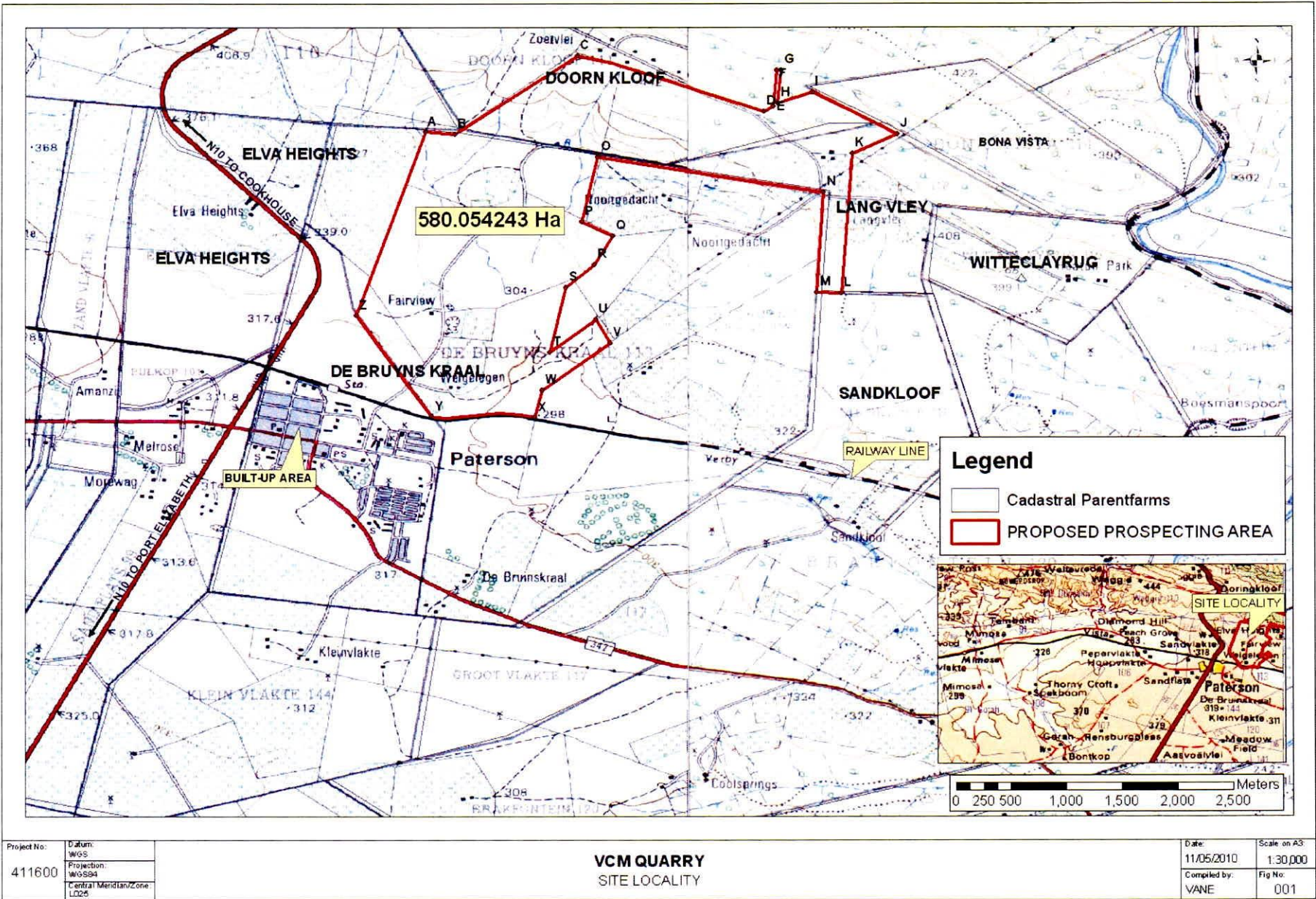


Figure 2-1: Location of the proposed prospecting site, also showing the coordinate points

2.4 Prospecting Work Programme and Methods

The following information was taken from the Prospecting Work Programme Report which was submitted together with the Prospecting Application on 24 March 2010. The full Prospecting Work Programme Report is available in Appendix D of this report.

The prospecting method will be conducted in phases with the aim to accurately define the deposit in terms of its volume and quality.

2.4.1 Phase 1

Phase 1 will comprise of the following tasks:

1. Desk top study utilising information from GIS sources as well as geological maps attained from the Eastern Cape Branch of the Council for Geoscience to determine;
 - a. The underlying geology of the area;
 - b. Any previous mining within the area, specifically for the commodity in question; and
 - c. Rough extent of the commodity on surface;
2. Geological mapping to confirm the findings of the desk top study and verify the presence of the potential deposit in the field;

2.4.2 Phase 2

Phase 2 will comprise of the following tasks:

1. Test pits excavated on a 400x400 m grid across the deposit to allow for an inferred resource to be estimated.
 - a. This equates to approximately 51 test pits across the Difusi Land Trust area (refer to Appendix B).
2. Test pits excavated on a 200x200 m grid to accurately define the deposit and get an Indicated or Measured Resource.
 - a. The test pits will be 'infill' test pits between those excavated on the 400x400 m grid (refer to Appendix B).
 - b. The total number of test pits is approximately 194 test pits.

NOTE: The desk top study and geological mapping conducted in Phase 1 will determine the broad lateral extent of the deposit thus affecting the size of the area to be prospected and the number of test pits to be excavated.

Prospecting Methods

- The test pits will be excavated with the use of a TLB. The test pits will comprise of the following dimensions:
 - o 4 m (length) x 0.75 m (breadth) x 3 m (height)
 - o The estimated volume of material to be excavated is ~320 m³ (400 x 400 m grid) and ~970 m³ (200 x 200 m grid).
- Each of the test pits will be logged and photographed;

- Only selected test pits will be sampled for silica sand. A five kilogram sample will be collected and submitted to an accredited laboratory for analysis;
- All test pits will be backfilled immediately after completion of the logging and sampling. No test pits will be left open and unattended. The surface of the test pit will be neatly smoothed to limit the visual impact.
- Each test pit will be clearly marked with a bright orange flag mounted on a 1.5 m plastic PVC pipe;
- The study area is characterised by many gravel roads and tracks thus reducing the need for off road driving. However, certain test pit locations will require off road driving and every effort will be made to limit the impact on the existing vegetation;
- The TLB operator and geologist will be the only two personnel on site during the investigation; and
- Refuelling (and servicing if necessary) of the TLB will be conducted off site or at a predefined location within the Difusi Land Trust area after agreement with Mr Nondumo.

A map indicating the proposed positions of the test pits on a 400 x 400 m and 200 x 200 m grid is included under Appendix B of this report.

Technical Ability to Conduct the Prospecting Operation

Vulani Coronation Mining (Pty) Ltd. has appointed SRK Consulting (Pty) Ltd. to submit a prospecting application including a prospecting works programme. SRK Consulting has assigned Mr Brent Cock to conduct the prospecting operation. Mr Cock is a geologist with 6 years experience in various geological disciplines, ranging from: resource core drilling, stream sediment sampling, geochemical soil sampling, lithostructural mapping and engineering geological investigations. Mr Cock has worked in numerous localities, namely: Bushveld Igneous Complex, Barberton Greenstone Belt, Botswana, Zambia, Democratic Republic of Congo and Burkina Faso. Mr Cock will conduct the fieldwork and reporting with the draft report to be submitted to a Principal Geologist for review prior submission.

Mr Cock's contact details are provided below:

SRK Consulting

Groundfloor, Bay Suites

Tel: (041) 509 4800

1a Humewood Road, Humerail

Fax: (041) 509 4850

Port Elizabeth

Email: bcock@srk.co.za

A resume outlining Mr Cock's work experience is filed under Appendix L of the Prospecting Work Programme (see Appendix D of this report).

The proposed prospecting budget is included in Table 2-3 under section 2.5 below.

2.4.3 Phase 3

The entire Difusi Land Trust area, including boundary fences, will be surveyed to provide an accurate DTM surface of the deposit.

Each test pit location will be surveyed to provide an accurate X, Y and Z coordinate in order to calculate the approximate volume of sand.

2.4.4 Phase 4

A bulk sample will need to be taken to determine whether the deposit can be mined efficiently and cost effectively. The anticipated grade and mineable volumes of silica sand will be determined.

2.5 Cost Analysis for Financial Provision

The proposed financial provision for the project has been divided into two sections which comprise the prospecting budget (to finance the prospecting process) and the rehabilitation budget (to finance adequate rehabilitation for the entire area disturbed during prospecting).

2.5.1 Prospecting budget

The cost analysis for the proposed prospecting activities (budget summary) and the applicant's financial ability are indicated in Table 2-3 below:

Table 2-3: Prospecting cost analysis

Phases	Description	Time (hrs)	Travel (km)	Samples	Other	Rate	Amount
Phase 1	Desktop study	4				540	R 2,160.00
	Geological Mapping	8				540	R 4,320.00
	Travelling		150			2.75	R 412.50
	Field allowance				1	45	R 45.00
						Sub-Total	R 6,937.50
Phase 2	400 x 400 m grid:						
	Fieldwork	16				540	R 8,640.00
	TLB Hire	16				300	R 4,800.00
	Load Bed				2	1,400	R 2,800.00
	Sampling - chemical			5		750	R 3,750.00
	Sampling - grading			5		345	R 1,725.00
	Travelling		150			2.75	R 412.50
	Field allowance				1	45	R 45.00
						Sub-total	R 22,172.50
	200 x 200 m grid:						
	Fieldwork (48 TP's)	24				540	R 12,960.00
	TLB Hire	24				300	R 7,200.00
	Load Bed				2	1,400	R 2,800.00
	Sampling - chemical			10		750	R 7,500.00
	Sampling - grading			10		345	R 3,450.00
	Travelling		500			2.75	R 1,375.00
	Field allowance				3	45	R 135.00
						Sub-total	R35,420.00
Phase 3	Topographical & TP survey	8				350	R 2,800.00
	Travelling		150			3.6	R 540.00
	GPS				2	1,500	R 3,000.00
	Reductions	3				350	R 1,050.00
						Sub-total	R 7,390.00
Phase 4	Bulk Sample				1	50,000	R 50,000.00
						Sub-total	R 50,000.00
Phase 5	Geotechnical Report	55				540	R 21,731.90

						Sub-total	R 21,731.90
						TOTAL	R 143,651.90

2.5.2 Rehabilitation budget

At this stage, after the entire scope of the proposed activity has been determined and the specific area to be disturbed by the prospecting activities is known, a budget for the rehabilitation of these disturbed areas can be estimated. Rehabilitation of the site will be an ongoing process throughout the prospecting phase and thereafter. The cost analysis has been drawn up according to the Rehabilitation Plan included in section 6.8.1 of this report. The cost analysis for rehabilitation is presented in Table 2-4 below.

Table 2-4: Rehabilitation cost analysis

ACTIVITY	Travel (km)	EAP Time (hrs)	Worker Time (hrs)	Other (printing, etc.)	Rate	AMOUNT
Phase 1 – Rehabilitation						R 5,300
Backfill each test pit			16		R 100 /day	R 200
Watering each test pit (requires water tanker)			8	R 5,000	R 100 /day	R 5,100
Phase 2 – Initial Inspection						R 5,140
Site visit	150			R 350	R5.40	R 1160
		6			R 350	R 2,100
Landowner Consultation		1		R 30	R 350	R 380
Compile Letter Report		4		R 100	R 350	R 1,500
Phase 3 – Final Inspection						R 9,510
Site visit	150			R 790	R5.40	R 1,600
Remove alien vegetation from test pit areas		16		R 30	R 350	R5,630
			32		R 100 /day	R 400
Landowner Consultation		1		R 30	R 350	R 380
Compile Final Performance Assessment Report		4		R 100	R 350	R 1,500
TOTAL (Excluding VAT)						R 19,950



3 Nature of the Affected Environment (Pre-prospecting Environment)

3.1 Biophysical Environment

3.1.1 Topography

The topography of the study area is generally flat with undulating sand dunes to the south of the site. Towards the north, the site is characterised by steeper rocky hills.

3.1.2 Geology and Soils

The town of Paterson is located on Quaternary aeolian (windblown) sand, which is in turn underlain mostly by the Nanaga Formation. The primary source of the Aeolian sand is the underlying Nanaga Formation, which consists of semi-consolidated to consolidated calcareous sandstone, and sandy limestone with large-scale cross-bedding. The sand has accumulated at the foot of the Suurberg mountain range (Toerien & Hill, 1989). A geological map for the area is included in Figure 3-1 below for reference.

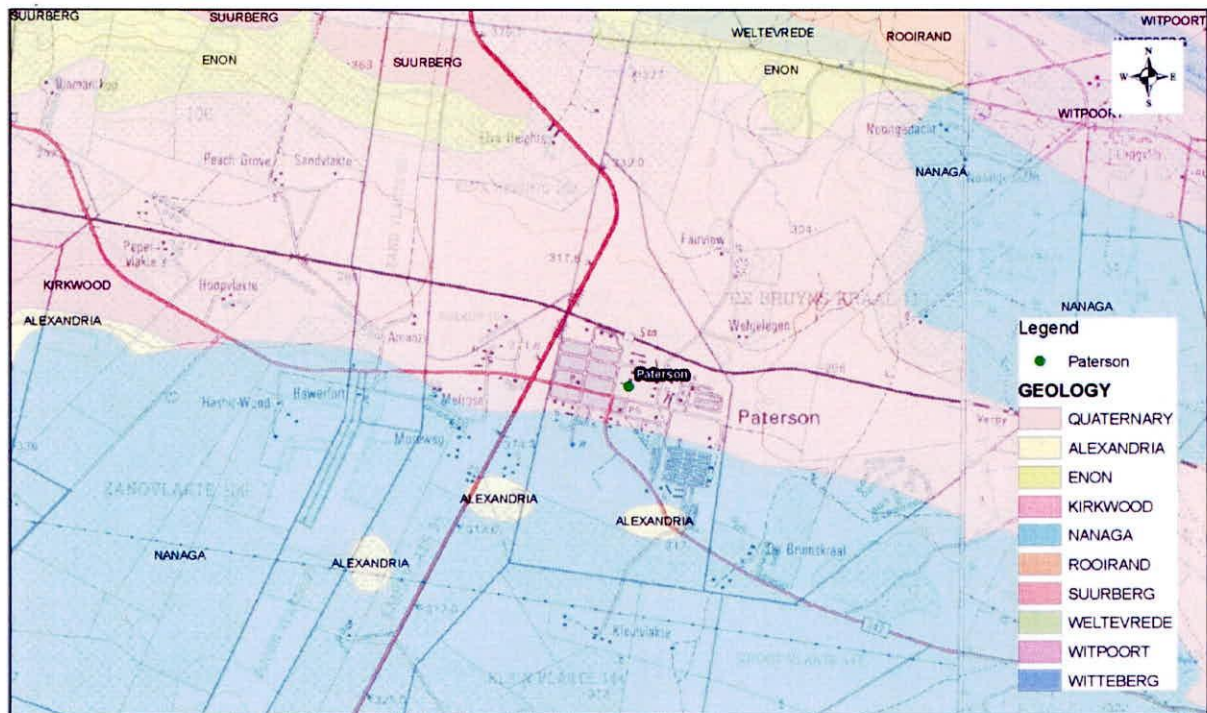


Figure 3-1: Geology of the Paterson area

On the proposed prospecting site, a semi-vegetated sheet dune field occurs, which was deposited by the prevailing south-westerly winds in the area. The sand originates from the up-wind coastal dune fields, but does generally not contain calcium carbonate (CaCO_3) as is the case with the coastal dune fields. The sand in this area occurs as a veneer over the landscape that varies between 0.5 and three meters thick. The sand essentially covers the southern sections of the Difusi Land Trust area as well as adjacent farms to the west and southeast (which is not included in this application). Below the sand layer is a very thick firm sandy clay layer. The contact between the layers is sharp and easily located.

Through the prospecting process, the size, quality and volume of this sand deposit on the pre-determined site will be established.

3.1.3 Hydrology

There are no specific large water courses on or close to the proposed site. However, various drainage lines and a number of reservoirs occur on the site. Test pits will not be excavated in or near drainage depressions. The prospecting operations would therefore not impact on any surface water resources in the area.

Also, no groundwater resources should be affected by the proposed test pits as groundwater in the area occurs deeper than 25 meters below ground level.

After prospecting, all the test pits should be rehabilitated adequately and no ditches should be left that would probably be natural accumulation areas for runoff from the surrounding areas.

3.1.4 Land Use

Portions of the proposed site is currently used for agricultural purposes, more specifically for grazing (dairy farming) and is traversed by a network of small roads and tracks. A large percentage of the site has been cleared for planted pasture. Two farm houses and other farming infrastructure also occur on the northeast and southeast corners of the site.

Sand has previously been mined on a small scale on the proposed site (see Figure 3-5).

3.1.5 Ecology

The natural vegetation at the proposed site falls within the Thicket biome (T). The southern section of the site is further classified as mosaic thicket (m) in which case the thicket occurs as clumps in vegetation types associated with a different biome. According to the Subtropical Thicket Ecosystem Programmes (STEP) (Cowling, *et al.*, 2003), four different vegetation types are present on the proposed prospecting site which are Shamwari Grassland Thicket, Salem Karroid Thicket, Albany Valley Thicket and Paterson Savanna Thicket (see Figure 3-2). In the STEP programme, the conservation status of these vegetation types are described as being “Least Threatened” for the first two types and “Vulnerable” for the latter two vegetation types. Ecosystems described as “Least Threatened” may be able to withstand loss of natural area through disturbance or development and those described as “Vulnerable” means that only limited loss of this vegetation type can be endured and that development should be well-planned.

According to the Eastern Cape Provincial Biodiversity Conservation Plan, the proposed site falls within Class 3 (functional landscapes) and Class 4 (cultivated land/town and settlements) of the Biodiversity Land Management Classes (BLMC) and various parts are shown to be degraded (see Figure 3-3). This indicates that 10 to 70% transformation is allowed within a land parcel classified as Class 3 and 70 to 100% transformation is allowed within a land parcel classified as Class 4 (Berliner & Desmet, 2007). This is considered reasonable as the site has been transformed to a large degree due to agricultural activities and planting of pasture. No activities are expected to take place in the northern parts of the proposed site as these are rocky hilly areas with little sand available. On the southern half of the site mosaic thicket is clearly visible with numerous bare sand patches between thicket clumps. The area is also traversed by a network of small roads and tracks due to livestock grazing.

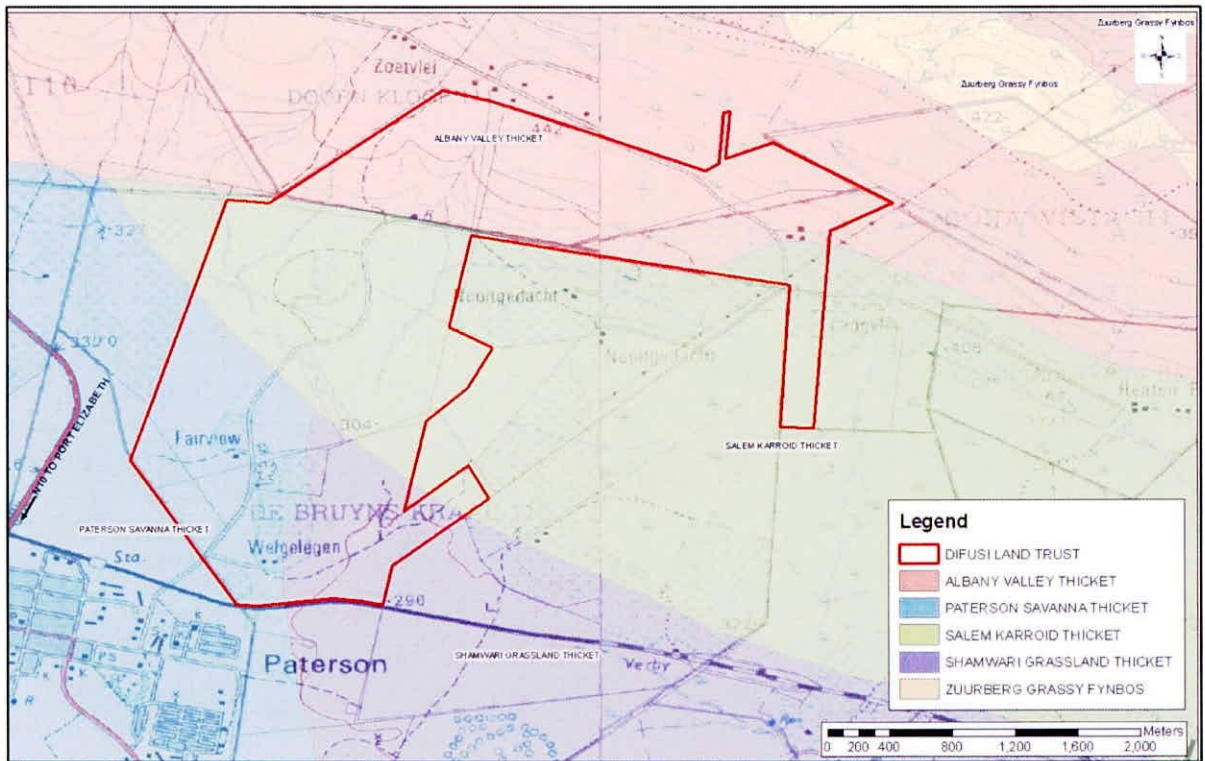


Figure 3-2: Vegetation type of the proposed site.

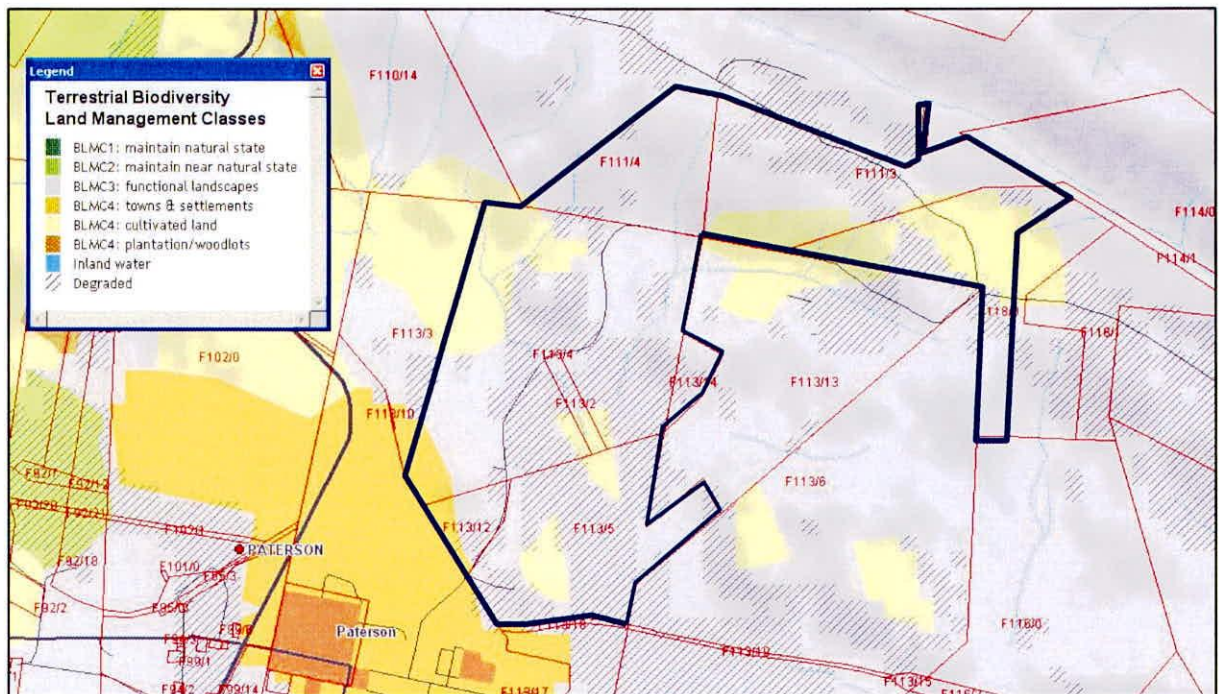


Figure 3-3: Biodiversity Land Management Classes of the area according to the provincial Biodiversity Conservation Plan.



Figure 3-4: Vegetation at proposed site, also showing sand patches

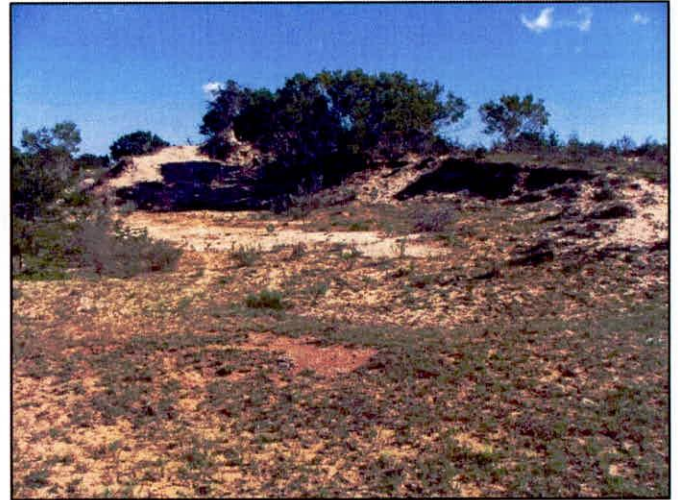


Figure 3-5: Vegetation at proposed site, also showing previously mined area



Figure 3-6: Vegetation on the western part of the proposed site, also showing planted pastures



Figure 3-7: Vegetation on the northern part of the proposed site

In terms of fauna, according to the Eastern Cape Biodiversity Conservation Plan, there are no protected or endangered species occurring on or near the proposed site.

With regard to bigger mammals, livestock such as cattle graze on the proposed site. Evidence of small mammals was also observed.

3.1.6 Air quality

Air quality levels around the relevant site are typically good in rural areas such as the affected environment, but may be affected on a small scale by emissions from vehicles on the N10 National Route which occurs to the west of the proposed site.

3.1.7 Noise

The identified site is situated to the east of the N10 National Route which is a source of noise in the Paterson area. The current ambient noise levels in this area are assumed to be relatively high at certain times due to high traffic volumes on the N10. Receptors of this noise impact would be residents of Paterson and farm houses located near the N10 road.

Noise levels on the proposed site vary with distance from the N10 and the town of Paterson. Generally, low noise levels occur on the site with very little receptors which would include residents of the farm houses on the northeast and southeast corners of the site.

3.1.8 Sites of archaeological and cultural interest

A Phase 1 Archaeological Impact Assessment has been undertaken (see Appendix F). One Middle Stone Age (MSA) stone artefact surface scatter was recorded. The stone artefact scatter was observed on an open calcrete patch that underlies the overlying Holocene river sand dunes that may have been disturbed during previous prospecting activities. They were identified by the characteristic faceted platform 'prepared core technique' and include flakes and blades made on fine-grained quartzite and silcrete. Also, one Later Stone Age (LSA) stone artefact scatter was observed within a deflation bay. The stone artefact scatter included flakes and one scraper made on fine-grained quartzite, quartz chalcedony and silcrete. No other archaeological materials were observed to be in association with stone tool surface scatters and no depth of archaeological deposit was recorded.

According to the specialist study, the proposed area for prospecting is considered to have a low cultural significance. However, certain recommendations are listed in section 6.5.4 that should be taken into consideration during the construction activities.

3.2 Social and Economic Environment

No people should be directly affected by the proposed prospecting operations on the Difusi Land Trust area. As the landowner of the farm is also the applicant, no challenges should arise with regards to access to the site or disturbing the landowners. No farm house or farming infrastructure will be damaged and everyday farming activities will be unhindered.



4 Public Participation Process

Public participation for the proposed project was not necessary as the applicant for the project is also the landowner (Mr Speedo Nondumo, principal trustee of the Difusi Land Trust). Mr HMG Ferreira, who lives in a farm house on the far northeast corner of the proposed site, has signed the public consultation letter as Manager of the Difusi Land Trust during the site visit on 7 May 2010 (see Appendix E). The applicant has also signed the Undertaking included in Appendix H of this document.



5 Assessment of Environmental Impacts

5.1 Potential Impacts

The potential environmental issues were identified and assessed by the environmental assessment practitioner (EAP) and by means of specialist studies. The objective of the specialist studies was to further investigate each of the issues identified and assess their potential environmental impact in order to determine their significance and propose mitigation measures to address the impacts, if required.

The identification of potential impacts is based on:

- The legal requirements;
- The nature of the proposed activity; and
- The nature of the receiving environment.

After consideration of these aspects, the required specialist studies (listed below) are identified and are conducted in order to investigate the potential environmental impacts associated with the proposed activities. Specialists were required to assess the significance of anticipated impacts and to recommend mitigation measures. The specialist study conducted has been attached to this document under Appendices F:

- Heritage Impact Assessment.

The following potential impacts have been addressed by SRK in consultation with the project team:

- Topographical impacts;
- Soil and geology impacts;
- Vegetation impacts;
- Surface and groundwater impacts;
- Air quality impacts;
- Noise impacts;
- Land capability impacts;
- Visual impacts;
- Stormwater and erosion impacts;
- Waste management impacts;
- Heritage impacts; and
- Socio-economic impacts.

Table 5-1 summarises the potential impacts of the proposed prospecting operations on the surrounding environment. The status and significance of the relevant impacts are also listed (see Appendix G for the detailed impact rating table and rating methodology). All measures recommended to mitigate and manage the identified impacts are incorporated into Chapter 6 which lists the mitigatory specifications for the different phases of the proposed prospecting process. The completed specialist study and its findings have been integrated into Table 5-1 and Chapter 6.

Table 5-1: Potential impact on the surrounding environment

Element	Description of Potential Impact	Status	Significance		Reference to Mitigation
			Without Mitigation	With Mitigation	
Topography	Alteration of topography through excavation of test pits and the deposition of material adjacent to the pit.	-ve	Very Low	Insignificant	Sections 6.6, 6.8.1.1 & 6.8.1.3
Geology	Permanent alteration of geology through the removal of material from borrow pits.	-ve	Very Low	Insignificant	Section 6.8.1.1 & 6.8.1.3
Soils	Potential loss of soil from test pits due to removal of topsoil and stockpiling for rehabilitation.	-ve	Very Low	Insignificant	Section 6.5.2 & 6.8.1.3
Vegetation	Small scale loss of endemic vegetation associated with activities (accessing to the test pits, excavating test pits, and stockpiling of topsoil). No planned access roads will be constructed.	-ve	Very Low	Insignificant	Sections 6.4.2, 6.5.1 & 6.8.1.4
Fauna	Farm stock can be scared away by heavy vehicles and prospecting activities, break out through open gates or fall into open test pits. No endangered or rare species expected on site.	-ve	Very Low	Insignificant	Section 6.4.2 & 6.5.1
Surface Water	No impacts on surface water are expected as test pits will not be excavated in drainage depressions.	N/A	N/A	N/A	None required
Groundwater	Impacts on ground water are not expected.	N/A	N/A	N/A	None required
Air quality	Nuisance impact of dust generated from excavating as well as increased traffic on gravel roads.	-ve	Very Low	Insignificant	Section 6.5.7
Land capability	No permanent or significant impact on land capability is expected.	-ve	Very Low	Insignificant	None required
Noise	Nuisance impact of noise during working hours due to excavation activities. There are limited receptors for the impact as there are only a few residents near the proposed sites.	-ve	Very Low	Insignificant	Section 6.5.6
Waste management	Pollution of construction and domestic waste as well as waste water could lead to other visual impacts and loss of natural habitat.	-ve	Very Low	Insignificant	Sections 6.5.8 & 6.8.1.6
Archaeology / Heritage	No archaeological or cultural sites will be affected. Graves or archaeological material may be uncovered.	-ve	Insignificant	Insignificant	Section 6.5.4
Visual impact	Potential visual impact if waste is not properly disposed of and if the test pits are not adequately rehabilitated.	-ve	Very Low	Insignificant	Section 6.5.5
Stormwater & Erosion	Potential erosion of areas with damaged vegetation and excavated areas if rehabilitation is not done soon after excavation.	-ve	Low	Insignificant	Sections 6.5.3 & 6.8.1.5
Socio-economic structure	Farming infrastructure could be damaged which would impact on residents of the farmhouses on the site.	-ve	Insignificant	Insignificant	Section 6.7

6 Mitigation and Management of Identified Impacts

6.1 Introduction and scope

This chapter describes how the environmental aspects identified above should be managed and the potential impacts be mitigated in the event of prospecting authorisation being granted. Although the mitigation measures are written as if the project has been authorised, this approach in no way presupposes that the project will be approved. Rather, the style of writing is aimed at providing a clear picture to the Department of Mineral Resources (DMR), other organs of state, and IAP's, regarding the management of environmental aspects associated with the construction and operational activities of this project.

The preceding chapters in this document form an integral part of this chapter as they provide details regarding the sensitivity of the affected environment, and the findings of the impact assessment. As such, while this Chapter provides a list of environmental specifications aimed at mitigation of the identified impacts, and in a more general sense compliance with environmental and mining legislation, the preceding Chapters are particularly useful for understanding the importance of the measures proposed here.

For easy reference, specific measures for the prospecting phase are included in sections 6.4 to 6.7, while the rehabilitation plan and measures for closure are listed in section 6.8.

It is important to note that the guidelines, operating procedures and rehabilitation/pollution control requirements described in this Chapter will be binding on the holder of the prospecting permit after approval of the EMP.

6.2 Responsibility

The environment affected by the prospecting operations shall be rehabilitated by the holder (or appointed party), 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 prospecting permit to ensure that the manager/engineer/geotechnical specialist on the site and the employees are capable of complying with all the statutory requirements which must be met in order to conduct prospecting operations, which includes the implementation of this EMP.

6.3 Environmental Procedures

6.3.1 Monitoring and Reporting

- a) Regular monitoring of all the environmental management measures and components shall be carried out by the holder of the prospecting permit in order to ensure that the provisions of this EMP are adhered to.

- b) Ongoing and regular reporting of the progress of implementation of this programme will be done.
- c) Various points of compliance will be identified with regard to the various impacts that the operations will have on the environment.
- d) Inspections and monitoring shall be carried out on both the implementation of the EMP and the impact on plant and animal life.
- e) Visual inspections on erosion and physical pollution shall be carried out on a regular basis.
- f) Layout plans will be updated on a regular basis and updated copies will be submitted to the Regional Manager on a basis decided by the said Manager.
- g) Any emergency or unforeseen impact will be reported as soon as possible.
- h) An assessment of environmental impacts that were not properly addressed or were unknown when the plan was compiled shall be carried out and added as a corrective action.

6.3.2 Training

The manager on site is responsible for ensuring that the sentiments of the EMP are conveyed to all personnel (including sub-contracted personnel). It is recommended that regular training sessions (including basic environmental awareness training at induction) be conducted to fulfil this purpose. Training registers shall be kept as proof for auditing purposes. The environmental training should, as a minimum, include (but not be limited to) the following:

- a) The importance of conformance with all environmental policies;
- b) The environmental impacts, actual or potential, of the proposed activities;
- c) The environmental benefits of improved personal performance;
- d) Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with this EMP, including associated procedures and emergency preparedness and response requirements;
- e) The potential consequences of departure from specified operating procedures; and
- f) The mitigation measures required to be implemented when carrying out their work activities.

6.3.3 Environmental Incidents

- a) The manager on site shall maintain a register of all environmental incidents occurring as a result of the activities associated with the contract. Environmental incidents that shall be recorded include (but are not limited to):
 - Fires;
 - Accidents (e.g. traffic);
 - Spills of hazardous materials, contaminating soil or water resources;
 - Non-compliances with applicable legislation; and
 - Non-compliances with this EMP.

- b) Each environmental incident shall be investigated by the competent person and an environmental incident report shall be forwarded to the holder of the permit. Such incident report shall be presented within five working days of the incident occurring.
- c) Environmental incident reports shall include (as a minimum) a description of the incident, the actions taken to contain any damage to the environment, personnel, or the public, and the actions taken to repair / remediate any such damage.
- d) Prescribe additional measures that may be required to remediate damage resulting from the incident and/or to prevent similar incidents occurring in the future.

6.4 General Requirements

6.4.1 Layout Plan

- a) A copy of the layout plans as provided in Appendix B of this document must be available at the prospecting site for scrutiny when required. These plans must include details on site locality, site boundaries, access roads and entry points to the site.
- b) A final layout plan must be submitted at closure of the prospecting site or when operations have ceased.

6.4.2 Demarcating and Fencing of the Prospecting Area

- a) Prospecting and resultant operations shall only take place within the site illustrated on the Locality Plan (Appendix A).
- a) Fencing of the entire prospecting area should not be required as the property/farm is already fenced.
- b) However, a fence, cones or danger tape shall be placed around each open test pit to ensure its visibility and that people and animals do not fall into the test pits.

6.4.3 Signage and Access

- a) Signage (as per SARTM) shall be erected on either sides of the intersection of access on the National Route 10.
- b) The landowner of the proposed site shall be given at least 21 days written notice before prospecting commences.
- c) The access gateway for the proposed new prospecting area shall be obtained through farm gates. All farm gates should be closed immediately after use.

6.4.4 Restrictions on Mining

- a) On assessment of the application, the Regional Manager may prohibit prospecting operations over portions of the proposed area.
- b) No construction/excavation shall be allowed outside the authorised prospecting site.
- c) The stone scatter occurrences (see Archaeological Specialist Report – Appendix F) should be taken into account when the specific areas for prospecting have been defined.
- d) In the case of areas that are excluded from prospecting, no operations shall be conducted within 5 m of these areas.

6.5 Environmental Requirements

6.5.1 Protection of Flora and Fauna

- a) The indigenous vegetation encountered on the site, specifically the southern portion of the proposed site, is to be conserved and left intact as far as possible.
- b) Where off-road driving is necessary, attempts to follow fence lines and animal tracks shall be made at every possible opportunity.
- c) Clearing should be kept to the minimum and must take place in a phased manner (i.e. each test pit should be dug and backfilled immediately after use), to ensure proper rehabilitation and to enable animal species to move into safe areas and to prevent wind and water erosion of the cleared areas.
- d) Test pits shall be placed in areas with the least impact on natural vegetation as possible, preferably on bare sand patches where possible.
- e) The removal of big trees and shrubs will be avoided as far as possible. Only trees and shrubs directly affected by the works, and such others as may be indicated by the Engineer/Consultant in writing, may be cleared.
- f) Where indigenous trees/shrubs must be removed, this should be done carefully in order for replanting to be possible. This should be done by loosening the soil around the base of the plants using a pick and spade and the plants removed making every effort to keep the root mass intact. These should be replanted and watered as soon as possible after the test pit has been investigated and backfilled.
- g) Exotic alien plant species shall be removed within the areas impacted upon by the activities. Removal of alien plants shall be done according to the Working for Water Guidelines.
- h) Rehabilitation of vegetation on the site will be done as described in the Rehabilitation Plan (section 6.8.1).
- i) Where necessary, permits for the protected flora must be obtained from the respective departments timeously:

Department of Water Affairs and Forestry (DWAF) for NFA permits	Department of Economic Development and Environmental Affairs (DEDEA) for PNCO permits
Contact person: Mr Thabo Nokoyo	Contact person: Mr Alan Southwood
Tel: 041 586 4884	Tel: 041 508 5800
Fax: 041 586 0379	Fax: 041 585 1964/585 1958
Email: nokoyot@dwaf.gov.za	Email: alan.southwood@deaet.ecape.gov.za

- j) Fauna disturbed by the prospecting process on the site shall be carefully and safely removed from site to an equivalent environment.
- k) No animals shall be harmed during the course of mining.
- l) No workers will be allowed to collect any plant or snare any animal. All animal life, vegetation, firewood, etc., will remain the property of the land owner and will not be disturbed, upset or used without their express consent.

- m) Staff will not sleep on the site and will be supervised at all times.
- n) No domestic animals will be permitted on site.

6.5.2 Soil Aspects

- a) Topsoil shall be removed from all test pits and areas where physical disturbance of the surface will occur. Topsoil means that layer of soil covering the earth and which provides a suitable environment for the germination of seeds, allows the penetration of water, and is a source of micro organisms, plant nutrients and in some cases seed.
- b) Topsoil shall be stockpiled in nearby areas in such a way that it will not cause damming up of water or washaways, or wash/blow away itself. Piles will not exceed a height of 2 meters and shall be managed so as to maintain the regrowth potential of the topsoil.
- c) The overburden, i.e., that layer of soil immediately beneath the topsoil, will be removed and stored separately from the topsoil.
- d) The overburden shall be used to backfill the test pits immediately after each test pits was used and investigated.
- e) The topsoil shall be placed on the exposed subsoil as soon as the test pits were backfilled and shall be watered to enhance the regrowth of vegetation on these areas.
- f) No chemical pollution shall be allowed to contaminate the soils; any plant equipment found to be attributing to this shall be removed from the site and repaired.
- g) In the event of a petrochemical (diesel, oil, fuels, etc.) spill, the Engineer/Consultant must take suitable measures to contain the pollution and prevent it from spreading or seepage. Once the spill has been contained, contaminated material (soil, etc.) shall be removed and disposed of at a registered hazardous waste disposal site.

6.5.3 Stormwater and Erosion Control

- a) No planned drainage works are required as surface water is expected to drain naturally.
- b) Each test pit should be investigated and backfilled as soon possible to limit potential erosion opportunities of the pits and topsoil stockpiles.
- c) During rehabilitation the ground should be flattened and restored to its original slope.
- d) Existing vegetation must be retained as far as possible to minimize erosion problems. Where off-road driving is necessary, attempts to follow fence lines and animal tracks should be made.
- e) Rehabilitation of test pits shall be planned and completed in such a way that the runoff water (if any) will not cause erosion (see section 6.8.1).
- f) Visual inspections shall be done on a ongoing basis during the prospecting operations with regard to the erosion and siltation
- g) No river or surface water will be affected by silt emanating from the test pits.
- h) Groundwater will not be affected by the proposed test pits.

- h) SAHRA must be notified in the event that additional graves are located during construction and operation and obtain permits for relocation of graves.

6.5.5 Visual Aspects

- a) The test pits shall only be visible temporarily and will be rehabilitated as soon as possible after each test pit was used.
- b) High visibility of each test pit is considered to be a positive attribute as it is required to prevent people and animals from accidentally falling into the pits.
- c) On completion of the project, all structures, equipment and vehicles shall be demolished and/or removed from the site.
- d) Care must be taken to ensure that all rehabilitated areas merges with the immediate environment and any negative visual impacts will be rectified to the satisfaction of the Regional Manager.
- e) Overburden will be placed back into excavation as part of the rehabilitation programme (see section 6.8.1).

6.5.6 Noise

- a) Construction activities shall be kept to normal working hours when residents are at work or in school (i.e. 6:00 to 18:00, Monday to Saturday) according to the Noise Control Regulations in terms of the Environmental Conservation Act (Act 73 of 1989). The hours of the activities will be reviewed on receipt of complaints (if any).
- b) Compliance with the appropriate legislation with respect to noise is mandatory.
- c) Well- maintained equipment and vehicles shall be used.
- d) In the event that activities continue outside the stipulated hours the Engineer/Consultant will communicate such occurrences to potentially affected communities (if any) prior to commencing such activities.
- e) A complaints register should be made available on site, should members of the surrounding communities wish to lodge complaints. In the event of a complaint being recorded the Engineer/Consultant will deal with the complaint appropriately and timeously.

6.5.7 Dust

- a) Dust caused due to the excavation of test pits should be minimal and for a short period.
- b) A dust complaints register will be developed to manage complaints relating to impacts on nearby residents.

6.5.8 Waste Management, refuse disposal and toilet facilities

- a) Sufficient weather and scavenger- proof bins (with lids, to prevent the escape of litter) shall be provided, and be easily accessible at all points were wastes are generated.
- b) The site shall be kept clean and free of litter and no litter from the site shall be allowed to disperse to surrounding areas.
- c) All personnel shall be instructed to dispose of all waste in the proper manner.

- d) The Engineer/Consultant shall identify and separate materials that can be reused or recycled to minimise waste e.g. metals, packaging and plastics, and provide separate marked bins for these items.
- e) All waste (construction and domestic waste) shall be stored in a container at a collecting point and collected on a weekly basis and disposed of at a recognised disposal facility near Paterson.
- f) No dumping within the surrounding area shall be permitted, and no waste may be buried or burned. Where potentially hazardous substances are to be disposed of, a safe disposal slip shall be kept on record as proof of final disposal.
- g) As a minimum requirement, the holder of the prospecting right shall, at least, provide pit latrines for employees in such a way that they do not cause water or other pollution and proper hygiene measures shall be established.
- h) The use of any existing facilities must take place in consultation with the landowner.
- i) 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.

6.5.9 Fires

- a) Smoking shall only be allowed in designated areas.
- b) Visual awareness of surroundings must be maintained.
- c) Sufficient fire-fighting equipment (e.g. fire extinguishers) shall be maintained and be accessible on site at all times.
- d) In the event that the fire is too large for the on-site personnel to control, the Fire Brigade shall be called to extinguish it.

6.6 Excavations

Excavations shall be done as described in section 2.4 of this document. Whenever excavation of the test pits is undertaken, the following operating procedures shall be adhered to:

- a) It is suggested that excavation commence at the access and then advance rapidly therefrom.
- b) Excavations shall take place only within the approved demarcated prospecting area.
- c) Topsoil shall, in all cases be handled as described in section 6.5.2 above.
- d) Overburden rocks and coarse material shall be placed concurrently adjacent to the excavation, to be used as backfill material once the required investigation has been done.
- e) Excavations shall not be used for the dumping of wastes.
- f) Rehabilitation of excavated areas shall be done according to the Rehabilitation Plan in section 6.8.1 below.

6.7 Labour and Affected Parties

6.7.1 Labourers on Site

- a) The Engineer/Consultant shall ensure that their staff is trained regarding the Safety Health and Environmental (SHE) procedures to be followed on site. Penalty clauses for transgressions shall also be considered in this regard.
- b) The Engineer/Consultant shall ensure that the standard safety measures as stipulated in the Mine, Health and Safety Act are complied with.
- c) All employees and contractors shall be briefed about appropriate road safety measures. Penalties and disciplinary actions will be imposed on employees and engineers for non compliance with safety, environmental and social measures.
- d) Workers should remain in the determined prospecting site and not enter any other farm or areas outside the site without consent.

6.7.2 Other Affected Parties

- a) Any complaints, if they arise, will be timeously dealt with. This will require the joint formulation of compliance contracts and grievance procedures and project-specific communication mechanisms (for example keeping of a complaints register).
- b) Inadvertent access to construction areas shall be prevented. Such areas will be strictly controlled using warning signs and access control.

6.8 Rehabilitation and Closure

6.8.1 Rehabilitation Plan

6.8.1.1 Rehabilitation schedule

- a) Each test pit will be backfilled immediately after completion of the logging and sampling thereof.
- b) An initial inspection will take place on completion of the prospecting process to ensure that all specified rehabilitation measures have been complied with.
- c) Final rehabilitation and inspection will take place after a period of three months after completion of the project in order to ensure adequate rehabilitation of vegetation.

6.8.1.2 General requirements

- a) Rehabilitation will be restricted to new excavation areas.
- b) The objective of rehabilitation will be to restore the test pits to their present condition.
- c) Rehabilitation shall be done separately for each test pit immediately after the necessary investigations in the test pits have been completed.
- d) Waste (non-biodegradable refuse) will not be permitted to be deposited in the excavations.

6.8.1.3 Surplus material and topsoil

- a) On completion of each test pit, all surplus material in and around the excavation, including any stockpiled sand/gravel or rocks, but excluding topsoil, shall be backfilled into the pit.

- b) The topsoil stockpiled prior to excavation shall be spread evenly over the backfilled areas, to merge with the natural topography of the site and to a thickness of not less than 75 mm.
- c) The topsoil must be keyed into the re-profiled surfaces to ensure that they are not eroded or washed away.
- d) The top-soiled surface shall also be left fairly rough to enhance seedling establishment, reduce water run-off and increase infiltration.
- e) The rehabilitated land will merge with the immediate environment, and any negative visual impact will be rectified to the satisfaction of the Regional Manager.
- f) After spreading of the topsoil, the soil should be watered to enhance regrowth of vegetation.

6.8.1.4 Revegetation

- a) Revegetation in a large degree should not be required as indigenous trees/shrubs shall be avoided and test pits shall mostly be positioned on bare sand areas as far as possible.
- b) Where indigenous trees/shrubs must be removed, this should be done carefully in order for replanting to be possible. These should be replanted and watered as soon as possible after the test pit has been investigated and backfilled.
- c) After spreading of the topsoil on the backfilled test pits, the soil should be watered to enhance regrowth of vegetation.
- d) No seeding of replaced topsoil should be required, as topsoil will not be stored for a period longer than 12 months. Once replaced, the topsoil will be left to revegetate naturally unless the process does not occur unaided or if significant topsoil erosion occurs.
- e) During monitoring visits alien vegetation that grew from the closed test pits should be removed.
- f) No alien species shall be planted at any time in this area.

6.8.1.5 Drainage works/erosion protection

- a) Areas where prospecting is completed shall be rehabilitated immediately to reduce the opportunity for erosion.
- b) The final surface level shall be restored to merge with the natural topography and to be free draining.
- c) Runnels, erosion channels or wash-aways developing after rehabilitation shall be backfilled and consolidated and the areas restored to a proper stable condition.

6.8.1.6 General site clean-up

- a) All infrastructure, equipment, plant, fencing, temporary services and foreign materials shall be removed from the site (according to section 44 of the MPRDA)
- b) Waste material of any description, including receptacles, scrap, rubble and tyres will be removed entirely from the prospecting area and disposed of at a recognised landfill facility. It will not be permitted to be buried or burned on the site.
- c) The prospecting area will be kept in a neat and tidy condition at all times.

6.8.1.7 Additional measures

- a) No construction equipment, vehicles or unauthorised personnel shall be allowed onto areas that have been finished off.
- b) Only persons or equipment required for the preparation of areas, application of fertiliser and spreading of top material shall be allowed to operate on these areas.
- c) Where fences have been damaged, permanent, stock-proof fencing shall be erected/reinstated adjacent to farm land and alongside the road.

6.8.2 End Use

Rehabilitation of the test pits should be restored to mimic the surrounding environment and no end use for the specific areas is prescribed. After rehabilitation the site will be used for agricultural purposes (grazing) as before.

6.8.3 Monitoring and Maintenance Programme

- a) As the proposed prospecting operations would be a very quick process (approximately one month), ongoing monitoring throughout the prospecting process should not be necessary.
- b) An initial inspection will take place on completion of the prospecting process to ensure that all specified rehabilitation measures have been complied with.
- c) A final inspection will take place after a period of three months after completion of the project in order to ensure adequate rehabilitation of vegetation.
- d) A final performance assessment report will be submitted to the DMR when the above-mentioned activities have been completed.

6.8.4 Closure

The proposed prospecting operations should be a very quick process of approximately one month. When all the proposed activities have been completed, a final performance assessment report will accompany the closure of the prospecting right notification to the DMR.

6.9 Safety and Security

It is noted that this EMP is not a Health & Safety Plan. It is the Engineer's/Consultant's responsibility to ensure that a Health & Safety Plan, as per the requirements of the Occupational Health & Safety Act, is prepared prior to any physical work occurring on the site. Safety in terms of labourers on site is discussed in section 6.7. In general, the Engineer/Consultant shall maintain the test pits such that they do not become a danger to persons or livestock. The Engineer/Consultant shall at all times observe proper and adequate safety precautions on the site and shall be deemed to be responsible for security of the site.



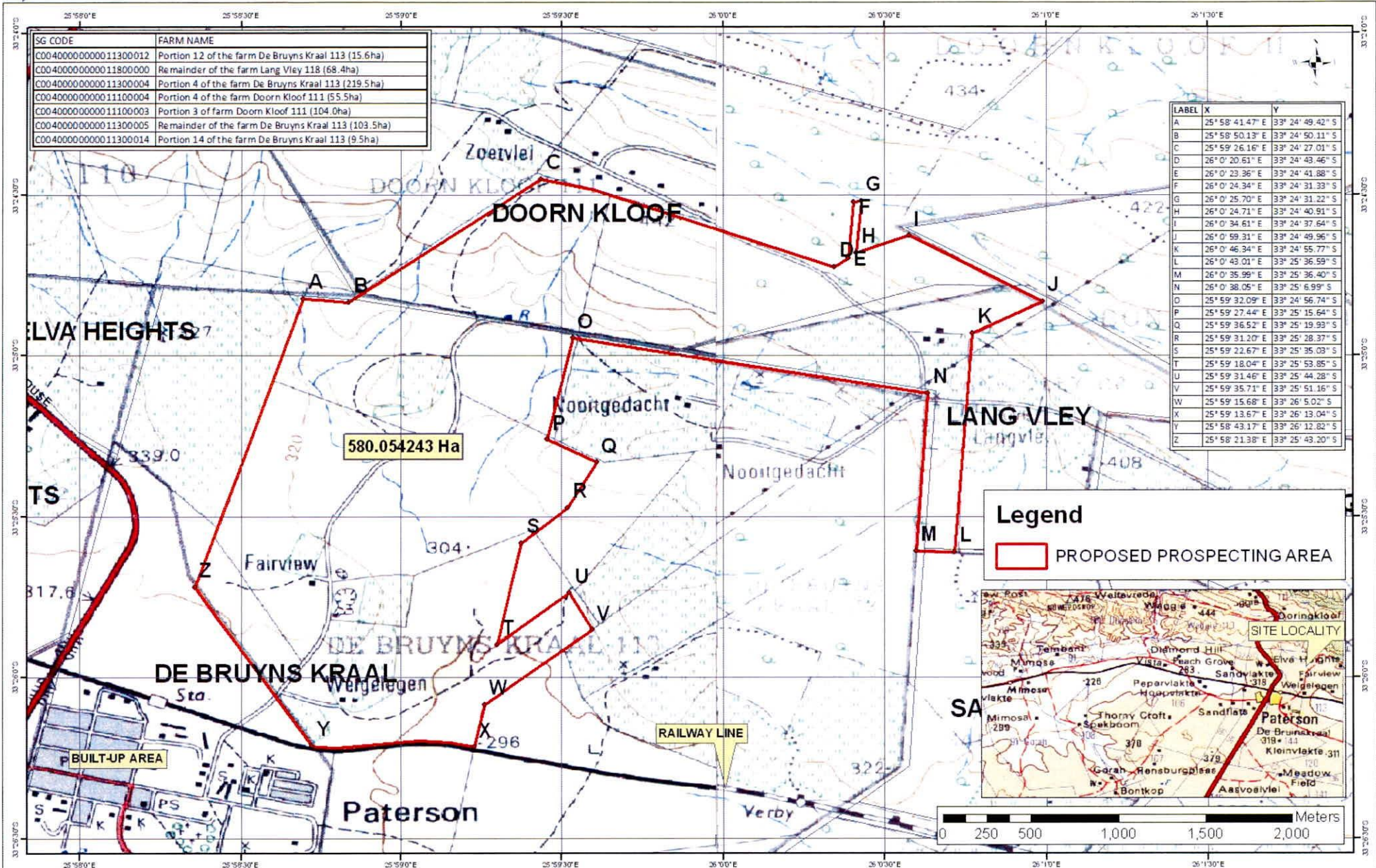
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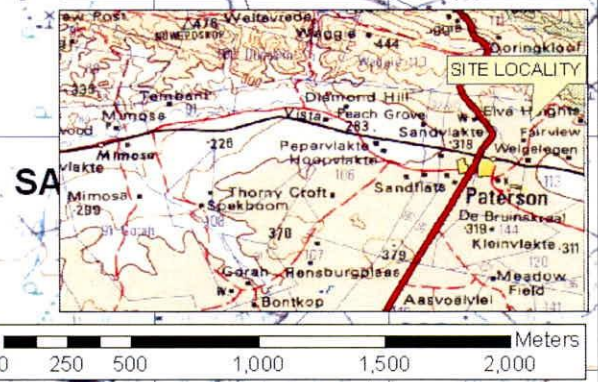
Appendices

Appendix A – Site Locality Plans



Legend

PROPOSED PROSPECTING AREA



Project No:	Datum:
411600	WGS
	Projection:
	WGS84
	Central Meridian/Zone:
	LC25

VCM QUARRY
SITE LOCALITY FOR DIFUSI LAND TRUST PROPERTIES

Date:	Scale on A3:
13/05/2010	1:20,000
Compiled by:	Fig No:
VANE	001