



**the dme**

Department:  
Minerals and Energy  
REPUBLIC OF SOUTH AFRICA

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Reference:  
Date:

(EC)30/5/1/3/3/2/1(0394)EM  
11 December 2009

South African Heritage Resources Agency  
P.O. Box 758  
GRAHAMSTOWN  
5200

ATTENTION: MR. T. LUNGILE

*Case ID: 2434*

Sir

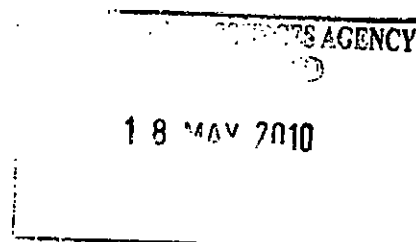
**CONSULTATION IN TERMS OF SECTION 40 OF THE MPRDA OF 2002:  
ENVIRONMENTAL MANAGEMENT PLAN IN SUPPORT OF AN APPLICATION TO  
MINE SAND AND CLAY ON PORTION 19 OF FARM 850, DIVISION OF EAST  
LONDON, EASTERN CAPE**

1. Mr van Loggerenberg has applied for a mining permit on the above-mentioned area.
2. Attached is the EMP for your comment.
3. Please forward any written comments or requirements your department may have on this application, to this office no later than 7 February 2010. Failure to do so will lead to the assumption that your Department has no objection(s) or comments with regards to the application.
4. Consultation on this application has been initiated with other relevant State Departments.
5. Kindly quote the relevant file reference number in all correspondence.

Sincerely,

*Atorla*

REGIONAL MANAGER  
EASTERN CAPE



32/0394MP

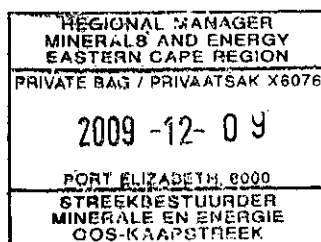
## Application for mining permit Farm 850/19

# ENVIRONMENTAL MANAGEMENT PLAN

Prepared by:



**Coastal & Environmental Services**  
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South Africa



December 2009

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# 1 INTRODUCTION

## MPRDA No. 28 of 2002 Regulations No. R. 527 of 2004

52. (1) An applicant who's application for a prospecting right or mining permit was accepted in terms of the Act, must submit an environmental management plan at the office of the Regional Manager in whose region the application was lodged within 60 days from the date of notification by the Regional Manager.

### 1.1 Current Environmental authorisation in South Africa

The regulation and protection of the environment within South Africa, occurs mainly through the application of various items of legislation, within the regulatory framework of the Constitution (Act 108 of 1996).

The primary legislation regulating Environmental Management within South Africa is the National Environmental Management Act ("NEMA" Act 107 of 1998). When NEMA was initially promulgated provision was made for the Minister of Environmental Affairs and Tourism ("the Minister") to identify **activities which may not commence prior to authorisation** from the either the Minister or the provincial Member of the Executive Council ("the MEC"). In addition to this NEMA also provided for the formulation of regulations in respect of such authorisations.

Due to the nature of the proposed project, the relevant legislation also includes 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).

The over arching principles for Environmental management are however contained in NEMA and as such, the guidelines as set out in GN.R 385 were applied for this Report.

### 1.2 Details and Expertise of Environmental Assessment Practitioner (EAP)

**In terms of section 18 of the EIA Regulations (2006), an EAP must have expertise in conducting environmental impact assessments, including knowledge of the Act, these Regulations and any guidelines that have relevance to the proposed activity.**

In fulfilment of this requirement Coastal and Environmental Services wishes to point to the following expertise of the study team, which includes Dr Alan Carter (Director), Ms Jahne de Wet (Environmental Consultant) and Dr Greer Hawley (Senior Environmental Consultant, Ecological specialist).

**Dr Alan Carter** holds a PhD in Botany and is a registered professional Accountant, with extensive training and experience in both financial accounting and environmental science disciplines with international accounting firms in South Africa and the USA. He has 15 years experience in environmental management and has specialist skills in sanitation, coastal environments and industrial waste. Dr Carter is registered as a Professional Natural Scientist under the South African Council for Natural Scientific Professions and is a certified ISO14001 Environmental Management Systems Auditor.]

**Ms Jahne de Wet**, Environmental Consultant, has a B.Sc in Biochemistry and Microbiology and a Masters degree in Environmental science (Microbiology). She also spent a number of years researching antibiotic and biocide resistance and bacterial air quality, the generation of methane gas from solid municipal waste and a number of other studies including molecular biology and studies related to Occupational health and safety). She has completed a course in Environmental Legislation and has experience in the application and public participation fields. She is currently involved in numerous impact assessments in the East London Branch.

**Dr Greer Hawley**, Senior Environmental Consultant, has a BSc degree in Botany and Zoology and a BSc Honours in Botany from the University of Cape Town. She has submitted her PhD thesis (Microbiology) at Rhodes University. Greer has been involved in a number of diverse activities. The core academic focus has been directed in the field of taxonomy both in the plant and fungal kingdom. The theory of taxonomy and phylogenetic analysis has been applied to further knowledge of species identification and understanding of biodiversity in South Africa.

Greer's research ranges from studying fresh and marine algae, estuarine diatoms, Restio species classification in the fynbos vegetation and fungal species identification and ecology in Pinus plantations. Greer's Microbiological study of fungi have also contributed towards an understanding of soil ecology and "below ground" networks, including plant pathogens, saprotrophic micro-organisms and mutual symbioses (mycorrhiza and bacteria) that provide a living medium for all plant life. She is currently working on numerous impact assessments at the East London branch.

## **1.6 The Proponent**

**Name of person:** Everitt van Loggerenberg

**Name of mine:** N/A

**Physical address:** Farm 850/19

**Postal address:** PO Box 5304, Greenfields, 5208

**Telephone number:** (043) 764 9304

**Fax number:** (043) 745 0396

**E-mail address:** Evritt@gmail.com

**Location of mine:** Farm 850/19

Buffalo City Municipality

Amathole District

Eastern Cape Province

**Commodity:** Sand and Clay

**Life of mine:** 24 months

**Financial year end:** 30 June

## **1.7 Relevant Authorities**

Department of Minerals and Energy- Port Elizabeth

Address: Private Bag X6078, PORT ELIZABETH, 8000

**Tel:** 27(41) 5853862

**Fax:** 27(41) 5853881

0415853887



**the dme**  
Department:  
Minerals and Energy  
REPUBLIC OF SOUTH AFRICA

DME 12  
Private Bag X6078, Port Elizabeth, 6000  
Tel: (041) 396 3500 Fax: (041) 356 3845  
Cnr. Ouz and Meint Roads  
Port Elizabeth, 6001

Enquiries: S van den Berg  
E-mail: Samuel.vandenbergh@dme.gov.za

Reference: EC 30/5/10/20394 MP  
Date: 03 December 2009

**PER REGISTERED MAIL**

Mr E C van Loggarenberg  
Postnet 98  
Private Bag X9063  
East London  
5200

Sir

**APPLICATION FOR A MINING PERMIT IN TERMS OF SECTION 27 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (ACT 28 OF 2002) (MPRDA): SAND (GENERAL) AND CLAY (GENERAL) MINING ON PORTION 19 OF FARM 850, DIVISION OF EAST LONDON, EASTERN CAPE.**

I refer to the above matter and I confirm that your application for a mining permit in terms of Section 27 of the MPRDA has been accepted.

In terms of Section 27(5) of the MPRDA you are therefore required:

- (a) to notify in writing and consult with the landowner or lawful occupier and any other affected party;
- (b) to submit the result of such consultation to this office on or before 02 January 2010 (i.e. within 30 days of this notice); and
- (c) to submit an environmental management plan, in sevenfold, on or before 01 February 2010 (i.e. within 60 days of this notice).

Where State Land is affected by the application, community consultation should be done, and a community resolution should be obtained in conjunction with the Departments of Land Affairs and Traditional Affairs. (See the enclosed list for the relevant contact details.)

Kindly be advised that this notice of acceptance must not be construed as the approval of the Mining Permit, since the process of approval or refusal that will commence on the date of acceptance, must run its course.

Yours faithfully

  
**REGIONAL MANAGER**  
**EASTERN CAPE**  
S.21st MP.394.Lorenberg (in acc)

**FAX** TO: Jahne PAGE: \_\_\_\_\_ OF: \_\_\_\_\_  
 COMPANY: CES  
 FAX NO: 043-742 3306 DATE: \_\_\_\_\_  
 FROM: Paul  
 COMPANY: Ishani PHONE NO: \_\_\_\_\_  
 FAX NO: \_\_\_\_\_

Figure 1.1: Acceptance of application by DME

## 2 PROPOSED ACTIVITY

### 2.1 Property Descriptions and Location of Activity

The proposed activity is situated south of the Bridle drift dam on Farm 850/19, East London. The property is currently used for agriculture.

### 2.2 Details of mining method and equipment to be used

The method to be employed will be strip mining. Strip mining is a method generally used when the deposit to be mined is horizontal or gently dipping and the resource is located within 60 m of the surface. Equipment to be used for the strip mining on Farm 850/19 will be shovels, an excavator and a truck for haulage of sand.

The site to be mined will be divided into four equally sized strips. Mining will start at the strip to the West of the site and will move in small concentric circles within this strip. Once mining on strip 3 has started, rehabilitation of strip 1 must start. Once mining on Strip 4 starts, rehabilitation of strip 2 must so etc. Mining will at all times aim to create gentle slopes and avoid the creation of steep banks as this will make rehabilitation very difficult and will require significant volumes of backfill material.

A haulage truck will not be required for the transport of the sand and clay, as the buyers will themselves come to mining site itself to upload.

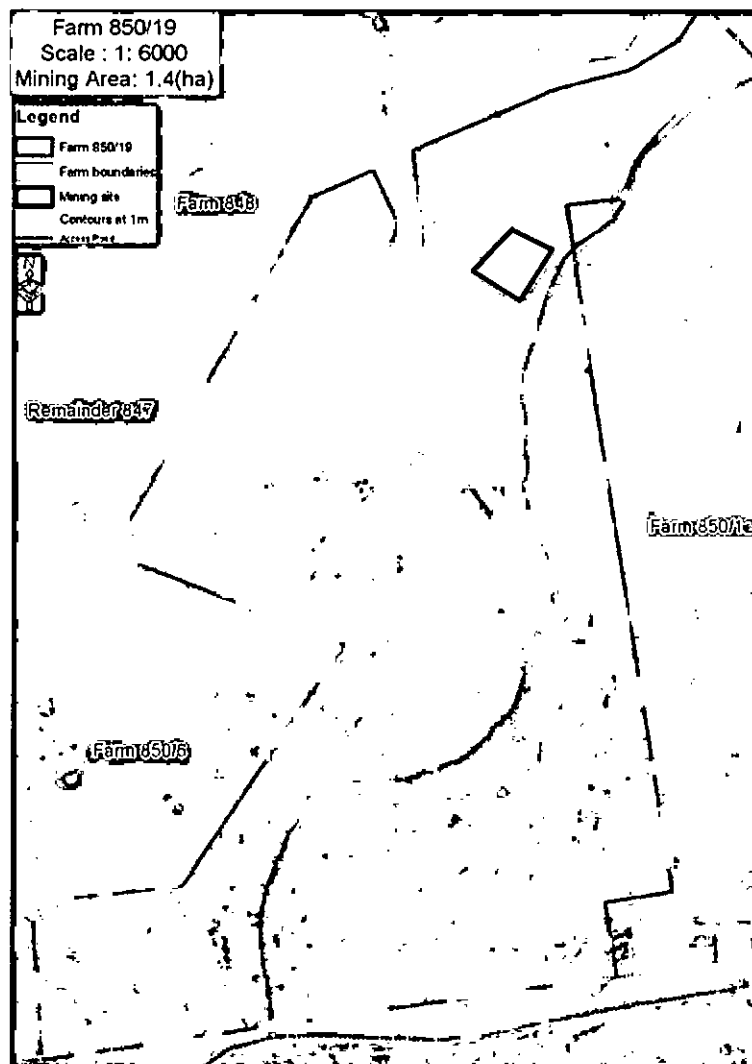


Figure 2.1a: Locality Map in local context



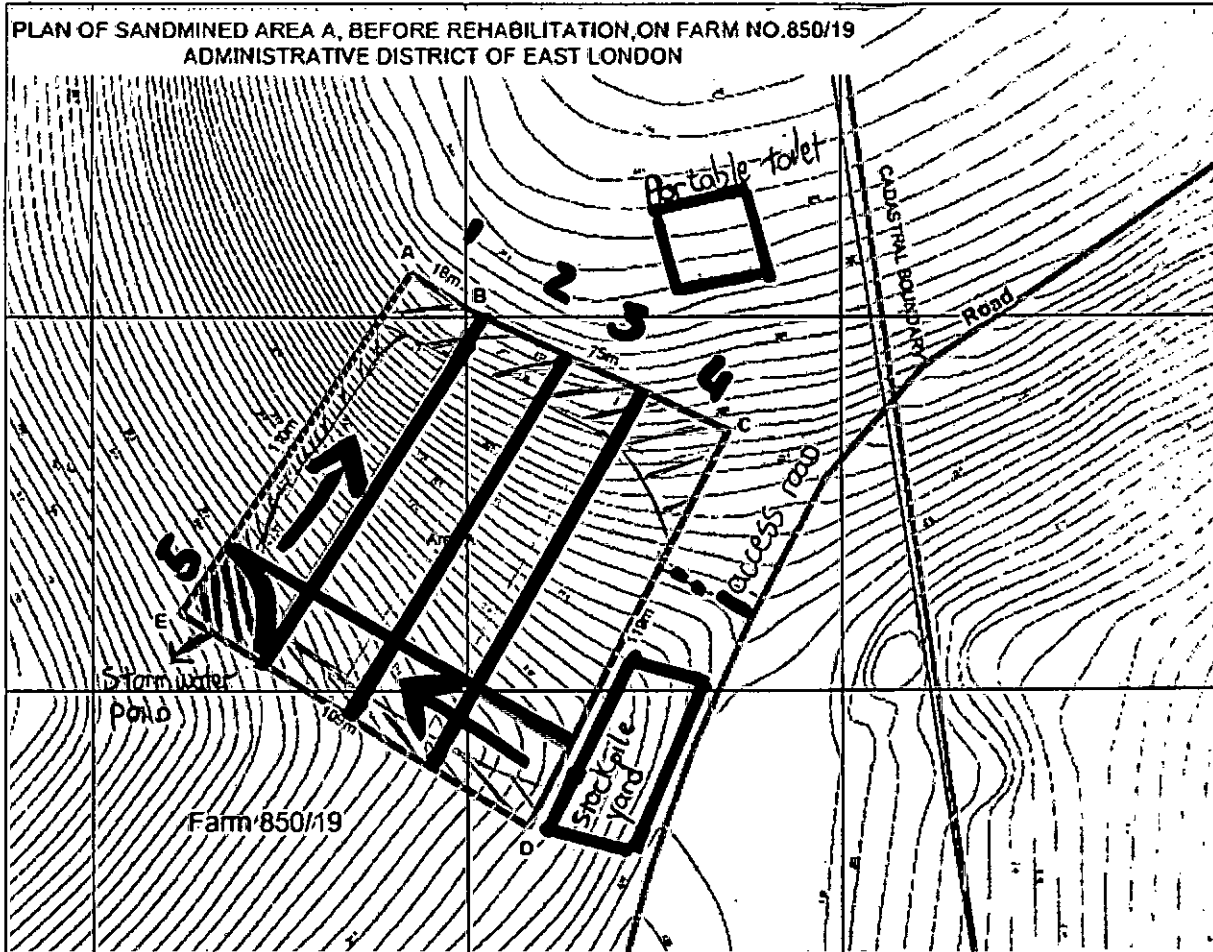


Figure 2.1b: Mining method to be employed

## 3 POLICY AND LEGISLATION

### 3.1 Relevant guidelines and policy

#### 3.1.1 BCM Conservation Plan and Municipal Open Space System (MOSS)(2008)

BCM is currently in the process of finalizing a Conservation Plan and Municipal Open Space System (MOSS). Farm 850/19 is located in an area designated as having MOSS potential. While this does not preclude any activity, environmental and biodiversity conservation principles are relevant and the proponent could be required to zone portions of land with high MOSS potential as **Conservation Land** or **Private Nature Reserve**.

The following limitations are also imposed:

- That no building or structure is placed on any slope greater than 1:5 (as per the BCM Spatial Activity Framework).
- That no building or structure is placed within the 100-year flood-line or, if the flood-line is undetermined, then not within 30m of any watercourse (as per the BCM Spatial Activity Framework; Watercourse: as defined by the National Water Act, 1998).
- Where land is left undeveloped or as open space: that alien flora is removed and indigenous trees and vegetation conserved where possible (as stipulated in the National Environmental Management: Biodiversity Act, 2004).

### 3.2 Relevant legislation

#### 3.2.1 Constitution (Act 108 Of 1996)

As the supreme law of the Republic, any law or conduct that is inconsistent with the Constitution is considered invalid, and any obligation imposed by it must be fulfilled.

In terms of environmental rights and obligations, section 24 of the Bill of Rights states that: "Everyone has the right:

- 1 to an environment that is not harmful to their health or well being; and
- 2 to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that:
  - o prevent pollution and ecological degradation;
  - o promote conservation; and
  - o Secure ecologically sustainable activity and use of natural resources while promoting justifiable economic and social activity.

#### Implications for the proposed activity:

- Obligation to ensure that proposed activity will not result in pollution and/or ecological degradation;
- Obligation to ensure that where possible conservation is promoted; and
- Obligation to ensure that the proposed activity is ecologically sustainable, while demonstrating economic and social activity.

#### 3.2.2 National Environment Management Act (No 107 of 1998) (NEMA)

NEMA creates the legal framework that ensures the environmental rights guaranteed in section 24 of the Constitution.

As such the fundamental principles that apply to environmental decision making are laid out, the core environmental principle being the promotion of sustainable activity (environmental, social and economic). These principles serve as a guideline for any organ of state when exercising any function in the process of decision making under NEMA.

NEMA introduces the **duty of care** concept which is based on the policy of strict liability. This duty of care extends to the prevention, control and rehabilitation of significant pollution and environmental degradation. It also dictates a duty of care to address emergency incidents of pollution. A failure to perform this duty of care may lead to criminal prosecution, and may lead to the incarceration of managers or directors of companies for the conduct of the legal persons.

In addition NEMA introduces a new framework for environmental impact assessments, the EIA Regulations (2006).

#### **NEMA Principles:**

The section 2 principles relevant to be utilised in the process of decision making by DEDEA, are as follows:

(2) Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, cultural and social interests equitably.

(3) Activity must be socially, environmentally and economically sustainable.

(4)(a) Sustainable activity requires the consideration of all relevant factors including the following:

(i) that the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;

(ii) that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;

(iii) that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;

(iv) that waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;

(v) that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;

(vi) that the activity, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised;

(vii) that a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions;

(viii) that negative impacts on the environment and on peoples' environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.

4(b) Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.

4(c) Environmental justice must be pursued so that adverse environmental impacts must not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.

4 (d) Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination

4(e) Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.

4(f) The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured.

4(g) Decisions must take into account the interests, needs and values of all interested and affected parties, and this includes recognising all forms of knowledge, including traditional and ordinary knowledge.

4(h) Community wellbeing and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.

4(i) The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.

4(j) The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.

4(k) Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.

4(l) There must be intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment.

4(m) Actual or potential conflicts of interest between organs of state should be resolved through conflict resolution procedures.

4(n) Global and international responsibilities relating to the environment must be discharged in the national interest.

4(o) The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.

4(p) The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.

4(q) The vital role of women and youth in environmental management and activity must be recognised and their full participation therein must be promoted.

4(r) Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and activity pressure.

Implications for the proposed activity:

- As these principles are utilised as a guideline by the relevant decision makers in ensuring the protection of the environment, the proposed activity should, where possible, be consistent with these principles.
- Where this is not possible, deviation from these principles would have to be very strongly motivated.

**3.2.3 National Water Act (No. 36 of 1998) (NWA)**

The purpose of this Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in an environmentally sustainable way (meeting current human needs as well as the needs of future generations).

*Water Use*

Section 22(2) of the Water Act states "A person who uses water...

- 1 must use the water subject to any condition of the relevant authorisation of that use;
- 2 is subject to any limitation, restriction or prohibition in terms of this Act or any other applicable law;

- 3 in the case of the discharge or disposal of water or water containing waste contemplated in section 21(f),(g), (h) or (j) must comply with any applicable waste standards or management practices prescribed under section 26(l)(h) and (i), unless the conditions of the relevant authorisation provide otherwise,
- 4 may not waste that water,
- 5 must return any seepage, run-off or water containing waste which emanates from that use, to the water resource from which the water was taken, unless the responsible authority directs otherwise or the relevant authorisation provides otherwise (except if irrigating with waste water).

In terms of Section 22 of the NWA a person may only use water **without a licence**:

- 1 if that water use is permissible under schedule 1;
- 2 if that water use is permissible in terms of a general authorisation issued under section 39;
- 3 if the water use is authorised by a licence under this Act; or
- 4 if the responsible authority has dispensed with a licence requirement under subsection (3).

The extent of General Authorisations (GA), the specific requirements and any uses/areas excluded from GA are detailed for all water uses relevant to this project.

#### *Pollution prevention*

Also relevant to the proposed activity is Section 19 of the Act, which deals with Pollution prevention (Chapter 3: Part 4).

The person who owns, controls occupies or uses the land in question, is responsible for taking reasonable measures to prevent pollution of water resources. If the measures are not taken, the catchment management agency concerned, may itself do whatever is necessary to prevent the pollution or remedy its effects and recover all reasonable costs from the persons responsible for the pollution.

The 'reasonable measures' which have to be taken may include measures to:

- 1 cease, modify or control any act or process causing the pollution;
- 2 comply with any prescribed waste standard or management practice;
- 3 contain or prevent the movement of pollutants;
- 4 eliminate any source of the pollution;
- 5 remedy the effects of the pollution; and
- 6 remedy the effect of any disturbance to the bed and banks of a watercourse.

With respect to pollution of rivers, the following definition is relevant when considering the potential impacts of activity on water resource quality. Water resource quality extends to all aspects of a water resource including:

- 1 the quality, pattern, timing, water level and assurance of flow;
- 2 the water quality, including the physical, chemical and biological characteristics of the water;
- 3 the character and condition of the instream and riparian habitat;
- 4 the characteristics, condition and distribution of the aquatic biota.

#### **Implications for the proposed activity:**

##### Water uses

- Any proposed water uses must be specified and registered and/or licensed.
- Any modifications to the drainage line on site must be investigated in terms of water use requirements.

##### Pollution

- The proponents are responsible for taking reasonable measures to prevent pollution of water resources that it owns, controls occupies or uses on the land in question.
- The proponents are required to remedy a situation where pollution of a water resource occurs following emergency incident and where it is responsible for the incident or owns or is in control of the substance involved.
- The proponents must take all reasonable measures to minimise the impacts of the incident, undertake clean-up procedures, remedy the effects of the incident and take measures as directed by the catchment agency.
- Waste created during mining needs to be controlled adequately to negate the impacts on the

ground and surface water.

### 3.2.4 National Forests Act (No 84 of 1998)(NFA)

#### Protected Trees

In terms of section 12(1)(d) of the National Forests Act, 1998 (Act No 84 of 1998) and GN No. 1012 (promulgated under the NFA), no person may, except under licence:

- 1 cut, disturb, damage or destroy a protected tree; or
- 2 possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree.

#### Implications for the current activity:

- Any of the above activities on protected trees would require a licence.

### 3.2.5 Cape Nature and Environmental Conservation Ordinance (No. 19 of 1974)

Protected indigenous plants in general are currently controlled under the relevant provincial Ordinances or Acts dealing with nature conservation. The Eastern Cape falls under the Cape Nature and Environmental Conservation Ordinance (1974). In terms of this Ordinance, a permit must be obtained from Department of Economic Activity and Environmental Affairs (DEDEA) to remove or destroy any plants listed in the Ordinance.

#### Implications for the current activity:

- DEDEA would have to be contacted in order to obtain a permit to remove any protected indigenous plants.

### 3.2.6 Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) & CARA Regulations (1984)

CARA aims to conserve the natural agricultural resources by amongst other things:

- 1 Combating and preventing erosion
- 2 Combating weeds and invader plants

In terms of section 6 of the Act, the Minister may prescribe control measures (regulations) with which all land users have to comply. The control measure may relate to the following:

- 1 the regulating of the flow pattern of run-off water;
- 2 the control of weeds and invader plants;

#### *Control of weeds and invaders*

Category 1 plants are prohibited plants (declared weeds) that are no longer tolerated and must be removed.

Category 2 plant invaders can only be grown in areas demarcated for their growth as they have commercial value, and their growth in these areas qualify as a water use in terms of the NWA.

Category 3 plants (invaders) and can only occur where they existed prior to Regulation 15 of CARA (2001), and not within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. All reasonable measures should be taken to stop these plants from spreading.

*Stormwater*

In terms of Regulation 8, no land user may effect an obstruction that will disturb the natural flow pattern of run-off water or permit the creation of such an obstruction, unless there is sufficient protection against soil erosion by water flow.

Implications for the current activity proposal

- The proponent will be responsible for the control of weeds and invaders.
- Storm-water control must be implemented both during mining and closure.

**3.2.7 National Heritage Resources Act (No 25 of 1999) (NHRA)**

The protection of archaeological and palaeontological sites and material is the responsibility of a provincial heritage resources authority and all archaeological objects, palaeontological material and meteorites are the property of the state.

Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority (South African Heritage Resource Authority – SAHRA).

In term of section 38 (1), any person who intends to undertake a activity categorised as:

- 1 exceeding 5,000 m<sup>2</sup> in extent; or
- 2 the re-zoning of a site exceeding 10,000 m<sup>2</sup> in extent must at the very earliest stages of initiating such a activity, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed activity.

The responsible heritage resources authority must, within 14 days of receipt of a notification:

- 1 if there is reason to believe that heritage resources will be affected by such activity, notify the person who intends to undertake the activity to submit an impact assessment report. Such report must be compiled at the cost of the person proposing the activity, by a person or persons approved by the responsible heritage resources authority with relevant qualifications and experience and professional standing in heritage resources management;
- 2 notify the person concerned that this section does not apply.

Implications for the proposed activity:

The following guidelines are applicable to the activity:

- Any artefacts uncovered during the mining phase must be reported to SAHRA
- No person may alter or demolish any structure or part of a structure, which is older than 60 years or disturb any archaeological or palaeontological site or grave older than 60 years without a permit issued by the relevant provincial heritage resources authority. The age of the stable building on site needs to be determined.
- SAHRA must be informed of the proposed activity and provided an opportunity to comment. This may result in the need for a basic heritage assessment.

**3.2.7 Minerals and Petroleum Resources Activity Act (No 28 of 2002)**

The relevant sections of Mineral and Petroleum Resources Activity Act and its supporting Regulations are summarised below. The onus is on the applicant to familiarise him/herself with the provisions of the full version of the Mineral and Petroleum Resources Activity 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 and actively conduct prospecting operations; comply with requirements of approved EMP, pay prospecting fees and royalties	R 100 000 or two years imprisonment or both
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
<b>Section of Act</b>	<b>Legislated Activity/ Instruction/ Responsibility or failure to comply</b>	<b>Penalty in terms of Section 99</b>
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



## SUMMARY OF RELEVANT LEGISLATION

Act	Summary	Relevance to activity
<b>Constitution (Act 108 Of 1996)</b>	Everyone has the right to a un-harmful environment which must protect for the benefit of future generations. This is achieved through measures such as; preventing pollution and degradation, promoting conservation, promoting sustainable activity and sustainable use of natural resources	Ensure conservation principals are promoted, that the proposed activity is ecologically sustainable and will not result in pollution and/ or ecological degradation.
<b>National Environment Management Act (No 107 of 1998)</b>	NEMA creates the legal framework that ensures the environmental rights are guaranteed The core principal relates to promoting sustainable activity. The duty of care concept extends to prevent, control and rehabilitate pollution and degradation. Failure to perform these duties may lead to criminal prosecution. NEMA also introduces the EIA Regulations (2006)	The proposed activity should be in accordance with the NEMA principals, where this is not possible, reasons for deviation must be strongly motivated
<b>National Water Act (No. 36 of 1998) and pollution prevention</b>	The purpose of this Act is to ensure that the nation's water resources are protected, managed and controlled in an environmentally sustainable way. Also relevant to the proposed activity is Section 19 of the Act which deals with Pollution prevention	Any water use must be investigated, specified, registered and licensed. Proponents are responsible for taking measures to prevent pollution of water resources, undertaking necessary clean up procedures and controlling waste
<b>National Forests Act (No 84 of 1998)</b>	In terms of the act no one without a license can damage a protected tree or any forest product derived from a protected tree	Any activity mentioned in the Act would require a licence
<b>Cape Nature and Environmental Conservation Ordinance (No. 19 of 1974)</b>	A permit is needed to remove or destroy any plants listed in the Ordinance	Contact DEDEA to obtain a permit
<b>Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) &amp; CARA Regulations (1984)</b>	CARA aims to conserve the natural agricultural resources by combating and preventing erosion, weeds and invader plants. No land user must affect the natural flow pattern of run-off water	The proponent will be responsible for weed and invader control, storm water control must also be implemented
<b>National Heritage Resources Act (No 25 of 1999)</b>	The protection of archaeological and palaeontological sites and material is the responsibility of a provincial heritage resources authority and all archaeological objects, These are the property of the state.	Any artefacts uncovered during the mining phase must be reported to SAHRA
<b>Minerals and Petroleum Resources Activity Act (No 28 of 2002)</b>	The proposed mining requires a mining permit in terms of thresholds provided in the Act	All recommendations an instructions contained in the Act must be adhered to and enforced

**Environmental management programme and environmental management plan (As per MPRDA No.28 of 2002)**

- (3) An applicant who prepares an environmental management programme or an environmental management plan must—
- (a) establish baseline information concerning the affected environment to determine protection, remedial measures and environmental management objectives;
  - (b) investigate, assess and evaluate the impact of his or her proposed prospecting or mining operations on—
    - (i) the environment;
    - (ii) the socio-economic conditions of any person who might be directly affected by the prospecting or mining operation; and
    - (iii) any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999), with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act;

**MPRDA No. 28 of 2002 Regulations No. R. 527 of 2004**

52. (2) An environmental management plan, must substantially be in the standard format provided by the Department and must contain-
- (a) a description of the environment likely to be affected by the proposed prospecting or mining operation;
  - (b) an assessment of the potential impacts of the proposed prospecting or mining operation on the environment, socio-economic conditions and cultural heritage, if any;
  - (c) a summary of the assessment of the significance of the potential impacts, and the proposed mitigation and management measures to minimise adverse impacts and benefits;
  - (d) financial provision which must include-
    - (i) the determination of the quantum of the financial provision contemplated in regulation 54; and
    - (ii) details of the method providing for the financial provision contemplated in regulation 53;
  - (e) planned monitoring and performance assessment of the environmental management plan;
  - (f) closure and environmental objectives;
  - (g) a record of the public participation undertaken and the results thereof; and
  - (h) an undertaking by the applicant regarding the execution of the environmental management plan.

#### 4.1 Socio- economic environment

##### *Surrounding Landuse Patterns and Local Economy*

Portion 19 of Farm 850, East London falls within Buffalo City Municipality (BCM), which falls within Amathole District Municipality in the Eastern Cape Province. The site falls outside the urban edge and borders the Bridle Drift dam. The lands are at presently zoned for agriculture use. The nature of other activities in the area is that of agricultural land and nature reserves.

##### *Demographics*

Buffalo City is situated centrally in the Eastern Cape Province. The Province is the second largest in South Africa, covering some 169,580 square kilometres, or 13, 9% of South Africa's total land area. Buffalo City is the key urban centre of the eastern part of the Eastern Cape. It consists of a corridor of urban areas, stretching from the port city of East London to the east, through to Mdantsane, and reaching Dimbaza in the west. Buffalo City's land area is approximately 2,515 km<sup>2</sup>, with 68km of coastline. East London is the primary node of this corridor, while the King Williams Town area is the secondary node. This urban corridor also contains a wide band of rural areas on either side of the corridor.

In terms of the 2001 Census, Statistics South Africa (Stats SA), estimates that the total population of Buffalo City, was 701 890, however based on these official statistics, the Growth and Activity Summit (2007) Socio-Economic Profile, estimates that Buffalo City accounts for about 42% of the total population of the Amathole District. The Buffalo City Activity Strategy (2006), in turn estimates that the annual population growth of Buffalo City is 0.6%. Based on the official statistics and calculated at an annual growth rated of 0.6% over seven years, the current population of Buffalo City could be in the region of 995 600 people.

Unemployment within BCM is high with almost one third of adults being unemployed. Up to 70% of households earn less than R1, 500 a month. The average monthly household income is just over R2, 655. The average African household's income is about R2, 800 and for white households it is about R10, 500. The government, community services, finance, manufacturing and trade sectors employ most people and employment within the informal sector is steadily increasing. The greatest threats to employment and the economy are lack of skills, HIV/AIDS and lack of the labour force's adaptability. In terms of education, more than 40% of people have completed Grades 8 to 12 in school. Almost 10% of adults have never been to school, and about the same percentage have some sort of post-matric education.

#### 4.2 Sites of historical/cultural/archeological value

*SAHRA have requested a site visit and will consequently submit a Heritage assessment report*

#### 4.3 Bio-physical environment

##### 4.3.1 Topography and geology:



**Plate 4.1:** Slope of South Western end of site

The geology of the region predominantly comprises the Beaufort Group of the Karoo Supergroup. This Supergroup was deposited between 310 – 182 million years ago (i.e. Late Carboniferous to Middle Jurassic Periods) in association with the large and deep inland Karoo Sea that was present across most of South Africa at the time.

The Beaufort Group of rocks represents the middle sequence of five groups of rock forming the Karoo Supergroup and was deposited approximately 250 million years ago. Specifically, the Beaufort Group was deposited during the time when the Karoo Sea was largely silted up and large meandering rivers crossed extensive floodplains: sand, silt and mud were deposited in varying dominance during this time.

Thick, weathered dolerite sills are a prominent feature of Karoo Supergroup deposits – such as at Umtiza and Fort Pato. These sills (and dykes) were formed 182 million years ago as the fragmentation of Gondwana, the supercontinent, commenced and magma was injected into and onto the Karoo Supergroup rocks. Two episodes of coastal uplifting occurred approximately 20 million and 5 million years ago. These episodes lead to rivers generally cutting a deeper incised landscape while retaining their meandering pattern, as can be seen on the Tyolomnqa and Buffalo River

An analysis of the soils on site was conducted by ControlLab (East London). The results are presented in Figure 4.1. The analysis indicates that there are sufficient sand deposits to mine economically.

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**CONTROLAB cc**

CIVIL ENGINEERING MATERIALS AND  
GEOTECHNICAL LABORATORY



ISO/IEC 17025:2005 Accredited Laboratory  
10308

OTHER BRANCH OFFICES: Cape Town, Kokstad, Mthatha, Port Elizabeth

CLIENT: Inno-Vasion T/A  
Everitt Scrape  
P O Box 18381  
QUIGNEY  
5211  
ATT: Mr E Loggerenberg

PROJECT: FARM MT COKE ROAD  
DATE RECEIVED: 2009-08-26  
DATE TESTED: 2009-09-07  
DATE REPORTED: 2009-09-08  
TEST REPORT NO.: 49034  
OIN:

**MATERIALS TEST REPORT**

SAMPLE NO:	8737				
POSITION / CHAINAGE	Delivered				
DESCRIPTION	dk R O				
	dec Dol +				
	clay s				

Slave Analysis (Wet Preparation) TMH1 - Method A1 (a)

% PASSING 75 mm					
63 mm					
53 mm					
37.5 mm					
26.5 mm					
19 mm	100				
13.2 mm	98				
4.75 mm	88				
2.00 mm	72				
0.425 mm	39				
0.075 mm	21.8				

Soil Mortar Analysis - TMH1 - Method A5

COURSE SAND (%)	46				
FINE SAND (%)	24				
SILT / CLAY (%)	30				
GRADING MODULIUS	1.67				

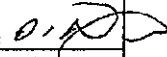
Atterberg Limits - TMH1 - Methods A2, A3, A4

LIQUID LIMIT (%)	32				
PLASTICITY INDEX (%)	12				
LINEAR SHRINKAGE (%)	6.0				

Maximum Dry Density & Optimum Moisture Content - TMH1 - Method A7 / California Bearing Ratio - TMH1 - Method A8

Maximum Dry Density (kg/m <sup>3</sup> )	2000				
Optimum Moisture Content (%)	13.2				
C.B.R. @ 100% COMPACTION	51				
C.B.R. @ 98% COMPACTION	44				
C.B.R. @ 95% COMPACTION	36				
C.B.R. @ 93% COMPACTION	31				
C.B.R. @ 90% COMPACTION	25				
SWELL @ 100% COMP. (%)	0.20				
TRH 14 CLASSIFICATION	G6				

The above test results are pertinent to the samples tested only. While the tests are carried out according to recognized standards, Controlab shall not be liable for erroneous testing or reporting thereof. This report may not be reproduced except in full without prior consent of Controlab.

Technical Signatory:   
RS Nkhu

Remarks:  
Sample Delivered by Customer   
Sampled by Controlab

Page 1 of 2

TR001

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OTHER BRANCH OFFICES: Cape Town, Kokstad, Mthatha, Port Elizabeth

CLIENT: Inno-Vasion T/A  
Everitt Scrape  
P O Box 18381  
QUIGNEY  
5211

PROJECT: FARM MT COKE ROAD

DATE RECEIVED: 2009-08-26  
DATE TESTED: 2009-09-05  
DATE REPORTED: 2009-09-08

ATT: Mr E Loggerenberg

TEST REPORT NO.: 49034

**FOUNDATION INDICATOR REPORT**  
NON ACCREDITED TEST

SAMPLE NO	6738	6739	6740		
POSITION	Delivered				
DESCRIPTION	dk Br	dk Ol	dk Br		
	sty cl	Ferr + sdy cl	sty cl		

**SIEVE ANALYSIS % PASSING SIEVES: Method: TMH1 A1(a) & A5**

% PASSING	75 mm				
	37.5 mm				
	19 mm				
	9.5 mm				
	4.75 mm		100		
	2.36 mm	100	98	100	
	1.18 mm	99	88	99	
	0.600 mm	98	84	98	
	0.425 mm	98	83	97	
	0.300 mm	97	83	96	
	0.150 mm	93	80	93	
	0.075 mm	79.1	66.6	81.2	

**HYDROMETER ANALYSIS: Method ASTM D422**

	0.06 mm	68	57	71	
	0.02 mm	47	37	54	
	0.006 mm	35	27	43	
	0.002 mm	32	24	40	

**ATTERBERG LIMITS: Method: TMH1 A2 ; A3 & A4**

LIQUID LIMIT	46	55	53		
PLASTICITY INDEX	22	25	25		
LINEAR SHRINKAGE	11.5	11.0	10.0		

**PREDICTION OF HEAVE (VAN DER MERWE METHOD)**

PI WHOLE SAMPLE	22.0	21.0	24.0		
ACTIVITY	0.7	0.9	0.6		
POTENTIAL EXPANSIVENESS	MED	MED	MED		

The above test results are pertinent to the samples received and tested only.

While the tests are carried out according to recognized standards Controlab shall not be liable for erroneous testing or reporting thereof. This report may not be reproduced except in full without prior consent of Controlab.

Remarks:

Samples Delivered by Customer: YES

Sampled by Controlab

Technical Signatory:

RS Nichol

Figure 4.1: Soil analysis conducted for the proposed mining site

### 4.3.2 Ecological State

#### Subtropical Thicket Ecosystem Programme (STEP)

The aim of STEP was to assess regional biodiversity in the south-eastern Cape, with special emphasis on the Thicket biomes. It determined what biodiversity we will lose if we continue with unrestricted activity and misuse of land.

Large areas of BCM and coastal areas are classified in terms of STEP as Conservation Network Areas, and as such the general land-use recommendations of STEP should be applied as described below.

#### Purpose of STEP

- I. *to ensure the persistence of biodiversity* - The Megaconservancy Networks (MCN) (or, for short, the Network) comprise corridors of land along major river valleys and the coast which were identified as needing special safeguarding to ensure the sustainability of socio-economic systems and biodiversity. To achieve this, a co-operative strategy for conserving these corridors or pathways and enhancing livelihoods has been developed.
- II. *to ensure the retention of biodiversity* - The outlying land not included in the Network has been categorized into areas of different conservation status (i.e. the degree to which each area's biodiversity is endangered and therefore an indicator of the need for safeguarding) with guidelines for appropriate land-use.

All applications for activity (including subdivisions) within the STEP Network areas and outside of the Urban Edge should require a full EIA as contemplated in NEMA (although this requirement is ultimately subject to the consideration of DEDEA).

#### STEP Vegetation Map

The STEP programme has also produced a vegetation map for most of the Eastern Cape including the BCM area that shows the distribution of various "thicket" vegetation-types in BCM some of which are unique to the area. In terms of this vegetation map, Farm 850/19 falls within a thicket vegetation-type described as Buffels Valley Thicket

#### Endemic plant species

Endemic species are species that can be found nowhere else, for example, species that are found in a single river catchment or on a single mountain or mountain range. There are a number of levels of endemism that can be characterised based on the area in which the species is found. These include for example, endemism to Africa, to Southern Africa, to South Africa, to the Eastern Cape and on a smaller scale the Amatola Mountains within the Eastern Cape.

#### Species of special concern

Species of special concern in this report are considered as plant species which are endangered, vulnerable and/or protected. Listed plant species that are found occurring on site are compared to the list of Endangered/Protected Species List that can be on the South African National Biodiversity Institute Red Data List (October 2007).

The proposed activity site itself is impacted by agriculture, however the immediate surrounding vegetation is characterised by Buffels thicket. As the vegetation types are likely to be directly or indirectly impacted by the proposed activity, it is necessary to determine the impact of potential damage to vegetation both in terms of species and ecological sensitivity. It is also important to document the current state of the vegetation in terms of their species composition. The absence or presence of rare or endangered plant species (or even vegetation groups) will direct and inform necessary management requirements.

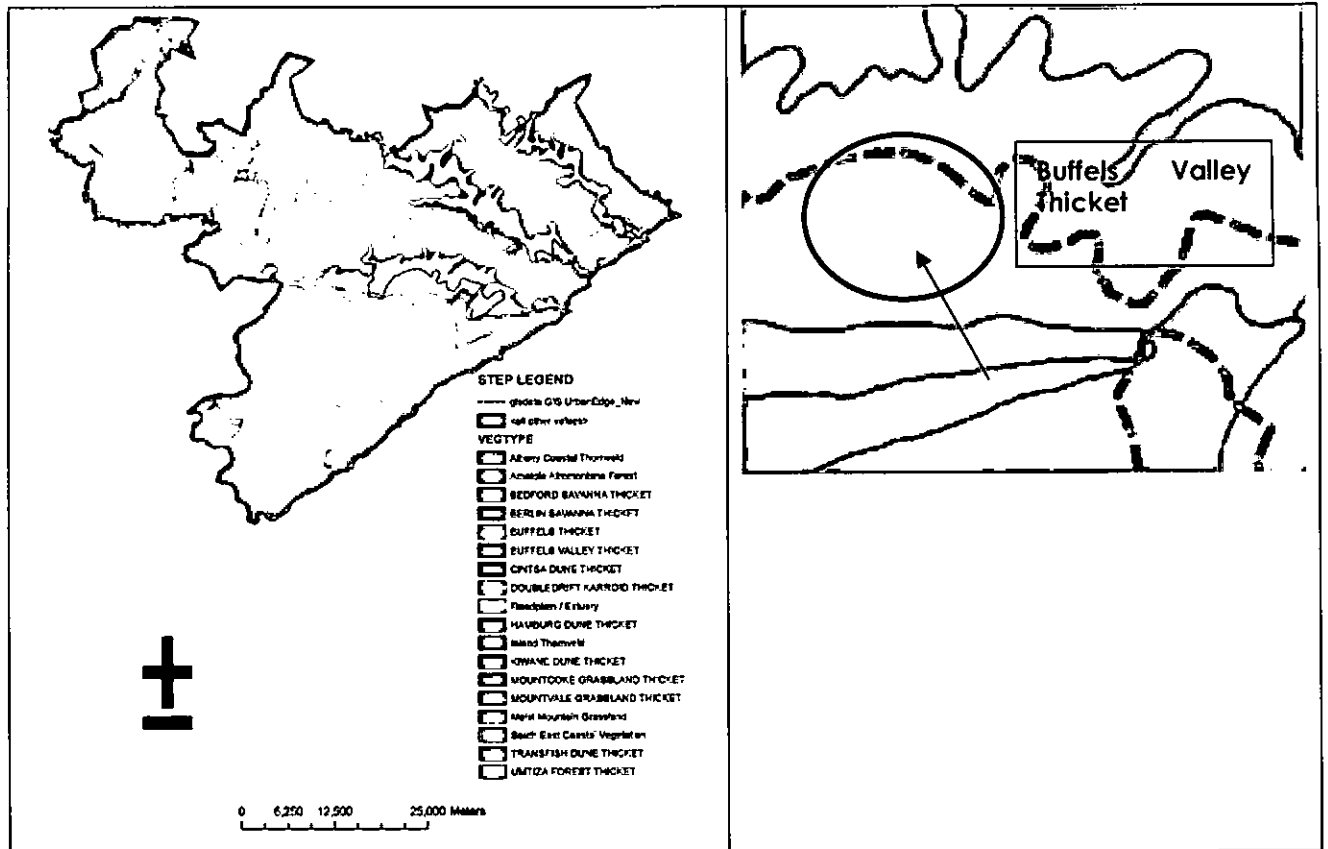


Figure 4.2: The distribution of the vegetation types in terms of STEP with location of Farm 850/19 encircled

**Buffels Thicket**

Dominant species include wild plum (*Harpephyllum caffrum*) and tree euphorbias (*Euphorbia triangularis*). The high cover of hook-thorn (*Acacia caffra*) and presence of forest trees such as coral tree (*Erythrina caffra*) and boxwood (*Buxus macowanii*), and of the understorey plants, dragon tree (*Dracaena aletriformis*) and cycad (*Encephalartos villosus*) are distinguishing features.



Plate 4.2: Buffels Thicket surrounding the site

### **STEP Conservation Plan**

STEP also provides guidelines to assist municipal managers and planners in environmental planning and in achieving conservation targets. The natural environment has been classified in terms of conservation importance with Class I having the highest and Class IV the lowest conservation priority.

- I. Critically Endangered Ecosystems
- II. Endangered Ecosystems
- III. Vulnerable Ecosystems
- IV. Currently Not Vulnerable Ecosystems

- I. Mega-conservancy networks
- II. Critical Ecosystem Process Areas
- III. Protected Areas
- IV. Impacted Areas

### **Eastern Cape Biodiversity Conservation Plan**

Although a number of landscape-scale conservation planning projects had been undertaken in the Eastern Cape prior to the ECBCP, there were large areas of the Province that were excluded. In addition, much of the information in these plans was not readily available to land use planners and decision-makers. To address these needs, as well as to provide a basis for future bioregional plans, the ECBCP has been developed. Its aim is to integrate information from existing biodiversity plans and to fill in the gaps, thereby providing a single, user friendly, biodiversity land use decision support tool for the whole Province.

In terms of the recently completed South African National Botanical Institute's (SANBI) vegetation distributions, BCM is represented by 10 different vegetation types. In terms of Farm 850/19, the area is dominated by Buffels Thicket (AT12) - located mostly along estuaries and river courses in BCM.

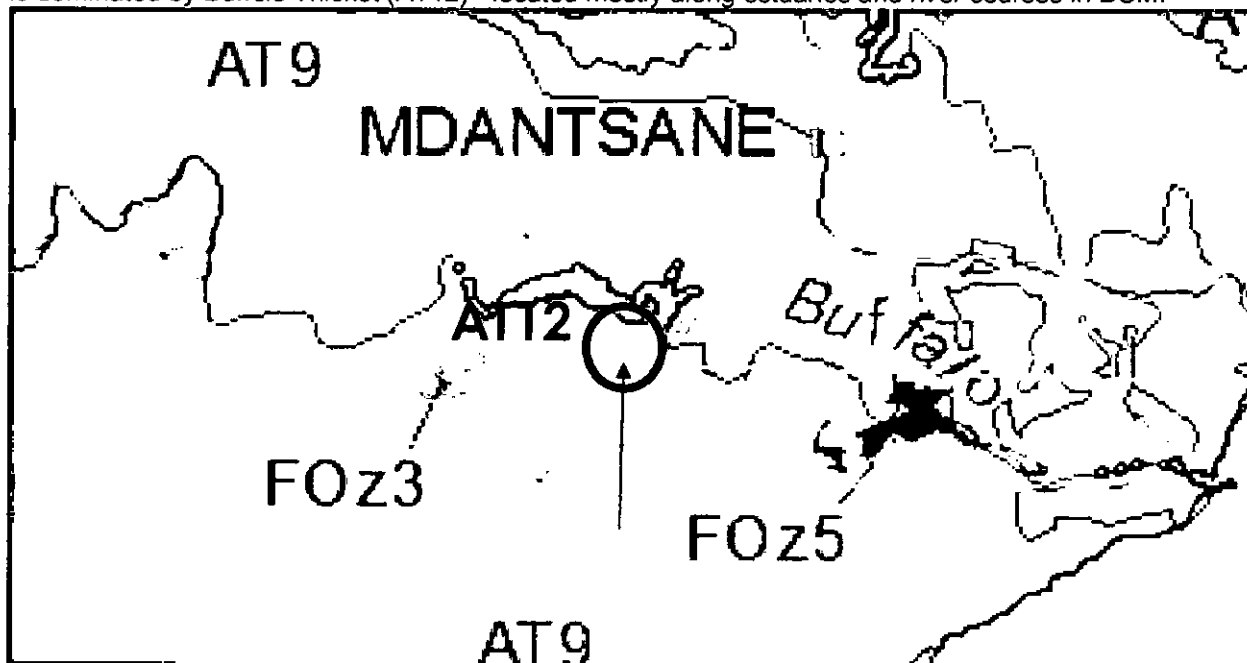


Figure 4.3: SANBI vegetation map for the BCM area with location of Farm 850/19 circled



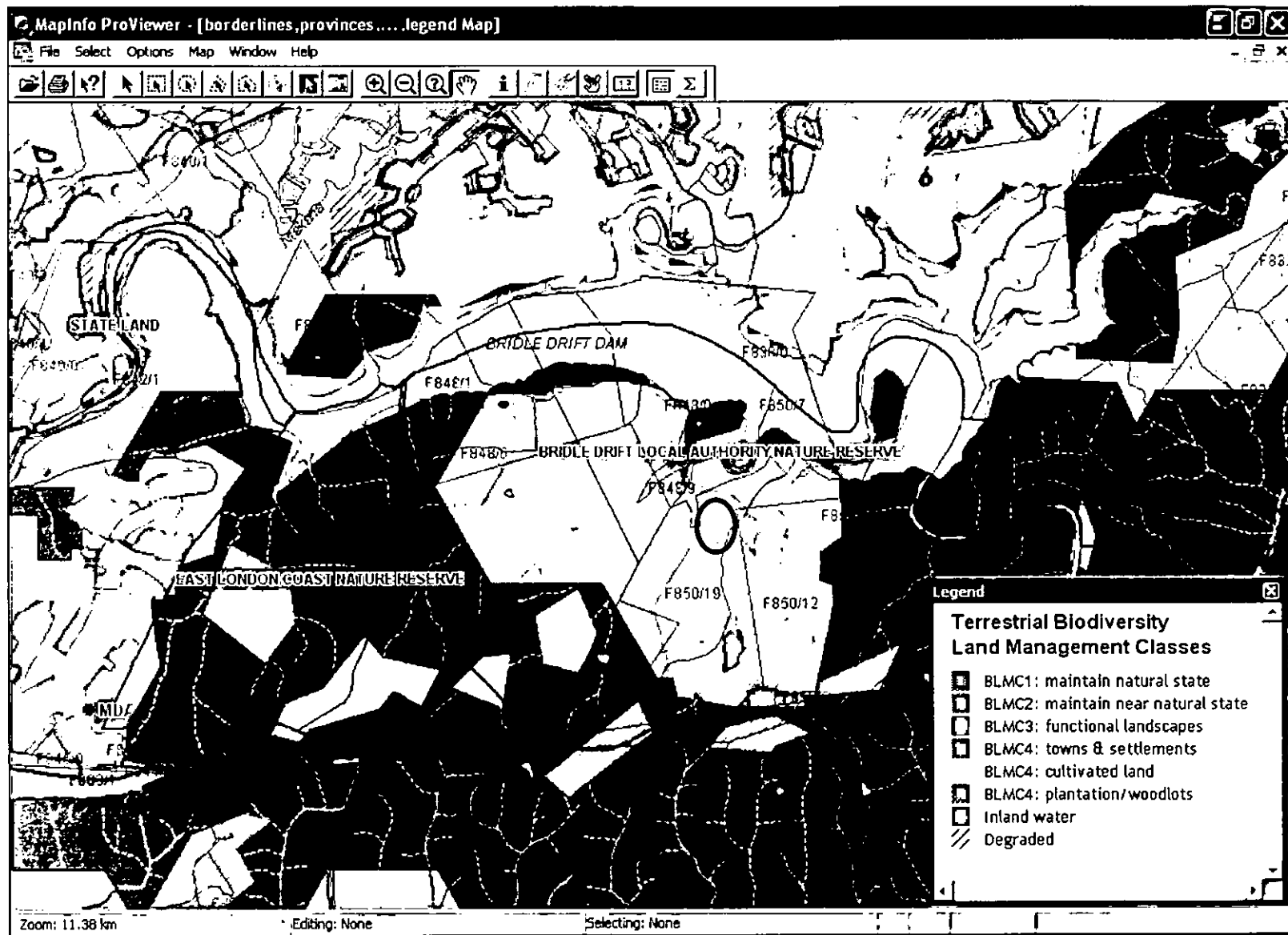


Figure 4.4: ECBCP map indicating land management classes

The ECBCP indicates that the site for the proposed mining must be maintained in a near natural state. Based on groundtruthing and the input of the vegetation specialist, it has been established that the area is impacted by past agricultural practices. Rehabilitation of the site must attempt to restore the site as close to its natural state as possible. The following principles as described in the ECBCP must be adhered to:

#### Land use planning principles

- Avoid land use that results in vegetation loss in critical biodiversity areas.
- Maintain large intact natural patches – try to minimize habitat fragmentation in critical biodiversity areas
- Maintain landscape connections (ecological corridors) that connect critical biodiversity areas.
- Maintain ecological processes at all scales, and avoid or compensate for any effects of land uses on ecological processes.
- Plan for long-term change and unexpected events, in particular those predicted for global climate change.
- Plan for cumulative impacts and knock-on effects.
- Minimize the introduction and spread of non-native species.
- Minimize land use types that reduce ecological resilience (ability to adapt to change), particularly at the level of water catchments.
- Implement land use and land management practices that are compatible with the natural potential of the area
- Balance opportunity for human and economic activity with the requirements for biodiversity persistence.

#### BCM SDF

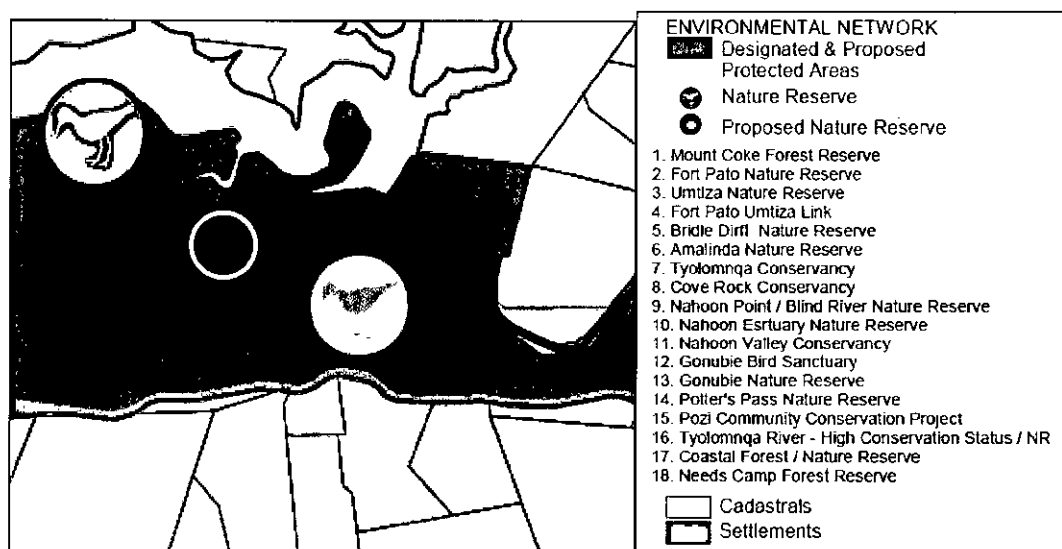


Figure 4.5: BCM existing and proposed nature reserves in the area proposed for activity (Site circled with yellow)

#### BCM Conservation Plan and Municipal Open Space System (MOSS)(2008)

BCM is currently in the process of finalizing a Conservation Plan and Municipal Open Space System (MOSS). The map below provides an indication of the MOSS areas identified for the Bridle Drift Dam area.

It can be seen from the map that Farm 850/19 is located in an area designated as having MOSS potential. While this does not preclude any activity, environmental and biodiversity conservation principles are relevant and the proponent could be required to zone portions of land with high MOSS potential as **Conservation Land** or **Private Nature Reserve**.

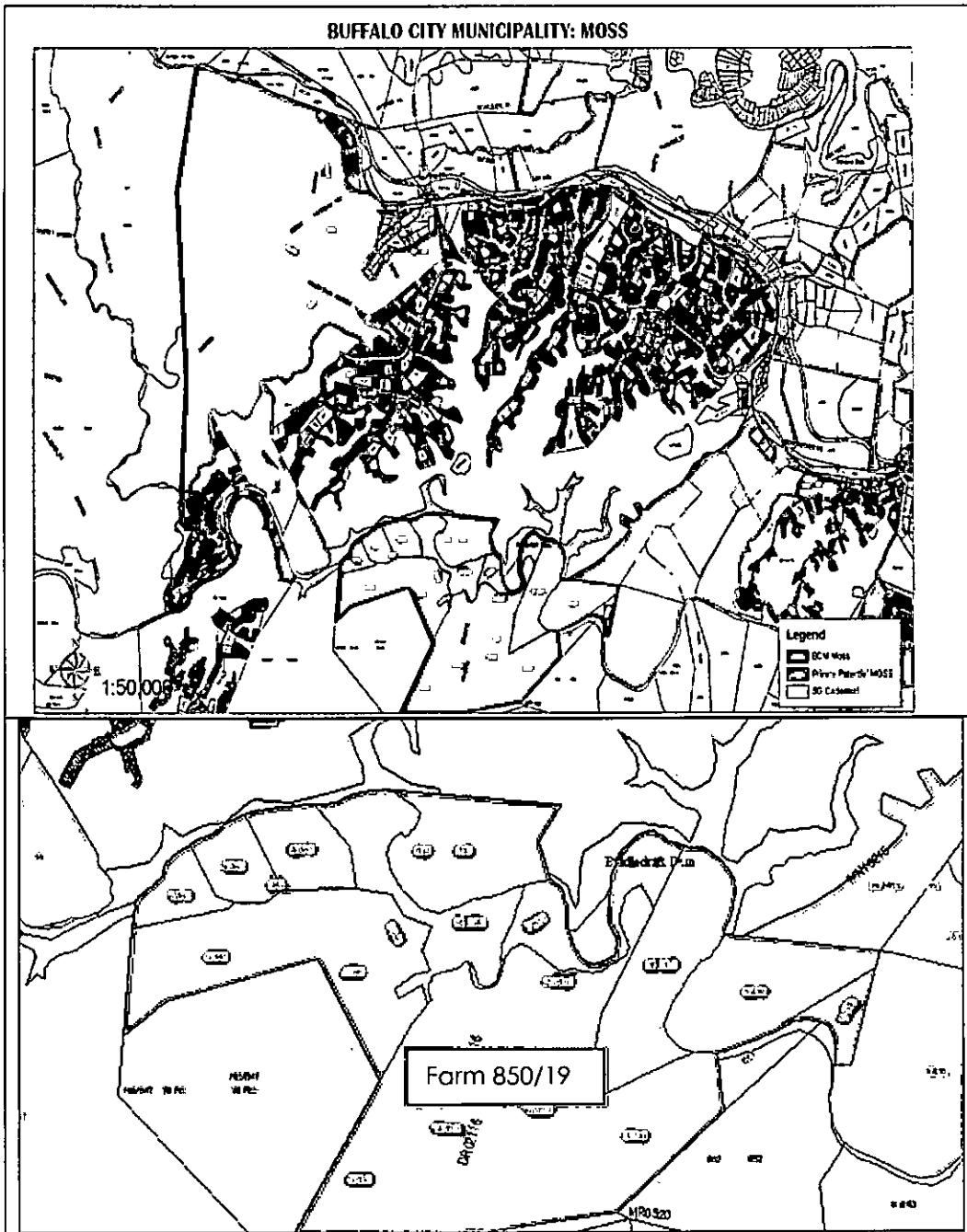


Figure 4.6: MOSS demarcation map for the area (MOSS indicated by green)

**BCM Integrated Environmental Management Unit (IEMP Unit) requirements**

The BCM Integrated Environmental Management Unit (IEMP Unit) typically requires assessment of the following with respect to activity proposals.

- Any socio-economic impact that the activity may have on the surrounding community.
- The impact of storm-water runoff on the environment due to the activity and the mitigation & management thereof.
- The impact of potential flooding due to the activity and the mitigation & management thereof.
- The impact of wastewater produced due to the activity and the mitigation & management thereof (not necessary if connected to the municipal sewage reticulation system).
- The impact of solid waste produced due to the activity, including during mining, and the mitigation & management thereof.
- The impact of any hazardous waste produced due to the activity and the mitigation & management thereof.
- The impact of the provision of water supply for the activity and the mitigation & management thereof.
- The loss of any indigenous biodiversity due to the proposed activity and the mitigation and management thereof, including any IUCN red data book listed species as well as the degree to which the activity affects the STEP or any other national, regional, bioregional or local conservation planning initiative.
- The impact of the activity on any sensitive environments or ecological processes, including watercourses, wetlands, forests, dune systems or any other environment regarded as sensitive or unique.
- The impact of the activity on any heritage resources as determined by the National Heritage Resources Act.
- Any environmental impacts that the activity may have, external to the property in question.
- The visual impact of the activity on the surrounding landscape.
- The legal context regarding the activity, particularly with regard to any environmental legislation or policy.

The following limitations are also imposed:

- That no building or structure is placed on any slope greater than 1:6 (as per the BCM Spatial Activity Framework).
- That no building or structure is placed within the 100-year flood-line or, if the flood-line is undetermined, then not within 30m of any watercourse (as per the BCM Spatial Activity Framework; Watercourse: as defined by the National Water Act, 1998).
- Where land is left undeveloped or as open space: that alien flora is removed and indigenous trees and vegetation conserved where possible (as stipulated in the National Environmental Management: Biodiversity Act, 2004).

### BCM Conservation Plan

The recently completed BCM Conservation Plan identifies the area of Farm 850/19 as being a high priority biodiversity conservation area.

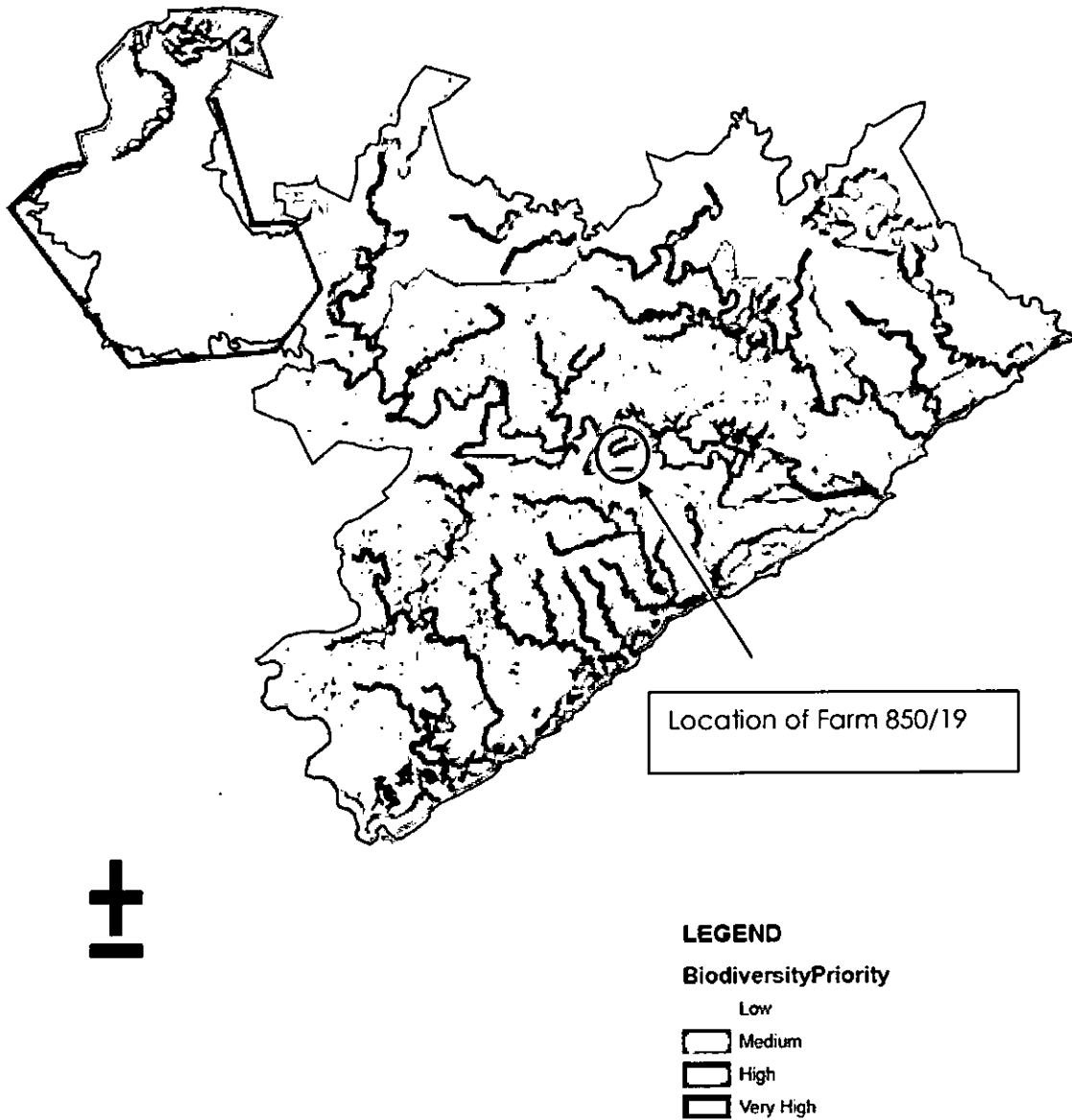


Figure 4.7: Map showing distribution of priority biodiversity areas in BCM

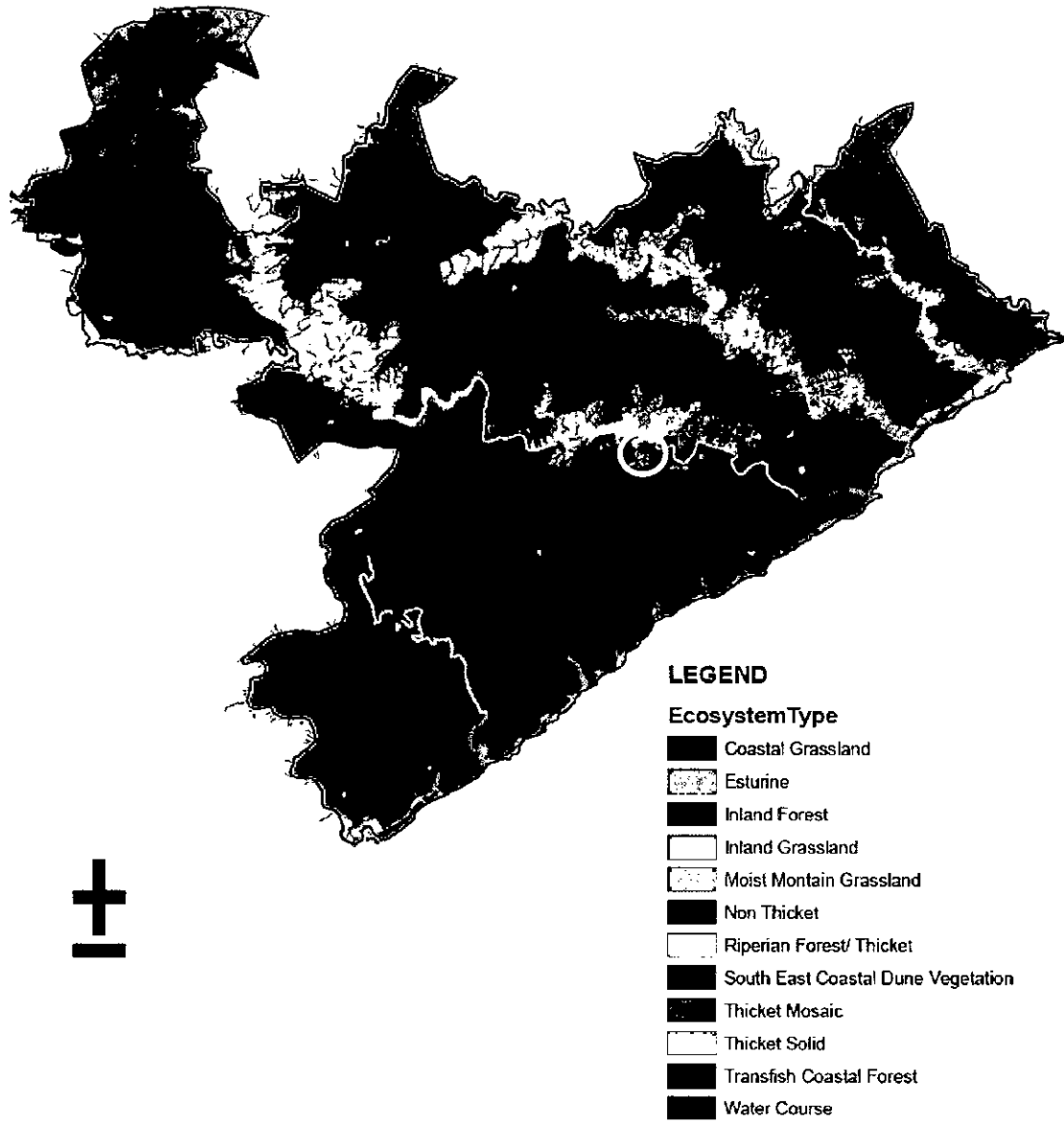


Figure 4.8: Biodiversity patterns (ecosystem type) in BCM (site circled with yellow)

## 4.4 Study site assessment

### 4.4.1 Methodology of data collection

Vegetation was analysed in terms of the species that were present. Obvious dominant types were observed and noted.

It is important to note that the Thicket vegetation was not completely analysed as the nature, Thicket type and conservation value of this biome is already acknowledged. **In addition, it was found that the activity will not encroach significantly into the Thicket vegetation as the site is impacted by historical agricultural practices.** In spite of this the Thicket may be impacted in a number of ways due to the proposed mining (Please refer to the Impact Statement).

### 4.4.2 Results

**Table 4.1:** List of alien invasive species found on site (see classification details in Appendix B)

Species name	Common name	Classification
<i>Cestrum laevigatum</i>	Inkberry	Declared Weed (category 1)
<i>Solanum mauritianum</i>	Bugweed	Declared Weed (category 1)
<i>Ricinus communis</i>	Castor-oil plant	Declared invader (category 2)
<i>Acacia mearnsii</i>	Black wattle	Declared invader (category 2)
<i>Acacia longifolia</i>	Long-leafed wattle	Declared Weed (category 1)
<i>Acacia saligna</i>	Port Jackson willow	Declared invader (category 2)
<i>Acacia cyclops</i>	Red eye or Rooikrans	Declared invader (category 2)
<i>Psidium guajava</i>	Guava	Declared invader (category 2)

**Table 4.2:** Indigenous vegetation in the surrounding area

<i>Indigenous vegetation present</i>
<i>Euphorbia</i> sp.
<i>Cussonia</i> sp.
<i>Vepris lanceolata</i>
<i>Crussula</i> sp.
<i>Harpephyllum caffrum</i>
<i>Phoenix</i> sp.
<i>Erythroxylum emarginatum</i>
<i>Erica</i> sp.
<i>Podocarpus falcatus</i>
<i>Hypoxis</i> sp.
Astrid
<i>Cryptocarya myrtifolia</i>
<i>Tulbaghia alliaceae</i>
<i>Tephrosia diffusa</i> or <i>kraussiana</i>
<i>Eriosema cf distinctum</i>
<i>Dietes grandiflora</i>
<i>Diospyros dichrophylla</i>
<i>Brachylaena elliptica</i>
<i>Solanum linnaeanum</i>
<i>Passerina</i> sp.
<i>Harpephyllum caffrum</i>
<i>Euphorbia tetragona</i>
<i>Cussonia spicata</i>
<i>Acacia caffra</i>
<i>Olea europaea</i>
<i>Erica</i> sp.

<i>Brachylaena elliptica</i>
<i>Solanum linnaeanum</i>
<i>Eucomis comosa</i>
<i>Gladiolus</i> sp.
<i>Acacia karoo/natalensis</i>

Please note that this list is not exhaustive and may include any other vegetation common to Buffels Thicket or vegetation that is indigenous to the area.

#### 4.5 Sensitivity analysis



Figure 4.9: Sensitivity index. **Red:** No-Go areas (steep slopes , drainage lines and Buffels Thicket), **Yellow:** Limited activity, **Green:** Previously impacted areas

#### Sensitivity scale:

Slope gradient and soil stability		Aquatic associations		Unique niche habitat potential		Biodiversity		Ecological functionality: biological corridors or networks which would sustain biodiversity.	
10		10		10		10		10	
Flat	0-3	100 metres+ from any water bodies	0-4	Not unique, few niches	0-4	Low diversity < 10 species observed per	0-4	Low network potential	0-3



						100m <sup>2</sup>			
gently undulating	4-6	50-100 metres from any water bodies	5-7	Average potential	5-7	Medium 10<X<50 species per 100 m <sup>2</sup>	5-7	Seasonal/moderate network areas	4-7
slopes and steep banks		0-50 metres from water bodies	8-10	High potential to support high diversity, unique niche		High diversity > 50 species per 100m <sup>2</sup>	8-10	High network area, diverse ecology	

████ = 38-50  
**MEDIUM** = 20-37  
**LOW** = 0-19

But, any environment which ranks between 8-10 for any of the above criteria are considered HIGH risk and needs considerable motivation for and aggressively mitigated or compensated.

	Slope gradient and soil stability	Aquatic associations	Unique niche habitat potential	Biodiversity	Ecological functionality: biological corridors or networks which would sustain biodiversity.	Total
Impacted areas (Green)	2	5	2	3	7	19
Drainage lines, steep slopes and sensitive vegetation (Red)	8	8	8	8	9	

Impacted areas = LOW.

Drainage lines, steep slopes and sensitive vegetation = HIGH. This area contains sensitive species and sensitive thicket vegetation, is a biodiversity corridor and is characterised by steep slopes.

### Faunal Biodiversity

The following fauna are known to be present in the area:

- Bushbuck
- Duiker
- Grey Duiker
- Hare
- Vervet Monkey

## 5 MANNER IN WHICH ENVIRONMENT MAY BE AFFECTED

### Environmental management programme and environmental management plan (As per MPRDA No.28 of 2002)

(3) An applicant who prepares an environmental management programme or an environmental management plan must—

(b) investigate, assess and evaluate the impact of his or her proposed prospecting or mining operations on—

(i) the environment;

(ii) the socio-economic conditions of any person who might be directly affected by the prospecting or mining operation; and

(iii) any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999), with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act;

### MPRDA No. 28 of 2002 Regulations No. R. 527 of 2004

52. (2) An environmental management plan, must substantially be in the standard format provided by the Department and must contain-

(b) an assessment of the potential impacts of the proposed prospecting or mining operation on the environment, socio-economic conditions and cultural heritage, if any;

(c) a summary of the assessment of the significance of the potential impacts, and the proposed mitigation and management measures to minimise adverse impacts and benefits;

## 5.1 Possible Environmental Issues & Impacts

### Methodology for Assessing Impacts and Alternatives

#### Introduction

Identified impacts will be assessed against the following criteria:

- Temporal scale
- Spatial scale
- Risk or likelihood
- Degree of confidence or certainty
- Severity or benefits
- Significance

The relationship of the issue to the temporal scale, spatial scale and the severity are combined to describe the overall importance rating, namely the significance.

Table 5.1.a: Significance Rating Table

Significance Rating Table	
<b>Temporal Scale</b> (The duration of the impact)	
<u>Short term</u>	Less than 5 years (Many mining phase impacts are of a short duration).
<u>Medium term</u>	Between 5 and 20 years.
<u>Long term</u>	Between 20 and 40 years (From a human perspective almost permanent).
<u>Permanent</u>	Over 40 years or resulting in a permanent and lasting change that will always be there.
<b>Spatial Scale</b>	

<b>(The area in which any impact will have an affect)</b>	
<b>Individual</b>	Impacts affect an individual.
<b>Localised</b>	Impacts affect a small area of a few hectares in extent. Often only a portion of the project area.
<b>Project Level</b>	Impacts affect the entire project area.
<b>Surrounding Areas</b>	Impacts that affect the area surrounding the activity.
<b>Municipal</b>	Impacts affect the Local Municipality.
<b>Regional</b>	Impacts affect the wider district municipality or the province as a whole.
<b>National</b>	Impacts affect the entire country.
<b>International/Global</b>	Impacts affect other countries or have a global influence.
<b>Will definitely occur</b>	Impacts will definitely occur.
<b>Degree of Confidence or Certainty</b> (The confidence with which one has predicted the significance of an impact)	
<i>Definite</i>	More than 90% sure of a particular fact. Should have substantial supportive data.
<i>Probable</i>	Over 70% sure of a particular fact, or of the likelihood of that impact occurring.
<i>Possible</i>	Only over 40% sure of a particular fact or of the likelihood of an impact occurring.
<i>Unsure</i>	Less than 40% sure of a particular fact or of the likelihood of an impact occurring.

**Table 5.1.b: Impact Severity Rating**

<b>Impact severity</b> (The severity of negative impacts, or how beneficial positive impacts would be on a particular affected system or affected party)	
<b>Very severe</b>	<b>Very beneficial</b>
An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated. For example the permanent loss of land.	A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit. For example the vast improvement of sewage effluent quality.
<b>Severe</b>	<b>Beneficial</b>
Long term impacts on the affected system(s) or party(ies) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming, or some combination of these. For example, the clearing of forest vegetation.	A long term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these. For example an increase in the local economy.
<b>Moderately severe</b>	<b>Moderately beneficial</b>
Medium to long term impacts on the affected system(s) or party (ies), which could be mitigated. For example constructing the sewage treatment facility where there was vegetation with a low conservation value.	A medium to long term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are equally difficult, expensive and time consuming (or some combination of these), as achieving them in this way. For example a 'slight' improvement in sewage effluent quality.
<b>Slight</b>	<b>Slightly beneficial</b>

Medium or short term impacts on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary. For example a temporary fluctuation in the water table due to water abstraction.	A short to medium term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.
<b>No effect</b>	<b>Don't know/Can't know</b>
The system(s) or party(ies) is not affected by the proposed activity.	In certain cases it may not be possible to determine the severity of an impact.

**Table 5.1.c: Overall Significance Rating**

<b>Overall Significance</b> (The combination of all the above criteria as an overall significance)	
<b>VERY HIGH NEGATIVE</b>	<b>VERY BENEFICIAL</b>
These impacts would be considered by society as constituting a major and usually permanent change to the (natural and/or social) environment, and usually result in <b>severe</b> or <b>very severe</b> effects, or <b>beneficial</b> or <b>very beneficial</b> effects. <b>Example:</b> The loss of a species would be viewed by informed society as being of VERY HIGH significance. <b>Example:</b> The establishment of a large amount of infrastructure in a rural area, which previously had very few services, would be regarded by the affected parties as resulting in benefits with VERY HIGH significance.	
<b>HIGH NEGATIVE</b>	<b>BENEFICIAL</b>
These impacts will usually result in long term effects on the social and/or natural environment. Impacts rated as HIGH will need to be considered by society as constituting an important and usually long term change to the (natural and/or social) environment. Society would probably view these impacts in a serious light. <b>Example:</b> The loss of a diverse vegetation type, which is fairly common elsewhere, would have a significance rating of HIGH over the long term, as the area could be rehabilitated. <b>Example:</b> The change to soil conditions will impact the natural system, and the impact on affected parties (such as people growing crops in the soil) would be HIGH.	
<b>MODERATE NEGATIVE</b>	<b>SOME BENEFITS</b>
These impacts will usually result in medium to long term effects on the social and/or natural environment. Impacts rated as MODERATE will need to be considered by society as constituting a fairly important and usually medium term change to the (natural and/or social) environment. These impacts are real but not substantial. <b>Example:</b> The loss of a sparse, open vegetation type of low diversity may be regarded as MODERATELY significant.	
<b>LOW NEGATIVE</b>	<b>FEW BENEFITS</b>
These impacts will usually result in medium to short term effects on the social and/or natural environment. Impacts rated as LOW will need to be considered by the public and/or the specialist as constituting a fairly unimportant and usually short term change to the (natural and/or social) environment. These impacts are not substantial and are likely to have little real effect. <b>Example:</b> The temporary change in the water table of a wetland habitat, as these systems is adapted to fluctuating water levels. <b>Example:</b> The increased earning potential of people employed as a result of a activity would only result in benefits of LOW significance to people who live some distance away.	
<b>NO SIGNIFICANCE</b>	
There are no primary or secondary effects at all that are important to scientists or the public. <b>Example:</b> A change to the geology of a particular formation may be regarded as severe from a geological perspective, but is of NO significance in the overall context.	
<b>DON'T KNOW</b>	
In certain cases it may not be possible to determine the significance of an impact. For example, the primary or secondary impacts on the social or natural environment given the available information. <b>Example:</b> The effect of a particular activity on people's psychological perspective of the environment.	

**PLANNING AND DESIGN**

Impacts	Type of impact	Spatial Scale (Duration)	Temporal Scale	Certainty Scale Likelihood	Severity/Beneficial Scale	Significance pre-mitigation	Mitigation Measure	Significance post-mitigation
<b>Issue: Environmental impacts (Fauna, Flora, Soil, Water)</b>								
Fauna and flora habitat loss and disturbance due to clearing for mining and presence of workers (-)	Direct/ Indirect	Local	Medium term	Likely	Moderately severe	Moderate negative	<ul style="list-style-type: none"> <li>Vegetation only to be removed in areas approved by the ECO, using appropriate methods</li> <li>Boundaries of the site to be clearly indicated and no person or equipment allowed outside the boundaries of the site</li> <li>The EMP must be adhered to and enforced</li> </ul>	Low negative
Dust and other particulates released/ created by mining activities or vehicles using the road may impact on vegetation by impairing photosynthesis (-)	Indirect	Local	Short-term	Possible	Moderately severe	Moderate negative	<ul style="list-style-type: none"> <li>The liberation of dust into the atmosphere must be controlled by: spraying water or other nontoxic dust allaying agents</li> <li>The speed of haul trucks must also be kept to a minimum</li> <li>Vehicles and equipment must be maintained in an excellent condition to reduce production of smoke and fumes</li> </ul>	Low negative
Reduction in biodiversity on site due to loss of habitat and disturbance (-)	Cumulative	Local	Medium term	Possible	Moderately severe	Moderate negative	<ul style="list-style-type: none"> <li>Vegetation only to be removed in areas approved by the ECO, using appropriate methods</li> <li>Boundaries of the site to be clearly indicated and no person or equipment allowed outside the boundaries of the site</li> <li>The EMP must be adhered to and enforced</li> </ul>	Low negative

PLANNING AND DESIGN								
Impacts	Type of impact	Spatial Scale (Duration)	Temporal Scale	Certainty Scale Likelihood	Severity/Beneficial Scale	Significance pre-mitigation	Mitigation Measure	Significance post-mitigation
Altered landforms due to excavation and stockpiling (-)	Direct/ Indirect	Local	Permanent	Certain	Moderately severe	Moderate negative	<ul style="list-style-type: none"> <li>Land and topography to be remediated as close to the original state as possible</li> </ul>	Low negative
Encroachment of alien invasive plants from waste stockpiles and disposal areas (-)	Indirect	Local	Medium term	Possible	Moderately severe	Moderate negative	<ul style="list-style-type: none"> <li>All conditions of the EMP must be adhered to. This includes the management of stockpiles to prevent aliens/invasive flora colonising the piles</li> </ul>	Low negative
Poorly maintained machinery and equipment may result in spillages (fuel, oil, etc) and impact on environmental health by pollution of soil, vegetation and groundwater (-)	Indirect	Local and water catchment	Short-term	Possible	Moderately severe	Moderate negative	<ul style="list-style-type: none"> <li>Ensure that all building is conducted in line with a standard EMP derived to prevent site pollution</li> <li>Ensure that all machinery and equipment is properly maintained</li> <li>Spills should be cleaned up immediately by removing the spills together with the polluted soil and disposing thereof at a recognised facility to the satisfaction of the regulators.</li> </ul>	Low negative
Willingness of the proponent to comply with the EMP and legislative limits and conditions can impact on the extent of environmental damage (-/+)	Direct/ Indirect/ Cumulative	Local	Short-term	Definite	Severe	High negative	<ul style="list-style-type: none"> <li>Building Contractor should be bound by a contract to adhere to the EMP</li> </ul>	Low negative/ High negative
Potential poaching of fauna and collection of wood for fires during operations (-)	Indirect	Local	Short-term	Possible	Moderately severe	Moderate negative	<ul style="list-style-type: none"> <li>Controlled access to vegetated areas to be instituted</li> <li>No poaching of animals is allowed</li> </ul>	Low negative
Littering on site will impact on environmental/ecological health and detract from the aesthetics of the area (-)	Indirect	Local and water catchment	Short-term	Possible	Moderately severe	Low negative	<ul style="list-style-type: none"> <li>Ensure that all mining is conducted in compliance with a standard Environmental Management Plan (EMP) and</li> </ul>	Low negative

**PLANNING AND DESIGN**

Impacts	Type of impact	Spatial Scale (Duration)	Temporal Scale	Certainty Scale Likelihood	Severity/Beneficial Scale	Significance pre-mitigation	Mitigation Measure	Significance post-mitigation
							<p>overseen by an Environmental Control Officer to prevent site pollution, fires and dumping of materials</p> <ul style="list-style-type: none"> <li>• <b>Non-biodegradable</b> refuse (such as glass bottles, plastic bags metal, scrap, etc.) must be stored in a container at a collecting point and collected on a regular basis and disposed of at an <b>authorised disposal facility</b>. Precautions must be taken to prevent any refuse from spreading on and from the campsite.</li> <li>• <b>Biodegradable</b> refuse generated from the camp site, storage area or any other area must either be handled as above or be buried in a pit excavated for that purpose and be covered with layers of soil, incorporating a final 0,5 metre thick layer of topsoil (if practical) or as specified by the local authority, if applicable.</li> <li>• Suitable covered receptacles must be provided and conveniently placed for waste disposal. All used oils, grease or hydraulic fluid must be placed therein and these receptacles will be removed from the site on a regular basis for disposal at a recognized or licensed disposal facility.</li> </ul>	
Fires on site could pose a threat to adjacent land, vegetation and residents in the area (-)	Direct	Local	Short-term	Possible	Moderately severe	Moderate negative	<ul style="list-style-type: none"> <li>• Ensure that all mining is conducted in compliance with a</li> </ul>	Low negative

PLANNING AND DESIGN								
Impacts	Type of impact	Spatial Scale (Duration)	Temporal Scale	Certainty Scale Likelihood	Severity/Beneficial Scale	Significance pre-mitigation	Mitigation Measure	Significance post-mitigation
							standard mining Environmental Management Plan (EMP) and overseeing Environmental Control Officer to prevent site fires on site.	
Lack of appropriate toilet facilities for workers may result in abluting in inappropriate areas and result in environmental pollution (-)	Indirect	Local and water catchment	Short-term	Possible	Moderately severe	Low negative	<ul style="list-style-type: none"> <li>Ensure that all building (including the provision of portable toilets) is conducted in line with a standard EMP derived to prevent site pollution.</li> </ul>	Low negative
Inappropriate storage of and utilisation of building equipment and hazardous materials (e.g. fuel) on site can lead to contamination of ground and groundwater (-)	Direct/ Indirect	Local and water catchment	Short-term	Possible	Moderately severe	Moderate negative	<ul style="list-style-type: none"> <li>Ensure that all mining is conducted in compliance with a standard mining Environmental Management Plan (EMP) and overseeing Environmental Control Officer to prevent site pollution and dumping of materials.</li> </ul>	Low negative
Accumulation of wastes and rubble can cause contamination of soils and ground water which may impact on human and environmental health and cause visual unsightliness (-)	Indirect/ Cumulative	Local and water catchment	Short-term	Possible	Moderately severe	Moderate negative	<ul style="list-style-type: none"> <li>Ensure that all mining is conducted in compliance with a standard mining Environmental Management Plan (EMP) and overseen by an Environmental Control Officer to prevent site pollution and dumping of materials.</li> </ul>	Low negative
Unnecessary disturbance of vegetated areas outside of the site may lead to degradation of these areas (-)	Indirect	Local	Short-term	Possible	Moderately severe	Moderate negative	<ul style="list-style-type: none"> <li>Ensure minimal disturbance of vegetation</li> <li>Rehabilitation of the disturbed site must be undertaken</li> <li>Rehabilitation must include transplanting of disturbed vegetation</li> <li>An Environmental Control</li> </ul>	Low negative



## PLANNING AND DESIGN

Impacts	Type of impact	Spatial Scale (Duration)	Temporal Scale	Certainty Scale Likelihood	Severity/Beneficial Scale	Significance pre-mitigation	Mitigation Measure	Significance post-mitigation
							Officer must oversee the clearing to mark out protected trees and ecologically sensitive features	
Issue: Water bodies and stormwater								
Altered drainage patterns and runoff flows due to creation of steep slopes and damming of water in excavated areas (-)	Indirect	Local and water catchment	Short-term /Permanent (if not rehabilitated)	Likely	Moderately severe	Moderate negative	<ul style="list-style-type: none"> <li>Ensure that all building is conducted in line with this EMP derived to prevent environmental degradation due to mining.</li> <li>Site to be rehabilitated as close to natural state (including topographical features) as possible, as described in this report</li> <li>Stormwater management plan to be implemented.</li> </ul>	Low negative
Soil erosion and resultant sedimentation of drainage lines due to stripping and clearing of vegetation (-)	Indirect	Local and water catchment	Short-term /Permanent (if not rehabilitated)	Possible	Moderately severe	Moderate negative	<ul style="list-style-type: none"> <li>Ensure that all building is conducted in line with an EMP derived to prevent environmental degradation.</li> <li>Site to be rehabilitated as close to natural state (including topographical features) as possible, as described in this report</li> <li>Stormwater management plan to be implemented.</li> </ul>	Low negative
Contamination of surface and groundwater by seepage and effluent discharges (-)	Indirect	Local and water catchment	Short-term	Possible	Moderately severe	Moderate negative	<ul style="list-style-type: none"> <li>All potentially polluting substance need be managed in an appropriate manner as</li> </ul>	Low negative

## PLANNING AND DESIGN

Impacts	Type of impact	Spatial Scale (Duration)	Temporal Scale	Certainty Scale Likelihood	Severity/Beneficial Scale	Significance pre-mitigation	Mitigation Measure	Significance post-mitigation
							described in the EMP • Fuel must be banded	
<b>Issue: Heritage sites</b>								
Potential loss of heritage sites due to National Heritage Resources Act (No 25 of 1999) (NHRA) (See Section 3.2.7) not being adhered to (-)	Direct	Local	Permanent	Possible	Severe	High negative	• The ECO and SAHRA must be informed immediately if any artefact/site is discovered during operations	Low negative
<b>Issue: Socio-economic impacts</b>								
Decreased aesthetic appeal of site (-)	Direct	Local	Permanent	Possible	Moderately severe	Moderate negative	• Rehabilitation to occur as described in the EMP under the guidance of an ECO • Proponent to be bound by contract to adhere to the EMP	
Degradation of roads due to heavy vehicle traffic (-)	Indirect	Local	Short-term	Possible	Slight	Low negative	• NMP	Low negative
Job creation and contribution to the local economy (+)	Direct	Local	Short-term	Definite	Beneficial	Beneficial	• NMP	Beneficial
Disturbance to surrounding residents due to noise and vibrations from mining activities (-)	Indirect	Community	Short-term	Possible	Moderately severe	Low negative	• Ensure that all building is conducted in line with the EMP • Operations only to occur between the hours of 8-17:00 weekdays	Low negative
Dust and fumes from mine vehicles may cause nuisance to surrounding residents (-)	Indirect	Community	Short-term	Possible	Moderately severe	Moderate negative	• The liberation of dust into the atmosphere must be controlled by: spraying water or other nontoxic dust allaying agents • The speed of haul trucks must also be kept to a minimum	Low negative

PLANNING AND DESIGN								
Impacts	Type of Impact	Spatial Scale (Duration)	Temporal Scale	Certainty Scale Likelihood	Severity/Beneficial Scale	Significance pre-mitigation	Mitigation Measure	Significance post-mitigation
							<ul style="list-style-type: none"> <li>Vehicles and equipment must be maintained in an excellent condition</li> </ul>	
Windborne dust from stockpiles (-)	Indirect	Community	Short-term	Possible	Moderately severe	Moderate negative	<ul style="list-style-type: none"> <li>The liberation of dust into the atmosphere must be controlled by: spraying water or other nontoxic dust allaying agents</li> </ul>	Low negative
Loss of productive land for alternative uses e.g. agriculture (-)	Indirect	Community	Short-term	Possible	Moderately severe	Moderate negative	<ul style="list-style-type: none"> <li>All activity and activities must be done in line with relevant legislation and policy</li> </ul>	Low negative
Insufficient stabilisation of steep banks may present a hazard to workers and increase the risk of landslides (-)	Direct	Local	Long-term	Possible	Severe	High negative	<ul style="list-style-type: none"> <li>Stabilisation measures to be implemented as described in this Report</li> <li>Once a section has been mined, revegetation must immediately take place</li> </ul>	Low negative

### CLOSURE

Impacts	Type of impact	Spatial Scale (Duration)	Temporal Scale	Certainty Scale Likelihood	Severity/Beneficial Scale	Significance pre-mitigation	Mitigation Measure	Significance post-mitigation
Decreased aesthetic appeal of site if not adequately rehabilitated (-)	Direct	Local	Permanent	Possible	Moderately severe	Moderate negative	• Rehabilitation to occur as per this Report	Low negative
Insufficient stabilisation of steep banks may present a hazard to future activities and result in landslides (-)	Indirect	Local	Long-term	Possible	Moderately severe	Moderate negative		Low negative
Failure to remove rubble and sediment may result in unsightliness of the area (-).	Indirect	Local	Long-term	Possible	Moderately severe	Moderate negative		Low negative
Failure to remove rubble and sediment may result in environmental pollution (-)	Indirect/ Cumulative	Local and water catchment	Long-term	Possible	Moderately severe	Moderate negative		Low negative
Alteration of topography and drainage lines due to inappropriate rehabilitation may impact on surrounding fauna and flora (-)	Indirect	Local and water catchment	Long-term	Possible	Moderately severe	Moderate negative		Low negative
Permanent loss of biodiversity if the recommendations made in this Report were not followed (-)	Indirect	Local	Long-term	Possible	Moderately severe	Moderate negative		Low negative

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52. (2) An environmental management plan, must substantially be in the standard format provided by the Department and must contain-

53;

- (e) planned monitoring and performance assessment of the environmental management plan;
- (f) closure and environmental objectives;
- (g) a record of the public participation undertaken and the results thereof; and
- (h) an undertaking by the applicant regarding the execution of the environmental management plan.

**6.1 Site establishment**

- The site must be clearly demarcated, and all mining activities including site camp sites and stockpiling must be strictly confined to this demarcated area.
- Immediately after completion of the mining all equipment, fencing and other temporary structures must be removed, and these areas rehabilitated.
- "No-go" areas that have been identified must be pegged. These must remain out-of-bounds during the mining period. Permission from the ECO is required to enter these areas and for specific purposes only.
- Any area falling within the sensitive vegetation should be demarcated clearly and avoided where possible when mining on site occurs. In the event infrastructural material needs to transect sensitive vegetation areas, this should be done in the least destructive manner and rehabilitation measures instituted around these disturbed sensitive areas.

**6.2 Site plan**

- The site offices will be situated in a flat area away from drainage lines (i.e. at least 100m from large drainage lines). Disturbance to these must be avoided. All mining yards and site offices must be fenced, must not infringe on "no-go" areas and must be situated within the road reserve.
- The proponent must establish his mining camps on the site in a manner that does not adversely affect the environment.
- Detailed, electronic colour photographs must be taken of the proposed site before any clearing may commence. These records are to be kept by the contractor for consultation during rehabilitation of the site.

The site plan must detail:

- The locality of the sites.
- Site access (including entry and exit points).
- Access and haulage routes.
- All material and equipment storage areas (including storage areas for hazardous substances such as fuel and chemicals).
- Mining offices and other structures (accommodation for staff, where required and considered appropriate).
- Areas where mining vehicles will be serviced.
- Security requirements (including temporary and permanent fencing, and lighting) and accommodation areas for security staff.
- Areas where vegetation will be cleared.
- Solid waste collection facilities for litter, kitchen refuse, and for all non-hazardous solid waste including office and workshop waste.

- Waste treatment facilities for sewage, grey water and workshop-derived effluents, where no formal facilities exist.
  - Stormwater control measures.
  - Provision of potable water and temporary ablution facilities.
  - Potential pollution hazards and mechanisms to manage these.
- Only designated areas may be used for the storage of materials, machinery, equipment, site offices and accommodation facilities.

Throughout the period of mining, the Contractor must restrict all activities to within the designated areas on the mining layout plan. Any relaxation or modification of the mining layout plan is to be approved by the ECO.

The following activities are to be prohibited and must be monitored by the Contractors and the ECO:

- The use of rivers and streams for washing of clothes
- The use of welding equipment, oxy-acetylene torches and other bare flames where veld fires constitute a hazard.
- Indiscriminate disposal of rubbish or mining wastes or rubble.
- Littering of the site.
- Spillage of potential pollutants, such as petroleum products.
- Collection of firewood.
- Poaching of any description.
- Latrining outside of the designated facilities.
- Burning of wastes and/or cleared vegetation.

### **6.3 Environmental awareness training or instruction (See Appendix C)**

The project manager, before commencement of any mining activities, must implement an environmental awareness programme or instruction. All mining personnel, including senior staff, sub-contractors and suppliers, must attend the training programme or instruction.

The programme must include all relevant aspects covered in the EMP and must be repeated for all new or temporary staff.

### **6.4 Removal of vegetation**

As the site is located at a steep gradient it is crucial that **removal of vegetation occurs systematically**. Strips of vegetation must be removed and that area mined completely before moving onto the next section. **Rehabilitation must occur as per the following diagram**

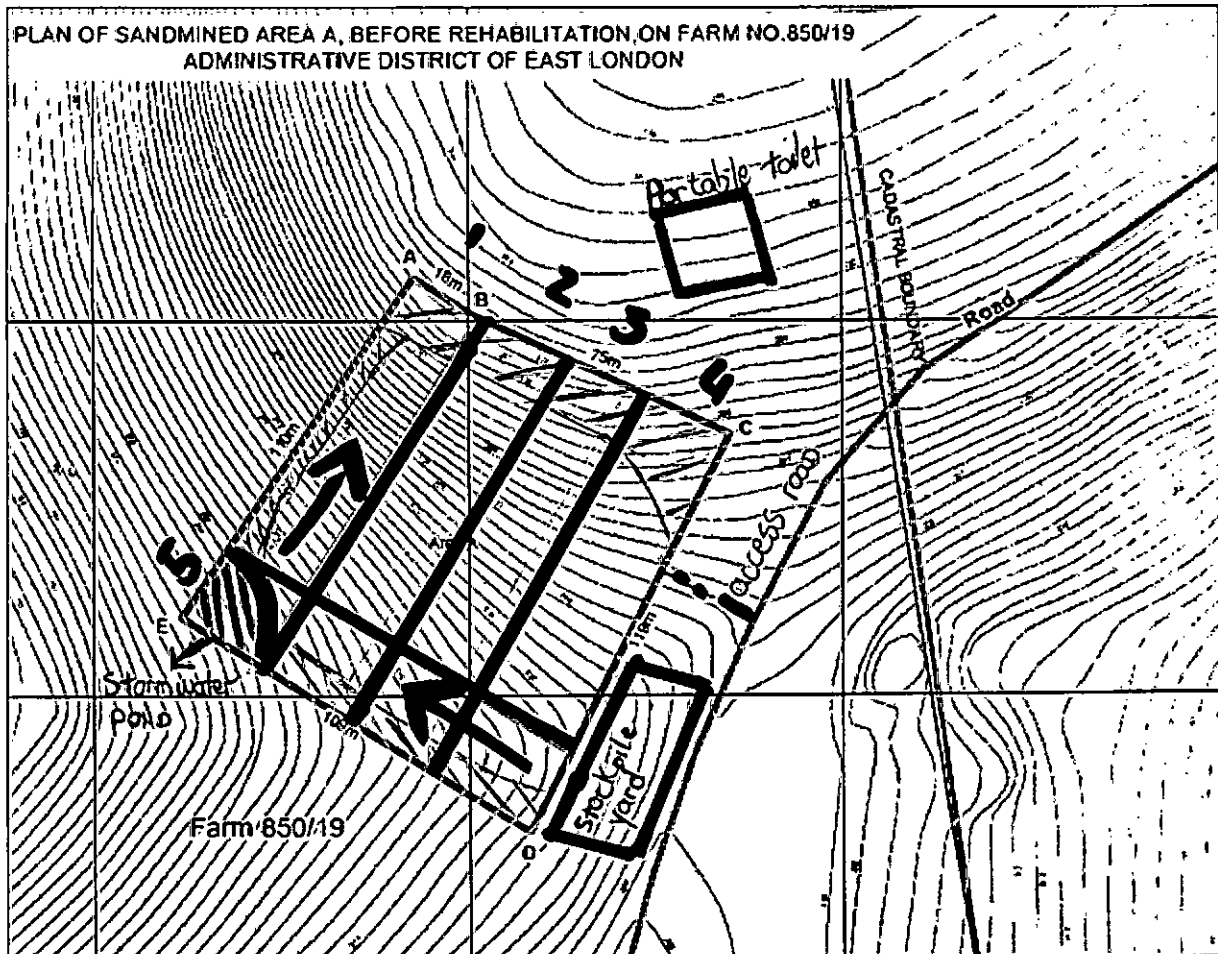


Figure 6.1: Mining plan

The site to be mined will be divided into four equally sized strips. Mining will start at the strip to the West of the site and will move in small concentric circles within this strip. Once mining on strip 3 has started, rehabilitation of strip 1 must start. Once mining on Strip 4 starts, rehabilitation of strip 2 must so etc. Mining will at all times aim to create gentle slopes and avoid the creation of steep banks as this will make rehabilitation very difficult and will require significant volumes of backfill material.

This will shorten the time required for rehabilitation once all mining is complete and will ensure that the risk of environmental damage due to stormwater runoff, landslides, or risk to workers is minimised. Section 7 gives a detailed plan on how to implement rehabilitation.

**No blanket clearing of vegetation is to take place on site, i.e. the entire activity must not be cleared at once but in stages as areas become needed for mining.**

**The removal of indigenous vegetation must be limited. All disturbed areas on the property must be re-vegetated and rehabilitated in a progressive manner i.e. re-vegetation of disturbed sites must be undertaken as soon as mining activities at each individual site have been completed.**

Where there is use of herbicides, these must be in compliance with the terms of the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No 36 of 1947). In terms of this Act, a registered pest control operator must apply herbicides, or must supervise the application of herbicides. The use of herbicides must be restricted to the removal and control of alien vegetation and within the on-site nursery, and must not be permitted within identified sensitive areas.

Special care must also be taken not to kill or unnecessarily disturb any animals. Penalties for the killing of any animal must be imposed on the Contractor.

## Soil management

All excavated soil must be stockpiled for use during rehabilitation- See Figure 6.1

- Topsoil must be removed from all areas where physical disturbance of the surface will occur and must be stored and adequately protected. The contract will provide for the stripping and stockpiling of topsoil from the site for later re-use. Topsoil is considered to be the natural soil covering, including all the vegetation and organic matter. Depth may vary at each site. The areas to be cleared of topsoil must include the storage areas.
- Topsoil, including roots and plant residue, will be harvested in two phases. The top 100mm of material will be striped and stockpiled in areas as agreed by the ECO.
- The topsoil must be stored in windrows that should not exceed 1,5m in height, as this material contains most of the living components of the soil. Where possible and available, the next 300mm of soil underlying the topsoil must be stripped and stockpiled separately in windrows with no height restriction.
- Stockpile areas must be close to the areas of origin (but must not be in sensitive areas and must be re-used in the areas of origin).
- All topsoil stockpiles and windrows must be maintained throughout the contract period in a weed-free condition. Weeds appearing on the stockpiled or windrowed topsoil must be removed by hand.
- The topsoil stockpiles must be stored, shaped and sited in such a way that they do not interfere with the flow of water to cause damming or erosion, or itself be eroded by the action of water. Stockpiles of topsoil must not exceed a height of 2m. Soil must be stockpiled for as short a period as possible. Where possible, a rotational system must be implemented to reduce storage time. For short term stockpiling (for 1-2 months), temporary erosion measures must be implemented, by securely covering the material (e.g. using a perforated tarpaulin or hessian). If stockpiles stand for between 3 to 6 months, a cover of suitable grass must be established around the slopes to reduce the effects of erosion washes.
- The Contractor must ensure that no topsoil is lost due to erosion – either by wind or water. Areas to be topsoiled and grassed must be done so systematically to allow for quick cover and reduction in the chance of heavy topsoil losses due to unusual weather patterns. Attention is drawn to the fact that unusually high rainfall events occur frequently in the area. The Contractor's programme must clearly show the proposed rate of progress of the application of topsoil and grassing. The Contractor must be held responsible for the replacement, at his own cost, for any unnecessary loss of topsoil due to his failure to work according to the progress plan approved by the Engineer and ECO. The Contractor's responsibility must also extend to the clearing of drainage or water systems within and beyond the boundaries of the activity that may have been affected by such negligence.
- Stockpiles must be monitored at weekly intervals to identify invasive plants, which must be removed when they germinate, to prevent contamination of the seed bank. Stockpiles must not be covered with materials such as plastic that may cause it to compost, or kill any seeds. Before indigenous vegetation clearing or soil removal for stockpiling begins, the Contractor must remove alien invasive weeds present within the mining area.
- Topsoil must not be compacted in any way, especially by vehicles riding over it. Where it is essential to drive a vehicle over the topsoil (once it has been re-spread), as approved by the Engineer, the contact pressure must not be greater than 1500kg/m<sup>2</sup>.
- Soils contaminated by hazardous substances must be disposed of at an approved waste disposal site.

**The following diagrams illustrate methods to rehabilitate steep areas:**



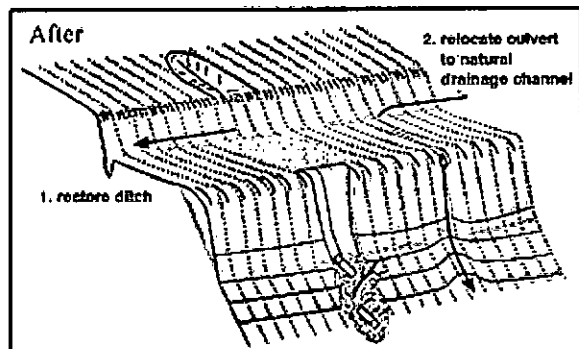
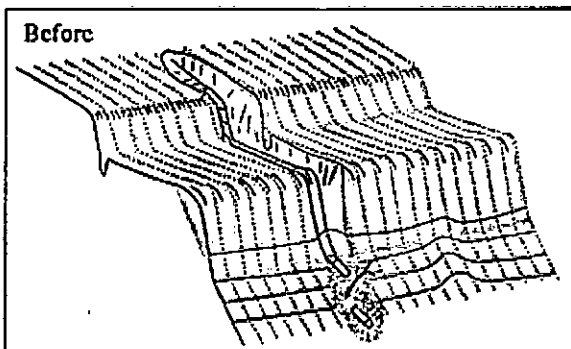
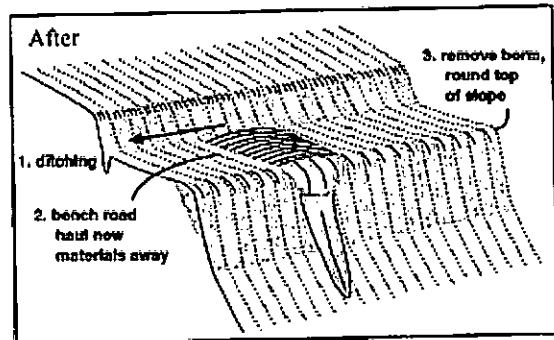
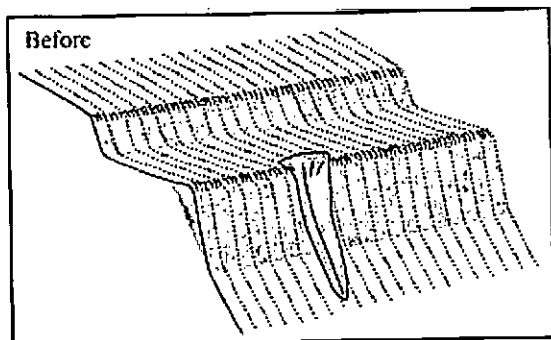
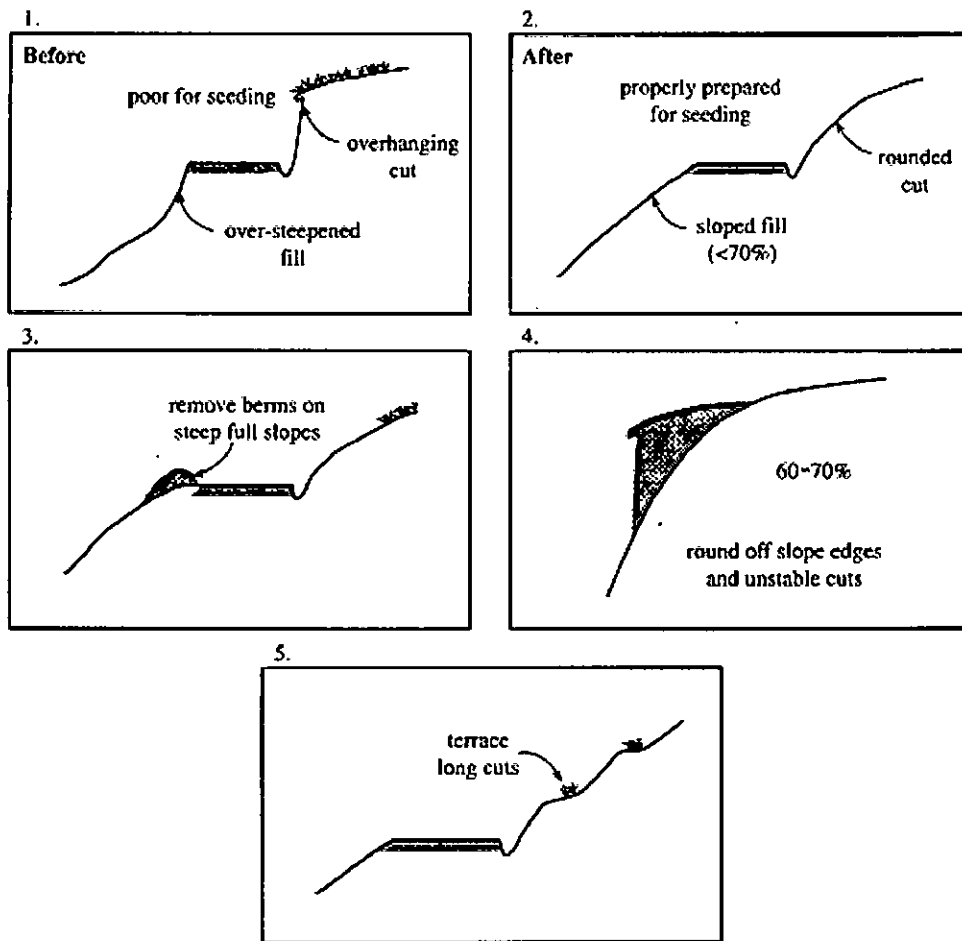


Figure 6.1: Slope stabilisation

## Slope Stabiliser and Anti-erosion material

Grass sodding is the preferred method for slope stabilisation. However, specifically in areas where gradients are steeper than 1:8, slope stabilizer and/or anti-erosion materials may be required if the hydroseeding and planting proves unsuccessful.

Allowance for any one of the following acceptable erosion control measures may be required where disturbance has been created and no subsequent activity will occur. Any decisions in this regard will need to be made in conjunction with the ECO and the Engineer:

### Stabilisation cylinders

Stabilisation cylinders must consist of cylindrical capsules approximately 125mm in diameter by 1.5m in length, and must be manufactured from biodegradable material such as hessian or of extruded biodegradable plastic netting. The plastic material must be sufficiently robust to last for a period of not less than 3 years and not more than 10 years before disintegrating under normal conditions. Stabilisation cylinders must be filled with shredded mulch or similar material. Only material passing through a 31mm sieve with round holes and retained on a 5mm sieve with square holes must be used. Wood chips can be used, but splinters and flat chips are not acceptable. Indigenous seed approved by the ECO must be included in the cylinders. Cylinders must be anchored in position using biodegradable material, such as wooden pegs. Cylinders must not be used to stabilise any rock faces.

### Biodegradable netting/matting

Biodegradable netting/matting must be made from jute, sisal, coir or similar material. A 1m<sup>2</sup> sample of the geofabric, geogrid or nylon (biodegradable) fabric must be submitted to the ECO for approval prior to procurement. The netting/matting must be sufficiently robust to last for a period of not less than 3 years under normal conditions.

Holes in the netting/matting must have a minimum size of 400mm<sup>2</sup> and a maximum size of 900mm<sup>2</sup> and be made from at least 4-6mm thick cord.

### Logs

Slopes could also be stabilised by means of continuous rows of logs, secured to the slope with timber pegs, parallel to the contour. Logs must be untreated pine or gum poles of not less than 150 mm with a taper of not more than 75mm over its length. Timber pegs to be treated and not less than 400mm in length. Timber pegs must be longer if thicker logs than the minimum are used. The slope could also be covered with "geojute" prior to placing the logs. The Horticultural/Landscape Contractor must install Kaytech Soil Saver 292 (or a similar product) as per the manufacturer's specifications except for the pegging that is replaced by the log stabilization.

Logs must be secured to the slope in such a manner that they will not become dislodged during mining and/ or planting. Logs to be secured to the slope by means of a minimum of two pegs driven into the soil not less than 250mm deep. For logs longer than 3m, additional pegs must be required. Log ends to be butt-jointed and plugged with wood chips or similar to prevent water from washing through at the joint. Logs must be placed at 2m intervals with a bottom row parallel to the edge of the road. Logging of the slope to start at the top of the slope to prevent the stretching of the "geojute".

### Hard structures

All hard structures used for slope stabilisation must have natural stone face finishes.

### Mulch stabilisation

Mulch must be applied by hand to achieve a layer of uniform thickness. The mulch must then be lightly worked into the topsoil layer so that it mixes with the soil and serves to bind it. The mulch must be spread at a coverage rate of 100kg per 250m<sup>2</sup> or 4t/ha. Where brush-cut material is to be utilised as mulch, this material must be evenly spread across the area to a uniform depth of 25mm. The mulch must then immediately be rotovated into the upper 100mm layer of soil. This operation must not be attempted when the wind strength is such as to remove the mulch before it can be rotovated in.

## 6.5 Waste management

- The contractor must institute an on-site waste management system in order to prevent the spread of refuse within and beyond the site. Refuse refers to all solid waste, including mining

debris (wrapping materials, timber, cans etc.), food packaging, cement, rubble and other mining materials, etc.

- All waste must be collected and contained immediately.
- The Contractor must not dispose of any waste and/or mining debris by burning or burying.
- Waste bins must be used, and these must be provided with lids and external closing mechanisms to be scavenger proof and to prevent their contents blowing out.
- The Contractor must ensure that his employees deposit all waste in the waste bins. Bins must not be used for any other purposes than waste collection and must be emptied on a regular basis.
- All waste must be disposed of off-site at the nearest Waste Disposal Site.

## 6.6 Toilets

- The contractor must provide the necessary ablution facilities for all his employees. These must be easily accessible, transportable, and there should be a minimum of 1 toilet per 15 persons.
- The toilets should be secured, and be provided with an external closing mechanism to prevent toilet paper from being blown out.
- A rented chemical toilet must be used, and the rental company will be responsible for emptying the toilet, which must be done on a daily basis.
- Sewerage must not be disposed of in watercourses, streams or rivers.

## 6.7 Pollution and stormwater management

- The Contractor must ensure that erosion or pollution of ground or surface water does not occur as a result of site activities. Pollution could result from the release, accidental or otherwise, of contaminated runoff from mining camps, discharge of contaminated mining water, chemicals, oils, fuels, sewage, run off from stockpiles, solid waste, litter, etc.
- All equipment and machinery, e.g. cement mixers, generators etc., must be placed on drip trays.
- The Contractor must ensure that polluted runoff, such as runoff from the mining camp where equipment is cleaned and/or serviced, fuel stores, workshops, etc. is not discharged overland. Natural run-off must be diverted away from the work site and storage areas.
- The Contractor must take appropriate measures e.g. the erection of silt traps, or drainage retention areas, to prevent silt and sand entering drainage courses.

## 6.8 Discharge of mining water

- Mining water refers to all water dirtied as a result of mining activities.
- Silt laden water may be discharged overland and be allowed to filter into the ground, but the Contractor must ensure that no erosion results from this procedure. The contractor must ensure that silt-laden water is not discharged directly into any surface water courses, and must take suitable measures to prevent this.
- Cement-laden water, i.e. water from washings from trowels, wheelbarrows, etc., may not be discharged overland but must be disposed of off site at a facility capable of handling such waste water. Where possible, water should be collected and reused for mixing new concrete.

## 6.9 Servicing/fuelling of mining equipment

- Servicing and fuelling should preferably occur off-site. If these activities occur on-site, the Contractor must ensure that it takes place in designated areas. All waste generated during these activities must be collected and disposed off at an appropriate off site facility capable of handling such waste.
- All equipment that leaks must be repaired immediately. In the case of changing oil or lubricants on-site, the Contractor must have Drizit pads (or equivalent) and/or drip trays available to collect any oil, fluid, etc.
- The Contractor must take all reasonable precautions to prevent the pollution of the ground and/or water resources by fuels and chemicals as a result of his/her activities. No oil, diesel, petrol, etc., must be discharged onto the ground.
- Pumps and other machinery requiring oil, diesel, petrol, etc. that are to remain in one position for longer than two days must be placed on drip trays.
- The drip trays must be emptied regularly and the contaminated water disposed of off site at a

facility capable of handling such waste water. Drip trays must be cleaned before weekends and holidays and before any possible rain events that may result in the drip trays overflowing.

- The Contractor must remove all oil-, petrol- and diesel-soaked sand immediately and must dispose of it as hazardous waste.
- Tanks containing fuel must have lids and must remain firmly shut.
- Fuel stores must be placed on a bunded seal base, and waste water or spilled fuel collected within the bund must be disposed of as hazardous waste. Only clean, empty tanks may be stored on the ground.
- The Contractor must take the necessary precautions to prevent fires or spills at the fuel stores.
- No smoking or other activities that can initiate fires must be allowed in the vicinity of the stores.
- Any hazardous waste substances must be disposed of off-site at a licensed landfill site.

#### **6.10 Safety**

- The Contractor must ensure that all mining vehicles using public roads are in a roadworthy condition, they adhere to speed limits, their loads are secured and that all other regulations are adhered to.

#### **6.11 Noise**

- The Contractor must take all reasonable precautions to minimise noise generated on site as a result of his operations.
- The Contractor must comply with the National Building Regulations with regard to noise.

#### **6.12 Historical and archaeological sites**

SAHRA must be contacted immediately should any noticeable concentration of heritage resources be discovered during the course of the activity.

If an artifact on site is uncovered, work in the immediate vicinity must be stopped immediately. The Contractor must take reasonable precautions to prevent any person from removing or damaging any such article and must immediately inform the ECO of such discovery. The South African Heritage Resources Agency (SAHRA) or the National Monuments Council must be contacted such that an archaeological/heritage resources consultant can be appointed to record the site and excavate if necessary. Work may only resume once clearance is given in writing by an archaeologist (Mr. Gavin Andersen)

#### **6.13 Dust control**

Dust caused by strong winds must be controlled by means of water spray vehicles, or any other appropriate means as approved by the ECO.

Dust that may be generated during mining from stockpiled, excavated material must be dampened to minimize dust until such time that this material has been utilized during the rehabilitation process or that it can be removed and disposed of.

Appropriate dust-suppression techniques (e.g. the use of water spray vehicles) must be employed on all exposed surfaces during periods of high wind. Potential methods include:

- Remove only limited vegetation to accommodate mining activities.
  - Spray unpaved roads and mining areas, including stockpiles and spoil, with water routinely throughout mining to contain dust.
  - Implement traffic control measures to limit vehicle entrained dust from unpaved roads (e.g. by limiting mining vehicle speeds and by restricting traffic volumes).
  - Re-vegetate verges and cuttings once all of the mining is completed, and when the lay down area/mining camp is vacated.
- Vehicles emitting black smoke and fumes must be repaired and maintained.
  - No burning of waste material must be allowed.

#### **6.14 Emergency procedures**

- The Contractor must know emergency procedures for events such as fire, accidents and leakage of petroleum, chemicals and other harmful substances. The Contractor must be responsible for informing the staff of these procedures.

#### **6.15 Employment**

Without compromising mining activities and schedules, local labour should be employed as far as possible. Those successful in obtaining employment must be provided with the appropriate skills activity and training.

#### **6.16 Water for human consumption**

Water for human consumption must be available at the site offices and at other convenient locations on site.

#### **6.17 Cooking fuel**

The Contractor must provide adequate facilities for his staff so that they are not encouraged to supplement their comforts on site by accessing what can be taken from the natural surroundings, if necessary due to staff on site overnight (e.g. security). The Contractor must ensure that energy sources are available at all times for mining and supervision personnel for heating and cooking purposes.

#### **6.18 Protection of natural resources**

- Where applicable all indigenous fauna and flora must be protected. Wild animals must not be disturbed, caught or injured by any means. In terms of the Game Theft Act No. 105 of 1991, which regulates ownership of game, theft and unlawful hunting, catching and taking possession of game is illegal and punishable by law.
- Defacement of natural features or environmental damage outside of the demarcated site must not occur.
- No fires must be lit by the Contractor and employees anywhere on property, or on private land without the consent of the landowner. If the fires are lit on the property or in the mining camp, provision must be made that no accidental fires are started. No firewood may be collected in the veld.
- Defacement of natural features or environmental damage outside of the demarcated site must not occur.

## 7 RESTORATION, REHABILITATION AND RE-VEGETATION

### 7.1 Introduction

Rehabilitation of disturbed and heavily impacted environments is closely linked to ecological successional theory (van Ardel & Aronson, 2005). Succession can be described as a change of species, or patterns of species abundance, over time. Directional, continuous and sequential patterns of colonisation by various species are indicators of successional stages of a particular environment.

The first sequence of succession (e.g. after a disturbance, which in this case would be the mining) is thought to be the initial colonisation of an area of fast-growing, aggressive pioneering species, which in the case of plants are often short-lived, perennial species. These plant species are responsible for changing soil properties and creating micro-niches for further colonisation.

This initial sequence of pioneer species is then followed by early and late successional species migrating into the area over time, resulting in a climax community. The concept of a climax community is better explained as a natural equilibrium that is reached, which strikes the balance between minor disturbance events and regeneration.

The time taken to reach a climax community is dependant on many biotic and abiotic factors, which make predicting the time scale of reaching a stable climax population/community impossible. In addition, plant successions effect and are affected by faunal populations, and faunal components may contribute towards the rate of plant community succession.

When considering the rehabilitation of an environment that has been damaged, the 4 R approach is often employed and include:

- **Restoration**
- **Rehabilitation**
- **Replacement or re-vegetation**
- **Reservation (Conservation)**

Methods to reclaim, restore or rehabilitate areas are suggested in the body of this report, but it is important to note that these activities frequently begin with soil remediation, which may be required in specific cases. Soil remediation includes activities such as improvements to soil stabilisation, soil structure and soil fertility.

The success of rehabilitating the community/population within a designated area is dependent on the satisfactory establishment of the chosen plant species. To ensure that the process is optimised, the correct plant species in the correct densities and combinations should be utilised. Monitoring of the rehabilitation process is imperative to ensure that aggressive plant species and herbivores are controlled and slopes/banks remain stable.

In summary, the following phases required for site rehabilitation need to be completed:

- a. Bank/soil stabilisation and/or removal of alien plant species
- b. Remediate soil (composition, ph, nutrients, etc.), ensure soil is stabilised (through planting or physical structures)
- c. Re-vegetate using appropriate natural successional species.
- d. Monitor: removal of aggressive indigenous plant, follow up on alien invasive plant species, successful establishment of re-vegetated areas.

The property has historically been impacted by agriculture, erosion of water drainages lines. The resultant deterioration of the drainage lines in terms of bank erosion is significant. In addition, the continued disturbance has given alien invasive plant species the opportunity to colonise impacted areas.

## 7.2 Specific Rehabilitation Objectives

### 7.2.1 Alien invasive plant species and recommended removal plan

The difficulty with maintaining a rehabilitated site is the requirement of continued effort over long time periods. In addition, the possibility of alien colonisation is always high due to upstream dispersal of seedbanks along drainage courses. Therefore vegetation rehabilitation must take the form of an annual commitment to constantly remove alien invasive species and regularly plant appropriate indigenous species.

#### The following must be considered when removing the alien invasive vegetation:

- **Bull-dozing is not an appropriate method of removing trees;** the trees must be cut down individually.
- **Where possible** an attempt to protect indigenous plant/tree species must be made as this will ensure a more rapid stabilisation and recovery of the vegetation.
- The **indigenous trees and bulbs** that are removed must be transported to an appropriate site and burnt to prevent further dispersal of seeds.
- Use of pesticide/herbicide

There are a number of possible methods which can be used to control alien invasive species; these include mechanical, chemical and biological control. The sections below outline possible techniques used in mechanical and chemical control methods. Biological control is not a feasible option for this site, and is thus not discussed further. Table 6 outlines specific management details for each of the alien invasive species identified on site.

#### **Alien invasive control strategy:**

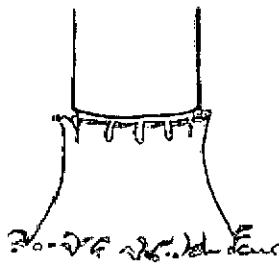
##### **Mechanical control methods**

Mechanical methods include felling, removing or burning invading alien plants.

**Hand pulling:** Grip the young plant low down and pull out by hand (using gloves).

**Ring barking:** Bark is removed to from the bottom of the stem to a height of 0.75-1.0 m to below ground level. Bush knives or hatchets can be used for debarking.

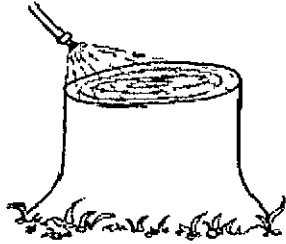
**Frill:** Using an axe or bush knife, angled cuts are made downward into the cambium layer through the bark in a ring; herbicide is applied into the cuts.



The Frilling Method

Where trees can be felled and removed use chainsaws, bowsaws, bush-cutters or cane knives.

**Cut stump treatment:** Stems should be cut as low as practical as stipulated on the herbicide label. Chemical herbicides are applied in diesel or water as recommended. Applications in diesel should be to the whole stump and exposed roots and in water to the cut area as recommended on the label.



Cut stump treatment

### Chemical control methods

Chemical methods include using a number of approved environmentally safe herbicides, which are applied to the leaves, stems or stumps of alien invader species (details of herbicides suitable for the various species are provided in Table 7.1).

### Instruction guidelines for alien invasive plant removal

#### Initial control

It is important to note that the entire site cannot be cleared at the same time and should be staggered over a period of a few months. **Clearing large areas of land can result in extensive environmental damage, rendering the remaining soil vulnerable to destabilisation and erosion.**

It is therefore recommended that clearing should be done in phases following a systematic grid-like pattern. Strip clearing is recommended; this process will make removal and follow-up of adjacent clearing processes easier to manage, ensuring that no areas are overlooked during clearing and subsequent follow-up programmes.

Where possible the use of a bulldozer should be avoided due to the excessive damage caused by them. Large-medium trees can be removed by cutting by contractor using chainsaws, bush-cutters and bone saws. In addition, foliar poisons and hand pulling can be used for smaller samplings and less dense patches of plants. Where stems are cut, it must be done as close to the ground as possible and followed by poisoning with the appropriate poison.

In isolated cases, large or difficult to reach trees can be ring-barked or frilled. Herbicide must be applied immediately after the cutting/felling operation to the cut surface.

Steps to be taken when clearing the site:

- Demarcate the area to be cleared.
- Identify the alien plants in the demarcated area and clear the species (large trees) which require felling (using chainsaws, bush-cutters or bonesaws) or hand pulling first (See Table 7.1). Apply herbicide directly onto stumps and/or frills of larger trees immediately after felling.
- Species that are to be sprayed with herbicide should be targeted next. Identify the species present in the demarcated area and identify the species which require the same herbicide concentrations, spray all of the species with the same foliar application requirements together (See Table 7.1 for an overall summary of appropriate measures).
- Remove all cut and dead material from the property. The accumulation of dead and dry plant material will present a very real fire hazard. It is important that seed from the alien plant species is not spread from this area. The seed bearing branches of larger trees should be removed from the main stem and remain on site until dry and the seed has dropped before it is removed from the property.

Once clearing has taken place, foliar spraying should be conducted on smaller alien plants. Different herbicides are recommended for the various alien species present on site (see Table 7.1). This is a manual process using a knapsack sprayer. The herbicide applicators only target the affected surface area, although caution must be taken to prevent extensive run-off from the plant onto the soil.



### Follow-up control

Follow-up of the cleared areas will need to continue for at least five years after mining. Every two months after the mining has completed, follow-up visits to the site must be done. Methods used during follow-up operations include: mechanical pulling and felling of seedlings and foliar sprays of stands of seedlings, root suckers or coppice growth (See Table 7.1 for an overall summary of appropriate measures and control methods).

#### Follow-up requirements:

- The follow-up treatments in the cleared site will need to be performed every two months.
- Foliar sprays (less labour intensive) and hand pulling will be the most common methods employed.
- For large dense stands of seedlings or saplings, foliar spraying can be used effectively. Target species that require the same herbicides together.
- For areas that are more sparsely populated with seedlings, hand pulling is recommended to avoid destroying natural grasses and other vegetation binding and holding the soil.
- Coppicing may occur on large tree species which have been chopped down, foliar sprays appropriate to that specie are required and must be applied during the follow-up to prevent the plant from re-seeding.

### Maintenance control

The site should be re-visited on an annual basis to monitor and ensure that the area continues to be free of alien invasion. If it is found that the area has been re-invaded, follow-up clearing and foliar sprays appropriate to the invader species must be implemented immediately.

**Table 7.1:** Summary of methods to be used for removal of alien invasive species identified on site.

Species name	Hand pull or hoe	Foliar Spray		Cut stump and herbicide	Frill and herbicide
		Seedlings	Trees		
<i>Lantana camara</i> L.	seedlings	Touchdown	Touchdown	Chopper	
<i>Cestrum laevigatum</i>	seedlings			Chopper	Chopper
<i>Solanum mauritianum</i>	seedlings and saplings	Touchdown		Chopper	Chopper
<i>Ricinus communis</i>				Confront (2%)	
<i>Acacia mearnsii</i>	Seedlings	Touchdown	Garlon (young trees)	Timbrel 3A *	Timbrel 3A *
<i>Acacia longifolia</i>	seedlings and saplings up to 2m tall	Garlon	Garlon	Timbrel 3A *	Timbrel 3A *
<i>Acacia saligna</i>	seedlings and saplings	Touchdown	Garlon (young trees)	Timbrel 3A *	Timbrel 3A *
<i>Acacia cyclops</i>	seedlings and saplings	Garlon	Garlon (trees up to 2m tall)		Timbrel 3A *
<i>Psidium guajava</i>				Chopper	
<i>Eucalyptus</i> sp.	seedlings			Chopper	Chopper
<i>Melia azedarach</i>	seedlings			Chopper	Chopper

## **2. Stabilisation of steep slopes**

The proposed mining will result in steep slopes on site. These areas need to be stabilised and contoured in such a manner as to not negatively impact natural drainage patterns.

## **3. Indigenous Vegetation- Ecosystem Restoration**

The general aim of the implementation of a rehabilitation programme is to recreate a natural ecosystem after mining by:

1. Remediating soil (composition, ph, nutrients, etc.), ensure soil is stabilised (through planting or physical structures). Bank/soil stabilisation and/or removal of alien plant species
2. Rehabilitate using appropriate action plan and natural successional species.
3. Monitor: removal of aggressive indigenous plant, follow up on alien invasive plant species, successful establishment of re-vegetated areas.

The fundamental hypothesis adopted is that natural self-sustaining ecosystems can be recreated by growing the appropriate selection of many different species following a successional logic.

In order to establish a sustainable indigenous vegetation cover it is necessary to:

- Establish a cover crop of pioneering, fast-growing plant species or physical structure to stabilise the sand/soil after vegetation removal
- Establish secondary pioneer species (early successional species) to provide shade, habitats for insects and birds, etc.
- Establish late successional species, namely trees, herbs and lianas which make up the compliment of the natural ecosystem.

Thus, provide the necessary habitat and ecosystem for the potential for other biota to colonise.

The first phase of rehabilitation will involve soil remediation and in some cases, re-placement of topsoil, such that the establishment of a cover crop will be successful.

### **Species of special concern**

It is important to note that even the pruning of some of this species would require authorisation. All protected species require DWAF permits to transplant, remove or damage.

**In the event that trees need to be felled, the tree should be searched for Orchids. They must be rescued and transplanted to another tree.**

## **8 COMPLIANCE MONITORING**

### **8.1 APPOINTMENT OF AN ENVIRONMENTAL CONTROL OFFICER (ECO)**

For the purposes of implementing the conditions contained herein, an ECO must be appointed who must be the responsible person for ensuring that the provisions of the EMP are complied with during the life of the project. The ECO must submit written reports to the proponent and relevant contractor after visiting the site.

### **8.2 RECORD KEEPING**

The ECO will monitor the relative contractor's adherence to the approved impact prevention procedures and must issue the Contractor a notice of non-compliance whenever transgressions are observed. The ECO should document the nature and magnitude of the non-conformance in a designated register, the action taken to discontinue the non-conformance, the action taken to mitigate its effects and the results of the actions. The non-conformance must be documented and reported in the monthly report. These reports should be made available to DEDEA/DME when requested.

Copies of any permits and this EMP must be kept on site and made available for inspection by visiting officials from the employer or relevant environmental departments.

A list of reports likely to be generated during all phases of the project is set out below, and all applicable documentation must be included in the environmental filing system catalogue or document retrieval index.

- Final EMP
- Final design documents and diagrams issued to and by the Contractor
- All communications detailing changes of design/scope that may have environmental implications
- Daily, weekly and monthly site monitoring reports
- Occupational Health and Safety reports
- Complaints register
- Medical reports
- Training manual
- Training attendance registers
- Incident and accident reports
- Emergency preparedness and response plans
- Copies of all relevant environmental legislation
- Permits and legal documents, including letters authorising specific personnel of their duties as Occupational Health and Safety representatives or as part of emergency preparedness teams e.g. fire teams, etc.
- Crisis communication manual
- Disciplinary procedures
- Monthly site meeting minutes during mining
- All relevant permits
- All method statements from the Contractor and/or Contractor for all phases of the project.

### **8.3 TRAINING**

#### **8.3.1 ENVIRONMENTAL CONTROL OFFICER**

The ECO must be appropriately trained in environmental management and must possess the skills necessary to impart environmental management skills to all personnel involved in the contract.

#### **8.3.2 ENVIRONMENTAL AWARENESS COURSE**

Contractors must ensure that its employees and any third party who carries out all or part of the Contractor's obligations are adequately trained with regard to the implementation of the EMP, as well as regarding environmental legal requirements and obligations. Training must be conducted by the ECO where necessary.

Environment and health awareness training programmes should be targeted at three distinct levels of employment, i.e. the executive, middle management and labour. Environmental awareness training programmes must contain the following information:

- The names, positions and responsibilities of personnel to be trained.
- The framework for appropriate training plans.
- The summarised content of each training course.
- A schedule for the presentation of the training courses.

The ECO must ensure that records of all training interventions are kept in accordance with the record keeping and documentation control requirements as set out in this EMP. The training records must verify each of the targeted personnel's training experience.

The Proponent must ensure that adequate environmental training takes place. All employees must have been given an induction presentation on environmental awareness and the content of the EMP. The presentation needs to be conducted in the language of the employees to ensure it is understood. The environmental training must, as a minimum, include the following:

- The importance of conformance with all environmental policies.
- The environmental impacts, actual or potential, of their work activities.
- The environmental benefits of improved personal performance.
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirement of the Agency's environmental management systems, including emergency preparedness and response requirements.
- The potential consequences of departure from specified operating procedures;
- The mitigation measures required to be implemented when carrying out their work activities.
- Environmental legal requirements and obligations.
- Details regarding floral/faunal species of special concern and protected species, and the procedures to be followed should these be encountered during the mining of the bridge, main access roads, approach roads or mining camps.
- The importance of not littering.
- The importance of using supplied toilet facilities.
- The need to use water sparingly.
- Details of and encouragement to minimise the production of waste and re-use, recover and recycle waste where possible.
- Details regarding archaeological and/or historical sites which may be unearthed during mining and the procedures to be followed should these be encountered.

Recommended Environmental Education Material is provided in Appendix C

### **8.3.3 ADMINISTRATION**

Before a contractor begins mining he must provide the ECO with the following information:

- The type of mining activity.
- Locality where the activity will take place.
- Identification of the environmental aspects and impacts that might result from the activity.
- Methodology for impact prevention for each activity or aspect.
- Methodology for impact containment for each activity or aspect.
- Emergency/disaster incident and reaction procedures.
- Treatment and continued maintenance of impacted environment.

The ECO must be informed of any variations prior to the activity.

### **8.4 GOOD HOUSEKEEPING**

Good housekeeping extends beyond the wise practice of mining methods that leaves production in a safe state from the ravages of weather to include the care for and preservation of the environment. Any site-specific measures should be highlighted by the ECO to the contractors.

## 8.5 ROLES AND RESPONSIBILITIES

### 8.5.1 PROPONENTS

The proponent/proponents must ultimately be responsible for the management of environmental impacts on site.

### 8.5.2 CONTRACTORS

The contractors must:

- be responsible for the overall implementation of the EMP in accordance with the requirements of DME and DEDEA;
- ensure that all third parties who carry out all or part of the Contractor's obligations under the Mining Contract comply with the requirements of this EMP;
- Sign the Pro-Forma: Protection of the Environment.

### 8.5.3 ENVIRONMENTAL CONTROL OFFICER (ECO)

The ECO will oversee the mining phase of the project on the ground, and ensure that all environmental specifications and EMP requirements are met at all times.

The ECO will be responsible for the monitoring, reviewing and verifying of compliance with the EMP by the contractors.

The ECO's duties in this regard will include, *inter alia*, the following:

- Ensuring that all the environmental authorisations and permits required in terms of the applicable legislation have been obtained prior to mining commencing.
- Monitoring and verifying that the EMP is adhered to at all times and taking action if specifications are not followed.
- Monitoring and verifying that environmental impacts are kept to a minimum.
- Reviewing and approving mining method statements with input from the independent environmental consultant, where necessary, in order to ensure that the environmental specifications contained within this EMP are adhered to.
- Assisting the Contractor in finding environmentally responsible solutions to problems.
- Keeping accurate and detailed records of all activities on site.
- Inspecting the site and surrounding areas on a regular basis regarding compliance with the EMP.
- Monitoring the undertaking by the Contractor of environmental awareness training for all new personnel on site.
- Ensuring that activities on site comply with all relevant environmental legislation.
- Ordering the removal of, or issuing spot fines for person/s and/or equipment not complying with the specifications of the EMP.
- Undertaking a continual internal review of the EMP and submitting any changes to the Applicant for review and approval.
- Keeping a register of complaints on site and recording community comments and issues, and the actions taken in response to these complaints.
- Ensuring that the required actions are undertaken to mitigate the impacts resulting from non-compliance.
- Reporting all incidences of non-compliance to the Engineer.

The ECO must have:

- a good working knowledge of all relevant environmental policies, legislation, guidelines and standards;
- the ability to conduct inspections and audits and to produce thorough and informative reports;
- the ability to manage public communication and complaints;
- the ability to think holistically about the structure, functioning and performance of environmental systems; and
- proven competence in the application of the following integrated environmental management tools:
  - \* EMP
  - \* Environmental auditing.
  - \* Mitigation and optimisation of impacts.

- \* Monitoring and evaluation of impacts.

The ECO must be fully conversant with the details of the proposed project and all relevant environmental legislation.

## 8.6 EMERGENCY PREPAREDNESS

The Contractor must maintain environmental emergency procedures to ensure that there will be an appropriate response to unexpected or accidental actions or incidents that will cause environmental impacts, throughout the mining period. Such activities may include, *inter alia*:

- Accidental discharges to water and land.
- Accidental exposure of employees to hazardous substances.
- Accidental veld or forest fires.
- Accidental spillage of hazardous substances.
- Accidental toxic emissions into the air
- Specific environmental and ecosystem effects from accidental releases or incidents.

These plans must include:

- Emergency organisation (manpower) and responsibilities, accountability and liability.
- A list of key personnel and contact details.
- Details of emergency services available (e.g. the fire department, spill clean-up services, etc.).
- Internal and external communication plans, including prescribed reporting procedures where required by legislation.
- Actions to be taken in the event of different types of emergencies.
- Incident recording, progress reporting and remediation measures required to be implemented.
- Information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release.
- Training plans, testing exercises and schedules for effectiveness.

The Contractor must comply with the emergency preparedness and incident and accident-reporting requirements, as required by the Occupational Health and Safety Act, 1993 (Act No 85 of 1993), the NEMA, 1998 (Act No 107 of 1998), the National Water Act, 1998 (Act No 36 of 1998) and the National Veld and Forest Fire Act, 1998 (Act No 101 of 1998) as amended and/or any other relevant legislation.

## 8.7 INCIDENT REPORTING AND REMEDY

If a leakage or spillage of hazardous substances occurs on site, the local emergency services must be immediately notified of the incident. The following information must be provided:

- the location;
- the nature of the load;
- the extent of the impact; and
- the status at the site of the accident itself (i.e. whether further leakage is still taking place, whether the vehicle or the load is on fire).

Written records must be kept on the corrective and remedial measures decided upon and the progress achieved therewith over time. Such progress reporting is important for monitoring and auditing purposes. The written reports may be used for training purposes in an effort to prevent similar future occurrences.

## 8.8 COMPLIANCE AND PENALTIES

The contractors must act immediately when such notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the mining site pertaining to the environment must be recorded in a dedicated register and the response noted with the date and action taken. The ECO should be made aware of any complaints.

Any non-compliance with the agreed procedures of the EMP is a transgression of the various statutes and laws that define the manner by which the environment is managed.

Failure to redress the cause must be reported to the relevant authority for them to deal with the transgression, as it deems fit.

The Contractor is deemed not to have complied with the EMP if, *inter alia*:

- there is evidence of contravention of the EMP specifications within the boundaries of the mining site, site extensions and roads;
- there is contravention of the EMP specifications which relate to activities outside the boundaries of the mining site.
- environmental damage ensues due to negligence;
- mining activities take place outside the defined boundaries of the site; and/or
- the Contractor fails to comply with corrective or other instructions issued by the Engineer within a specific time period.

It is recommended that the engineers/contractors institute penalties for the following less serious violations, and any others determined during the course of work as detailed below:

- Littering on site.
- Lighting of illegal fires on site.
- Persistent or un-repaired fuel and oil leaks.
- Any persons, vehicles or equipment related to the Contractor's operations found within the designated "no-go" areas.
- Excess dust or excess noise emanating from site.
- Possession or use of intoxicating substances on site.
- Any vehicles being driven in excess of designated speed limits.
- Removal and/or damage to fauna, flora or cultural or heritage objects on site.
- Urination and defecation anywhere except at designated facilities.

Where environmental damage is caused or a pollution incident, and/or failure to comply with any of the environmental specifications contained in the EMP, the proponent and/or contractor must be liable.

The following violations, and any others determined during the course of work, should be penalised:

- Hazardous chemical/oil spill and/or dumping in non-approved sites.
- Damage to sensitive environments.
- Damage to cultural and historical sites.
- Unauthorised removal/damage to indigenous trees and other vegetation, particularly in identified sensitive areas.
- Uncontrolled/unmanaged erosion.
- Unauthorised blasting activities (if applicable).
- Pollution of water sources.
- Unnecessary removal or damage to trees.

**MPRDA No. 28 of 2002 Regulations No. R. 527 of 2004**

52. (2) An environmental management plan, must substantially be in the standard format provided by the Department and must contain-  
 (g) a record of the public participation undertaken and the results thereof;

The public participation followed the process stipulated in section 56 of the EIA Regulations (2006).

**9.1 Notification of Interested and Affected Parties**

**Newspaper advertisement**

The proposed activity was advertised in the Daily Dispatch on 30 July 2009 (Figure 1 below). This advertisement detailed the proposed activity and provided IAP's a period to register.

Figure 1: Advertisement in Daily Dispatch



### Stakeholder identification and notification

In addition to the above notification, certain stakeholders were identified based on their potential interest in the project (Table 1). These organisations were contacted via registered mail for comment and were sent a Letter of Notification (Figure 3) and Background Information Document (BID) (Figure 4).

**Table 1: Identified stakeholders**

Name of Interested/affected party	Contact details: Address & telephone number	How did consultation take place?	What were his/her main concerns about the operation?
1. DWAF	Jack Landile JackL@dwaf.gov.za	e-mail	No comment
2. BCM-IEMP	Shirley Fergus shirleyf@buffalocity.gov.za	e-mail	No comment
3. BCM Planning	Hans Schluter HansS@buffalocity.gov.za	e-mail	No comment
4. DEDEA (East London)	Briant Noncembu Briant.Noncembu@deaet.ecape.gov.za	e-mail	No comment
5. South African Heritage Resources Agency (SAHRA)	Dr. A. Jerardino ajerardino@sahra.org.za	e-mail	Requested a Heritage Assessment (Please see Appendix D)

**Jahne De Wet**

**From:** "Jahne De Wet" <j.dewet@cesnet.co.za>  
**To:** "Jack Landile (ELS)" <JackL@dwaf.gov.za>; <ajerardino@sahra.org.za>;  
<HansS@buffalocity.gov.za>; <Briant.Noncembu@deaet.escape.gov.za>;  
<shirleyf@buffalocity.gov.za>  
**Sent:** 12 August 2009 11:09 AM  
**Attach:** Notification to stakeholders.pdf; Tshani mining BID.pdf  
**Subject:** Notification of the intent to submit a mining permit application and EMP

Dear Stakeholder

Please be informed of the intent to submit a Mining Permit Application and an EMP for the proposed strip mining of sand on Farm 850/19, East London. Attached please find a BID detailing the proposed activity. The property in question is owned by the Applicant.

Kind regards

Jahne de Wet  
Environmental Consultant  
Coastal and Environmental Services

Tel: (043) 742 3302  
Fax: (043) 742 3306  
e-mail: [j.dewet@cesnet.co.za](mailto:j.dewet@cesnet.co.za)  
web: [www.cesnet.co.za](http://www.cesnet.co.za)

**Figure 2:** Proof of notification sent to stakeholders

**COASTAL & ENVIRONMENTAL SERVICES**  
Environmental Management and Impact Assessment



67 African Street P.O. Box 834  
Grahamstown 6140 SOUTH AFRICA  
Tel: 043-622 2364 Fax: 043-622 6564  
International: +27-43-722 2364  
Email: [info@cesnet.co.za](mailto:info@cesnet.co.za)  
Website: [www.cesnet.co.za](http://www.cesnet.co.za)

2 Marine Terrace P.O. Box 8145  
East London 5210 SOUTH AFRICA  
Tel: 043-722 5812 Fax: 043-742 3306  
International: +27-43-722 5812  
Email: [cesel@cesnet.co.za](mailto:cesel@cesnet.co.za)  
Website: [www.cesnet.co.za](http://www.cesnet.co.za)

12 August 2009

Dear Interested and/or Affected Party

**APPLICATION FOR MINING PERMIT AND ENVIRONMENTAL MANAGEMENT PLAN- Strip mining of sand, Farm 850/19, East London**

Notice is hereby given in terms of In terms of Section 39(2) of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA), which requires any person who applies for a reconnaissance permission, prospecting right or mining permit to submit an Environmental Management Plan (EMP) and undertake a Public Participation Process (Regulation 52(2)(g)) as prescribed to the Regional Manager concerned for his approval.

**Activity:**

The proposed mining permit will involve strip mining of sand on Farm 850/19, East London, for a total of 1.4ha.

**Location:**

Farm 850/19, East London

**Proponent:**

Tshani Consulting cc.

**Consultant:**

Coastal & Environmental Services  
Attn: Ms. Jahne de Wet  
PO Box 8145  
East London  
Tel: 043 742 3302  
Fax: 043 742 3306  
E-mail: [j.dewet@cesnet.co.za](mailto:j.dewet@cesnet.co.za)

Please note that you have been identified as a potential Interested or Affected Party (I&AP) in the above mentioned matter. Please contact our office within 30 days of the date of this letter at the details given above to receive more information and/or to comment.

Please feel free to contact me should you have any comments or queries

Kind regards

Jahne de Wet  
Environmental Consultant  
[j.dewet@cesnet.co.za](mailto:j.dewet@cesnet.co.za)

Henque 1018 t/a Coastal & Environmental Services . Reg no. CK 1997/061914/23 . Vat No. 4380172835  
Members: Dr AM Avis (PhD Rhodes) . Prof RA Lubke (PhD Western Ontario)  
Mrs CE Avis (MA Rhodes, CAIB) . Dr P Scheman (PhD Rhodes)  
Dr AR Carter (PhD Rhodes, CPDA USA) .

Figure 3: Letter of notification to Stakeholders


<b>BACKGROUND INFORMATION DOCUMENT &amp; INVITATION TO COMMENT:</b>	
<b>PROPOSED APPLICATION FOR A MINING PERMIT, FARM 850/19, EAST LONDON</b>	
<p><b>AIM OF THIS DOCUMENT</b></p> <p>The aim of this Background Information Document is to provide people affected by and interested in the proposed project with information about this project, the process being followed and to provide them with an opportunity to be involved in the EMP process.</p> <p>Interested and Affected Parties (IAPs) may raise issues of concern. These will be examined and included in the EMP.</p> <p>The EMP will be provided to the DME for final decision making, as to whether or not the project should go ahead and if so under what conditions.</p> <p><u>Return address for comments:</u></p> <p><b>Jahne de Wet</b>  <b>1 Hampton Court</b>  <b>2 Marine Terrace</b>  <b>P.O. Box 3145</b>  <b>Nahoon, 5210</b>  <b>Tel: (043) 742-3302</b>  <b>Fax: (043) 742-3306</b>  <b>Email:</b>  <b>j.dewet@cesnet.co.za</b></p> <p>Submit comments by:  <b>23<sup>rd</sup> August 2009</b></p> <p><b>Your involvement in this process is critical, and will help ensure that all relevant issues are raised and assessed.</b></p> 	<p><b>PROJECT DESCRIPTION</b></p> <p>The proposed activity involves strip mining of sand for a total area of 1.4ha on Farm 850/19. The property on which the proposed activity will take place is located next to the Bridledrift dam. Please note however that the proposed mining will not directly impact on the Bridledrift dam or any other known watercourses.</p> <p><b>Method to be employed</b></p> <p>Strip mining will be the method employed for mining and will involve the use of a front end loader, with a long-boom or long reach shovels. The surface soil or overburden will be stripped off and stockpiled for later land rehabilitation.</p> <p><b>RELEVANT LEGISLATION</b></p> <p>In terms of Section 39(2) of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA), any person who applies for a reconnaissance permission, prospecting right or mining permit must submit an Environmental Management Plan (EMP) as prescribed to the Regional Manager concerned for his approval. In terms of Section 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 the landowner. Furthermore, in terms of section 40, the Minister shall consult as to that with each department charged with the administration of any law which relates to any matter affecting the environment prior to granting approval.</p> <p><b>For this application a mining permit is required:</b></p> <ul style="list-style-type: none"> <li>A mining permit is granted for smaller operations with a surface area of less than 1.5ha and shorter periods of less than 2 years (Section 27 of the MPRDA, 2002).</li> </ul> <p>The permits and rights are issued followed by the approval of an EMP. An EMP has been developed by the DME for the management of the small-scale mining sector. The rationale behind the development of an EMP was to provide a simplified national standard that an applicant for a prospecting right or mining permit is able to comply with in terms of the MPRDA of 2002 and regulation 52. The EMP assists applicants by providing the information that the DME requires in a simple language and in a structured, prescribed format as contemplated in Section 52(2) of the MPRDA. As part of the EMP, an extensive Public Participation Process needs to be conducted (Regulation 52(2)(g)).</p> <p>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 and a record of the public participation undertaken and the results thereof included in the EMP.</p>

Figure 4: Background Information Document (page 1)

Application for a mining permit, Farm 850/19, East London  
BACKGROUND INFORMATION DOCUMENT (BID)

Locality of proposed development (indicated by green block)

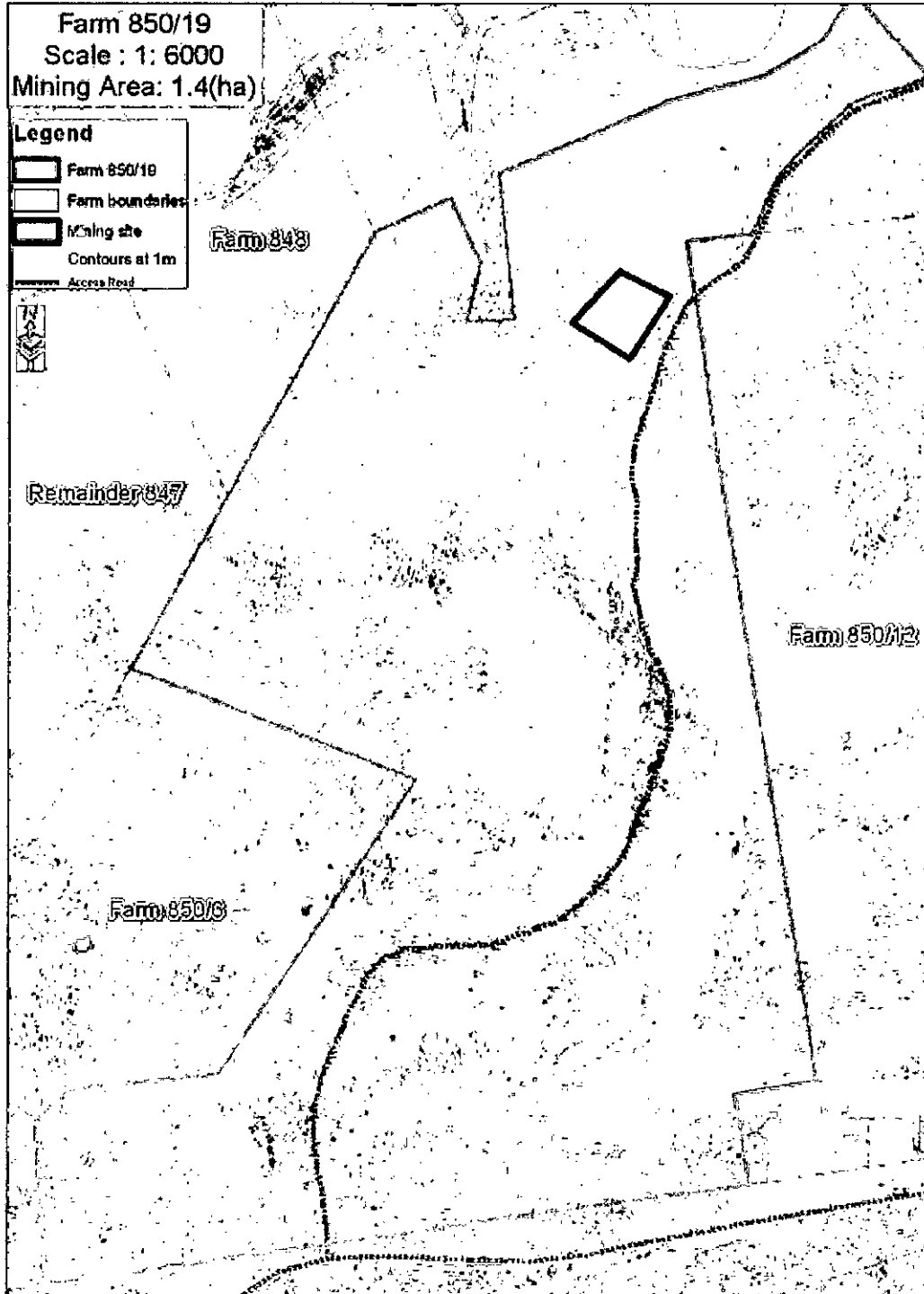


Figure 4: Background Information Document (page 2)

### 1.1.3 Surrounding and Affected Landowners

Surrounding landowners were notified of the proposed activity.

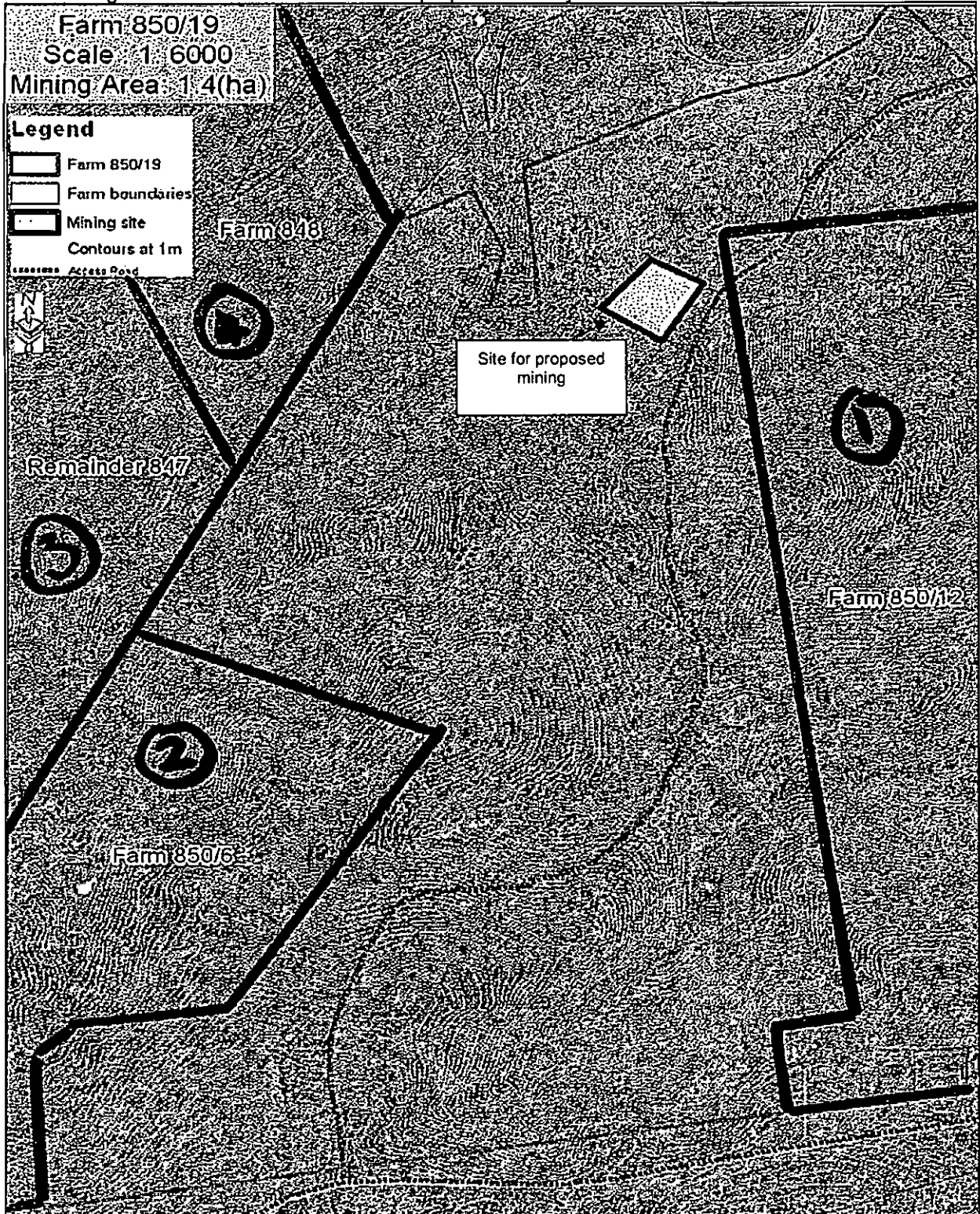


Figure 5: Surrounding properties and properties located within 100m of the proposed activity

**Table 2: Surrounding landowners**

Number	Erf	Owner	Contact details	Request to be registered as I&AP
1	850/12	Ronald Emiel Weimann	Informed by Mr. Everitte van Loggerenberg. Please see signed authorisation from Mr. Weimann in the Application form submitted to DME	Yes
2	850/6	Bamboo Rock 1060 CC	The	No
3	847RE	Republic of South Africa	BCM Municipality Dept. of Planning- Please see Figure 2 for proof of notification	No
4	848	Buffalo City Municipality	Dept. of Planning- Mr. Hans Schluter HansS@buffalocity.gov.za- Please see Figure 2 for proof of notification	No
		BCM-IEM	Shirley Fergus shirleyf@buffalocity.gov.za- Please see Figure 2 for proof of notification	No

**9.2 List of Registered IAPs**

One I&amp;AP requested to be registered

Name	Address	Tel	Fax	E-mail address
Quinera Lagoon Estate Homeowners Association- Mr AMA Craib	Quinera Lagoon Estate Homeowners Association, P.O.Box 932, Gonubie, 5256	043 703 2490/2466 Cell: 0829554159	27 (0)43 7032233	Andrew.Craib@eskom.co.za

**9.3 Issues Raised by IAPs**

A written comment was submitted by Mr. Andrew Craib on behalf of the Quinera Lagoon Estate Homeowners Association

**Jahne De Wet**

**From:** "Andrew Craib" <Andrew.Craib@eskom.co.za>  
**To:** <j.dewet@cesnet.co.za>  
**Cc:** <grafier@telkomsa.net>  
**Sent:** 14 August 2009 11:27 AM  
**Attach:** Andrew Craib3.vcf  
**Subject:** IAP Registration Farm850 19

Hi Jane

I would like to register Quinera Lagoon Estate Homeowners Association as an interested party for the Farm850/19 application. I am the secretary of the Homeowners Association. The Estate is situated on Quinera Drive (old PSA Resort dust road leading down to Quinera River (Gonubie side of Bonza Bay)) in Quinera (in the area of Farm 850).

Name: A.M.A.Craib  
Tel: 043 7032490/2466  
Cell: 0829554159

Postal Address: Quinera Lagoon Estate Homeowners Association, P.O.Box 932, Gonubie, 5256.

We would like you to make sure that thorough rehabilitation occurs once the site has been mined and that assurances/monies and a monitoring policy is set aside to achieve this (if this is possible). In our view, for thorough rehabilitation to occur, an inventory of the plant and tree life should be recorded during the initial environmental study.

Regards  
A.Craib (Pr.Eng)  
Senior Engineer  
Technology Head EDNS  
Eskom Distribution Southern  
Tel: ++27 (0)43 7032490  
Fax: ++27 (0)43 7032233  
Pax: 87102490  
Cell: 0829554159

**Figure 6:** Comment received from Quinera Lagoon Estate Homeowners Association

#### 9.4 Public Meeting

As only one written comment was received regarding the proposed activity, it is not deemed necessary to hold a public meeting.



## 7. CONCLUSIONS AND RECOMMENDATIONS

### 7.1 Issue: Environmental impacts (Fauna, Flora, Soil, Water)

- Vegetation only to be removed in areas approved by the ECO, using appropriate methods
- Boundaries of the site to be clearly indicated and no person or equipment allowed outside the boundaries of the site
- The EMP must be adhered to and enforced
- The liberation of dust into the atmosphere must be controlled by: spraying water or other nontoxic dust allaying agents
- The speed of haul trucks must also be kept to a minimum
- Vehicles and equipment must be maintained in an excellent condition to reduce production of smoke and fumes
- Land and topography to be remediated as close to the original state as possible
- All conditions of the EMP must be adhered to. This includes the management of stockpiles to prevent aliens/invasive flora colonising the piles
- Spills should be cleaned up immediately by removing the spills together with the polluted soil and disposing thereof at a recognised facility to the satisfaction of the regulators.
- Building Contractor should be bound by a contract to adhere to the EMP
- Controlled access to vegetated areas to be instituted
- No poaching of animals is allowed
- Ensure that all mining is conducted in compliance with a standard Environmental Management Plan (EMP) and overseen by an Environmental Control Officer to prevent site pollution, fires and dumping of materials
- **Non-biodegradable refuse** (such as glass bottles, plastic bags metal, scrap, etc.) must be stored in a container at a collecting point and collected on a regular basis and disposed of at an **authorised disposal facility**. Precautions must be taken to prevent any refuse from spreading on and from the campsite.
- **Biodegradable** refuse generated from the camp site, storage area or any other area must either be handled as above or be buried in a pit excavated for that purpose and be covered with layers of soil, incorporating a final 0,5 metre thick layer of topsoil (if practical) or as specified by the local authority, if applicable.
- Suitable covered receptacles must be provided and conveniently placed for waste disposal. All used oils, grease or hydraulic fluid must be placed therein and these receptacles will be removed from the site on a regular basis for disposal at a recognized or licensed disposal facility.
- Ensure minimal disturbance of vegetation
- Rehabilitation of the disturbed site must be undertaken
- Rehabilitation must include transplanting of disturbed vegetation

### 7.2 Issue: Water bodies and stormwater

- Ensure that all building is conducted in line with this EMP derived to prevent environmental degradation due to mining.
- Site to be rehabilitated as close to natural state (including topographical features) as possible, as described in this report
- Stormwater management plan to be implemented.
- All potentially polluting substance need be managed in an appropriate manner as described in the EMP
- Fuel must be banded

### 7.3 Issue: Heritage sites

- The ECO and SAHRA must be informed immediately if any artefact/site is discovered during operations

#### 7.4 Issue: Socio-economic impacts

- Rehabilitation to occur as described in the EMP under the guidance of an ECO
- Proponent to be bound by contract to adhere to the EMP
- Operations only to occur between the hours of 8-17:00 weekdays
- The liberation of dust into the atmosphere must be controlled by: spraying water or other nontoxic dust allaying agents
- The speed of haul trucks must also be kept to a minimum
- Vehicles and equipment must be maintained in an excellent condition
- All activity and activities must be done in line with relevant legislation and policy
- Stabilisation measures to be implemented as described in this Report
- Once a section has been mined, revegetation must immediately take place

## 8. REFERENCES

Cape Nature and Environmental Conservation Ordinance (19 of 1074).

Conservation of Agricultural Resources Act (Act 43 of 1983).

Constitution (Act 108 of 1996).

Environment Conservation Act (Act 73 of 1989).

National Environment Management Act (Act 107 of 1998).

National Forests Act (Act 84 of 1998).

National Heritage Resources Act (Act 25 of 1999).

National Water Act (Act 36 of 1998).



Nel *et al.*, (2004). (APPENDIX B)

Pierce, S.M. (2003) The STEP Handbook. Integrating the natural environment into land use decisions at the municipal level: towards sustainable activity. Terrestrial Ecology Research Unit Report No. 47. University of Port Elizabeth, South Africa.



## APPENDIX A- VISUAL MANUAL FOR EASY IDENTIFICATION OF ALIEN INVASIVE PLANT SPECIES

The following plates provide a guide to the alien invasive plant species identified on site at the proposed site for mining. Each species is described in terms of how it looks, timing of flowering and/or fruiting, its invasive status (as classified by the Conservation of Agricultural Resources Act (Act 43 of 1983a). See Section 2 for Invasive Status classification key).


Guideline to *Cestrum laevigatum* (Inkberry)

<b>Scientific name</b>	<i>Cestrum laevigatum</i>
<b>Common name(s)</b>	Inkberry
<b>Description</b>	Sparsely hairy, evergreen shrubs 1-2 m high or trees up to 15 m on the coast; leaves and stems bruise easily, emitting an unpleasant smell
<b>Leaves</b>	Light or dark green, mainly along the distal ends of branches
<b>Flowers</b>	Greenish-yellow in axillary clusters Flowering from October to May
<b>Fruits</b>	Berries 10 mm long, green turning purple-black
<b>Invasive status</b>	Transformers. Declared weed (category 1). Herbicide registration
	
<b>Proposed control methods</b>	
<b>Seedlings</b>	Hand pull
<b>Large trees</b>	Single stemmed: Basal stem and herbicide All: Cut stump and herbicide

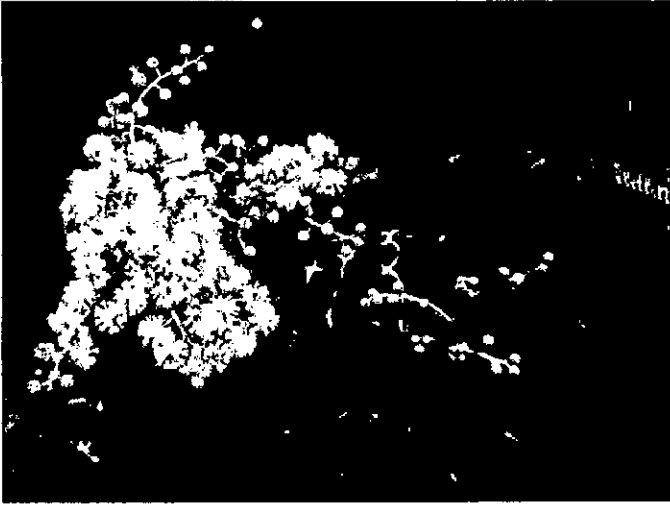
Guideline to *Solanum mauritianum* (Bugweed)

<b>Scientific name</b>	<i>Solanum mauritianum</i>
<b>Common name(s)</b>	Bugweed
<b>Description</b>	Unarmed, branched shrub or small tree 2-4 (-10) m high; all parts except older stems covered with a whitish-felty hairs
<b>Leaves</b>	Dull green and velvety above, white-felty beneath, up to 205 mm long x 100 mm wide, emit a strong smell when bruised; stipules ovate, 20 mm long
<b>Flowers</b>	Purple in compact terminal clusters, on dense felty stalks up to 100 mm long Flowering all year
<b>Fruits</b>	Globose berries 10 mm across, green turning yellow, in compact terminal clusters
<b>Invasive status</b>	Transformer. Declared weed (category 1). Herbicide registration
	
	
<b>Proposed control methods</b>	
<b>Seedlings and saplings</b>	Hand pull Foliar spray
<b>Big trees</b>	Cut down and spray coppice Cut stump and herbicide Frill or ring-bark

Guideline to *Ricinus communis* (Castor-oil)

<b>Scientific name</b>	<i>Ricinus communis</i>
<b>Common name(s)</b>	Castor-oil plant
<b>Description</b>	Annual herb, softly woody shrub or small tree up to 4 m high, sap is not milky, leaf and flowering stalks often with a grey bloom
<b>Leaves</b>	Shiny, dark green or reddish, paler below, large up to 300 mm wide, palmately five- to nine-lobed, margins closely serrated, petioles up to 300 mm
<b>Flowers</b>	Reddish (upper), cream (lower), on stalks up to 150 mm long Flowering August- April (-all year)
<b>Fruits</b>	Green, brown or reddish, three-lobed capusules, 10-15 mm long, covered with soft spines, seeds silvery mottled-brown "beans"
<b>Invasive status</b>	Declared invader (category 2)
	
<b>Proposed control methods</b>	Cut stump and poison with 'Confront' in a 2% solution.

Guideline to *Acacia mearnsii* (Black wattle)

<b>Scientific name</b>	<i>Acacia mearnsii</i>
<b>Common name(s)</b>	Black wattle
<b>Description</b>	Unarmed, evergreen tree 5-15 m high; branchlets mustowly ridged; all parts finely hairy, bipinnate; leaflets short (1.5-4.0 mm) and crowded; raised glands occur at and between the junctions of pinnae pairs
<b>Leaves</b>	Compound leaf
<b>Flowers</b>	Pale yellow or cream, globular flowerheads in large, fragrant sprays Flowering from August to September
<b>Fruits</b>	Dark brown pods, finely hairy, usually markedly constricted
<b>Invasive status</b>	Transformer. Declared invader (category 2). Herbicide registration.
	
<b>Proposed control methods</b>	
<b>Seedlings and saplings</b>	Hand pull or hoe Foliar spray
<b>Young trees</b>	Foliar spray
<b>Big trees</b>	Cut stump Frill Stem treatment
<b>Inaccessible trees</b>	Stem treatment

Guideline to *Psidium guajava* (Guava)






<b>Scientific name</b>	<i>Psidium guajava</i>
<b>Common name(s)</b>	Guava
<b>Description</b>	Evergreen shrub or small tree 2-5 (-10) m high; branchlets four-angled and hairy
<b>Leaves</b>	Bronze turning light green, ovate to oblong-elliptic; often broad and rounded at both ends, with a small, pointed apex
<b>Fruits</b>	Edible. Many seeded berries, with a musky penetrating odour
<b>Flowers</b>	White, in groups of 1-3 Flowering from October- December
<b>Invasive status</b>	Transformer. Declared invader (category 2). Herbicide registration
	
<b>Proposed control methods</b>	
<b>All trees</b>	Cut stump and herbicide

Table 3-12: Guideline to *Melia azedarach* (Syringa)

<b>Scientific name</b>	<i>Melia azedarach</i>	
<b>Common name(s)</b>	Syringa	
<b>Description</b>	Deciduous, spreading tree up to 23 m high; bark on young stems reddish-brown and smooth	
<b>Leaves</b>	Deep green, glossy above, turning yellow in autumn; odd-pinnate, leaflets serrated and sometimes lobed	
<b>Fruits</b>	Berries, green turning yellow, thinly fleshy, becoming wrinkled and persisting after leaves fall	
<b>Flowers</b>	Lilac, +-10 mm long, with purplish central column, in large, terminal, heavily perfumed sprays Flowering September-November	
<b>Invasive status</b>	Transformer. Declared invader (category 3). Herbicide registration.	
		
		
<b>Proposed control methods</b>		
<b>Seedlings</b>	Hand remove	
<b>All trees</b>	Cut stump and herbicide Frill	

Source: Henderson (2001), ISSG (2006) and WESSA (2006)



## APPENDIX B– CATEGORISATION OF INVASIVE PLANTS

Taken directly from Nel *et al.*, (2004).

**Appendix 1.** Major invaders grouped according to categories. 'No. grid-cells' is the number of grid-cells where the species has been recorded in the Southern African Plant Invaders Atlas (SAPIA) database; '% grid-cells abundant' is the percentage of grid-cells in South Africa where the species is recorded as very abundant or abundant in the SAPIA database (note: where more than one record with the same species and abundance code occurred within a grid-cell, it was counted as one record); 'Riparian or landscape' is the classification given to a species if more than 75% of its records in the SAPIA database fell into the respective category (if neither the landscape nor riparian records exceeded 75% then the species was classified as 'both'); and 'CARA category' lists the species regulated by the Conservation of Agricultural Resources Act (Act 43 of 1983), where 1 refers to Category 1 prohibited weeds that must be controlled in all situations; 2 includes Category 2 plants with commercial value that may be planted in demarcated areas subject to a permit, provided that steps are taken to control spread; 3 includes Category 3 ornamental plants that may no longer be planted or traded, but may remain in place provided a permit is obtained and steps taken to control their spread; and 'proposed' includes those species that were proposed for listing under the Conservation of Agricultural Resources Act, but require further investigation before they can be included.

Range-abundance	Scientific name	Common name	Number of grid-cells	% Grid-cells abundant	Riparian or landscape	CARA category
Very widespread-abundant	<i>Acacia measii</i>	Black wattle	432	28	Both	2
	<i>Populus alba/canescens</i>	White and grey poplars	557	20	Riparian	2
	<i>Prosopis glandulosa</i> var. <i>torreyana/velutina</i>	Honey mesquite/prosopis	453	15	Both	2
Very widespread-common	<i>Agave americana</i>	American agave	433	1	Landscape	Proposed
	<i>Anodo donax</i>	Giant reed	377	14	Riparian	1
	<i>Eucalyptus</i> spp.	Gum trees	506	4	Both	
	<i>Melia azedarach</i>	Seringa	558	7	Both	3
	<i>Nicotiane glauca</i>	Wild tobacco	396	3	Both	1
	<i>Opuntia ficus-indica</i>	Sweet prickly pear	863	4	Landscape	1
	<i>Ricinus communis</i>	Castor-oil plant	471	7	Riparian	2
	<i>Salix babylonica</i>	Weeping willow	475	12	Riparian	2
Widespread-abundant	<i>Acacia cyclops</i>	Red eye	167	29	Both	2
	<i>Acacia dealbata</i>	Silver wattle	256	24	Riparian	1/2
	<i>Acacia longifolia</i>	Long-leaved wattle	95	24	Both	1
	<i>Acacia saligna</i>	Port Jackson willow	160	28	Both	2
	<i>Ageratina adenophora</i>	Crofton weed	11	19	Riparian	1
	<i>Ageratum conyzoides/heoustonianum</i>	Invading ageratum	74	26	Riparian	1
	<i>Argemone mexicana</i>	Yellow-flowered Mexican poppy	29	18	Riparian	1
	<i>Atriplex lindleyi</i> ssp. <i>inflata</i>	Sponge-fruit saltbush	164	43	Landscape	3
	<i>Azolla filiculoides</i>	Red water fern	206	36	Riparian	1
	<i>Caesalpinia decapetala</i>	Mauritius thorn	128	19	Both	1
	<i>Campuloclinium macrocephalum</i>	Pompom weed	17	25	Both	1
	<i>Cardiospermum grandiflorum/halimacabum</i>	Balloon vines	63	22	Both	1
	<i>Cestrum aurantiacum/laevigatum</i>	Inkberry	80	24	Both	1
	<i>Chromolaena odorata</i>	Tiffid weed	96	36	Both	1
	<i>Eichhornia crassipes</i>	Water hyacinth	95	22	Riparian	1
	<i>Lantana camara</i>	Lantana	261	27	Both	1
	<i>Pinus pinaster</i>	Cluster pine	86	26	Landscape	2
	<i>Psidium guajava</i>	Guava	167	17	Both	2
	<i>Rubus cuneifolius</i>	American bramble	75	34	Both	1
	<i>Rubus fruticosus</i>	European blackberry	89	20	Both	2
	<i>Salix fragilis</i>	Crack willow	75	22	Riparian	2
	<i>Solanum mauritianum</i>	Bugweed	268	21	Both	1
	Widespread-common	<i>Acacia decurrens</i>	Green wattle	101	21	Both
<i>Acacia melanoxylon</i>		Australian blackwood	138	15	Both	2
<i>Achyrocline aspera</i>		Burweed	77	4	Both	1
<i>Ailanthus altissima</i>		Tree-of-heaven	32	5	Both	3
<i>Anredera cordifolia</i>		Bridal wreath	24	8	Both	1
<i>Araujia sericifera</i>		Moth catcher	36	2	Both	1
<i>Atriplex nummularia</i> ssp. <i>nummularia</i>		Old-man saltbush	173	7	Both	2
<i>Bidens formosa</i>		Cosmos	48	11	Riparian	
<i>Cardiospermum halimacabum</i>		Heart pea	30	0	Riparian	
<i>Casuarina equisetifolia</i>		Horsetail tree	24	3	Both	2
<i>Cereus jamecari</i>		Queen of the night	127	9	Landscape	1
<i>Coryza banariensis</i>		Flax-leaf fleabane	5	0	Riparian	
<i>Coralaria agathiflora</i> subsp. <i>imperialis</i>		Bird flower	18	0	Both	Proposed
<i>Cuscuta campestris</i>		Common dodder	82	1	Both	1
<i>Deture</i> spp. ( <i>D. ferax/D. innoxia/D. stramonium</i> )		Thorn apples	84	1	Riparian	1
<i>Echium plantagineum/vulgare</i>		Patterson's curse/blue echium	44	14	Both	1
<i>Eucalyptus camaldulensis</i>		Red river gum	123	15	Riparian	2
<i>Hakea senecio</i>		Silky hakea	78	12	Landscape	1
<i>Ipomoea alba</i>		Moonflower	23	3	Riparian	1
<i>Ipomoea indica/purpurea</i>		Morning glories	98	8	Both	1
						( <i>I. indica</i> ) 3
						( <i>I. purpurea</i> )
		<i>Jacaranda mimosifolia</i>	Jacaranda	201	6	Both
	<i>Mirabilis jalapa</i>	Four-o'clock	7	0	Landscape	Proposed

Continued on p. 62

Mining permit EMP - 2009

Appendix 1 (continued)

Range-abundance	Scientific name	Common name	Number of grid-cells	% Grid-cells abundant	Riparian or landscape	CARA category	
Widespread-common	<i>Morus alba</i>	White or common mulberry	130	4	Riparian	3	
	<i>Opuntia aurantiaca</i>	Jointed cactus	61	5	Landscape	1	
	<i>Opuntia imbricata</i>	Imbricate cactus	131	10	Landscape	1	
	<i>Opuntia monacantha</i>	Cochineal prickly pear	46	1	Both	1	
	<i>Opuntia robusta</i>	Blue-leaf cactus	225	1	Landscape		
	<i>Opuntia stricta</i>	Australian pest pear	108	10	Landscape	1	
	<i>Pinus halepensis</i>	Aleppo pine	85	3	Landscape	2	
	<i>Pinus patula</i>	Patula pine	90	12	Both	2	
	<i>Pinus radiata</i>	Radlata pine	71	12	Landscape	2	
	<i>Pinus spp.</i>	Pine trees	126	9	Landscape		
	<i>Pyracantha angustifolia</i>	Yellow firethorn	143	1	Both	3	
	<i>Robinia pseudoacacia</i>	Black locust	110	9	Both	2	
	<i>Schinus molle</i>	Pepper tree	232	1	Both	Proposed	
	<i>Senna dihyrnobotrye</i>	Peanut butter cassia	142	13	Both	3	
	<i>Senna occidentalis</i>	Wild coffee	56	8	Both		
	<i>Sesbania punicea</i>	Red sesbania	325	13	Riparian	1	
	<i>Solanum seaforthianum</i>	Potato creeper	33	7	Both	1	
	<i>Solanum sisymbirifolium</i>	Dense-throated bitter apple	40	6	Both	1	
	<i>Sorghum halepense</i>	Johnson grass	44	4	Riparian	2	
	<i>Tamarix spp. (T. chinensis/T. ramosissima)</i>	Tamarisk	92	4	Riparian	1/3	
	<i>Verbena bonariensis</i>	Purple top	58	5	Riparian		
	<i>Verbena tenuisecta</i>	Fine-leaved verbena	14	4	Riparian		
	<i>Xanthium strumarium</i>	Large cocklebur	151	12	Both	1	
	<i>Zinnia peruviana</i>	Redstar zinnia	4	0	Both		
	Widespread-s scarce	<i>Acacia baileyana</i>	Bailey's wattle	87	0	Both	3
		<i>Populus nigra var. italica</i>	Lombardy poplar	90	0	Riparian	Proposed
	Localized-abundant	<i>Acacia pycnantha</i>	Golden wattle	35	25	Landscape	1
<i>Albizia lebeck</i>		Lebeck tree	5	33	no data	1	
<i>Azola pinata var. imbricata</i>		Mosquito fern	3	25	Riparian		
<i>Colocasia esculenta</i>		Elephant's ear	10	21	Riparian		
<i>Echinopsis spachiana</i>		Torch cactus	57	3	Landscape	1	
<i>Eucalyptus lehmannii</i>		Spider gum	41	13	Landscape	1/2	
<i>Feverla bidentis</i>		Smelter's bush	19	26	Riparian		
<i>Hakea drapacea</i>		Sweet hakea	28	7	Landscape	1	
<i>Hakea gibbosa</i>		Rock hakea	18	11	Landscape	1	
<i>Harrisia martinii</i>		Moon cactus	21	43	Both	1	
<i>Hedychium coccineum</i>		Red ginger lily	3	20	Riparian	1	
<i>Hedychium flavescens</i>		Yellow ginger lily	5	40	Both	1	
<i>Hedychium spp.</i>		Ginger lilies	7	25	Riparian	1	
<i>Helianthus annuus</i>		Sunflower	5	17	no data		
<i>Leptospermum laevigatum</i>		Australian myrtle	38	30	Landscape	1	
<i>Ligustrum vulgare</i>		Common privet	3	20	Riparian	3	
<i>Lilium formosenseum</i>		Formosa lily	16	21	Landscape	3	
<i>Litsea glutinosa</i>		Indian laurel	8	44	Both	1	
<i>Macleodena unguis-cati</i>		Cat's claw creeper	27	27	Both	1	
<i>Medicago alba</i>		White sweet clover	15	40	Riparian		
<i>Metrosideros excelsa</i>		New Zealand bottlebrush	2	25	Riparian	3	
<i>Myriophyllum aquaticum</i>		Parrot's feather	48	19	Riparian	1	
<i>Nassella trichotoma</i>		Nassella tussock	12	21	Landscape	1	
<i>Nerium oleander</i>		Oleander	24	6	Riparian	1	
<i>Opuntia felgida</i>		Chainfruit-cholla/rosea cactus	11	17	Landscape	1	
<i>Opuntia lindheimeri/Opuntia engelmannii var. lindheimeri</i>		Small round-leaved prickly pear	11	21	Landscape	1	
<i>Paraserianthes lophantha</i>		Stinkbean	54	10	Both	1	
<i>Parthenium hysterophorus</i>		Parthenium weed	24	37	Riparian	1	
<i>Paspalum distatum</i>		Common Paspalum	6	33	Riparian		
<i>Pennisetum vilosum</i>		Feathertop	22	21	Landscape	1	
<i>Pinus efiortii</i>		Slash pine	34	15	Landscape	2	
<i>Pistia stratiotes</i>		Water lettuce	27	17	Riparian	1	
<i>Pittosporum undulatum</i>		Australian cheese-wood	3	0	Both	1	
<i>Rumex usambarensis</i>		Rumex	4	20	Landscape		
<i>Salvinia molesta</i>		Salvinia	33	20	Riparian	1	
<i>Schinus terebinthifolius</i>		Brazilian pepper tree	32	16	Both	1	

**APPENDIX C – ENVIRONMENTAL AWARENESS COURSE**

# WHAT IS THE ENVIRONMENT?

- Soil
- Water
- Plants
- People
- Animals
- Air we breathe
- Buildings, cars and houses



## WHY MUST WE LOOK AFTER THE ENVIRONMENT?

- It affects us all as well as future generations
- We have a right to a healthy environment
- A contract has been signed
- Disciplinary action (e.g. construction could stop or fines issued)

## HOW DO WE LOOK AFTER THE ENVIRONMENT?

- Report problems to your supervisor/ foreman
- Team work
- Follow the rules in the EMP



## WORKING AREAS

Workers & equipment must stay inside the site boundaries at all times



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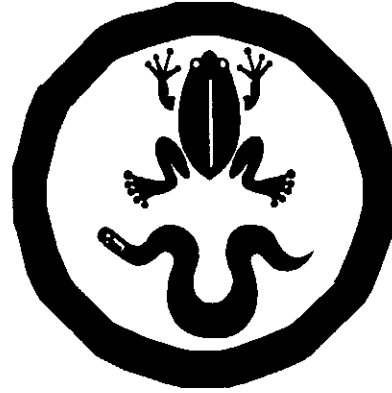
## RIVERS & STREAMS

- Do not swim in or drink from streams
- Do not throw oil, petrol, diesel, concrete or rubbish in the stream
- Do not work in the stream without direct instruction
- Do not damage the banks or vegetation of the stream



## ANIMALS

- Do not injure or kill any animals on the site
- Ask your supervisor or Contract's Manager to remove animals found on site



## TREES AND FLOWERS

- Do not damage or cut down any trees or plants without permission
- Do not pick flowers



## SMOKING AND FIRE

- Put cigarette butts in a rubbish bin
- Do not smoke near gas, paints or petrol
- Do not light any fires without permission
- Know the positions of fire fighting equipment
- Report all fires
- Do not burn rubbish or vegetation without permission



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## PETROL, OIL AND DIESEL

- Work with petrol, oil & diesel in marked areas
- Report any petrol, oil & diesel leaks or spills to your supervisor
- Use a drip tray under vehicles & machinery
- Empty drip trays after rain & throw away where instructed



## DUST

Try to avoid producing dust -  
Use water to make ground &  
soil wet



## NOISE

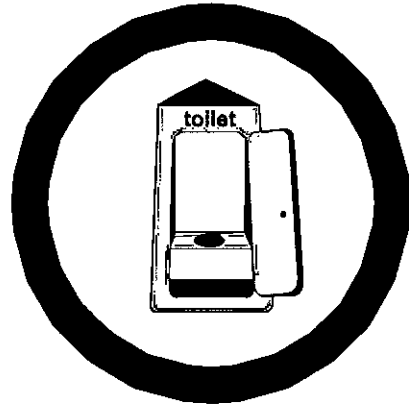
- Do not make loud noises around the site, especially near schools and homes
- Report or repair noisy vehicles





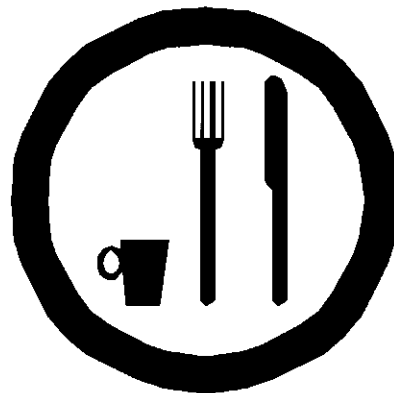
## TOILETS

- Use the toilets provided
- Report full or leaking toilets



## EATING

- Only eat in demarcated eating areas
- Never eat near a river or stream
- Put packaging & leftover food into rubbish bins



## RUBBISH

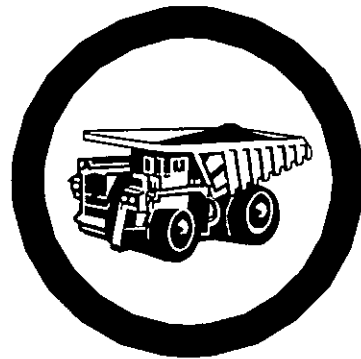
- Do not litter - put all rubbish (especially cement bags) into the bins provided
- Report full bins to your supervisor
- The responsible person should empty bins regularly



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## TRUCKS AND DRIVING

- Always keep to the speed limit
- Drivers - check & report leaks and vehicles that belch smoke
- Ensure loads are secure & do not spill

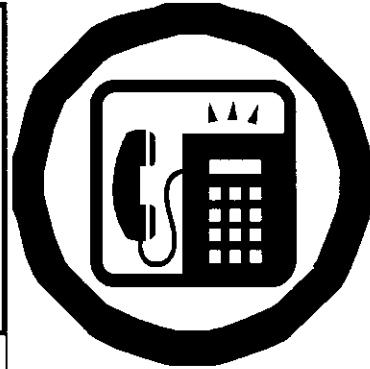


## EMERGENCY PHONE NUMBERS

Know all the emergency phone numbers:

- Ambulance:
- Fire:
- Police:

Local Municipality: Buffalo City

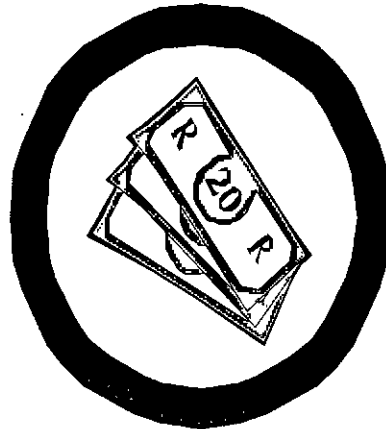


## FINES AND PENALTIES

- Spot fines of between

To be determined by ECO

- Your company may be fined
- Removal from site
- Construction may be stopped



## PROBLEMS - WHAT TO DO!

- Report any breaks, floods, fires, leaks and injuries to your supervisor
- Ask questions!



**A LETTER OF RECOMMENDATION (WITH CONDITIONS) FOR THE EXEMPTION  
OF A FULL PHASE 1 ARCHAEOLOGICAL HERITAGE IMPACT ASSESSMENT FOR  
THE APPLICATION FOR A MINING PERMIT ON FARM 850/19 EAST LONDON,  
AMATHOLE DISTRICT MUNICIPALITY, EASTERN CAPE PROVINCE**

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6330  
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Cell: 0728006322  
Email: kobusreichert@yahoo.com

**Date:** October 2009

## **PROJECT INFORMATION**

### **Registration No.:**

### **The type of development**

The proposed development will include the mining of dolerite. The total mining area will be 1,4 hectares.

### **The Developer**

Mr E. van Loggerenberg  
P.O. Box 5304  
Greenfields  
5208  
Tel: 043-764-9304

### **The Consultant**

TshaniConsulting  
Contact person: Mr KreasonNaidoo  
12 Elton Street  
Southernwood  
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Cell: 082 940 2502  
Email: kreasonn@iafrica.com

## **TERMS OF REFERENCE**

The original proposal was to conduct a Phase 1 Archaeological Heritage Impact Assessment of the proposed mining of dolerite on farm 80/19, East London, Amathole District Municipality, Eastern Cape Province; to describe and evaluate the importance of possible archaeological heritage sites, the potential impact of the development and to make recommendations to minimize possible damage to these sites.

## **DESCRIPTION OF THE PROPERTY**

**Map:** 1:50 000 – 3227 DC Berlin

### **Location data**

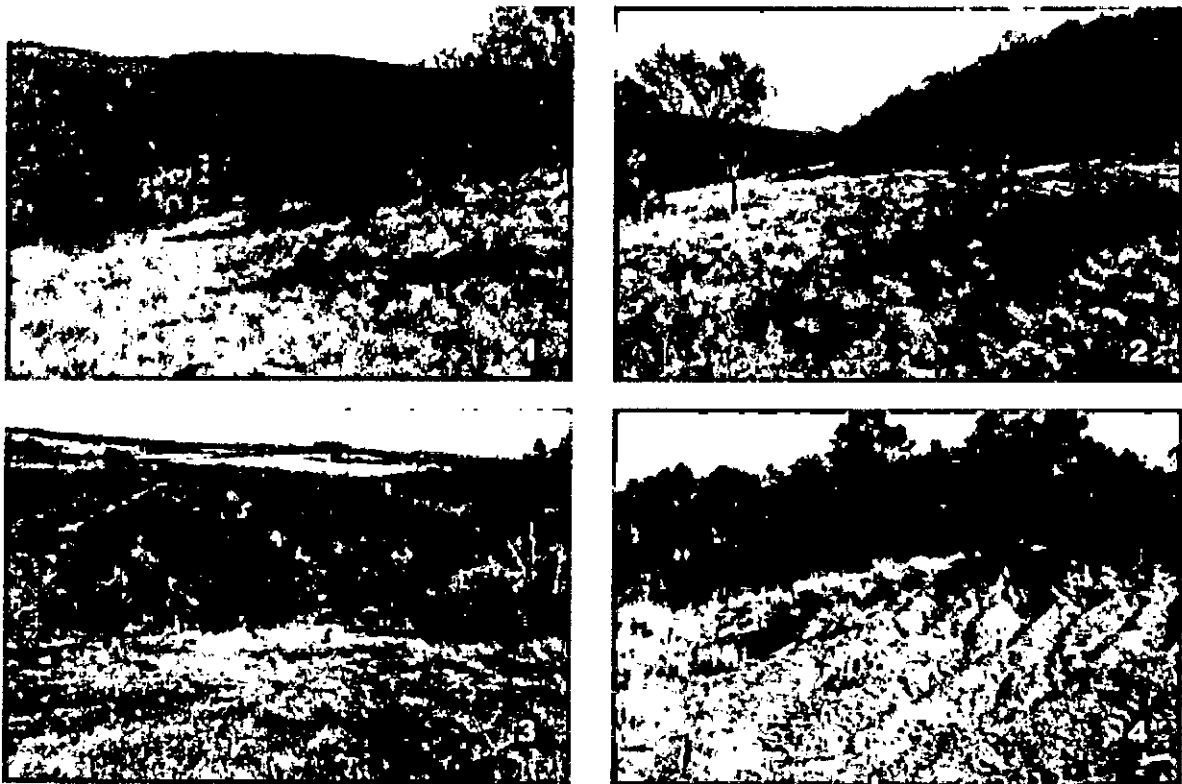
The proposed area for the mining of dolerite on farm 850/19, East London, Amathole District Municipality, Eastern Cape Province, is located approximately a kilometer south of the Bridle

Drift Dam and some 15 kilometres west of East London next to the gravel road to the R346 main road between East London and King William's Town (Maps 1-2). A GPS reading was taken using a Garmin Plus II at 32.39.37,55S; 27.42.40,58E.

## ARCHAEOLOGICAL INVESTIGATION

### Methodology

The investigation was conducted on foot. The proposed area for mining is situated on a south-facing hill with a gentle gradient. Low dense grass and indigenous trees covers the slope of the hill and made it difficult to found archaeological sites (Figs 1-3). There are ploughed fields on the hill top and it is possible that the slope has been ploughed in the past as well. It is evident from a nearby borrow pit that the top soil overlying the dolerite deposit is shallow and does not allow for archaeological features, such as grain pits, hut floors and cattle kraals (Fig 4). No archaeological sites/materials were found during the survey. In general it would appear that it is unlikely that any archaeological heritage remains of any value will be found *in situ* or of any contextual value will be exposed during the development.



Figs 1-3. Views of the area to be mined. Note the dense grass and trees. Fig 4. View of an old borrow pit nearby.

## Conditions

Although it is unlikely that any archaeological heritage remains of any value will be found *in situ* or of any contextual value, there is always a possibility that human remains and/or other archaeological and historical material may be uncovered during the development. Such material must be reported to the nearest museum, archaeologist or to the South African Heritage Resources Agency (SAHRA) if exposed, so that a systematic and professional investigation can be undertaken. Sufficient time should be allowed to remove/collect such material (See Appendix A for a list of possible archaeological sites that may be found in the area).

## LETTER OF RECOMMENDATION

It is recommended that the proposed mining on farm 850/19, East London, Amathole District Municipality, Eastern Cape Province, is exempted from a full Phase 1 Archaeological Heritage Impact Assessment. The proposed area for development is of low cultural sensitivity and it is believed that it is unlikely that any archaeological heritage remains will be found on the property. The proposed development may proceed as planned.

**Note:** This letter of recommendation **only** exempts the proposed development from a full Phase 1 Archaeological Heritage Impact Assessment, but **not** for other heritage impact assessments.

It must also be clear that this letter of recommendation for exemption of a full Phase 1 archaeological heritage impact assessment will be assessed by the relevant heritage resources authority. The final decision rests with the heritage resources authority, which should give a permit or a formal letter of permission for the destruction of any cultural sites.

**The National Heritage Resources Act (Act No. 25 of 1999, section 35) requires a full Heritage Impact Assessment (HIA) in order that all heritage resources, that is, all places or objects of aesthetics, architectural, historic, scientific, social, spiritual linguistic or technological value or significance are protected. Thus any assessment should make provision for the protection of all these heritage components, including archaeology, shipwrecks, battlefields, graves, and structures older than 60 years, living heritage, historical settlements, landscapes, geological sites, palaeontological sites and objects.**

## GENERAL REMARKS AND CONDITIONS

It must be emphasised that this letter of recommendation for exemption of a full Phase 1 archaeological heritage impact assessment is based on the visibility of archaeological sites/material and may not therefore, reflect the true state of affairs. Sites and material may be covered by soil and vegetation and will only be located once this has been removed. In the unlikely event of such finds being uncovered, (during any phase of construction work), archaeologists must be informed immediately so that they can investigate the importance of the sites and excavate or collect material before it is destroyed (see attached list of possible archaeological sites and material). The *onus* is on the developer to ensure that this agreement is honoured in accordance with the National Heritage Act No. 25 of 1999.



## **APPENDIX A: IDENTIFICATION OF ARCHAEOLOGICAL FEATURES AND MATERIAL FROM INLAND AREAS: guidelines and procedures for developers**

### 1. Identification of Iron Age archaeological features and material

- Upper and lower grindstones, broken or complete. Later Iron Age lower and upper grindstone/rubber will be pitted.
- Circular hollows - sunken soil, would indicate storage pits and often associated with grindstones.
- Ash heaps, called middens, with cultural remains and food waste such as bone.
- Khaki green soils would indicate kraal areas.
- Baked clay/soil blocks with or without pole impression marks indicate hut structures.
- Ceramic potsherds.
- Iron slag and/or blowpipes indicate iron working.
- Human remains may also be associated with khaki green soils.
- Metal objects and ornaments.

### 2. Human Skeletal material

Human remains, whether the complete remains of an individual buried during the past, or scattered human remains resulting from disturbance of the grave, should be reported. In general the remains are buried in a flexed position on their sides, but are also found buried in a sitting position with a flat stone capping or in ceramic pots. Developers are requested to be on the alert for these features and remains.

### 3. Fossil bone

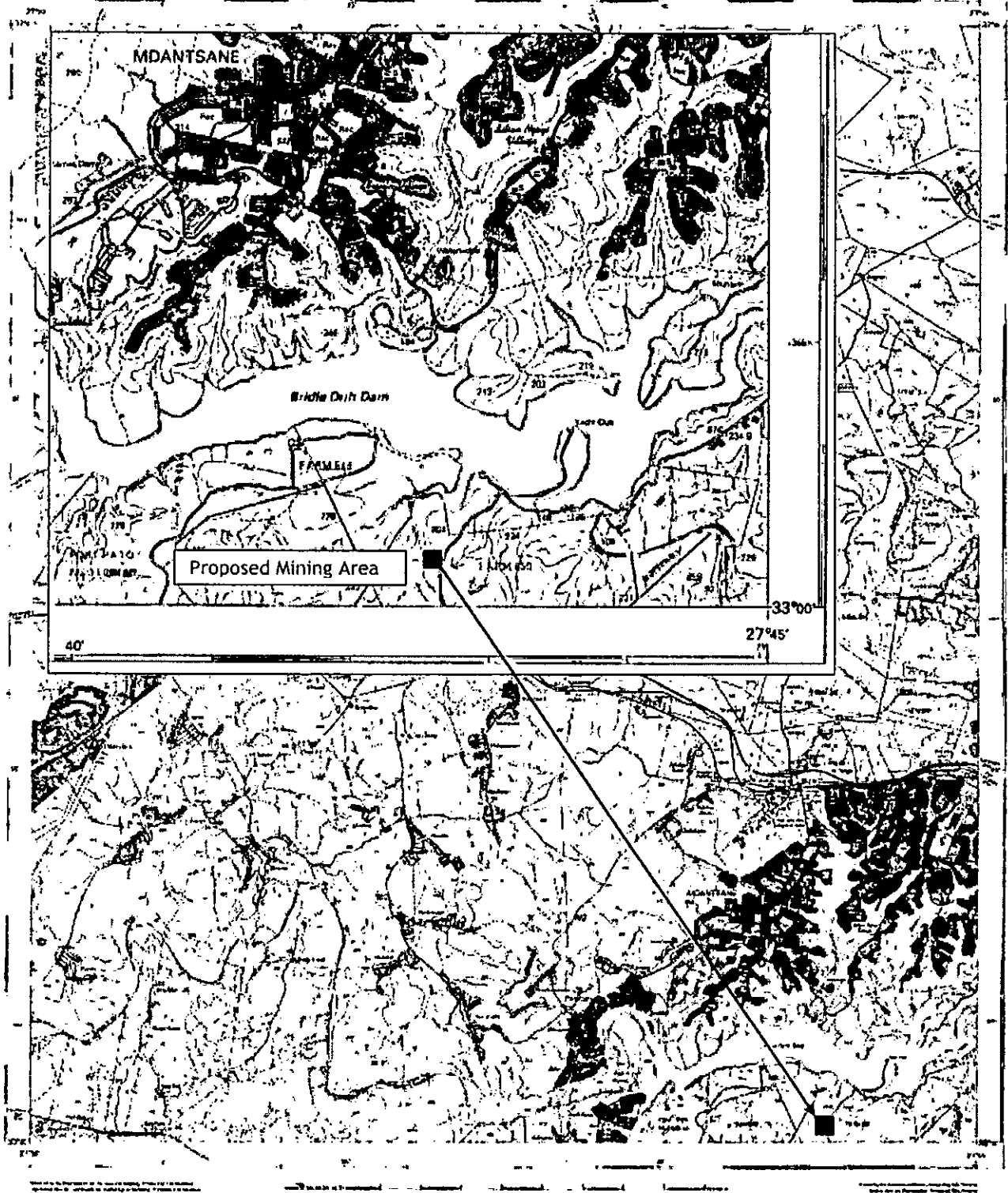
Fossil bones may be found embedded in deposit at the sites. Any concentrations of bones, whether fossilized or not, should be reported.

### 4. Stone artefacts

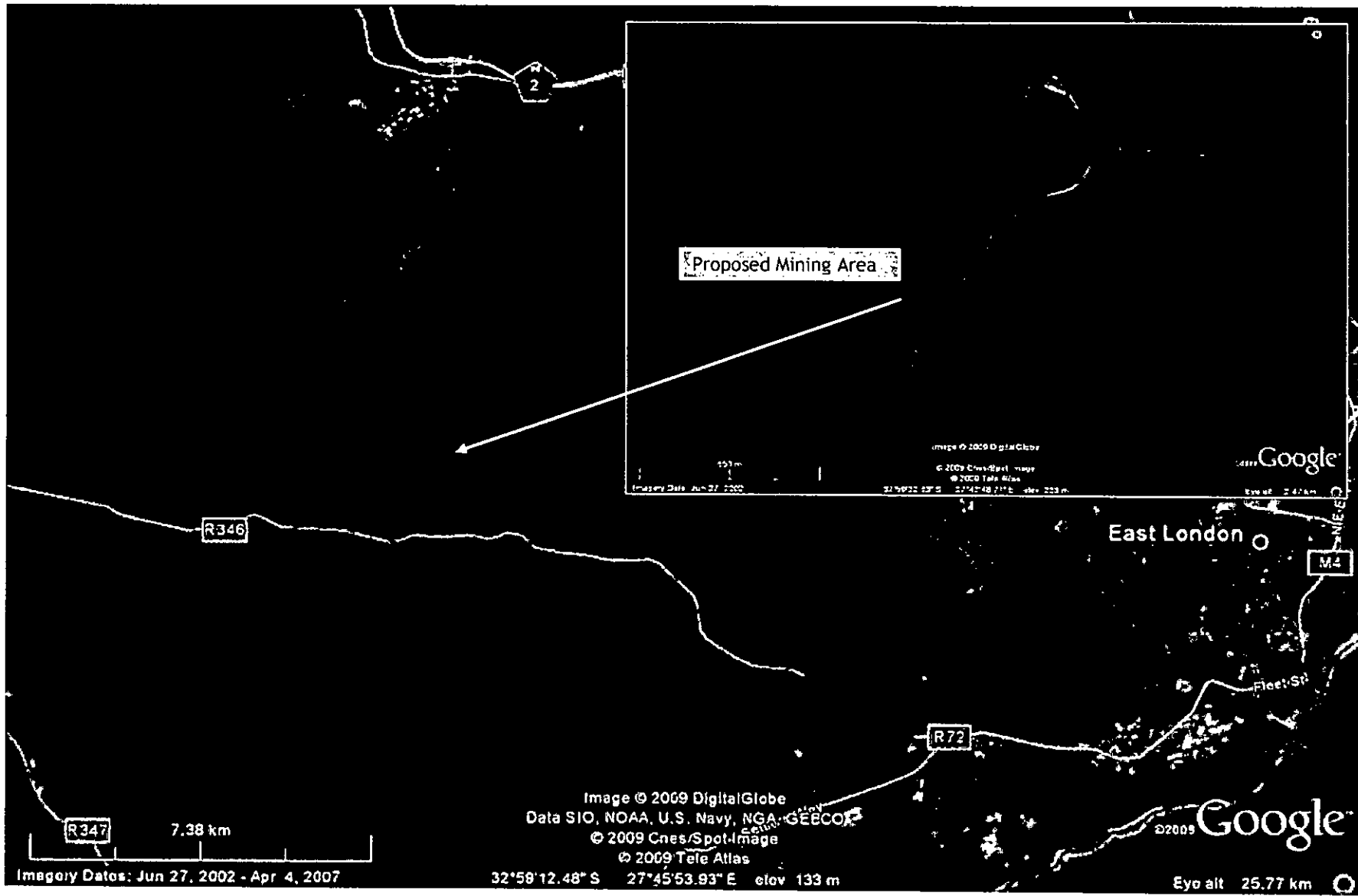
These are difficult for the layman to identify. However, large accumulations of flaked stones which do not appear to have been distributed naturally should be reported. If the stone tools are associated with bone remains, development should be halted immediately and archaeologists notified.

### 5. Historical artefacts or features

These are easy to identified and include foundations of buildings or other construction features and items from domestic and military activities.



Map 1. 1:50 000 maps indicating the proposed area for mining.



Map 2. Aerial views of the proposed area for mining.

