



**water & sanitation**

Department:  
Water and Sanitation  
REPUBLIC OF SOUTH AFRICA

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## **Augmentation of the Lusikisiki Regional Water Supply Scheme**

### **Borrow Pits: Environmental Management Programme**



**September  
2016**

**AUGMENTATION OF THE LUSIKISIKI REGIONAL WATER SUPPLY SCHEME: BORROW  
PITS, EASTERN CAPE PROVINCE, SOUTH AFRICA**

**ENVIRONMENTAL MANAGEMENT PROGRAMME**

DMR Reference: EC 30/5/1/3/3/2/1/00047 BPEM

**Prepared for:**



**water & sanitation**

Department:  
Water and Sanitation  
REPUBLIC OF SOUTH AFRICA

**Department of Water and Sanitation  
Private Bag X313  
Pretoria  
0001**

**Prepared by:**



**EOH Coastal & Environmental Services**

EAST LONDON  
25 Tecoma Street  
East London  
5214  
043 726 7809

*Also in Grahamstown, Cape Town, Johannesburg, Port Elizabeth and Maputo*  
[www.cesnet.co.za](http://www.cesnet.co.za)

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## 1 INTRODUCTION

The Department of Water and Sanitation (DWS) has completed a detailed feasibility study for the Augmentation of the Lusikisiki Regional Water Supply Scheme (LRWSS) at Lusikisiki, within the OR Tambo District Municipality (ORTDM) in the Eastern Cape. The LRWSS is proposed to augment the existing water supply to the region between Lusikisiki (approximately 15km inland), and the coast, extending from the Mzimvubu River in the south west to the Msikaba River in the north east. In terms of the National Environmental Management Act (Act No. 107 of 1998), the final Environmental Impact Report (EIR) for the LRWSS has been submitted to the Department of Environmental Affairs (DEA) and awaits Environmental Authorisation (EA).

The LRWSS will include the construction of an Earth Core Rockfill Dam on the Xura River. Borrow areas within the dam basin cannot provide sufficient impervious material (residual and completely weathered dolerite) for the clay core of an embankment dam. However, large quantities of impervious material is available in borrow areas located within a 2 km radius downstream of the dam (borrow pits 1 and 2).

In terms of Section 106 of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002; MPRDA) DWS is exempted from the application for a Mining Right for the two borrow pits but is not exempted from the application for environmental authorisation for the borrow pits.

This Environmental Management Programme (EMPr) has been prepared as part of the Environmental Impact Assessment (EIA) process to provide specific environmental guidance for the planning, Site establishment, mining and decommissioning and closure phases of the proposed borrow pits near Lusikisiki, Eastern Cape.

The competent authority, being the Department of Mineral Resources (DMR), requires that an environmental management programme (EMPr) be submitted in accordance with Regulation 33 of the regulations published in Government Notice No. R. 984 of 4 December 2014, which should be read with Section 24 N of the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998), as amended.

### 1 Objectives of an EMPr

The EMPr has been compiled to provide recommendations and guidelines according to which compliance monitoring can be done during the site establishment and mining activities associated with the proposed borrow pits as well as to ensure that all relevant factors are considered to ensure for environmentally responsible development. The purpose of the EMPr is to provide specifications for "good environmental practice" for application during site establishment and mining.

This EMPr informs all relevant parties (the Project Coordinator, the Contractor, the Environmental Control Officer (ECO) and all other staff employed by DWS at the site) as to their duties in the fulfilment of the legal requirements for the planning and design, site establishment, mining and decommissioning and closure of the borrow pits with particular reference to the prevention and mitigation of anticipated potential environmental impacts.

All parties should note that obligations imposed by the EMPr are legally binding in terms of the environmental authorisation granted by the relevant environmental permitting authority.

The objectives of an EMPr are to:

- Ensure compliance with regulatory authority stipulations and guidelines which may be local, provincial, national and/or international;
- Ensure that there is sufficient allocation of resources on the project budget so that the scale of EMPr-related activities is consistent with the significance of project impacts;

- Verify environmental performance through information on impacts as they occur;
- Provide feedback for continual improvement in environmental performance;
- Identify a range of mitigation measures which could reduce and mitigate the potential impacts to minimal or insignificant levels;
- Detail specific actions deemed necessary to assist in mitigating the environmental impact of the project;
- Identify measures that could optimize beneficial impacts;
- Create management structures that address the concerns and complaints of I&APs with regards to the development;
- Establish a method of monitoring and auditing environmental management practices during all phases of the activity;
- Ensure that safety recommendations are complied with;
- Specify time periods within which the measures contemplated in the final environmental management programme must be implemented, where appropriate.

## 2 Form and function of an EMPr

An EMPr is focused on sound environmental management practices, which will be undertaken to minimise adverse impacts on the environment through the lifetime of a development. In addition, an EMPr identifies what measures will be in place or will be actioned to manage any incidents and emergencies that may occur during mining of the sites.

As such the EMPr provides specifications that must be adhered to, in order to minimise adverse environmental impacts associated with the mining of the sites.

The content of the EMPr is consistent with the requirements as set out in Regulation 33 of the EIA regulations stated below, for the site establishment and mining phases.

### According to APPENDIX 4 of GN R 982, an environmental management programme must include:

- a) Details of –
  - i. The EAP who prepared the environmental management programme; and
  - ii. The expertise of the EAP to prepare an environmental management programme, including a curriculum vitae;
- b) A detailed description of the aspects of the activity that are covered by the draft environmental management programme as identified by the project description;
- c) A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;
- d) Information on any proposed management or mitigation measures that will be taken to address the environmental impacts that have been identified in a report contemplated by these Regulations, including environmental impacts or objectives in respect of –
  - i. Planning and design;
  - ii. Pre-construction;
  - iii. construction activities;
  - iv. Rehabilitation of the environment after construction and where applicable post closure; and
  - v. where relevant, operation activities;
- e) a description and identification of impact outcomes required for the aspects contemplated in (d).
- f) a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable include actions to –
  - i. Avoid, modify, remedy, control or stop any action, activity or process which causes

- pollution or environmental degradation;
- ii. Comply with any prescribed environmental management standards or practices;
- iii. Comply with any applicable provisions of the Act regarding closure, where applicable;
- iv. Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;
- g) The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);
- h) The frequency of monitoring the implementation of the impact management actions contemplated in (f);
- i) An indication of the persons who will be responsible for the implementation of the impact management actions;
- j) The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;
- k) The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);
- l) A program for reporting on compliance, taking into account the requirement as prescribed by the regulations;
- m) An environmental awareness plan describing the manner in which –
  - i. The applicant intends to inform his or her employees of any environmental risk which may result from their work; and
  - ii. Risks must be dealt with in order to avoid pollution or the degradation of the environment; and
- n) Any specific information that may be required by the competent authority.

### 3 Legal requirements

This EMPr will form an integral part of the contract documents and inform the Contractor as to his duties in the fulfillment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by mining activities associated with the project. The Contractor should note that obligations imposed by the approved EMPr are legally binding in terms of environmental statutory legislation and in terms of the additional conditions to the general conditions of contract that pertain to this project.

The Contractor shall identify and comply with all South African national and provincial environmental legislation, including associated regulations and all local by-laws relevant to the project. The list of applicable legislation provided below is intended to serve as a guideline only and is not exhaustive:-

- The Constitution of the Republic of South Africa Act 108 of 1996
- National Environmental Management Act 107 of 1998
- Mineral and Petroleum Resources Development Act 28 of 2002
- National Environmental Management: Biodiversity Act 10 of 2004
- National Forests Act 43 of 1983
- Hazardous Substances Act 15 of 1973
- National Heritage Resources Act 25 of 1999
- National Environmental Management: Waste Management Act 59 of 2008
- Health Act 63 of 1977
- Occupational Health and Safety Act 85 of 1993
- All relevant provincial legislation, Municipal by-laws, Powers and ordinances.

## 2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT TEAM

According to APPENDIX 4 of GN R 982, an environmental management programme must include:

- a) Details of –
  - i. The EAP who prepared the environmental management programme; and
  - ii. The expertise of the EAP to prepare an environmental management programme, including a curriculum vitae;

### Environmental consulting company:

EOH Coastal & Environmental Services  
Dr Alan Carter  
25 Tecoma Street, Berea, East London  
PO Box 8145, Nahoon, East London, 5210  
Tel: (043) 726 7809  
Fax: (043) 726 8352  
e-mail: cesel@cesnet.co.za  
www.cesnet.co.za

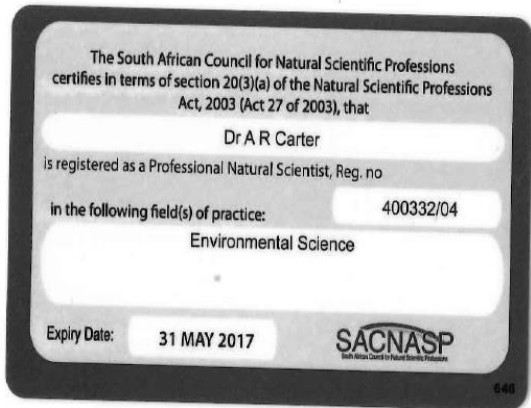
EOH CES was established in 1990 as a specialist environmental consulting company.

EOH CES has considerable experience in terrestrial, marine and freshwater ecology, the Social Impact Assessment (SIA) process, State of Environment Reporting (SOER), Integrated Waste Management Plans (IWMP), Environmental Management Plans (EMPs), Spatial Development Frameworks (SDF), public participation, as well as the management and co-ordination of all aspects of the Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) processes. EOH CES has been active in all of the above fields, and in so doing have made a positive contribution towards environmental management and sustainable development in the Eastern Cape, South Africa and many other African countries. We believe that a balance between development and environmental protection can be achieved by skilful, considerate and careful planning.

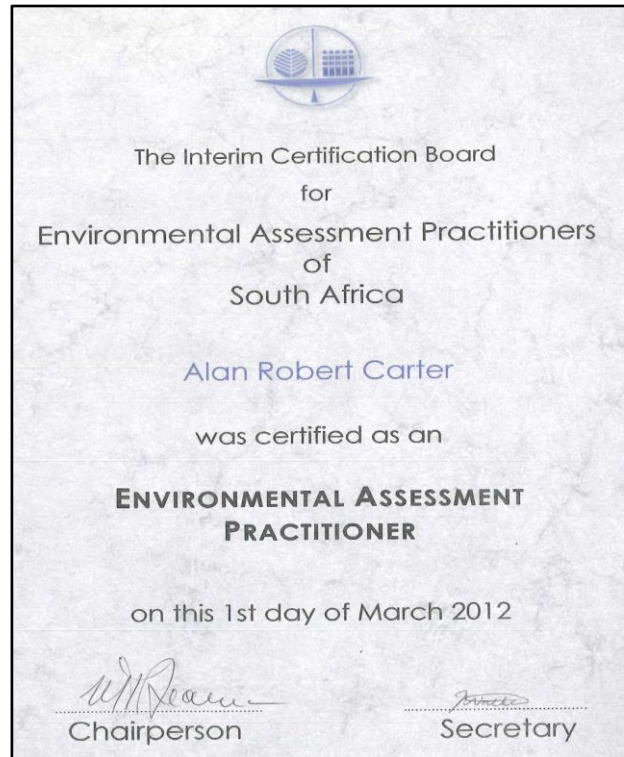
**Dr Alan Carter**, a Director at EOH-CES, holds a PhD in Marine Biology and is a certified Public Accountant, with extensive training and experience in both financial accounting and environmental science disciplines with international accounting firms in South Africa and the USA. He has 15 years of 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 (Plate 1.) and as an Environmental Assessment Practitioner under the Environmental Assessment Practitioners of South Africa (Plate 2).

**Ms Amy Hunter**, Environmental Consultant. Amy holds an MSc. in Aquaculture from Stellenbosch University, as well as a BSc. in Biochemistry and Zoology and a BSc. Honours in Zoology, both from the University of Johannesburg. Her honours project investigated the role of a tenebrionid beetle in the ecology of Bakwena Cave, Pretoria. Her M.Sc project was a study of the effects of probiotics on the physiological and biochemical development of hatchery raised dusky kob (*Argyrosomus japonicus*) larvae. Her professional interests and passion lies within coastal and marine ecology as well as the development of sustainable aquaculture in South Africa, with experience in coastal management projects and numerous EIAs.

**Ms Caitlin Smith** (*Pr. Sci. Nat.*). Environmental Consultant. Caitlin holds a BSc degree with majors in Geology and Geography as well as a BSc Honours degree (with distinction) in Geology both from Nelson Mandela Metropolitan University. Caitlin has four years' experience as a geologist in the heavy mineral sands mining industry.



SACNASP Registration for Alan Carter



EAPSA registration certificate for Alan Carter



### 3 PROPOSED ACTIVITY

According to APPENDIX 4 of GN R 982, an environmental management programme must include:

- (b) A detailed description of the aspects of the activity that are covered by the draft environmental management programme as identified by the project description;
- (c) A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;

#### 3 Description of proposed activity

DWS has completed a detailed feasibility study for the Augmentation of the LRWSS at Lusikisiki, within the OR Tambo District in the Eastern Cape. The LRWSS is proposed to augment the existing water supply to the region between Lusikisiki (approximately 15 km inland), and the coast, extending from the Mzimvubu River in the south west to the Msikaba River in the north east. An EIA for the LRWSS has been completed and awaits approval from DEA.

The LRWSS will include the construction of an Earth Core Rockfill Dam (the proposed Zalu Dam) on the Xura River. Borrow areas within the dam basin cannot provide sufficient impervious material (residual and completely weathered dolerite) for the clay core of an embankment dam, but large quantities of impervious material is available in borrow areas located within a 2 km radius downstream of the dam (borrow pits 1 and 2).

The affected areas and volumes of material to be removed from the borrow pits is illustrated in Table 3.1 and 3.2. Approximately 32 800 m<sup>3</sup> and 64 000 m<sup>3</sup> of topsoil will be removed from borrow pit 1 and 2 respectively using an excavator. This topsoil will be stockpiled in demarcated areas and will be used to back-fill the excavation and level the slopes once mining is complete. The dolerite material will be removed using an excavator, loaded onto trucks and transported to the proposed Zalu Dam Wall site.

A perimeter fence will be constructed around the borrow areas and an access road will possibly need to be constructed for borrow pit 1 (Figure 3.1). Borrow pit 2 is accessible via existing gravel roads.

**Table 3.1: Size of borrow pits.**

	Area (hectare)	
	Borrow pit 1	Borrow pit 2
Area impacted	12	19
Mining area	10	16
Stockpile area	1,7	3,7

**Table 3.2: Volumes of material to be removed.**

Type of material	Estimated volume (m <sup>3</sup> )	
	Borrow pit 1	Borrow pit 2
Overburden for spoil: Organic topsoil	32 800	64 000
Impervious fill: Residual and completely weathered dolerite	410 000	880 000
<b>Total</b>	<b>442 800</b>	<b>944 000</b>

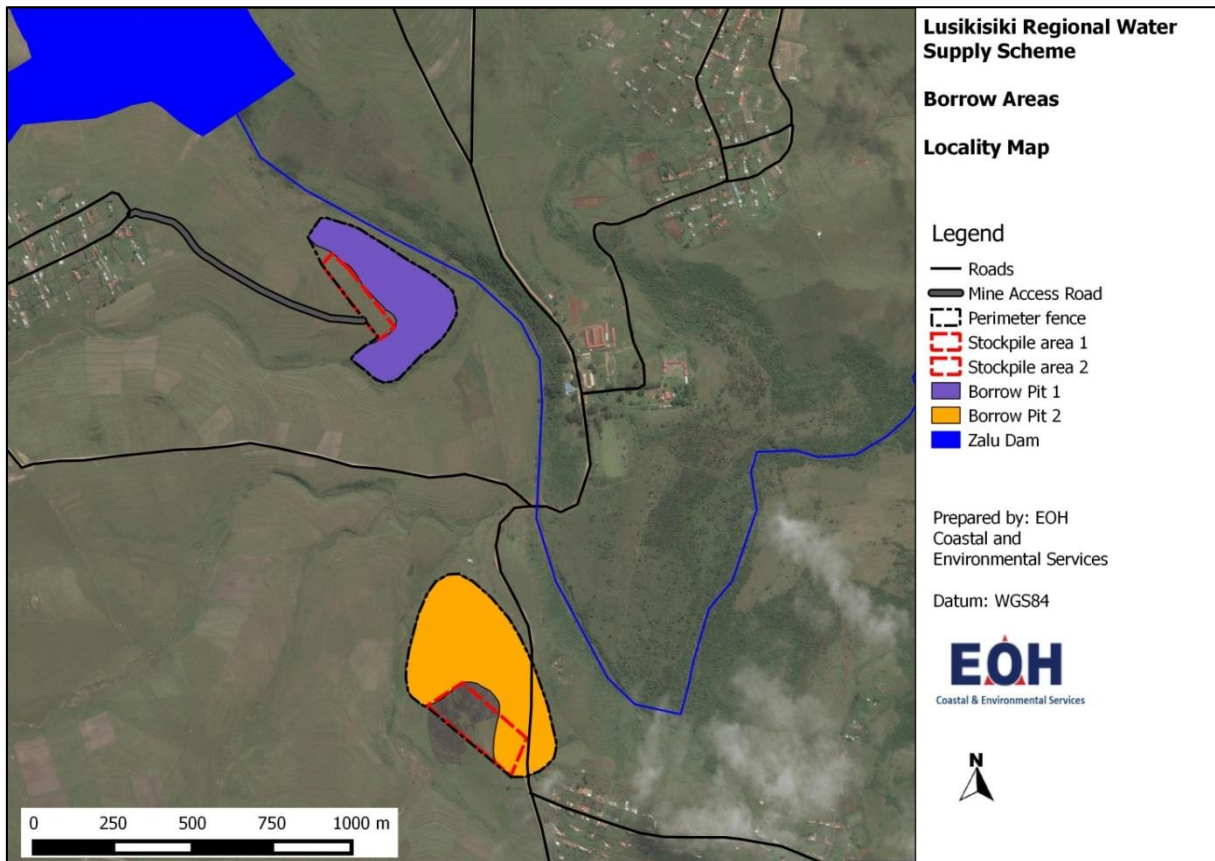


Figure 3.1: Proposed layout of the borrow pit areas.

## **4 SCOPE OF THE EMPr**

In order to ensure a holistic approach to the management of environmental impacts during the site establishment and mining activities, this EMPr sets out the methods by which proper environmental controls are to be implemented by the Contractor and all other parties involved.

The EMPr is a dynamic document subject to influences and changes as are wrought by variations to the provisions of the project specification.

### **4 Layout of the EMPr**

The EMPr is divided into four phases of development. Each phase has specific issues unique to that period of the site establishment and mining of the proposed borrow pits. The impacts are identified and given a brief description. The four phases of the development are then identified as below:

#### **Planning and design phase**

This section of the EMPr provides management principles for the planning and design phase of the project. Environmental actions, procedures and responsibilities as required from DWS during the planning and design phase are specified. These specifications will form part of the contract documentation and therefore the Contractor will be required to comply with these specifications to the satisfactory of the Project Coordinator and ECO.

#### **Site establishment phase**

This section of the EMPr provides management principles for the site establishment phase of the project. Environmental actions, procedures and responsibilities as required during the site establishment phase are specified. These specifications will form part of the contract documentation and therefore the Contractor will be required to comply with these specifications to the satisfaction of the Project Coordinator and ECO.

#### **Mining phase**

This section of the EMPr provides management principles for the mining phase of the project. Environmental actions, procedures and responsibilities as required during the mining phase are specified. These specifications will form part of the contract documentation and therefore the Contractor will be required to comply with these specifications to the satisfaction of the Project Coordinator and ECO.

#### **Decommissioning and closure phase**

This section of the EMPr provides management principles for the decommissioning and closure phase of the project. Environmental actions, procedures and responsibilities as required from DWS during the decommissioning and closure phase are specified.

## 5 MITIGATION AND/OR MANAGEMENT MEASURES

According to APPENDIX 4 of GN R 982, an environmental management programme must include:

- (d) Information on any proposed management or mitigation measures that will be taken to address the environmental impacts that have been identified in a report contemplated by these Regulations, including environmental impacts or objectives in respect of –
- (i) Planning and design;
  - (ii) Pre-construction;
  - (iii) construction activities;
  - (iv) Rehabilitation of the environment after construction and where applicable post closure; and
  - (v) where relevant, operation activities;
- (e) a description and identification of impact outcomes required for the aspects contemplated in (d).
- (f) a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable include actions to –
- (i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
  - (ii) Comply with any prescribed environmental management standards or practices;
  - (iii) Comply with any applicable provisions of the Act regarding closure, where applicable;
  - (iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;

A variety of potential impacts are associated with the planning and design phase, site establishment activities, mining activities and decommissioning and closure phase for this project. These impacts can be categorised as:

- Issues related to the planning and design, site establishment, mining and decommissioning and closure activities related to the borrow pits.
- Issues related to the specific conditions and sensitivity of the site

Specific mitigation measures and recommendations for the sites are highlighted in Tables 6.1 to 6.4 below.

**Table 6. 1: Impacts and mitigation measures associated with the planning and design phase**

Theme	Mitigation measure
<b>Planning and Design Phase</b>	
<b>GENERAL</b>	
Compliance with relevant environmental legislation and policy	<ul style="list-style-type: none"> <li>• All relevant legislation and policy must be consulted and the proponent must ensure that the project is compliant with such legislation and policy.</li> <li>• These should include (but are not restricted to): MPRDA, NEMA, Local and District Spatial Development Frameworks, Eastern Cape Biodiversity Conservation Plan (ECBCP), Local Municipal bylaws.</li> </ul>
Design of the borrow pits	<ul style="list-style-type: none"> <li>• The borrow pit mining plan must be designed by an appropriately qualified engineer.</li> <li>• All mining activity must avoid the watercourses.</li> <li>• Mining activity should not, as far as is possible take place within the 1:100 year floodline.</li> <li>• Also refer to the Ecological Impact Assessment mitigation measures</li> </ul>
Stormwater	<ul style="list-style-type: none"> <li>• Appropriate stormwater structures must be designed and implemented.</li> </ul>

Theme	Mitigation measure
<b>Planning and Design Phase</b>	
	<ul style="list-style-type: none"> <li>• All stormwater structures must be designed in line with DWS requirements.</li> <li>• A dirty water system must be designed to collect any dirty water generated from mining activities so that it is not likely to spill into any clean water system.</li> </ul>
Visual intrusion	<ul style="list-style-type: none"> <li>• The borrow pit design must ensure that the visual impact of the borrow pits is minimized where possible.</li> </ul>
Hazardous substances	<ul style="list-style-type: none"> <li>• An appropriate hazardous waste management plan must be developed prior to mining activities commencing.</li> </ul>
Waste management	<ul style="list-style-type: none"> <li>• Measures must be taken to ensure that waste generated on site will be stored and disposed of in an appropriate manner.</li> </ul>
Access control	<ul style="list-style-type: none"> <li>• Adequate access control measures must be developed to restrict access to the borrow pit sites to unauthorised people.</li> </ul>
<b>HERITAGE</b>	
Impact on sites of archaeological and cultural significance	<ul style="list-style-type: none"> <li>• All access roads, mining activity and planned mining activities must avoid the identified heritage sites.</li> </ul>
<b>ECOLOGICAL</b>	
Loss of natural vegetation	<ul style="list-style-type: none"> <li>• The borrow pit sites must be selected so that any sensitive ecological features are avoided.</li> <li>• The borrow pit sites must be clearly demarcated prior to the site establishment and mining phases to prevent the unnecessary clearing of natural vegetation outside of the designated borrow pit sites.</li> </ul>
Loss of SCC	<ul style="list-style-type: none"> <li>• Borrow pit design should avoid areas where plant and animal SCC have been identified.</li> <li>• If unavoidable, permits must be obtained from the relevant departments in order to remove plant and animal SCC from the development area prior to mining.</li> </ul>
Damage to riverine systems	<ul style="list-style-type: none"> <li>• The mining engineer must ensure that appropriate stormwater structures are included in the borrow pit design to manage stormwater and to minimise erosion and sedimentation of watercourses.</li> <li>• The mining engineer must ensure that borrow pits situated on slopes incorporate stormwater diversion.</li> <li>• The mining engineer must ensure that all stormwater structures are designed in line with both DMR and DWS requirements.</li> <li>• If any planned mining takes place inside or within 50 meters of any river, stream or drainage system, or within 500m of a wetland, authorisation must be obtained from DWS.</li> <li>• Additional conditions from DWS may be applied in order to protect these systems.</li> </ul>
Soil erosion	<ul style="list-style-type: none"> <li>• Appropriate stormwater structures must be designed and implemented.</li> <li>• All infrastructure situated on slopes must incorporate stormwater diversions.</li> </ul>
Control of alien species	<ul style="list-style-type: none"> <li>• A Rehabilitation and Alien Management Plan must be developed prior to any activities associated with the borrow pits commencing.</li> </ul>

**Table 6.2: Impacts and mitigation measures associated with the site establishment phase**

Theme	Mitigation measure
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<b>Site Establishment Phase</b>	
<b>GENERAL</b>	
Legislation and policy compliance	<ul style="list-style-type: none"> <li>• All relevant legislation and policy must be complied with during site establishment.</li> <li>• These should include (but are not restricted to): MPRDA, NEMA, NWA, NFA, Local and District Spatial Development Frameworks, Eastern Cape Biodiversity Conservation Plan (ECBCP), Local Municipal bylaws.</li> </ul>
Stormwater	<ul style="list-style-type: none"> <li>• Appropriate stormwater structures must be installed during site establishment</li> <li>• All stormwater structures installed must be in line with DWS requirements.</li> </ul>
Visual intrusion associated with the establishment of the borrow pit sites	<ul style="list-style-type: none"> <li>• All site establishment activity must take place during normal working hours (i.e. 7 – 5pm).</li> <li>• All site establishment activity and equipment must be limited to the demarcated areas.</li> </ul>
Demarcation of the borrow pit sites	<ul style="list-style-type: none"> <li>• The boundaries of the borrow pit sites must be adequately demarcated to restrict site establishment and other (eating, washing and ablution) activities. All plant, equipment and other materials must remain within the demarcated boundaries.</li> <li>• The mining related activities should as far as possible not take place within the 1:100 year floodline.</li> <li>• Refer to the mitigation measures outlined in the Ecological Impact Assessment.</li> </ul>
Demarcation of the borrow pit sites	<ul style="list-style-type: none"> <li>• The boundaries of the borrow pit sites must be adequately demarcated to restrict site establishment and other (eating, washing and ablution) activities. All plant, equipment and other materials must remain within the demarcated boundaries.</li> <li>• Refer to the mitigation measures outlined in the Ecological Impact Assessment.</li> </ul>
Dust and noise	<ul style="list-style-type: none"> <li>• Cleared surfaces for site establishment must be dampened whenever possible and especially in dry and windy conditions to avoid excessive dust generation.</li> <li>• Any soil excavated, and not utilised for rehabilitation, must be removed from site or covered and no large mounds of soil should be left behind after mining activities have ceased.</li> <li>• Refer to the mitigation measures described Social Impact Assessment.</li> <li>• Site establishment activities, which include the movement of related vehicles, must be restricted to normal working hours (7:00am – 17:00pm).</li> <li>• Refer to the mitigation measures described Social Impact Assessment.</li> </ul>
Access control	<ul style="list-style-type: none"> <li>• Access to the borrow pit sites must be restricted to authorised personnel only</li> <li>• The borrow pit sites and camp sites must be fenced off and access control must be implemented at all times.</li> </ul>
<b>HERITAGE</b>	
Impact on sites of archaeological and cultural significance	<ul style="list-style-type: none"> <li>• If any graves/heritage features are damaged during site establishment then site establishment must stop immediately.</li> <li>• Any damage to heritage features must be reported to the EM, Heritage Specialist and SAHRA.</li> </ul>
	<ul style="list-style-type: none"> <li>• If human graves are uncovered during site establishment then all activity must stop immediately.</li> </ul>

<b>Theme</b>	<b>Mitigation measure</b>
<b>Site Establishment Phase</b>	
	<ul style="list-style-type: none"> <li>• The police and ECPHRA must to be notified immediately.</li> <li>• If any other archaeological artefacts are uncovered during site establishment then site establishment must stop and these should be reported to the EM, Heritage Specialist and SAHRA/ECPHRA immediately.</li> </ul>
<b>PALEONTOLOGICAL IMPACTS</b>	
Impact on sites of paleontological significance	<ul style="list-style-type: none"> <li>• If fossils are uncovered during the site establishment phase, all activity must cease immediately.</li> <li>• The ECO, the appointed Palaeontologist and ECPHRA must be notified immediately.</li> <li>• The Palaeontologist must apply for permits from SAHRA to collect any fossils have been uncovered.</li> </ul>
<b>ECOLOGICAL</b>	
Soil erosion	<ul style="list-style-type: none"> <li>• Bank restoration, re-vegetation and stabilisation must be implemented once site establishment is complete and must include the use of gabions for bank stabilisation if required.</li> </ul>
Control of alien species	<ul style="list-style-type: none"> <li>• A Rehabilitation and Alien Management Plan must be developed and implemented during the site establishment phase to reduce the establishment and spread of undesirable alien plant species.</li> <li>• Alien plants must be removed from the site through appropriate methods such as hand pulling, application of chemicals, cutting etc. This must be done under the supervision of the ECO.</li> </ul>
<b>SOCIAL IMPACTS</b>	
Influx of job seekers	<p>A project steering committee consisting of the DWS, contractor (community liaison person), recruitment agency, community leaders, elders, youth, ward councillors and the IHLM LED must be established in order to:</p> <ul style="list-style-type: none"> <li>• Conduct an audit of the affected communities in term of employment capacity.</li> <li>• Identify potential workers from the affected communities.</li> <li>• Identify possible conflicts in and between communities.</li> <li>• Recommend support programmes that would assist with conflict minimisation and resolution.</li> </ul> <p>Crime:</p> <ul style="list-style-type: none"> <li>• The role of Traditional Authorities in exerting control over land allocation in order to prevent densification of people around the site establishment areas should be supported.</li> <li>• The DWS and contractor must encourage settlement in Lusikisiki by providing daily transport for “outside” workers who settle in the town of Lusikisiki, to and from the site establishment sites to minimise the potential crime factor in the rural areas.</li> <li>• All mine workers must be clearly identifiable and wear easily recognisable uniforms. They need to carry identification cards issued by the contractor.</li> <li>• The SAPS must have access to the borrow pit sites.</li> <li>• Local communities should be encouraged to report suspicious activity to the community liaison or nearest environmental site officer.</li> <li>• The contractor must prevent loitering around the mining camp by providing transport to and from the camp sites.</li> <li>• All borrow pit and camp sites must be fenced and secure.</li> </ul>

Theme	Mitigation measure
	<p style="text-align: center;"><b>Site Establishment Phase</b></p> <p>Increased prostitution and sexual behaviour:</p> <ul style="list-style-type: none"> <li>• National and local awareness programmes that discourage promiscuity, especially at schools in the project area should be supported.</li> <li>• Condoms must be made easily accessible to all mine workers.</li> </ul> <hr/> <ul style="list-style-type: none"> <li>• An HIV/AIDS, non-discrimination, awareness, prevention and health care support, policy must be implemented.</li> <li>• Condoms must be made easily accessible to all mine workers.</li> <li>• An HIV/AIDS education and behaviour change programme for all contracted mine workers should be developed.</li> <li>• The above program must extend to the communities located near the borrow pit sites.</li> <li>• Existing public health care centres and programmes such as TAC must be involved in HIV/AIDS campaigns and monitoring of HIV/AIDS prevalence should be undertaken in collaboration with these agencies.</li> <li>• Voluntary counselling and testing should be encouraged for all workers.</li> </ul> <hr/> <ul style="list-style-type: none"> <li>• DWS is limited in its capacity to enhance the benefits of this impact, as the development of the communities and town will occur in response to the needs and demands of mine workers. The proponent can play role in facilitating the skills required to recognise the need and respond appropriately. The proponent must link the Provincial Department of Economic Development and Local Municipal LED programmes with small to medium enterprises (including communities) in the area so that a state of “readiness” to optimise economic benefits is achieved. This may involve training in the following sectors: business, tourism, catering etc.</li> </ul>
<p>Impact on health and general quality of life</p>	<ul style="list-style-type: none"> <li>• No mitigation measures are required</li> </ul> <hr/> <ul style="list-style-type: none"> <li>• Service providers associated with the IHLM and PSJLM, clinics, schools and the SAPS must be made aware of an increase in demand, both in the town of Lusikisiki and in the surrounding rural areas, and therefore the increased pressure to provide services for new households.</li> <li>• This will require direct communication with the local municipalities, ORTDM, the Department of Health, South African Police Service and the Department of Education. The channels of communication must be established as permanent points of contact throughout the site establishment phase of the project.</li> <li>• Regular monitoring of the schools and clinics in order to determine whether there are sufficient resources must be undertaken. When resources are deemed insufficient, DWS must communicate, through established channels, with the relevant departments for assistance.</li> </ul> <hr/> <ul style="list-style-type: none"> <li>• During windy periods un-surfaced and un-vegetated areas should be dampened down.</li> <li>• Vegetation should be retained where possible as this will reduce dust travel.</li> <li>• Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid</li> </ul>



Theme	Mitigation measure
<b>Site Establishment Phase</b>	
	<p>drifting of sand and dust into neighbouring areas.</p> <ul style="list-style-type: none"> <li>• A speed limit of 30km/h must not be exceeded on dirt roads.</li> <li>• Any complaints or claims emanating from the lack of dust control must be attended to immediately.</li> <li>• Drilling, blasting and movement of heavy machinery must be limited to normal working hours (7 AM to 5 PM).</li> <li>• Ensure there is a facility for nearby residents to make complaints. These must be addressed and recorded.</li> <li>• Communities must have access to a grievance reporting mechanism, e.g. through a project steering or liaison committee.</li> </ul> <p>Traffic safety:</p> <ul style="list-style-type: none"> <li>• All affected communities must be informed of the formal access routes.</li> <li>• All vehicle operators and drivers must undergo regular training, clearly outlining the high safety risk to local rural communities</li> <li>• Signage making communities aware of the high safety risk due to heavy vehicles on the road must be erected at appropriate locations.</li> <li>• Traffic calming devices such as speed bumps should be considered on rural access roads.</li> </ul> <p>Fire safety:</p> <ul style="list-style-type: none"> <li>• Fires outside borrow pit camps must be prohibited.</li> <li>• Fires that are lit must be in a contained area and safety precautions must be followed. The fire must be monitored for cinders and extinguished when no longer needed.</li> <li>• Fire fighting equipment must be stored onsite.</li> <li>• The borrow pit campsite must be surrounded by a firebreak.</li> <li>• Education of fire risks must form part of the mine-worker training.</li> </ul>
Loss of land as result of the borrow pit construction	<ul style="list-style-type: none"> <li>• The process for land acquisition by DWS must be conducted through the traditional authorities operating in the areas as they have jurisdiction over land allocations.</li> <li>• Individual landowners must be identified and engaged.</li> <li>• All the properties must be professionally assessed and valued by professional independent evaluators registered with South African Institute of Valuers and the South African Council for Property Valuers.</li> <li>• Valuations, and the process of evaluation, must be shared with the landowners and will form the basis for on-going negotiations with them.</li> </ul>
Stimulation of economic growth	<ul style="list-style-type: none"> <li>• Equal jobs opportunities for women and men must be promoted.</li> <li>• Culture and tradition must be considered when planning the division of labour for site establishment.</li> <li>• Employment must be managed by a recruitment agency/office that uses a selection system that ensures recruitment of semi and unskilled workers from all local impacted communities in accordance with recent government policies related to local procurement. This must ensure a fair and equitable recruitment process.</li> <li>• Where appropriate, employees involved in the site establishment phase should be incorporated into the permanent maintenance staff for the mining phase; and</li> </ul>

Theme	Mitigation measure
<b>Site Establishment Phase</b>	
	<ul style="list-style-type: none"> <li>• Particular attention must be paid to employment opportunities for women and disabled persons.</li> <li>• The proponent must ensure that the principal of utilising local business resources (suppliers and SMMEs) in accordance with recent government policies related to local procurement (State of the nation address, 2015) forms part of the procurement specifications. Examples of local business resources that must be considered: <ul style="list-style-type: none"> <li>– Catering services</li> <li>– Transport services</li> <li>– Quarries/borrow pits (where necessary)</li> <li>– Small civils</li> <li>– Accommodation</li> <li>– Security</li> <li>– Hygiene services</li> <li>– Fencing</li> </ul> </li> <li>• Implement a skills development programme which includes training in business, project management, monitoring and evaluation.</li> </ul>

**Table 6.3: Impacts and mitigation measures associated with the mining phase**

Theme	Mitigation measure
<b>Mining Phase</b>	
<b>GENERAL</b>	
Compliance with relevant environmental legislation and policy	<ul style="list-style-type: none"> <li>• The proponent must ensure that mining is compliant with the relevant legislation and policy.</li> <li>• These should include (but are not restricted to): MPRDA, NEMA, Local and District Spatial Development Frameworks, Eastern Cape Biodiversity Conservation Plan (ECBCP), Local Municipal bylaws.</li> </ul>
Storm water	<ul style="list-style-type: none"> <li>• Water runoff must be controlled and the stormwater management plan implemented.</li> <li>• All polluted water systems must be separated from clean water systems.</li> <li>• All water collected within any dirty area, including water seeping from mining operations, out crops or any other activity must be collected into a dirty water system.</li> <li>• Silt fences must be used to prevent soil eroding from nearby mining activities reaching water courses.</li> </ul>
Visual intrusion associated with mining activities	<ul style="list-style-type: none"> <li>• Mining activities should only take place during normal work hours (7am to 5pm).</li> <li>• Mining activities must be limited to the designated area and not encroach into surrounding areas.</li> </ul>
Sanitation facilities	<ul style="list-style-type: none"> <li>• Sanitation facilities must NOT be located near any water resources or water drainage areas and must be placed outside of areas susceptible to flooding.</li> <li>• Sanitation facilities must be located within the borrow pit footprint.</li> <li>• The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution.</li> <li>• Waste water from chemical toilets must not be discharged into any water resources.</li> <li>• If toilets are not going to be used for a while, they must be emptied and cleaned.</li> </ul>
Demarcation of the borrow pit sites	<ul style="list-style-type: none"> <li>• The boundaries of the borrow pit sites must be adequately demarcated to restrict mining and other (eating, washing and ablution) activities. All plant, equipment and other materials must</li> </ul>

<b>Theme</b>	<b>Mitigation measure</b>
<b><i>Mining Phase</i></b>	
	remain within the demarcated boundaries.
Spillage of hazardous substances	<ul style="list-style-type: none"> <li>• All oils, fuel and other maintenance equipment and supplies must be stored in a secure area with a compacted surface.</li> <li>• Temporary bunds must be constructed around chemical or fuel storage areas to contain potential spillages.</li> <li>• Storage areas should be located outside of the 1:100 year floodline of any watercourse and must be fenced to prevent unauthorised access into the area.</li> <li>• Spill kits must be kept on-site and maintained.</li> <li>• If pollution of any surface or groundwater occurs, it must be immediately reported to the Department of Water and Sanitation and appropriate mitigation measures must be employed.</li> <li>• Cement, concrete and chemicals must be mixed on an impermeable surface and provisions should be made to contain spillages or overflows into the soil. Mixed cement/concrete must not be allowed to flow into any watercourses.</li> <li>• No cement must be mixed within 100m of a watercourse.</li> <li>• Any storage tanks containing hazardous materials must be placed in bunded containment areas with sealed surfaces. The bund walls must be high enough to contain 110% of the total volume of the stored hazardous material.</li> <li>• Contaminated soil must be contained and disposed of off-site at an approved landfill site.</li> <li>• Any hazardous substances must be stored at least 100m from any of the water bodies on site.</li> <li>• Drip trays must be placed under all stationary machinery to avoid soil contamination from oil and fuel leaks.</li> <li>• Drip trays must be placed under vehicles during refuelling.</li> <li>• Vehicles must be washed in a designated and bunded wash bay to avoid soil contamination.</li> </ul>
Waste management	<ul style="list-style-type: none"> <li>• Sufficient waste containers must be available.</li> <li>• No waste must be buried on site.</li> <li>• Waste must be collected on a regular basis and disposed of at a licensed landfill site.</li> </ul>
Dust and noise	<ul style="list-style-type: none"> <li>• Exposed surfaces for mining activities must be dampened whenever possible and especially in dry and windy conditions to avoid excessive dust generation.</li> <li>• Refer to the mitigation measures described Social Impact Assessment.</li> <li>• Mining activities and blasting, which include the movement of related vehicles, must be restricted to normal working hours (7:00am – 17:00pm).</li> <li>• Refer to the mitigation measures described Social Impact Assessment.</li> </ul>
Access control	<ul style="list-style-type: none"> <li>• Access to the borrow pit sites must be restricted to authorised personnel only</li> <li>• The borrow pit areas must be fenced off and access control must be implemented at all times.</li> </ul>
<b><i>HERITAGE</i></b>	
Identification of archaeological and sites of cultural significance	<ul style="list-style-type: none"> <li>• If human graves are uncovered during mining then all activity must stop immediately.</li> <li>• The police and ECPHRA must to be notified immediately.</li> <li>• If any other archaeological artefacts are uncovered during mining activity then mining must stop and these should be reported to the EM, Heritage Specialist and SAHRA/ECPHRA immediately.</li> </ul>

<b>Theme</b>	<b>Mitigation measure</b>
<b>Mining Phase</b>	
<b>PALEONTOLOGICAL IMPACTS</b>	
Impact on sites of paleontological significance	<ul style="list-style-type: none"> <li>• If fossils are uncovered during the site establishment phase, all activity must cease immediately.</li> <li>• The ECO, the appointed Palaeontologist and ECPHRA must be notified immediately.</li> <li>• The Palaeontologist must apply for permits from SAHRA to collect any fossils have been uncovered.</li> </ul>
<b>ECOLOGICAL</b>	
Loss of natural vegetation	<ul style="list-style-type: none"> <li>• The entire site must be rehabilitated to natural Ngongoni Veld after completion of all mining activities.</li> <li>• Mining activities must be limited to the designated footprint of the mining site i.e. mining minerals, stockpiles, vehicular storage, borrow pit camps etc., must only occur in the designated mining area.</li> <li>• The mining site must be demarcated prior to mining commencing.</li> <li>• The mining footprint must be approved by an ECO to ensure that natural vegetation is not unnecessarily damaged.</li> </ul>
Loss of SCC	<ul style="list-style-type: none"> <li>• No SCC must be removed outside the approved demarcated mining areas.</li> <li>• No vegetation removal must occur outside the approved demarcated mining area.</li> <li>• The contractor’s workers must not poach or trap wild animals.</li> <li>• The contractor’s workers must not harvest natural vegetation.</li> <li>• The developer must develop a Vegetation and Animal Relocation Plan that must be approved by the appointed ECO and incorporated into the site EMPr.</li> <li>• All SCC must be removed according to the approved Vegetation and Animal Relocation Plan</li> <li>• Permits must be obtained for all SCC prior to commencement of site establishment activities onsite.</li> </ul>
Damage to riverine systems	<ul style="list-style-type: none"> <li>• If any mining activity occurs within 50 meters of a river, stream or drainage system, or within 500m of a wetland, authorisation must be obtained from DWS.</li> <li>• No mining must be done within 32 meters of any waterbody.</li> <li>• Silt fences should be used to prevent soil eroding from nearby mining activities reaching watercourses.</li> <li>• Wet cement must not be allowed to come into contact with any watercourse.</li> <li>• Borrow pit staff must not use any open water body or natural water source adjacent to the mining site for the purposes of bathing, washing of clothing or for any site establishment related activities.</li> <li>• All mine-water and contaminated runoff must be directed away from the watercourses.</li> </ul>
Soil erosion	<ul style="list-style-type: none"> <li>• Bank restoration, re-vegetation and stabilisation must be implemented and inspected regularly during mining and must include the use of gabions for bank stabilisation if required.</li> </ul>
Control of alien species	<ul style="list-style-type: none"> <li>• A Rehabilitation and Alien Management Plan must be developed and implemented during the mining phase to reduce the establishment and spread of undesirable alien plant species.</li> <li>• Alien plants must be removed from the site through appropriate methods such as hand pulling, application of chemicals, cutting etc.</li> </ul>

<b>Theme</b>	<b>Mitigation measure</b>
<b>Mining Phase</b>	
	This must be done under the supervision of the ECO.
Rehabilitation of disturbed areas	<ul style="list-style-type: none"> <li>• All impacted areas must be rehabilitated back to Ngongoni veld after mining.</li> <li>• Only topsoil from the immediate area must be used for rehabilitation. If none available alternative methods must be investigated and implemented like hydro-seeding, planting etc.</li> <li>• All mined areas must be restored as per the Rehabilitation and Alien Management Plan.</li> </ul>
<b>SOCIAL IMPACTS</b>	
Influx of job seekers	<p>A project steering committee consisting of the DWS, contractor (community liaison person), recruitment agency, community leaders, elders, youth, ward councillors and the IHLM LED must be established in order to:</p> <ul style="list-style-type: none"> <li>• Conduct an audit of the affected communities in term of employment capacity.</li> <li>• Identify potential workers from the affected communities.</li> <li>• Identify possible conflicts in and between communities.</li> <li>• Recommend support programmes that would assist with conflict minimisation and resolution.</li> </ul> <p>Crime:</p> <ul style="list-style-type: none"> <li>• The role of Traditional Authorities in exerting control over land allocation in order to prevent densification of people around the borrow pit areas should be supported.</li> <li>• The DWS and contractor must encourage settlement in Lusikisiki by providing daily transport for “outside” workers who settle in the town of Lusikisiki, to and from the borrow pit sites to minimise the potential crime factor in the rural areas.</li> <li>• All mine workers must be clearly identifiable and wear easily recognisable uniforms. They need to carry identification cards issued by the contractor.</li> <li>• The SAPS must have access to borrow pit sites.</li> <li>• Local communities should be encouraged to report suspicious activity to the community liaison or nearest environmental site officer.</li> <li>• The contractor must prevent loitering around the borrow pit camp by providing transport to and from the camp sites.</li> <li>• All borrow pits and camp sites must be fenced and secure.</li> </ul> <p>Increased prostitution and sexual behaviour:</p> <ul style="list-style-type: none"> <li>• National and local awareness programmes that discourage promiscuity, especially at schools in the project area should be supported.</li> <li>• Condoms must be made easily accessible to all mine workers.</li> </ul> <ul style="list-style-type: none"> <li>• An HIV/AIDS, non-discrimination, awareness, prevention and health care support, policy must be implemented.</li> <li>• Condoms must be made easily accessible to all mine workers.</li> <li>• An HIV/AIDs education and behaviour change programme for all contracted mine workers should be developed.</li> <li>• The above program must extend to the communities located near the borrow pit sites.</li> <li>• Existing public health care centres and programmes such as TAC must</li> </ul>

Theme	Mitigation measure
<b>Mining Phase</b>	
	<p>be involved in HIV/AIDS campaigns and monitoring of HIV/AIDS prevalence should be undertaken in collaboration with these agencies.</p> <ul style="list-style-type: none"> <li>• Voluntary counselling and testing should be encouraged for all workers.</li> <li>• DWS is limited in its capacity to enhance the benefits of this impact, as the development of the communities and town will occur in response to the needs and demands of mine workers. The proponent can play role in facilitating the skills required to recognise the need and respond appropriately. The proponent must link the Provincial Department of Economic Development and Local Municipal LED programmes with small to medium enterprises (including communities) in the area so that a state of “readiness” to optimise economic benefits is achieved. This may involve training in the following sectors: business, tourism, catering etc.</li> </ul>
Impact on health and general quality of life	<ul style="list-style-type: none"> <li>• No mitigation measures are required</li> <li>• Service providers associated with the IHLM and PSJLM, clinics, schools and the SAPS must be made aware of an increase in demand, both in the town of Lusikisiki and in the surrounding rural areas, and therefore the increased pressure to provide services for new households.</li> <li>• This will require direct communication with the local municipalities, ORTDM, the Department of Health, South African Police Service and the Department of Education. The channels of communication must be established as permanent points of contact throughout the site establishment phase of the project.</li> <li>• Regular monitoring of the schools and clinics in order to determine whether there are sufficient resources must be undertaken. When resources are deemed insufficient, DWS must communicate, through established channels, with the relevant departments for assistance.</li> <li>• During windy periods un-surfaced and un-vegetated areas should be dampened down.</li> <li>• Vegetation should be retained where possible as this will reduce dust travel.</li> <li>• Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas.</li> <li>• A speed limit of 30km/h must not be exceeded on dirt roads.</li> <li>• Any complaints or claims emanating from the lack of dust control must be attended to immediately.</li> <li>• Drilling, blasting and movement of heavy machinery must be limited to normal working hours (7 AM to 5 PM).</li> <li>• Ensure there is a facility for nearby residents to make complaints. These must be addressed and recorded.</li> <li>• Communities must have access to a grievance reporting mechanism, e.g. through a project steering or liaison committee.</li> </ul> <p>Traffic safety:</p> <ul style="list-style-type: none"> <li>• All affected communities must be informed of the formal access routes.</li> <li>• All vehicle operators and drivers must undergo regular training,</li> </ul>

Theme	Mitigation measure
<b>Mining Phase</b>	
	<p>clearly outlining the high safety risk to local rural communities</p> <ul style="list-style-type: none"> <li>• Signage making communities aware of the high safety risk due to heavy vehicles on the road must be erected at appropriate locations.</li> <li>• Traffic calming devices such as speed bumps should be considered on rural access roads.</li> </ul> <p>Fire safety:</p> <ul style="list-style-type: none"> <li>• Fires outside borrow pit camps must be prohibited.</li> <li>• Fires that are lit must be in a contained area and safety precautions must be followed. The fire must be monitored for cinders and extinguished when no longer needed.</li> <li>• Fire fighting equipment must be stored onsite.</li> <li>• The borrow pit campsite must be surrounded by a firebreak.</li> <li>• Education of fire risks must form part of the mine-worker training.</li> </ul>
Loss of land as result of the borrow pit construction	<ul style="list-style-type: none"> <li>• The process for land acquisition by DWS must be conducted through the traditional authorities operating in the areas as they have jurisdiction over land allocations.</li> <li>• Individual landowners must be identified and engaged.</li> <li>• All the properties must be professionally assessed and valued by professional independent evaluators registered with South African Institute of Valuers and the South African Council for Property Valuers.</li> <li>• Valuations, and the process of evaluation, must be shared with the landowners and will form the basis for on-going negotiations with them.</li> </ul>
Stimulation of economic growth	<ul style="list-style-type: none"> <li>• Equal jobs opportunities for women and men must be promoted.</li> <li>• Culture and tradition must be considered when planning the division of labour for site establishment.</li> <li>• Employment must be managed by a recruitment agency/office that uses a selection system that ensures recruitment of semi and unskilled workers from all local impacted communities in accordance with recent government policies related to local procurement. This must ensure a fair and equitable recruitment process.</li> <li>• Where appropriate, employees involved in the site establishment phase should be incorporated into the permanent maintenance staff for the mining phase; and</li> <li>• Particular attention must be paid to employment opportunities for women and disabled persons.</li> </ul> <ul style="list-style-type: none"> <li>• The proponent must ensure that the principal of utilising local business resources (suppliers and SMMEs) in accordance with recent government policies related to local procurement (State of the nation address, 2015) forms part of the procurement specifications. Examples of local business resources that must be considered: <ul style="list-style-type: none"> <li>– Catering services</li> <li>– Transport services</li> <li>– Quarries/borrow pits (where necessary)</li> <li>– Small civils</li> <li>– Accommodation</li> <li>– Security</li> <li>– Hygiene services</li> </ul> </li> </ul>

Theme	Mitigation measure
<b>Mining Phase</b>	
	<ul style="list-style-type: none"> <li>– Fencing</li> <li>• Implement a skills development programme which includes training in business, project management, monitoring and evaluation.</li> </ul>

**Table 6.4: Impacts and mitigation measures associated with the decommissioning and closure phase**

Theme	Mitigation measure
<b>Decommissioning/Closure Phase</b>	
<b>GENERAL</b>	
Final rehabilitation and decommissioning	<ul style="list-style-type: none"> <li>• All infrastructure, equipment, machinery and other items used during the mining period must be removed from the site.</li> <li>• Waste material of any description, including receptacles, scrap, rubble and tyres, must be removed entirely from the mining area and disposed of at a recognized landfill facility. No waste must be buried or burned on the site.</li> <li>• The borrow pits, access roads, storm water control areas and any other affected areas must be rehabilitated.</li> <li>• The site must be covered with locally occurring grass and shaped/levelled correctly.</li> <li>• All exposed areas must be re-vegetated where possible.</li> <li>• Mining areas must be inspected weekly for soil stability.</li> <li>• Alien invasive plant species must be eradicated as per the Rehabilitation and Alien Management Plan.</li> <li>• The closed borrow pits must pose no safety risks.</li> <li>• Rehabilitation must be completed in such a manner that the land can be optimally used post-mining.</li> <li>• Final rehabilitation must be completed within a period specified by the Regional Manager (DMR).</li> </ul>
Closure	<ul style="list-style-type: none"> <li>• Closure must comply with the MPRDA (Act 28 of 2002), NEMA (Act 107 of 1998) and the NEMA Regulations (2014) requirements for mine closure.</li> <li>• A closure plan must be compiled using the guidelines described in Appendix 5 of the NEMA Regulations (2014) and submitted to DMR.</li> <li>• A closure certificate must be obtained from the Minister of Mineral Resources.</li> </ul>
<b>ECOLOGICAL IMPACTS</b>	
Control of alien species	<ul style="list-style-type: none"> <li>• A Rehabilitation and Alien Management Plan must be developed and implemented during the decommissioning and closure phase to reduce the establishment and spread of undesirable alien plant species.</li> <li>• Alien plants must be removed from the site through appropriate methods such as hand pulling, application of chemicals, cutting etc. This must be done under the supervision of the ECO.</li> </ul>
Rehabilitation of disturbed areas	<ul style="list-style-type: none"> <li>• All impacted areas must be rehabilitated back to Ngongoni veld after mining.</li> <li>• Only topsoil from the immediate area must be used for rehabilitation. If none available alternative methods must be investigated and implemented like hydro-seeding, planting etc.</li> <li>• All mined areas must be restored as per the Rehabilitation and Alien Management Plan.</li> </ul>



## 6 ROLES AND RESPONSIBILITIES

According to APPENDIX 4 of GN R 982, an environmental management programme must include:

- (i) An indication of the persons who will be responsible for the implementation of the impact management actions;

### 6.1 Department of Water and Sanitation

Department of Water and Sanitation (DWS) is the applicant and the holder of the relevant Environmental Authorisation (see APPENDIX B) and shall therefore be the entity monitoring the implementation of the EMPr. However, DWS will appoint a Contractor to conduct the mining activities and hence implement the proposed mitigation measures documented in this EMPr on their behalf. The successful Contractor's responsibilities are outlined in Section 5.2 that follows.

### 6.2 Contractor

The successful Contractor shall:

- Be responsible for the finalisation of the EMPr in terms of methodologies which are required to be implemented to achieve the environmental specifications contained herein and the relevant requirements contained in the environmental authorisation, if issued by DMR;
- Be responsible for the overall implementation of the EMPr in accordance with the requirements of DWS and the environmental authorisation, if issued by DMR;
- Ensure that all third parties who carry out all or part of the Contractor's obligations under the Contract comply with the requirements of this EMPr;
- Be responsible for obtaining any environmental permits which are required for the design, site establishment and mining of the borrow pits; and
- Ensure that the appointments of the ECO and ESO are subject to the approval of DWS.

### 6.3 Environmental Site Officer

The Contractor shall appoint a nominated representative of the contractor as the Environmental Site Officer (ESO) for the contract. The ESO will be site-based and shall be the responsible person for implementing the environmental provisions of the mining contract.

There shall be an approved ESO on the site at all times. It may be necessary to have more than one ESO. The ESO's duties 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 site establishment and mining commencing.
- Reviewing and approving mining method statements with input from the ECO and Engineer, where necessary, in order to ensure that the environmental specifications contained within the mining contract are adhered to.
- Assisting the Contractor in finding environmentally responsible solutions to problems.
- Keeping accurate and detailed records of all activities on site.
- Keeping a register of complaints on site and recording community comments and issues, and the actions taken in response to these complaints.
- Keeping a weekly photographic record of progress on site from an environmental perspective.
- Maintain a daily diary for the duration of the mining phase.
- Ensuring that the required actions are undertaken to mitigate the impacts resulting from non-compliance.

- Reporting all incidences of non-compliance to the ECO and Contractor.
- The ESO shall submit weekly written reports to the ECO.

The ESO must have:

- The ability to manage public communication and complaints;
- The ability to think holistically about the structure, functioning and performance of environmental systems; and
- The ESO must be fully conversant with the EIR and Environmental Management Plan for the borrow pits and all relevant environmental legislation.

The ECO shall be in the position to determine whether or not the ESO has adequately demonstrated his/her capabilities to carry out the tasks at hand and in a professional manner. The ECO shall therefore have the authority to instruct the contractor to replace the ESO if, in the ECO's opinion, the appointed officer is not fulfilling his/her duties in terms of the requirements of the mining contract. Such instruction will be in writing and shall clearly set out the reasons why a replacement is required and within what timeframe. The ECO shall visit the development site and in addition to the responsibilities listed in section 7.4 below, review the performance of the ESO and submit regular performance reviews to DWS, but not less frequently than once a month.

#### **4 Environmental Control Officer**

For the purposes of implementing the conditions contained herein, DWS shall appoint an Environmental Control Officer (ECO) for the contract. The ECO shall be the responsible person for ensuring that the provisions of the EMPr as well as the environmental authorisation are complied with during the mining period. The ECO will be responsible for issuing instructions to the contractor where environmental considerations call for action to be taken. The ECO shall submit bi-weekly written reports to DWS and DMR.

The ECO will be responsible for the monitoring, reviewing and verifying of compliance with the EMPr and conditions of the environmental authorisation by the Contractor. The ECO's duties in this regard will include, inter alia, the following:

- Confirming that all the environmental authorisations and permits required in terms of the applicable legislation have been obtained prior to site establishment and mining commencing.
- Monitoring and verifying that the EMPr, Environmental Authorisation and Contract are 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 ESO and Engineer, where necessary, in order to ensure that the environmental specifications contained within this EMPr and environmental authorisation are adhered to.
- Inspecting the site and surrounding areas on a regular basis regarding compliance with the EMPr, Environmental Authorisation and Contract.
- 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 EMPr and/or environmental authorisation.
- Undertaking a continual internal review of the EMPr and submitting any changes to DWS and/or DMR (in case of major changes) for review and approval.
- Checking the register of complaints kept on site and maintained by the ESO and ensuring that the correct actions are/were taken in response to these complaints.

- Checking that the required actions are/were undertaken to mitigate the impacts resulting from non-compliance.
- Reporting all incidences of non-compliance to DWS.
- Keeping a photographic record of progress on site from an environmental perspective. This can be conducted in conjunction with the ESO as the ESO will be the person that will be onsite at all times and can therefore take photographic records weekly. The ECO would need to check and ensure that the ESO understands the task at hand.
- Recommending additional environmental protection measures, should this be necessary.
- Providing report back on any environmental issues at site meetings.
- 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, readable 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:
    - Environmental Impact Assessment.
    - Environmental management plans/programmes.
    - Environmental auditing.
    - Mitigation and optimisation of impacts.
    - Monitoring and evaluation of impacts.
    - Environmental Management Systems.

The ECO must be fully conversant with the Environmental Impact Assessment, Environmental Management Plan/Programme, Environmental Authorisation (if issued) for the borrow pits and all relevant environmental legislation.

DWS shall have the authority to replace the ECO if, in their opinion, the appointed officer is not fulfilling his/her duties in terms of the requirements of the EMPr or this specification. Such instruction will be in writing and shall clearly set out the reasons why a replacement is required and within what timeframe.

## 7 ENVIRONMENTAL MONITORING

According to APPENDIX 4 of GN R 982, an environmental management programme must include:

- (g) The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);
- (h) The frequency of monitoring the implementation of the impact management actions contemplated in (f);

### 7.1 General environmental monitoring

A monitoring programme will be implemented for the duration of the activities related to the borrow pits. This programme will include:

- Establishing a baseline through the taking of photographs of identified environmental aspects and potential impact sites prior to site establishment and mining.
- Pre-mining monitoring during the first day of mining where after a post-mining audit will be conducted by the ECO to ensure compliance to the EMPr conditions, and where necessary make recommendations for corrective action. These audits can be conducted randomly and do not require prior arrangement with the Project Coordinator.
- The compilation of an audit report with a rating of compliance with the EMPr.
- The ECO shall keep a photographic record of any damage to areas outside the demarcated site. The date, time of damage, type of damage and reason for the damage shall be recorded in full to ensure the responsible party is held liable.
- All claims for compensation emanating from damage should be directed to the ECO for appraisal.
- The Contractor shall be held liable for all unnecessary damage to the environment.
- A register shall be kept of all complaints from the Landowner or community.

## 8 ENVIRONMENTAL AWARENESS

According to APPENDIX 4 of GN R 982, an environmental management programme must include:

- (m) An environmental awareness plan describing the manner in which –
- (i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and
  - (ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment; and

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

The ECO shall ensure that records of all training interventions are kept in accordance with the record keeping and documentation control requirements as set out in this EMPr.

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

- The importance of conformance with all environmental policies and legislation.
- 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 site establishment and mining activities.
- 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 site establishment and mining activities and the procedures to be followed should these be encountered.

Recommended Environmental Education Material is provided in Appendix A

## 9 COMPLIANCE WITH THE EMPr

According to APPENDIX 4 of GN R 982, an environmental management programme must include:

- (j) The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;
- (k) The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);

A copy of the EMPr must be kept on site at all times during the site establishment and mining periods. The EMPr will be binding on all contractors operating on the site and must be included within the Contractual Clauses.

It should be noted that in terms of the National Environmental Management Act No 107 of 1998 (Section 28) those responsible for environmental damage must pay the repair costs both to the environment and human health and the preventative measures to reduce or prevent further pollution and/or environmental damage (The 'polluter pays' principle).

### 9 Non-compliance

The Contractor shall act immediately when 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 shall 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 EMPr is a transgression of the various statutes and laws that define the manner by which the environment is managed. Failure to redress the cause shall 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 EMPr if, *inter alia*:

- there is evidence of contravention of the EMPr specifications within the boundaries of the mining site, site extensions and roads;
- there is contravention of the EMPr specifications which relate to activities outside the boundaries of the mining site.
- environmental damage is caused 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 Contractors institute penalties to employees 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.

## **2 Emergency preparedness**

The Contractor shall compile and maintain Environmental Emergency Procedures (EEPs) 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 fires.
- Accidental spillage of hazardous substances.
- Accidental toxic emissions into the air.
- Specific environmental and ecosystem effects from accidental releases or incidents.

These plans shall 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 shall 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.

## **3 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.

## **4 Penalties**

Where environmental damage is caused or a pollution incident, and/or failure to comply with any of the environmental specifications contained in the EMP, Riverbank Wind Power and/or the Contractor shall 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.
- Unnecessary removal or damage to dune wetlands (dune slacks).

The following steps will be followed by the ECO on behalf of DWS, when observing a transgression:

1. **Transgression observed:** Give a warning to the Contractor, with time to remedy the situation. Report transgression and agreed remedial action to DWS.
2. **Transgression not remedied:** Report the Contractor directly to DWS and the Engineer and issue a financial penalty to the Contractor (see list of fines below) with an agreed time period to remedy the situation with the assistance of DWS (if necessary).
3. **Failure to remediate:** Depending on the severity and impact significance of the transgression, which must be assessed and discussed with DWS prior to reporting to competent authority, the ECO may undertake to report directly to DMR (Compliance) recommending that for:
  - HIGH impact: DMR to issue a notice to cease mining
  - MEDIUM impact: DMR to issue a notice instructing DWS to implement recommended remedial action
  - LOW impact: ECO to notify, but up to discretion of DMR to apply sanction.

In all cases, however, non-compliance with a condition must be reported to DMR in the monthly audit reports. However, the ECO will also report on corrective actions proposed and implemented.



## 10 CLOSURE PLANNING

Final site cleaning - the contractor shall clear and clean the site and ensure that all equipment and residual materials not forming part of the permanent works is removed from site before issuing the completion certificate or as otherwise agreed.

Rehabilitation - the contractor (landscape architect/horticulturist) shall be responsible for rehabilitating and re-vegetation of all areas disturbed/areas earmarked for conservation during mining to the satisfaction of the engineer and ECO.

### 10.1 Post-mining environmental audit

A post-mining environmental audit must be carried out and submitted to DMR at the expense of DWS. Objectives should be to audit compliances with the key components of the EMPr, to identify main areas requiring attention and recommend priority actions. The audit should be undertaken annually and should cover a cross section of issues, including implementation of environmental controls, environmental management and environmental monitoring.

Results of the audits should inform changes required to the specifications of the EMPr or additional specifications to deal with any environmental issues which arise on site and have not been dealt with in the current document.

### 10.2 General review of EMPr

The EMPr will be reviewed by the ECO on an on-going basis. Based on observations during site inspections and issues raised at site meetings, the ECO will determine whether any procedures require modification to improve the efficiency and applicability of the EMPr on site.

Any such changes or updates will be registered in the ECO's record, as well as being included as an annexure to this document. Annexure of this nature must be distributed to all relevant parties.

## 11 REPORTING

According to APPENDIX 4 of GN R 982, an environmental management programme must include:

- (l) A program for reporting on compliance, taking into account the requirement as prescribed by the regulations;

### 1 Administration

Before the Contractor begins the site establishment and mining activities, the Contractor shall give to the ECO and the Engineer a written method statement setting out the following:

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

The Contractor may provide such information in advance of any or all mining activities provided that new submissions shall be given to the ECO and/or engineer whenever there is a change or variation to the original.

The ECO and/or Engineer may provide comment on the methodology and procedures proposed by the Contractor but he shall not be responsible for the Contractor's chosen measures of impact mitigation and emergency/disaster management systems.

### 2 Good housekeeping

The Contractor shall undertake "good housekeeping" practices during mining. This will help avoid disputes on responsibility and allow for the smooth running of the contract as a whole. Good housekeeping extends beyond the wise practice of mining methods to include the care for and preservation of the environment within which the mining is situated.

### 3 Record keeping

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

### 4 Document control

The Contractor and Engineer shall be responsible for establishing a procedure for electronic document control. The document control procedure should comply with the following requirements:

- Documents must be identifiable by organisation, division, function, activity and contact person.

- Every document should identify the personnel and their positions, who drafted and compiled the document, who reviewed and recommended approval, and who finally approved the document for distribution.
- All documents should be dated, provided with a revision number and reference number, filed systematically, and retained for a five year period.

The Contractor shall ensure that documents are periodically reviewed and revised, where necessary, and that current versions are available at all locations where operations essential to the functioning of the EMPr are performed. All documents shall be made available to the ECO and other independent external auditors.

## 12 CONCLUSIONS

Although all foreseeable actions and potential mitigations or management actions are contained in this document, the EMPr should be seen as a day-to-day management document. The EMPr thus sets out the environmental and social standards, which would be required to minimise the negative impacts and maximise the positive benefits of the mining activities. The EMPr could thus change daily, and if managed correctly lead to a successful mining phase.

All attempts should be made to have this EMPr available, as part of any tender documentation, so that the Engineer and Contractor are made aware of the potential cost and timing implications needed to fulfil the implementation of the EMPr, thus adequately costing for these.

**APPENDIX A**

**PROPOSED ENVIRONMENTAL EDUCATION COURSE**

# WHAT IS THE ENVIRONMENT?

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

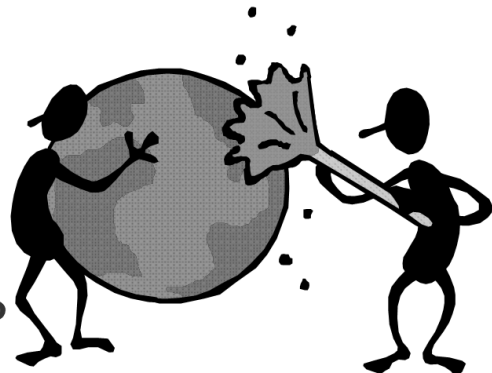


## WHY MUST WE LOOK AFTER THE ENVIRONMENT?

- 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



## RIVERS & STREAMS

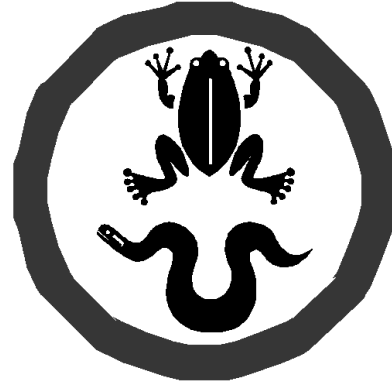
- Do not swim in or drink from streams
- Do not throw oil, petrol, diesel, concrete or rubbish in the stream
- Do not work in the stream without direct instruction
- Do not damage the banks or vegetation of the stream





## 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



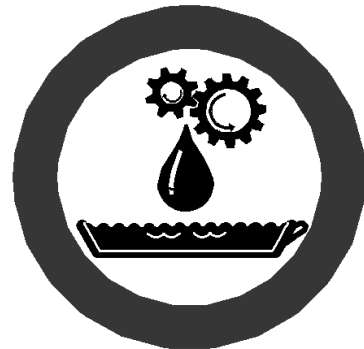
## SMOKING AND FIRE

- 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



## 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



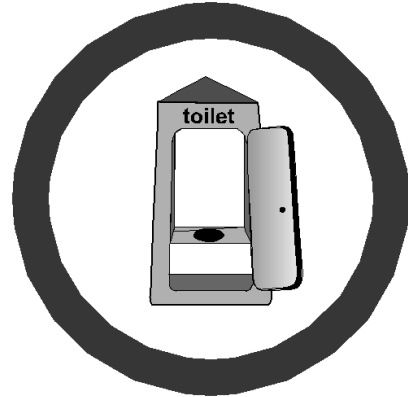
## NOISE

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



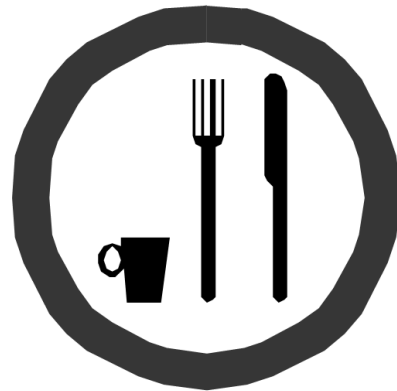
## TOILETS

- 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



## 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:

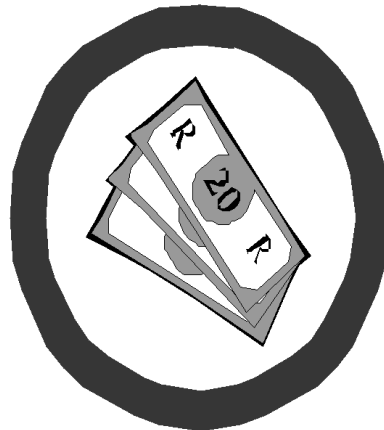


## FINES AND PENALTIES

- Spot fines of between

To be confirmed by Engineer

- 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!



**APPENDIX B**

**ENVIRONMENTAL AUTHORISATION**



**APPENDIX C**

**PRO-FORMA: PROTECTION OF THE ENVIRONMENT**

To be signed by Contractors

PRO FORMA

Employer \_\_\_\_\_  
Contract No \_\_\_\_\_  
Contract title \_\_\_\_\_

PROTECTION OF THE ENVIRONMENT

The Contractor will not be given right of access to the site until this form has been signed.

I/ we \_\_\_\_\_ (Contractor) record as follows:

1. I/ we, the undersigned, do hereby declare that I/ we am/ are aware of the increasing requirement by society that mining activities shall be carried out with due regard to their impact on the environment.
2. In view of this requirement of society and a corresponding requirement by the Employer with regard to this Contract, I/ we will, in addition to complying with the letter of the terms of the Contract dealing with protection of the environment, also take into consideration the spirit of such requirements and will, in selecting appropriate employees, plant, materials and methods of mining, in so far as I/ we have the choice, include in the analysis not only the technical and economic (both financial and with regard to time) aspects but also the impact on the environment of the options. In this regard, I/ we recognise and accept the need to abide by the “precautionary principle” which aims to ensure the protection of the environment by the adoption of the most environmentally sensitive mining approach in the face of uncertainty with regard to the environmental implications of mining.
3. I/ we acknowledge and accept the right of \_\_\_\_\_ to deduct, should they so wish, from any amounts due to me/us, such amounts (hereinafter referred to as fines) as the Resident Engineer and Environmental Site Officer shall certify as being warranted in view of my/ our failure to comply with the terms of the Contract dealing with protection of the environment, subject to the following:
  - 3.1 The Resident Engineer and Environmental Officer, in determining the amount of such fine, shall take into account *inter alia*, the nature of the offence, the seriousness of its impact on the environment, the degree of prior compliance/non-compliance, the extent of the Contractor’s overall compliance with environmental protection requirements and, in particular, the extent to which he considers it necessary to impose a sanction in order to eliminate/reduce future occurrences.
  - 3.2 The Resident Engineer and Environmental Officer shall, with respect to any fine imposed, provide me/ us with a written statement giving details of the offence, the facts on which the Resident Engineer and Environmental Officer has based his assessment and the terms of the Contract (by reference to the specific clause) which has been contravened.

Signed \_\_\_\_\_  
CONTRACTOR

Date \_\_\_\_\_