ENVIRONMENTAL MANAGEMENT PLAN

The Proposed Utilisation of Borrow Pits
Road: DR08348
(Amathole District Municipality)

Department of Roads and Public Works

Province of the Eastern Cape

Report Number 2011-R502

September 23, 2011

Biotechnology & Environmental Specialist Consultancy cc

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Prepared on behalf of

Department of Roads and Public Works
Province of the Eastern Cape

by

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1 Report Release Notice

Report Status	Date	Authorised
1. Internal Draft	July 08, 2011	Ms Lee-Anne Proudfoot
2. Client Draft	July 08, 2011	Dr Malcolme Logie
3. Public Draft	August 11, 2011	Ms Lee-Anne Proudfoot
4. Final Report	September 23, 2011	Ms Lee-Anne Proudfoot

This Environmental Management Plan Report has been prepared by BESC the trading name of Biotechnology & Environmental Specialist Consultancy cc, with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our Standard Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.

BESC disclaims any responsibility to the client and others in respect of any matters outside the scope of the above.

This Environmental Management Plan Report is exclusive to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

Ms Lee-Anne Proudfoot

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2 Limitations

BESC has prepared this report for the sole use of **DEPARTMENT OF ROADS & PUBLIC WORKS** in accordance with generally accepted consulting practises and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon by any other party without the explicit written agreement of **DEPARTMENT OF ROADS & PUBLIC WORKS** and **BESC**. No other warranty, expressed or implied, is made as to the professional advice included in this report.

The conclusions and recommendations contained in this report are based upon information provided by others and the assumption that all relevant information has been provided by those bodies from whom it has been requested. Where field investigations have been carried out, they have been restricted to a level of detail required to achieve the stated objectives of the work.

All items listed in BESC's Standard Terms and Conditions of Business are applicable to this report.

3 Limiting Conditions

This report was compiled from information obtained from the following sources:

1. Numerous site visits and assessments
2. Public participation
3. Information on biophysical environment - BESC
4. Information on Borrow pits – Controlab cc
5. Archaeological & Heritage Assessment – ArchaeoMaps
6. Palaeontological Assessment – Rob Gess Consulting

4 Special conditions

None

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5 Natural Science Professions Act

The Principal of BESC, Dr Malcolme Logie, is registered with the:

- South African Council for Natural Scientific Professions (SACNASP), in accordance with the Natural Sciences Professions Act (Act 27 of 2003), as a *Professional Natural Scientist - Environmental Scientist.* As such work undertaken by BESC in Environmental Management complies with the requirement of the Act, which states, "*only individuals registered may practice in a consulting capacity*."
- The South African Institute of Ecologist & Environmental Scientist, and is registered as a *Professional Member - Environmental Scientist*.
- Certification Board of the Environmental Assessment Practitioners of South Africa (EAPSA), as a *Certified Environmental Assessment Practitioner*
- International Association of Impact Assessors – South Africa
- Senior Lead Auditor: Bureau Veritas (Safety, Health, Environment & Quality)
- Lead Auditor: TUV (Safety, Health, Environment)
- Lead Auditor: British Standard Institute (Safety, Health, Environment)

Senior Environmental Consultants:

Ms Lee-Anne Proudfoot, is registered with the:

- South African Council for Natural Scientific Professions (SACNASP), in accordance with the Natural Sciences Professions Act (Act 27 of 2003), as a *Professional Natural Scientist - Environmental Scientist.* As such work undertaken by BESC in Environmental Management complies with the requirement of the Act, which states, "*only individuals registered may practice in a consulting capacity*."
- International Association of Impact Assessors – South Africa

Mr Conroy van der Riet - registration as *Candidate Scientist* with the:

- South African Council for Natural Scientific Professions (SACNASP), in accordance with the Natural Sciences Professions Act (Act 27 of 2003), as a *Professional Natural Scientist - Environmental Scientist.* As such work undertaken by BESC in Environmental Management complies with the requirement of the Act, which states, "*only individuals registered may practice in a consulting capacity*."
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6 Primary Legislative Specifications

Primary Environmental Legislation governing the Scope of Work undertaken is:

- GN R.1273: Mineral and Petroleum Resources Development Act, 2002, No. 28 of 2002.
- GN R. 527: Mineral and Petroleum Resources Development Act, 2002, (No. 28 of 2002): Mineral and Petroleum Resources Development Regulations, 2004.
- GN R.543: Regulations in terms of Chapter 5 of the National Environmental Management Act, 1998;

for the proposed utilisation of borrow pits for the proposed routine maintenance/re-gravelling of the DR08348.

The permitting of the materials sources required for the project will be undertaken in accordance with the Minerals and Petroleum Resources Development Act (M&PRDA) (No. 28 of 2002). It must be noted that the applicant (Department of Roads and Public Works), as an organ of state, has obtained exemption from the provisions of sections 16, 20, 22 and 27 (application processes) of the M&PRDA in respect of any activity to remove any mineral for the construction and maintenance of dams, harbours, roads and railway lines and for purposes incidental thereto, as allowed for by the said Act in section 106 (1). As such the utilisation of the material sources is subject only to the preparation, submission and approval of an Environmental Management Plan compiled in accordance with requirements of the M&PRDA.

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7 Legal Requirements

7.1 National Acts and Regulations

7.1.1 The Constitution of South Africa, Act No 106 of 1996

Chapter 2 of the Bill of Rights that forms part of The Constitution of South Africa provides for an 'environmental right', and in terms of Section 7, the State is obliged to respect, promote and fulfil the rights in the Bill of Rights. An obligation is therefore placed on the State to give effect to the environmental right and this is achieved through the right of everyone:

- To an environment that is not harmful to their health or well-being,
- To have the environment protected, for the benefit of present and future generations, though reasonable legislative and other measures that:
  - Prevent pollution and ecological degradation,
  - Promote conservation,
  - Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

7.1.2 Mineral and Petroleum Resources Development Act

The Minerals and Petroleum Resources Development Act, 2002 (Act No 28 of 2002) was developed to ensure that provision is made for equitable access to, and sustainable development of, South Africa's mineral and petroleum resources and to provide insight, guidance and control for matters connected thereto. It seeks to provide management tools that ensure that all mining operations are undertaken in an environmentally sound manner according to government approved documents that hold the applicant responsible for any environmental degradation that their mining actions might cause. It also seeks to expand opportunities for historically disadvantaged South Africans and promote employment and welfare of SA citizens. It ensures that holders of mining and production rights contribute towards the socio-economic development of the areas in which they operate.

7.1.3 Mineral and Petroleum Resources Regulations

Regulations in terms of Section 107(1) of the Act were published in Government Notice No. R. 526 on the 23rd April 2004. The regulations provide details of the procedures to be followed in applying for or renewing mining and prospecting rights and permits and for the closure of mining operations as provided and described in the Mineral and Petroleum Resources Development Act (M&PRDA).

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Department of Roads and Public Works, as an organ of state, has applied for exemption from certain provisions of the Act, as allowed in terms of Section 106(1). Utilization of any material sources is therefore subject to the preparation, submission and approval of an Environmental Management Plan compiled in accordance with Section 39(2) and Regulation 52 of the M&PRDA.

7.1.4 Mineral and Petroleum Resources Development Amendment Act

The Mineral and Petroleum Resources Development Act, 2009 (Act No 49 of 2009) was gazetted on the 21 April 2009 in order to amend the Mineral and Petroleum Resources Development Act, 2002, so as to make the Minister the responsible authority for implementing environmental matters in terms of the National Environmental Management Act, 1998 and specific environmental legislation as it relates to prospecting, mining, exploration, production and related activities or activities incidental thereto on a prospecting, mining, exploration or production area; to align the Mineral and Petroleum Resources Development Act with the National Environmental Management Act, 1998 in order to provide for one environmental management system, to remove ambiguities in certain definitions; to add functions to the Regional Mining Development and Environmental Committee; to amend the transitional arrangements so as to further afford statutory protection to certain existing old order rights; and to provide for matters connected therewith.

Any provision related to prospecting, mining, exploration and production and related activities comes into operation only 18 months after the commencement of the M&PDRA Amendment Act.

7.1.5 National Environmental Management Act

The National Environmental Management Act (Act 107 of 1998) (NEMA), has largely superseded the Environment Conservation Act (Act 73 of 1989), and now serves as a framework for environmental management, in which development must be socially, environmentally and economically sustainable.

Section 2(1) of NEMA sets out a range of environmental principles that are to be applied by all organs of state when taking decisions that significantly affect the environment. Included amongst the key principles is the directive that all development must be socially, economically and environmentally sustainable, and that environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably. Therefore the proposed development must to consider the following principles:

- Environmental management must be integrated, taking into account the effects of decisions on all aspects of the environment and on all people;

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- Environmental justice must be pursued to ensure that adverse impacts are not distributed in a manner so as to unfairly discriminate against any person, particularly vulnerable or disadvantaged persons;
- Equitable access to environmental resources, benefits and services to meet basic human needs and to ensure that human well-being is pursued;
- The participation of Interested & Affected Parties (I&AP's) in environmental governance must be promoted;
- Community well-being and empowerment must be promoted through environmental education;
- The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in light of these considerations; and
- Decisions must be taken in an open and transparent manner.

In terms of the current regulations, Section 1 of Government Notice R544 (2010), Section 1 of Government Notice R545 (2010) and Section 1 of Government Notice R546 (2010), provides a schedule of activities which may have a substantial detrimental effect on the environment, and which require authorisation by the DWEA (formerly DEAT) before they may commence. With regards to the proposed utilisation of the identified borrow pits, no listed activities requiring environmental authorisation have been triggered.

7.1.6 National Environmental Management Amendment Act

On 1 May 2009 the National Environmental Management Amendment Act, 2008 (Act No. 62 of 2008) ("the NEMA Amendment Act"), came into operation. The NEMA Amendment Act has implications on the way in which the Environmental Impact Assessment ("EIA") process is implemented.

It serves to amend the National Environmental Management Act, 1998, so as to insert certain definitions and to substitute others; to further regulate environmental authorisations; to empower the Minister of Minerals and Energy to implement environmental matters in terms of the National Environmental Management Act, 1998, in so far as it relates to prospecting, mining, exploration, production or related activities on a prospecting, mining, exploration or production area; to align environmental requirements in the Mineral and Petroleum Resources Development Act, 2002, with the National Environmental Management Act, 1998, by providing for the use of one environmental system and by providing for environmental management programmes, consultation with State departments, exemptions from certain provisions of the National Environmental Management Act, 1998, financial provision for the remediation of environmental damage, the management of residue stockpiles and residue deposits, the recovering

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of cost in the event of urgent remedial measures and the issuing of closing certificates as it relates to the conditions of the environmental authorisation; and to effect certain textual alterations; and to provide for matters connected therewith.

7.1.7 Environment Conservation Act

The Environmental Conservation Act (Act 73 of 1989) aimed "to provide for the effective protection and controlled utilization of the environment and for matters incidental thereto", and predated NEMA as the country's primary environmental statute. Much of the ECA was repealed with the promulgation of NEMA, with the environmental impact assessment regulations in turn being repealed when the regulations under NEMA mentioned in the previous section were adopted. The foundation before this promulgation consisted of Parts V and VI of the ECA that related to the "control of activities which may have detrimental effect on the environment".

In addition, section 25 of the Act makes provision for the regulations regarding noise, vibration and shock. These regulations are provided for Noise Control.

7.1.8 National Water Act

The National Water Act (Act 36 of 1998) (NWA) provided fundamental law relating to water resources. The preamble to the Act recognises that the ultimate aim of water management is to achieve sustainable use of water for the benefit of all users, and that the protection of the quality of water resources is necessary to ensure sustainability of the nation's water resources in the interests of all water users. The purpose of the Act is stated, in Section 2 as, *inter alia;*

- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Protecting aquatic and associated ecosystems and their biological diversity; and
- Reducing and preventing pollution and degradation of water resources.

7.1.9 National Forests Act

The principles of the National Forests Act (Act 84 of 1998) (NFA) pertain to:

- The protection of natural forests (except under exceptional circumstances where the Minister determines that the proposed new land use is preferable in terms of its economic, social or environmental benefits);
- The conservation of a minimum area of each woodland type; and
- The management of forests to ensure sustainability of resources (wood, soil, biological diversity, etc).

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No person may cut, disturb, damage or destroy any indigenous living tree in, or remove or receive any such tree from, a natural forest except in terms of-

(a) A license issued under subsection (1) or section 23; or

(b) An exemption from the provisions of this subsection published by the Minister in the Gazette on the advice of the Council.

The Minister may declare to be a natural forest a group of indigenous trees whose crowns are not largely contiguous; or where there is doubt as to whether or not their crowns are largely contiguous, if he or she is of the opinion based on scientific advice, that the trees make up a forest which needs to be protected in terms of this Part.

The Minister declares a forest to be a natural forest by publishing a notice in the Gazette; and publishing a notice in two newspapers circulating in the area; and airing a notice on two radio stations broadcasting to the area.

The Minister may issue a licence to cut, damage or destroy any indigenous, living tree in. or remove or receive any such tree from a natural forest.

7.1.10 Conservation of Agricultural Resources

The Conservation of Agricultural Resources Act (Act 13 of 1983) makes provision for the actions required with regard to any plant species depend on the *category* in which the plant appears of the amended regulations, and might differ from province to province. In certain cases, special conditions were added that apply only to that specific species.

Category 1 plants, or declared weeds

These are prohibited plants that will no longer be tolerated, neither in rural nor urban areas, except with the written permission of the executive officer or in an approved biocontrol reserve. These plants may no longer be planted or propagated, and all trade in their seeds, cuttings or other propagative material is prohibited. They may not be transported or be allowed to disperse.

Plant species were included in this list for one or more of the following reasons: they might pose a serious health risk to humans or livestock, cause serious financial losses to land users, be able to invade undisturbed environments and transform or degrade natural plant communities, use more water than the plant communities they replace or be particularly difficult to control.

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Most of the plants in this category produce copious numbers of seeds, are wind or bird dispersed or have highly efficient means of vegetative reproduction. Whereas some of these plants were introduced inadvertently, have no obvious function to fulfil in South Africa and are generally regarded as undesirable, many of them are popular garden or landscaping plants. What they all have in common, however, is the fact that their harmfulness outweighs any useful properties they might have. Care was taken not to include a plant in this category if part of the population of South Africa would suffer because of its absence. The ornamentals in this category ought to be reasonably easy to replace with less invasive substitutes.

Plant invaders of Category 2

These are plants with the proven potential of becoming invasive, but which nevertheless have certain beneficial properties that warrant their continued presence in certain circumstances. CARA makes provision for Category 2 plants to be retained in special areas demarcated for that purpose, but those occurring outside demarcated areas have to be controlled. The exception is that Category 2 plants may also be retained or cultivated in biological control reserves, where the plants will serve as host plants for the breeding of biological control agents. The growing of Category 2 plants in a demarcated area qualifies as a water use, and is subject to the requirements of section 21 of the National Water Act, 1998 (Act No. 36 of 1998).

An area can only demarcated for the growing of Category 2 plants by the Executive Officer. The land user needs to obtain a water use license; the plants have to primarily serve a commercial or utility purpose, such as a woodlot, shelter belt, building material, animal fodder, soil stabilization, medicinal or own consumption; the conditions under which they are cultivated, have to be controlled; all reasonable steps have to be taken to curtail the spreading of seeds or vegetatively reproducing material outside the demarcated area, and all specimens outside the demarcated area have to be controlled. The Executive Officer has the power to impose additional conditions to ensure the adequate control of Category 2 plants in demarcated areas.

Seed or other propagative material of Category 2 plants may only be sold to, and acquired by, land users of areas demarcated for the growing of that species, or for the establishment of a biocontrol reserve. Category 2 plants may not occur within 30 m from the 1:50 year flood line of watercourses or wetlands, unless authorization has been obtained in terms of the National Water Act. The Executive Officer has the power to grant exemption from some of the above requirements.

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Plant invaders of Category 3

These plants are undesirable because they have the proven potential of becoming invasive, but most of them are nevertheless popular ornamentals or shade trees that will take a long time to replace. A few of them were placed into this category instead of into category 1 because they do not cause problems in all situations. In terms of Regulation 15 of CARA, Category 3 plants will not be allowed to occur anywhere except in biological control reserves, unless they were already in existence when these regulations went into effect. The conditions on which these already existing plants may be retained are that they do not grow within 30 m from the 1:50 year flood line of watercourses or wetlands, that all reasonable steps are taken to keep the plant from spreading, and that the Executive Officer has the power to impose additional conditions or even prohibit the growing of Category 3 plants in any area where he has reason to believe that these plants will pose a threat to the agricultural resources.

Propagative material of these plants, such as seeds or cuttings, may no longer be planted, propagated, imported, bought, sold or traded in any way. It will, however, be legal to trade in the wood of Category 3 plants, or in other products that do not have the potential to grow or multiply. The Executive Officer will have the power to grant exemption from some of the above requirements.

Control methods

The amended regulations stress that, when controlling plants that occur in areas where they are not allowed, methods should be used that are appropriate for the species concerned as well as to the ecosystem in which they occur. One or a combination of the following control methods may be used: uprooting, felling, cutting, burning, treatment with registered herbicides, biological control or any other recognized and appropriate method. Repetitive follow-up actions will be mandatory until the required control has been achieved.

The aim of control is to reach a point where, ideally, the plants concerned do no longer occur in that particular area or, at least, where the plants can no longer grow, produce viable seeds or spores, coppice, sprout or produce root suckers, reproduce vegetatively, propagate themselves in any other way, or spread into other areas. If this is not possible, the plants have to be contained and their multiplication limited as far as possible.

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When controlling weeds and invaders, damage to the environment has to be limited to the minimum. CARA does not specify the types of environmental damage that might be caused by control actions, but a few examples would be:

1. The removal of or herbicidal damage to non-target plants
2. The chemical pollution of soil or water or any other threat to non-target organisms
3. The irresponsible use of fire
4. The creation of a fire hazard by allowing flammable material to accumulate in fire-sensitive areas
5. Unnecessary or irresponsible disturbance of the soil, especially on riverbanks or slopes
6. Failure to rehabilitate denuded areas so as to prevent soil erosion and invasion by other undesirable species
7. Any other action that might upset the ecological balance of the environment.

Biological control of weeds is subject to rigorous regulations, and will be recognized by CARA as a valid control method only if it is practiced in accordance with all these regulations. Biological control involves the use of host-specific natural enemies of weeds or invaders from the plant's country of origin, to either kill or remove the invasive potential of these plants. It may only be initiated by and carried out under the supervision of an academic or research institute or organization established by legislation, which practises and researches biological control of weeds and invader plants. In order to prevent the waste of biocontrol research effort, money and natural enemies, CARA also lays down certain rules for the protection of biological control agents. In areas where biological control is effective, no additional control methods should be used that would harm the biocontrol agents. Provision is made for certain areas to be set aside as biological control reserves, i.e. areas in which a number of invasive plants are maintained as host plants for the biological control agents, to ensure the continued presence of the agents in that area. Only the Executive Officer may designate a biological control reserve, on condition that it is used by a biocontrol expert to rear and redistribute biocontrol agents. In such a biological control reserve, no measures may be applied that would render the biocontrol agents ineffective.

Nothing contained in Regulation 15 may be used as a reason for ignoring or circumventing any other laws.

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7.1.11 National Environmental Management: Biodiversity Act

The Biodiversity Act (Act 10 of 2004) falls within the framework of the National Environmental Management Act and provides for:

- The management and conservation of biological diversity and of components of such biodiversity;
- Protection of species and ecosystems that warrant National protection;
- Sustainable use of indigenous biological resources;
- The fair and equitable sharing of benefits arising from bio-prospecting including indigenous biological resources; and
- The establishment of a National Biodiversity Institute.

Furthermore it gives affect to ratified international agreements relating to biodiversity which are binding on the Republic, it provides for co-operative governance in biodiversity management and conservation, and provides for a South African National Biodiversity Institute to assist in achieving the objectives of this Act.

7.1.12 Provincial Nature Conservation Ordinance

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

7.1.13 Eastern Cape Environment Conservation Bill, 2003

To provide for the consolidation and the repeal of certain laws relating to environmental conservation applicable in the Province, including the Sea-shore Act, 1935, Mountain Catchment Areas Act, 1970, and the Environmental Conservation Act, 1989; to provide for the declaration of Provincial protected areas; to provide for the management of biodiversity in the Province; to provide for Provincial coastal management; to regulate air quality and waste management in the Province; and to provide for matters connected therewith.

This bill provides a number of schedules which protect endangered flora and for which a permit is required. According to Chapter 12, "Miscellaneous provisions relating to endangered flora" 112.(1)

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Subject to the provisions of this Act, no person may – in respect of flora listed in Schedule 4, without a possession permit (iii) pick, uproot, damage or destroy any endangered flora.

7.1.14 Transkei Decree (9 of 1992)

The purpose of the Transkei Decree is to consolidate and amend laws relating to the conservation, management, protection and commercial utilization of indigenous fauna and flora and their habitats on land, in fresh water and in the sea; excluding national parks. To provide for the establishment of national wildlife reserves, protected natural environments, limited development areas, camping areas, hiking trails and coastal conservation areas.

In terms of this decree, the coastal conservation areas applies to the 1 km strip along the entire former Transkei coastline (excluding Municipal land), which is measured from the high water mark of the seashore and relevant tidal estuaries to 1 km inland. The Decree makes provision for various forms of legislation to manage development and conserve, protect and control the utilisation of indigenous fauna and flora within the coastal strip. This implies that any development within the 1 km coastal strip requires approval in terms of the Transkei Decree, 1992. The administration of this Decree is the responsibility of the Eastern Cape DEDEA. In the event of an environmental authorization being authorised (in terms of the EIA procedures), a development permit will be issued by DEDEA based on such environmental authorization. However the development site is not located within this 1 km strip.

This decree provides a number of schedules which protect indigenous endangered & protected Fauna & Flora. According to Chapter 3 permits are required from the Eastern Cape DEDEA should a person hunt, kill, capture, sell, buy, donate, receive, remove, disturb, interfere etc any endangered or protected fauna listed in the schedules of the Transkei Decree. According to Chapter 4 no person may without a permit from the Eastern Cape DEDEA be in possession of, pick, sell etc any endangered or protected flora listed in the schedules of the Transkei Decree.

7.1.15 National Heritage Resources Act

The purpose of the National Heritage Resources Act (Act 25 of 1999) is to:

- Introduce an integrated and interactive system for the management of the national heritage resources;
- Promote good government at all levels, and empower civil society to nurture and conserve their heritage resources so that they may be bequeathed to future generations;
- Introduce an integrated system for the identification, assessment and management of the heritage resources of South Africa;

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- Control the export/import of nationally significant heritage objects;
- Enable the province to establish heritage authorities which must adopt powers to protect and manage certain categories of heritage resources; and
- Provide for the protection and management of conservation worthy places and areas by local authorities.

Part 2 of the Act provides for the protection and preservation of structures, sites of archaeological and palaeontological sites, meteorite sites, burial grounds and graves, public monuments and memorials. It also includes the procedures and requirements for heritage resources management.

7.1.16 National Environment Management: Air Quality Act

The Atmospheric Pollution Prevention Act has been repealed by the National Environmental Management: Air Quality Act, 2004 (Act No 39 of 2004).The purpose of the National Environment Management: Air Quality Act (Act 39 of 2004) is to regulate air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto.

7.1.17 Explosives Act, 1956 (Act No 26 of 1956)

For blasting, a permit must be obtained from the Department of Mineral Resources in accordance with this Act.

7.1.18 Occupational Health and Safety Act

The Occupational Health and Safety Act, 1993 (No 85 of 1993) provides for the health and safety of persons at work; for the health and safety of persons in connection with the use of plant and machinery; and the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work. A number of regulations are published under this Act, including:

- Environmental Regulations for Workplaces (GN R2281 of 1987-10-16)
- Regulations for Hazardous Chemical Substances (GN R1179 of 1995-08-25)
- Asbestos Regulations, 2002 (GN R155 of 2002-02-10)
- Explosives Regulations (GN R109 of 2003-01-17)

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7.1.19 Mine Health and Safety Act

The Mine Health and Safety Act, 1996 (No 26 of 1996) provides for the protection of health and safety of employees and other persons at mines and serves –

- To promote a culture of health and safety;
- To provide for the enforcement of health and safety measures;
- To provide for appropriate systems for employee, employer and state participating in health and safety matters;
- To provide effective monitoring systems and inspections, investigations and inquiries to improve health and safety;
- To promote training and human resource development;
- To regulate employers' and employees' duties to identify hazards and eliminate, control and minimise the risk to health and safety;
- To entrench the right to refuse to work in dangerous conditions; and
- To give effect to public international law obligations of the Republic relating to mine health and safety.

7.2 Plans, Policies & Guiding Principles

7.2.1 Provincial Spatial Development Plan

The Eastern Cape has approved a Provincial Spatial Development Plan. The plan supports the view that the focus of development should be on developing nodes and areas where economic opportunities can be stimulated, particularly in the central and eastern areas of the province. The plan identifies key spatial development issues, main development nodes and zones where development should be encouraged. It aims to encourage consolidated settlement through the improved provision of infrastructure and facilities in targeted areas reinforcing the strategic advantages offered by coastal tourism nodes. For the coast in general the plan discourages linear development and places emphasis on the establishment of nodal developments to build on existing strengths and minimize environmental impacts. The plan also outlines environmentally sensitive areas where development should not be permitted. These are:

- State forests
- Dune forests and estuaries
- Within 30 meters of watercourses along major rivers
- Game reserves and nature sanctuaries
- Slopes steeper than 1:6
- Historic heritage sites

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- River basin catchment areas

7.2.2 Amatole District Municipality - Integrated Development Plan

The Amatole District Municipality published its Integrated Development Plan. Amatole District Municipality is a "C" municipality located in the Eastern Cape Province that has an extensive coast and a large rural hinterland. There are eight local "B" municipalities (Amahlati, Buffalo City, Great Kei, Mbashe, Mnquma, Ngqushwa, Nkonkobe, and Nxuba) located within its boundary.

The district wide strategies contained in this Integrated Development Plan were developed jointly with the local "B" municipalities and other stakeholders. This has ensured integration between this Integrated Development Plan for the Amatole District Municipality and the Integrated Development Plan's of the local "B" municipalities. As part of this approach, five strategic clusters (Infrastructure, Local Economic Development. Environment, Social Needs, Institution and Finance) were identified. Strategies, programmes and projects were developed within each cluster and then integrated through a budget alignment process as part of the integration phase of the Integrated Development Plan.

The key themes emerging from this IDP are:

- Developing environmental strategies to enhance sustainable development;
- Extending basic infrastructure;
- Increasing economic growth through access to economic opportunity, with an increasing focus on agriculture;
- Responding to the social needs of communities with emphasis on health and HIV/AIDS;
- Transforming the municipal institution to meet the developmental challenges of local government.

7.2.3 Mnquma Local Municipality – Integrated Development Plan, 2010/2011

The focus of the Integrated Development Plan (IDP) is vigorous economic growth, broadening of participation through community based planning and a coherent capacity building programme to ensure an efficient and effective delivery of municipal services. The Municipality is committed in ensuring that the targets set by the government broadly and the policies such as the Expanded Public Works Programs are fully implemented and monitored to archive the desired results.

Mnquma Local Municipality has already produced one full five year IDP and four reviews, that is, 2002/03, 2003/04, 2004/05, 2005/06 and 2006/07. Again Mnquma Local Municipality has produced another full five year IDP, that is 2007- 2012. The Municipality in its IDP has developed a set of long

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term goals and five year objectives that will form the basis of the annual business planning and budgeting carried out on an ongoing basis. The IDP will also be further moulded by inputs from communities and civil society, as well as direction from the new political leadership.

In pursuit of the vision of the IDP, the Municipality will:

- Create a democratic, responsive, effective, efficient and self-sustaining municipality able to deliver affordable quality services;
- Generate revenue and stimulate economic growth through investing in human capital;
- Ensure the optimal use of resources in a manner that will ensure active community participation and cooperative governance resulting in sustainable growth and development of our Municipality.

The 5 Key Performance Areas from the Five Year local Government Strategic Agenda are

1. Municipal Transformation & Organisational Development
2. Infrastructure development and Service Delivery
3. Local Economic Development
4. Municipal Financial Viability & Management
5. Good Governance & Public Participation

Within the IDP Document, Chapter Seven focuses on the Spatial Development Framework for the Mnquma Local Municipality. Within the framework of the spatial development plan the Mnquma Local Municipality has identified a broad spatial development scenario as follows:

- Butterworth has been identified as the 'economic hub' of Mnquma with other significant towns being Centane and Ngqamakhwe
- The conservation of the coastal area
- Forestry development north of Centane
- Mining on the coast

In terms of the Infratructure Development and Service Delivery profile the IDP has identified that under roads and storm water drainage the Mnquma Local Municipality generally lacks good road infrastructure. There is limited access to social services, employment and economic opportunities as well as general mobility. This is owing to the municipality's poor transport infrastructure, especially in remote rural areas. Approximately 8% of roads in the municipal area surfaced (tarred road) and about 92% is gravel road. These roads are not well maintained and are characterized by potholes, patches

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and cracks, deteriorating pavements, indistinct road markings and poor signage. These impact negatively on the general mobility of local residents as well as the efficiency of the municipality.

The municipality currently has no infrastructure investment plan which poses in soliciting funding for infrastructural backlogs. However, it must be noted that there is significant challenges related to availability of resources and funding to cover the existing road infrastructure.

7.2.4 Mbhashe Local Municipality – Integrated Development Plan, 2008 – 2009

Mbhashe municipality is situated in the south eastern part of the Eastern Cape Province, and is bound by the coast line flowing from Qhora River in the south to Mncwasa River in the north along the Indian Ocean. Mbhashe comprise the three towns of Dutwya, Gatyana and Xhora and numerous rural settlements. The area also boasts the head offices of the Amaxhosa kingdom at Nqadu Great Place. Mbhashe is 3030.47 km in area, consisting of 26 wards and having 51 councillors.

The Municipal Systems Act (MSA) 32 of 2000 makes provision for the preparation and annual review of an integrated development plan (IDP). The IDP is three principal strategic plan through which a municipality should guide all its planning, budgeting, management and decision making regarding resource allocation and prioritization for development. The IDP supersedes all other plans of a municipality.

In terms of the municipality's service delivery profile, roads is shown to have a serious backlog, with roads in poor condition. There's poor maintenance of roads due to absence of machinery.

7.2.5 DWAF – Best Practice Guidelines

The Department of Water Affairs & Forestry developed a series of Best Practice Guidelines (BPG's) for mines that was released in 2009 in line with the international Principles and Approaches towards sustainability. These guidelines have been grouped as follows:

- BPG's dealing with aspects of DWAF's water management hierarchy, namely,
    - H1: Integrated Mine Water Management
    - H2: Pollution Prevention and Minimization of Impacts
    - H3: Water Reuse and Reclamation
    - H4: Water Treatment
- BPG's dealing with General water management strategies, techniques & tolls, namely,
    - G1: Storm Water Management
    - G2: Water and Slat Balances

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  - G3: Water Monitoring Systems
  - G4: Impact Prediction
  - G5: Water Management Aspects for Mine Closure
- BPG's dealing with specific mining activities or aspects, namely,
  - A1: Small-Scale Mining
  - A2: Water Management for Mine Residue Deposits
  - A3: Water Management in Hydrometallurgical Plants
  - A4: Pollution Control Dams
  - A5: Water Management for Surface Mines
  - A6: Water Management for Underground Mines

The development of the guidelines is an inclusive consultative process that incorporates the input from a wide range of experts, including specialist within the and outside the mining industry and government. The BPG's form the flowing main functions:

- Utilization by the mining sector as input for compiling water use license applications (and other legally required documents such as EIA's, EMP's, closure plans, etc) and for drafting license conditions.
- Serve as a uniform basis for negotiations through the licensing process prescribed by the National Water Act.
- Used specifically by DWAF personnel as a basis for negotiation with the mining industry, and likewise by the mining industry as a guideline as to what the DWAFG considers as best practice in resource protection and waste management.
- Inform Interested & Affected Parties on good practice at mines.

7.2.6 Department of Environmental Affairs Guidelines

The Department of Environmental Affairs has also produced a series of guidelines to assist potential applicants and interested and affected parties (I&AP's) to understand what is required of them and what is required of them and what their role may be. The guidelines are intended to guide only and should be read in conjunction with NEMA and the regulations. They are not intended to be a substitute for the provisions of NEMA or the regulations in any way. The guidelines form part of the department's Integrated Environmental Management Guideline Series and consist of -

- Guideline 5: Companion to the National Environmental Management Act Environmental Impact Assessment Regulations of 2010
- Guideline 6: Environmental management framework
- Guideline 7: Public Participation

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8 Introduction

The **Department of Roads and Public Works** is responsible for the maintenance of the gravel roads network in the Eastern Cape Province through routine maintenance or regravelling contracts. The Department of Roads and Public Works has appointed a consortium of Engineering Consultants (RAMS Management Consultants) to manage the Road Asset Management System (RAMS) which includes the borrow pit management system. **Controlab cc** is the Professional Services for the conducting of Geotechnical Borrow pits. **BESC** have been appointed as independent environmental consultants by **Controlab cc** on behalf of **Department of Roads and Public Works** to undertake the necessary investigations and applications in order to obtain authorisation from the relevant authorities for the proposed works. To this end, an Environmental Management Plan as defined and required by the Minerals and Petroleum Resources Development Act (M&PRDA) (No. 28 of 2002), has been prepared for the proposed utilisation of the borrow pits for the routine maintenance/regravelling of the DR08348.

It is proposed that road construction materials be sourced from existing borrow pits located in the vicinity of the DR08348. As mentioned previously, the utilisation of the material sources required for the project will be undertaken in accordance with the Minerals and Petroleum Resources Development Act (M&PRDA) (No. 28 of 2002). Since the applicant, Department of Roads and Public Works, is an Organ of State, exemption has been obtained previously from the application process in terms of the Act. In terms of this exemption only an Environmental Management Plan for the utilisation of the borrow pits is required to be compiled in accordance with Section 39(2) and Regulation 52 of the M&PRDA.

The purpose of the Environmental Management Plan is to identify and assess potential impacts associated with the project through a process of stakeholder and public consultation and environmental investigations, and to provide sufficient detail on the project to the Department of Minerals Resources (DMR), in order to allow DMR to make an informed decision on the project.

It is also appropriate to highlight at this point that the Department of Mineral Resources may, in their Decision, reserve their rights to initiate criminal proceedings against the Consulting Engineer, contractor and/or any sub-contractors.

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8.1 Objectives of the Environmental Management Plan

The overall objectives of the Environmental Management Plan are defined as follows:

- To fulfil the requirements of Sections 39 of the Minerals and Petroleum Resources Development Act;
- To fulfil the criteria described in regulations 52 of the Minerals and Petroleum Resources Development Regulations, 2004, Government Notice No. 527.
- To inform the public and key stakeholders of the Project and to provide them with an opportunity to express any concerns or issues and to participate in the process;
- To identify and assess potential impacts associated with the activity. A “fatal flaw” constitutes an impact of HIGH significance and which cannot be managed to an acceptable level;
- Identify proposed mitigation and management measures to minimize adverse impacts and benefits; and
- Planned monitoring and performance assessment of the environmental management plan.

8.2 Integrated Environmental Management

The Integrated Environmental Management (IEM) procedure, which is outlined in Chapter 5 of the National Environmental Management Act (Act 107 of 1998) (NEMA), provides a framework for the integration of environmental issues into the planning, design, decision-making and implementation of plans and development proposals. The general objectives of Integrated Environmental Management are to:

- Promote the integration of the principles of environmental management in the making of all decisions, which may have a significant effect on the environment;
- Identify, predict and evaluate the actual and potential impacts on the environment, socio-economic conditions and cultural heritage; the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts and maximizing benefits and promoting compliance with the principles of environmental management;
- Ensure that the effects of activities on the environment received adequate consideration before actions are taken in connection with them
- Ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment;
- Ensure the consideration of environmental attributes in management and decision-making which may have a significant effect on the environment; and
- Identify and employ modes of environmental management best suited to ensure that the particular activity is pursued in accordance with the principles of environmental management.

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8.3 Project Details

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Email: lee-anne@besc.co.za

Contact Person: Ms Lee-Anne Proudfoot

Landowner

The Borrow pits fall within Farm and Communal Land. The Department of Rural Development and Land Reform is the legal custodian of the identified land.

Rd_Nr_	No_	Farm/Communal Name	Landowner
DR08348	348_BP01	FARM RE/140	Department of Rural Development and Land Reform
DR08348	348_BP02	FARM RE/333	Department of Rural Development and Land Reform
DR08348	348_BP03	FARM RE/333	Department of Rural Development and Land Reform
DR08348	348_BP04	KWANYANA LOC 14	Department of Rural Development and Land Reform
DR08348	348_BP05	KWANYANA LOC 14	Department of Rural Development and Land Reform
DR08348	348_BP06	KWANYANA LOC 14	Department of Rural Development and Land Reform

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9 Project Description

9.1 Study Area

The DR08348 is situated within the Mnquma Local Municpality and Mbhashe Local Municipality located in the Amathole District Municipality. DR08348 is a gravel road situated approximately 44km east of the town of Butterworth and ends at the town of Willowvale within the Province of the Eastern Cape. The DR08348 is approximately 26km long and runs in a south to north direction. The road starts at the intersection with DR08047 and ends at the town of Willowvale (Figure 1). The start and end co-ordinates are as follows:

- Start co-ordinate - S32° 25' 33" E28° 26' 40"
- End co-ordinate - S32° 16' 10" E28° 30' 52"

Six (6) Borrow pits were identified in the initial investigation for material sources along the DR08348; all 6 borrow pits were identified to be suitable for utilisation as material sources for the re-gravelling. The location of the borrow pits are as follows:

Road #	Borrow Pit #	Latitude	Longitude
DR08348	348_BP01	32°24'01.60"S	28°27'38.20"E
DR08348	348_BP02	32°23'02.20"S	28°28'03.00"E
DR08348	348_BP03	32°21'58.20"S	28°29'21.70"E
DR08348	348_BP04	32°18'50.20"S	28°29'22.90"E
DR08348	348_BP05	32°18'23.00"S	28°29'17.10"E
DR08348	348_BP06	32°17'42.10"S	28°29'12.30"E

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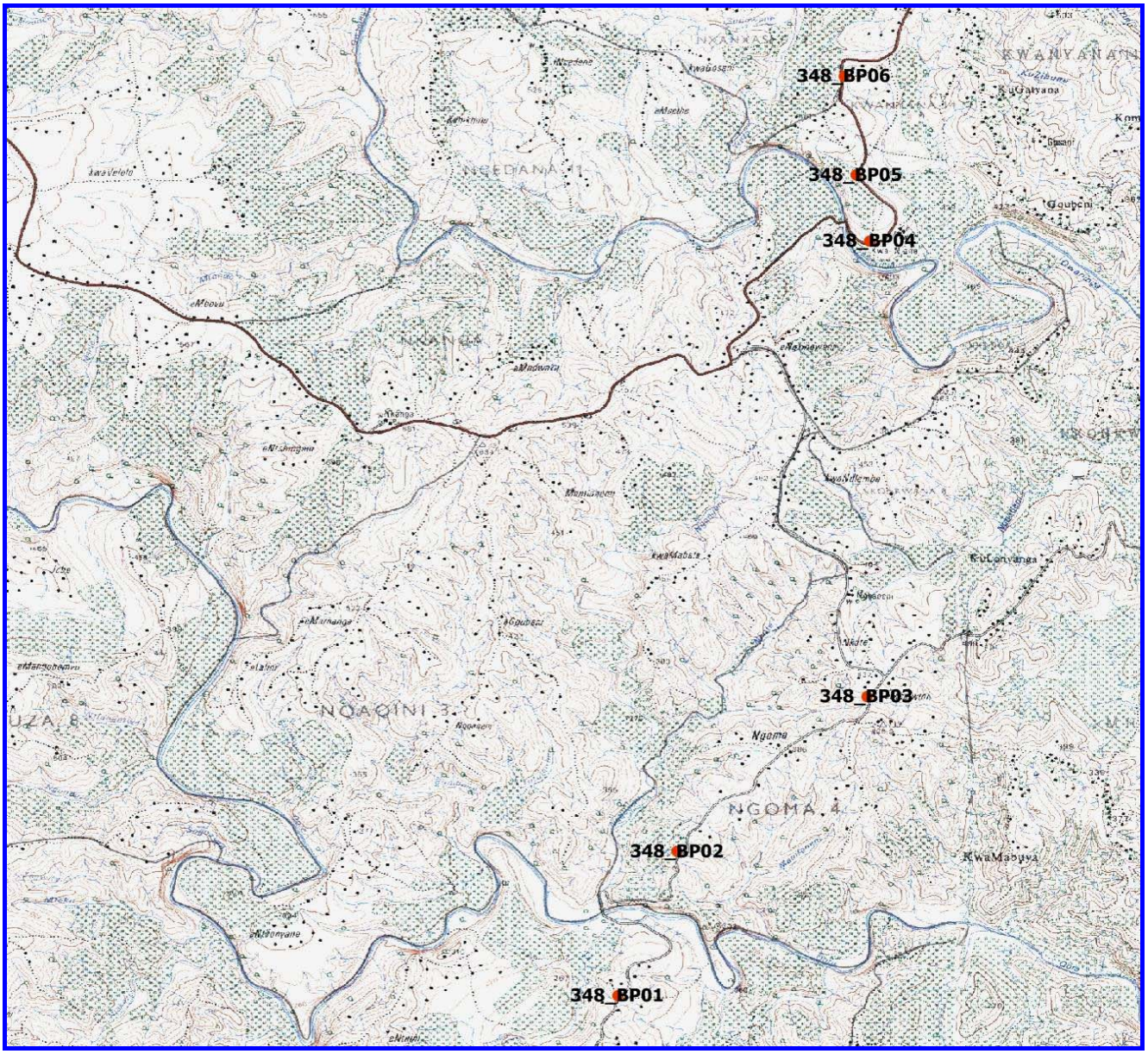

Figure 1: The location of the borrow pits (1: 50 000 map).

9.2 Current Land Use

All the borrow pits are existing and were previously used for road construction/upgrading activities.

9.3 Surrounding Land Use

The surrounding land use includes Rural / Communal Land and Natural Landscape.

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9.4 Proposal

The **Department of Roads and Public Works** is responsible for the maintenance of the gravel roads network in the Eastern Cape Province through routine maintenance or regravelling contracts. As such the Department has embarked on an investigation to identify borrow pits situated along or in close proximity to the district roads identified in the Amathole District Municipality which require routine maintenance in order to source materials for the proposed re-gravelling/maintenance of these roads.

It is proposed here to utilise six (6) borrow pits identified along the DR08348, for the routine maintenance/re-gravelling of this district road (Table above). The nearest formal town is Willowvale. The borrow pits are located adjacent to the DR08348.

Figure 2: Aerial Image - Road DR08348 & associated BP's.

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Table 1: Borrow pit Summary Table

Information		Borrow pits					
		348_BP01	348_BP02	348_BP03	348_BP04	348_BP05	348_BP06
Ownership		Farm Land - Department of Rural Development and Land Reform	Farm Land - Department of Rural Development and Land Reform	Farm Land - Department of Rural Development and Land Reform	Communal- Department of Rural Development and Land Reform	Communal- Department of Rural Development and Land Reform	Communal- Department of Rural Development and Land Reform
Situation along road		4.1 km	7.6 km	10.8 km	19.0 km	20.1 km	21.5 km
Type of Material		Shale	Shale	Shale	Shale	Shale	Shale
Existing or new		Existing	Existing	Existing	Existing	Existing	Existing
Co-ordinates	South	32°24'01.60"	32°23'02.20"	32°21'58.20”	32°18'50.20"	32°18'23.00"	32°17'42.10"
	East	28°27'38.20"E	28°28'03.00"	28°29'21.70"	28°29'22.90"	28°29'17.10"	28°29'12.30"
Distance to DR08348		+/- 10 m	+/- 10 m	+/- 10 m	+/- 10 m	+/- 10 m	+/- 20 m
Access		Yes	Yes	Yes	Yes	Yes	Yes
River Catchment		Qora River	Qora River	Qora River	Qwaninga River	Qwaninga River	Qwaninga River
Nearest Village		Mapondweni	Ngoma	Nkote	KwaNjana	KwaNjana	Xholongada
Distance to Nearest Houses		+/- 45 m	+/- 350 m	+/- 140 m	+/- > 1 km	+/- 700 m	+/- 35 m
Presence of servitudes		Water Line adjacent to borrow pit	None	None	Eskom Powerline on outskirts of borrow pit area	None	Telkom Overhead Line adjacent to borrow pit.
Proposed End Use		Closed and Rehabilitated	Closed and Rehabilitated	Closed and Rehabilitated	Closed and Rehabilitated	Closed and Rehabilitated	Closed and Rehabilitated

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9.5 Borrow pit 348_BP01

Figure 3: Topographical Location of 348_BP01 - 1:50 000 map

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Figure 4: 348_BP01

General Description

348_BP01 is an existing borrow pit which has been used in the past. It is located on a hill top, with the predominant slope of the site being towards the north. The site is accessed directly from the DR08348 and comprises of a shallow excavation. The nearest village is Mapondweni, with the nearest settlement located approximately 45 m from the borrow pit. It is the intension that the borrow pit will be mined from the existing borrow pit footprint and extended in a westerly and northerly direction as indicated on the mining plan in SECTION 20. It will not be necessary to relocate any households; however noise control and dust control measures will need to be implemented. Cognisance must be taken of the existing underground water line running adjacent to the borrow pit.

Prior to mining the access road will be demarcated to prevent vehicles damaging natural vegetation. The existing access to the borrow pit will be utilised to allow for trucks to access the working face. The entire mining area will be fenced to prevent unauthorized access of both humans and animals. The area to be fenced will be bigger than the area to be mined to allow for a storage area for topsoil. Water located within the borrow pit must be pumped out and discharged on to the grassy flats into the adjacent grasslands prior to the mining activities commencing.

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Site preparation will consist of the stripping of topsoil and overburden into stockpiles, which are to be stored separately. Existing topsoil stockpiles will be shifted out of the way to allow for mining of the material beneath. The topsoil and overburden material will be stockpiled on site and after the mining is complete this material will be spread over again. Once the whole area is open the stockpile can be moved around so as not to interfere with the mining process.

The material will be excavated from the face and floor of the borrow pit and if possible loaded directly onto haul trucks. The material to be mined will be shale. It is proposed that the extent of the area to be mined (existing and new) will be approximately 0.189 ha.

Stormwater control is viewed as a critical component of the borrow pit development. It is suggested that a cutoff-berm be located above the borrow pit face, protecting the active mining area and topsoil and overburden stockpiles from erosion. This storm water will then be channelled towards the natural drainage in the area. A diversion berm with dissipation beds should be installed down slope of the mining area to filter out any sediment washed off the site during heavy rainfall.

Proposed Rehabilitation Measures:

On completion of mining, the faces must be sloped to a 1:2 - 1:3 slope and overburden and then topsoil (imported if required) will be spread over the surface of the mining area. The access roads will be ripped. The entire area will be fertilized and seeded with an indigenous grass mix which includes quick-growing pioneers and climax species. The stormwater berms will be retained on closure. It may be feasible to rehabilitate to a stock watering dam, as currently the borrow pit is used by livestock.

Additionally, near vertical slopes (1:1 to 1:2) should be stabilised by natural rock wall structures using conventional building methods or in forms with slurry forced between the structures. All structures must have a 'natural' look and facilities for plants to grow in.

All areas where the slopes are 1.3 to 1:6 should be logged or otherwise stepped (using stabilisation cylinders or similar) in order to prevent soil erosion. Logs/ cylinders should be laid in continuous lines following the contours and spaced vertically 0.8-1.2 m apart, depending on the steepness of the slope. These logs/ cylinders must be secured by means of steel pegs and wire in rocky areas, and treated wooden pegs in other areas.

Inspections will be undertaken during the project liability period (one year after completion of the contract) to ensure that no erosion has taken place and to monitor the success of the revegetation.

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Should any damage occur, the necessary repair works will be undertaken. The intention is to establish an 80% grass cover within two years of rehabilitation. Should this not be achieved, it may be necessary to lightly rip, fertilise and reseed the site. The fence will be maintained by the contractor until the end of the contracts liability period.

9.6 Borrow pit 348_BP02

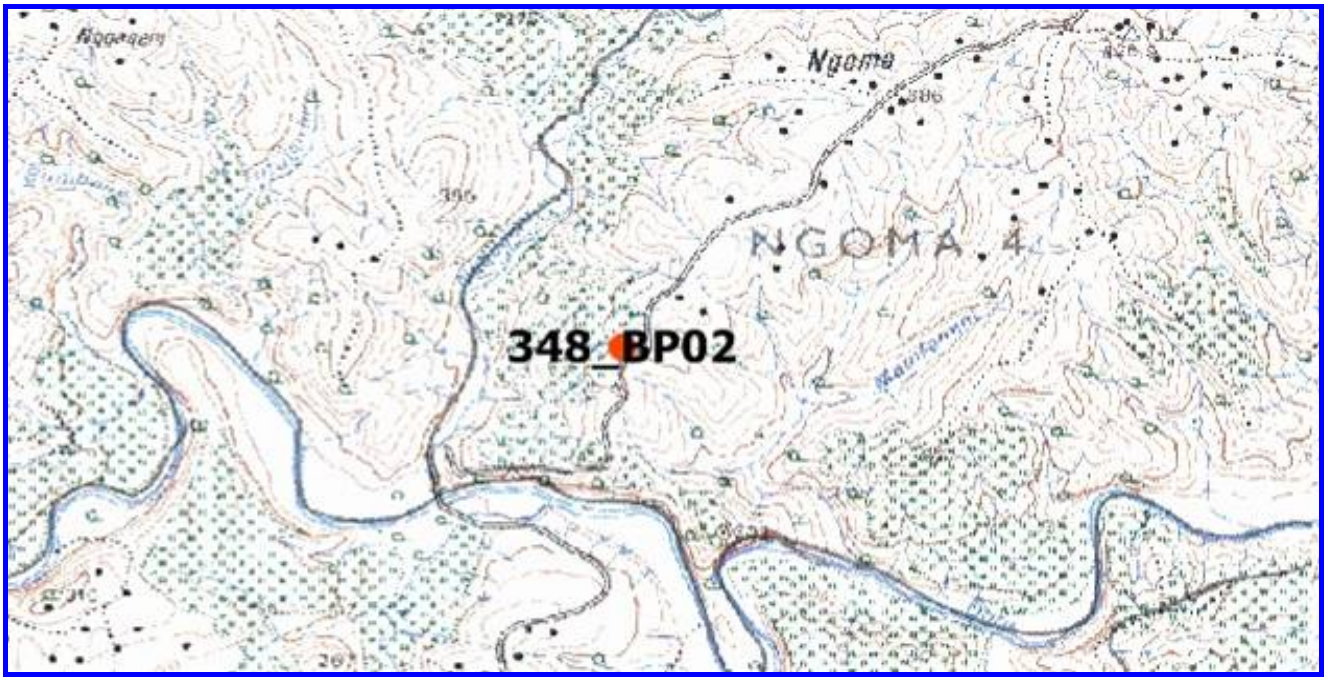

Figure 5: Topographical Location of 348_BP02 - 1:50 000 map

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Figure 6: 348_BP02

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General Description

348_BP02 is an existing borrow pit which has been used in the past. It is located on the side of a west facing hill slope. The site is accessed directly from the DR08348 and comprises of predominantly of an excavation into the hill side. The nearest village is Ngoma, with the nearest settlement located approximately 350 m from the borrow pit. It is the intension that the borrow pit will be mined from the existing borrow pit footprint and extended in a northerly direction into the existing face of the borrow pit as indicated on the mining plan in SECTION 20. It will not be necessary to relocate any households; however noise control and dust control measures will need to be implemented.

Prior to mining the access road will be demarcated to prevent vehicles damaging natural vegetation. The existing access to the borrow pit will be utilised to allow for trucks to access the working face. The entire mining area will be fenced to prevent unauthorized access of both humans and animals. The area to be fenced will be bigger than the area to be mined to allow for a storage area for topsoil. Water located within the borrow pit must be pumped out and discharged on to the grassy flats into the adjacent grasslands prior to the mining activities commencing.

Site preparation will consist of the stripping of topsoil and overburden into stockpiles, which are to be stored separately. Existing topsoil stockpiles will be shifted out of the way to allow for mining of the material beneath. The topsoil and overburden material will be stockpiled on site and after the mining is complete this material will be spread over again. Once the whole area is open the stockpile can be moved around so as not to interfere with the mining process.

The material will be excavated from the face and floor of the borrow pit and if possible loaded directly onto haul trucks. The material to be mined will be shale. It is proposed that the extent of the area to be mined (existing and new) will be approximately 1.232 ha.

Stormwater control is viewed as a critical component of the borrow pit development. It is suggested that a cutoff-berm be located above the borrow pit face, protecting the active mining area and topsoil and overburden stockpiles from erosion. This storm water will then be channelled towards the natural drainage in the area. A diversion berm with dissipation beds should be installed down slope of the mining area to filter out any sediment washed off the site during heavy rainfall.

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Proposed Rehabilitation Measures:

On completion of mining, the faces must be sloped to a 1:2 - 1:3 slope and overburden and then topsoil (imported if required) will be spread over the surface of the mining area. The access roads will be ripped. The entire area will be fertilized and seeded with an indigenous grass mix which includes quick-growing pioneers and climax species. The stormwater berms will be retained on closure.

Additionally, near vertical slopes (1:1 to 1:2) should be stabilised by natural rock wall structures using conventional building methods or in forms with slurry forced between the structures. All structures must have a 'natural' look and facilities for plants to grow in.

All areas where the slopes are 1.3 to 1:6 should be logged or otherwise stepped (using stabilisation cylinders or similar) in order to prevent soil erosion. Logs/ cylinders should be laid in continuous lines following the contours and spaced vertically 0.8-1.2 m apart, depending on the steepness of the slope. These logs/ cylinders must be secured by means of steel pegs and wire in rocky areas, and treated wooden pegs in other areas.

Inspections will be undertaken during the project liability period (one year after completion of the contract) to ensure that no erosion has taken place and to monitor the success of the revegetation. Should any damage occur, the necessary repair works will be undertaken. The intention is to establish an 80% grass cover within two years of rehabilitation. Should this not be achieved, it may be necessary to lightly rip, fertilise and reseed the site. The fence will be maintained by the contractor until the end of the contracts liability period.

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9.7 Borrow pit 348_BP03

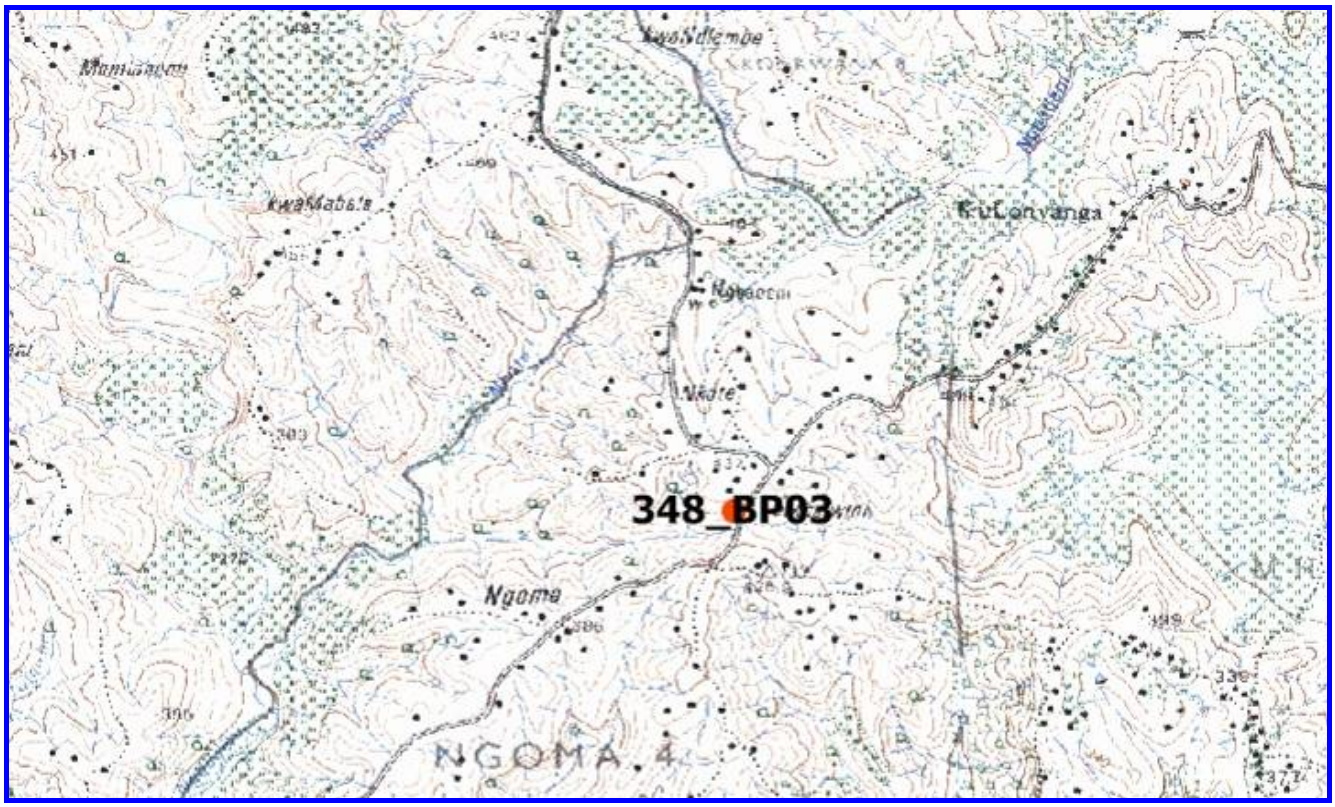

Figure 7: Topographical Location of 348_BP03 - 1:50 000 map

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Figure 8: 348_BP03

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General Description

348_BP03 is an existing borrow pit which has been used in the past. It is located on the side of a south facing hill slope. The site is accessed directly from the DR08348 and comprises predominantly of an excavation into the hill side. The nearest village is Nkote, with the nearest settlement located approximately 140 m from the borrow pit. It is the intension that the borrow pit will be mined from the existing borrow pit footprint and extended in a northerly direction into the existing face of the borrow pit as indicated on the mining plan in SECTION 20. It will not be necessary to relocate any households; however noise control and dust control measures will need to be implemented.

Prior to mining the access road will be demarcated to prevent vehicles damaging natural vegetation. The existing access to the borrow pit will be utilised to allow for trucks to access the working face. The entire mining area will be fenced to prevent unauthorized access of both humans and animals. The area to be fenced will be bigger than the area to be mined to allow for a storage area for topsoil. Water located within the borrow pit must be pumped out and discharged on to the grassy flats into the adjacent grasslands prior to the mining activities commencing.

Site preparation will consist of the stripping of topsoil and overburden into stockpiles, which are to be stored separately. Existing topsoil stockpiles will be shifted out of the way to allow for mining of the material beneath. The topsoil and overburden material will be stockpiled on site and after the mining is complete this material will be spread over again. Once the whole area is open the stockpile can be moved around so as not to interfere with the mining process.

The material will be excavated from the face and floor of the borrow pit and if possible loaded directly onto haul trucks. The material to be mined will be shale. It is proposed that the extent of the area to be mined (existing and new) will be approximately 0.904 ha.

Stormwater control is viewed as a critical component of the borrow pit development. It is suggested that a cutoff-berm be located above the borrow pit face, protecting the active mining area and topsoil and overburden stockpiles from erosion. This storm water will then be channelled towards the natural drainage in the area. A diversion berm with dissipation beds should be installed down slope of the mining area to filter out any sediment washed off the site during heavy rainfall.

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Proposed Rehabilitation Measures:

On completion of mining, the faces must be sloped to a 1:2 - 1:3 slope and overburden and then topsoil (imported if required) will be spread over the surface of the mining area. The access roads will be ripped. The entire area will be fertilized and seeded with an indigenous grass mix which includes quick-growing pioneers and climax species. The stormwater berms will be retained on closure.

Additionally, near vertical slopes (1:1 to 1:2) should be stabilised by natural rock wall structures using conventional building methods or in forms with slurry forced between the structures. All structures must have a 'natural' look and facilities for plants to grow in.

All areas where the slopes are 1.3 to 1:6 should be logged or otherwise stepped (using stabilisation cylinders or similar) in order to prevent soil erosion. Logs/ cylinders should be laid in continuous lines following the contours and spaced vertically 0.8-1.2 m apart, depending on the steepness of the slope. These logs/ cylinders must be secured by means of steel pegs and wire in rocky areas, and treated wooden pegs in other areas.

Inspections will be undertaken during the project liability period (one year after completion of the contract) to ensure that no erosion has taken place and to monitor the success of the revegetation. Should any damage occur, the necessary repair works will be undertaken. The intention is to establish an 80% grass cover within two years of rehabilitation. Should this not be achieved, it may be necessary to lightly rip, fertilise and reseed the site. The fence will be maintained by the contractor until the end of the contracts liability period.

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9.8 Borrow pit 348_BP04

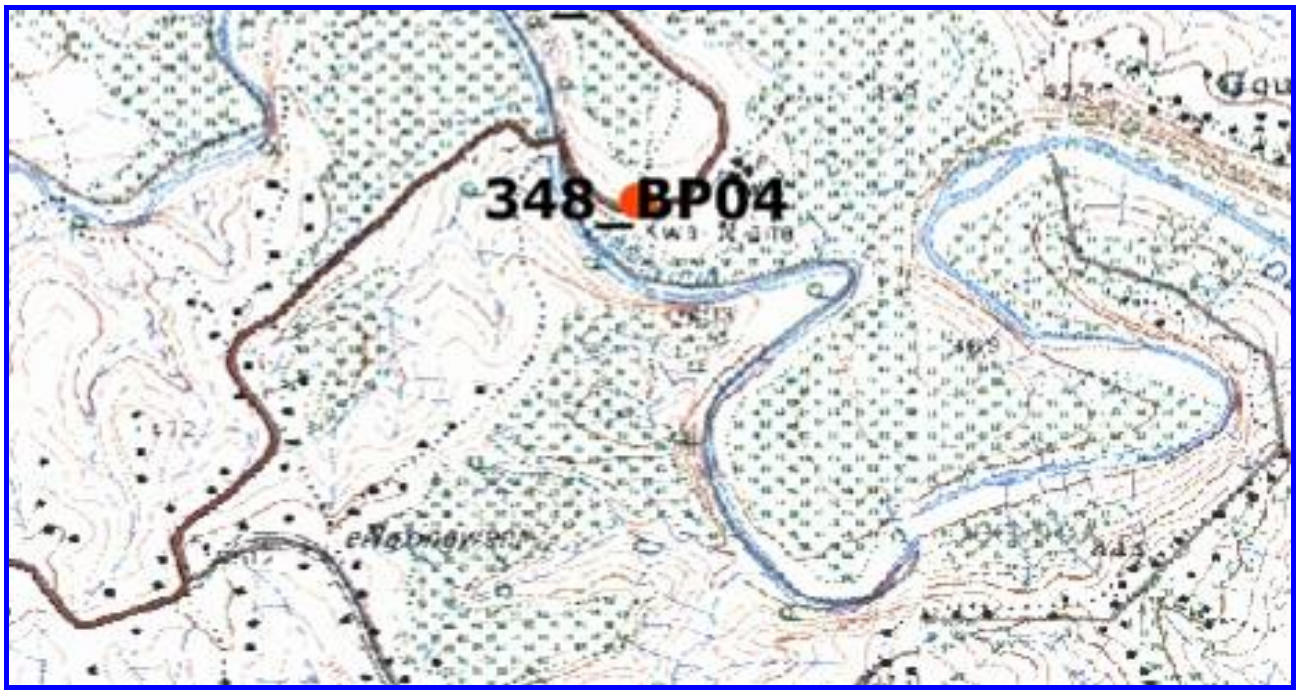

Figure 9: Topographical Location of 348_BP04 - 1:50 000 map

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Figure 10: 348_BP04

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General Description

348_BP04 is an existing borrow pit which has been used in the past. It is located on the side of a south west facing hill slope. The site is accessed directly from the DR08348 and comprises of predominantly of an excavation into the hill side. The nearest village is KwaNjana, with the nearest settlement located greater than 1000 m from the borrow pit. It is the intension that the borrow pit will be mined from the existing borrow pit footprint and extended in a northern direction into the existing face of the borrow pit as indicated on the mining plan in SECTION 20. It will not be necessary to relocate any households; however noise control and dust control measures will need to be implemented.

Prior to mining the access road will be demarcated to prevent vehicles damaging natural vegetation. The existing access to the borrow pit will be utilised to allow for trucks to access the working face. The entire mining area will be fenced to prevent unauthorized access of both humans and animals. The area to be fenced will be bigger than the area to be mined to allow for a storage area for topsoil.

Site preparation will consist of the stripping of topsoil and overburden into stockpiles, which are to be stored separately. Existing topsoil stockpiles will be shifted out of the way to allow for mining of the material beneath. The topsoil and overburden material will be stockpiled on site and after the mining is complete this material will be spread over again. Once the whole area is open the stockpile can be moved around so as not to interfere with the mining process.

The material will be excavated from the face and floor of the borrow pit and if possible loaded directly onto haul trucks. The material to be mined will be shale. It is proposed that the extent of the area to be mined (existing and new) will be approximately 0.636 ha.

Stormwater control is viewed as a critical component of the borrow pit development. It is suggested that a cutoff-berm be located above the borrow pit face, protecting the active mining area and topsoil and overburden stockpiles from erosion. This storm water will then be channelled towards the natural drainage in the area. A diversion berm with dissipation beds should be installed down slope of the mining area to filter out any sediment washed off the site during heavy rainfall.

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Proposed Rehabilitation Measures:

On completion of mining, the faces must be sloped to a 1:2 - 1:3 slope and overburden and then topsoil (imported if required) will be spread over the surface of the mining area. The access roads will be ripped. The entire area will be fertilized and seeded with an indigenous grass mix which includes quick-growing pioneers and climax species. The stormwater berms will be retained on closure.

Additionally, near vertical slopes (1:1 to 1:2) should be stabilised by natural rock wall structures using conventional building methods or in forms with slurry forced between the structures. All structures must have a 'natural' look and facilities for plants to grow in.

All areas where the slopes are 1.3 to 1:6 should be logged or otherwise stepped (using stabilisation cylinders or similar) in order to prevent soil erosion. Logs/ cylinders should be laid in continuous lines following the contours and spaced vertically 0.8-1.2 m apart, depending on the steepness of the slope. These logs/ cylinders must be secured by means of steel pegs and wire in rocky areas, and treated wooden pegs in other areas.

Inspections will be undertaken during the project liability period (one year after completion of the contract) to ensure that no erosion has taken place and to monitor the success of the revegetation. Should any damage occur, the necessary repair works will be undertaken. The intention is to establish an 80% grass cover within two years of rehabilitation. Should this not be achieved, it may be necessary to lightly rip, fertilise and reseed the site. The fence will be maintained by the contractor until the end of the contracts liability period.

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9.9 Borrow pit 348_BP05

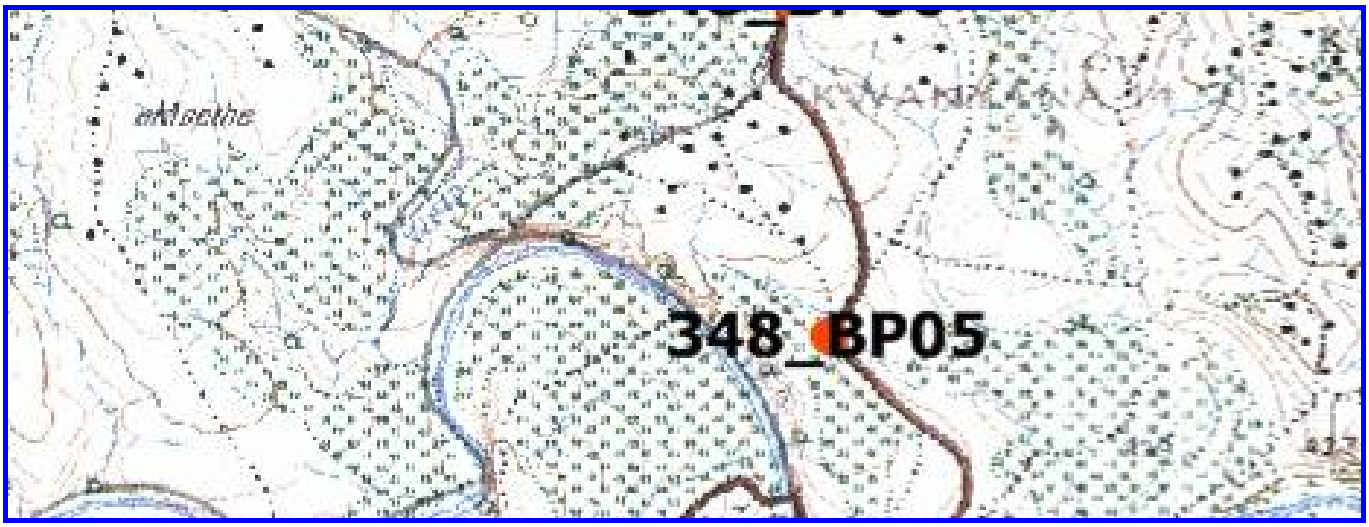

Figure 11: Topographical Location of 348_BP05 - 1:50 000 map

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Figure 12: 348_BP05

General Description

348_BP05 is an existing borrow pit which has been used in the past. It is located on the side of a easterly facing hill slope. The site is accessed directly from the DR08348 and comprises of predominantly of an excavation into the hill side. The nearest village is KwaNjana, with the nearest settlement located approximately 700 m from the borrow pit. It is the intension that the borrow pit will be mined from the existing borrow pit footprint and extended in a westerly and southerly direction as indicated on the mining plan in SECTION 20. It will not be necessary to relocate any households; however noise control and dust control measures will need to be implemented.

Prior to mining the access road will be demarcated to prevent vehicles damaging natural vegetation. The existing access to the borrow pit will be utilised to allow for trucks to access the working face. The entire mining area will be fenced to prevent unauthorized access of both humans and animals. The area to be fenced will be bigger than the area to be mined to allow for a storage area for topsoil.

Site preparation will consist of the stripping of topsoil and overburden into stockpiles, which are to be stored separately. Existing topsoil stockpiles will be shifted out of the way to allow for mining of the material beneath. The topsoil and overburden material will be stockpiled on site and after the mining is

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complete this material will be spread over again. Once the whole area is open the stockpile can be moved around so as not to interfere with the mining process.

The material will be excavated from the face and floor of the borrow pit and if possible loaded directly onto haul trucks. The material to be mined will be shale. It is proposed that the extent of the area to be mined (existing and new) will be approximately 0.301ha.

Stormwater control is viewed as a critical component of the borrow pit development. It is suggested that a cutoff-berm be located above the borrow pit face, protecting the active mining area and topsoil and overburden stockpiles from erosion. This storm water will then be channelled towards the natural drainage in the area. A diversion berm with dissipation beds should be installed down slope of the mining area to filter out any sediment washed off the site during heavy rainfall.

Proposed Rehabilitation Measures:

On completion of mining, the faces must be sloped to a 1:2 - 1:3 slope and overburden and then topsoil (imported if required) will be spread over the surface of the mining area. The access roads will be ripped. The entire area will be fertilized and seeded with an indigenous grass mix which includes quick-growing pioneers and climax species. The stormwater berms will be retained on closure.

Additionally, near vertical slopes (1:1 to 1:2) should be stabilised by natural rock wall structures using conventional building methods or in forms with slurry forced between the structures. All structures must have a 'natural' look and facilities for plants to grow in.

All areas where the slopes are 1.3 to 1:6 should be logged or otherwise stepped (using stabilisation cylinders or similar) in order to prevent soil erosion. Logs/ cylinders should be laid in continuous lines following the contours and spaced vertically 0.8-1.2 m apart, depending on the steepness of the slope. These logs/ cylinders must be secured by means of steel pegs and wire in rocky areas, and treated wooden pegs in other areas.

Inspections will be undertaken during the project liability period (one year after completion of the contract) to ensure that no erosion has taken place and to monitor the success of the revegetation. Should any damage occur, the necessary repair works will be undertaken. The intention is to establish an 80% grass cover within two years of rehabilitation. Should this not be achieved, it may be necessary to lightly rip, fertilise and reseed the site. The fence will be maintained by the contractor until the end of the contracts liability period.

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9.10 Borrow pit 348_BP06

Figure 13: Topographical Location of 348_BP06 - 1:50 000 map

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Figure 14: 348_BP06

General Description

348_BP06 is an existing borrow pit which has been used in the past. It is located on the side of a west facing hill slope. The site is accessed directly from the DR08348 and comprises of predominantly of an excavation into the hill side. The nearest village is Xholongada, with the nearest settlement located approximately 35 m from the borrow pit. It is the intension that the borrow pit will be mined from the existing borrow pit footprint and in a northerly and easterly direction into the existing face of the borrow pit as indicated on the mining plan in SECTION 20. It will not be necessary to relocate any households; however noise control and dust control measures will need to be implemented. Cognisance must be taken of the Telkom Overhead line adjacent to the borrow pit and the homestead in close proximity to the borrow pit.

Prior to mining the access road will be demarcated to prevent vehicles damaging natural vegetation. The existing access to the borrow pit will be utilised to allow for trucks to access the working face. The entire mining area will be fenced to prevent unauthorized access of both humans and animals. The area to be fenced will be bigger than the area to be mined to allow for a storage area for topsoil. Water located within the borrow pit must be pumped out and discharged on to the grassy flats into the adjacent grasslands prior to the mining activities commencing.

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Site preparation will consist of the stripping of topsoil and overburden into stockpiles, which are to be stored separately. Existing topsoil stockpiles will be shifted out of the way to allow for mining of the material beneath. The topsoil and overburden material will be stockpiled on site and after the mining is complete this material will be spread over again. Once the whole area is open the stockpile can be moved around so as not to interfere with the mining process.

The material will be excavated from the face and floor of the borrow pit and if possible loaded directly onto haul trucks. The material to be mined will be shale. It is proposed that the extent of the area to be mined (existing and new) will be approximately 0.756 ha.

Stormwater control is viewed as a critical component of the borrow pit development. It is suggested that a cutoff-berm be located above the borrow pit face, protecting the active mining area and topsoil and overburden stockpiles from erosion. This storm water will then be channelled towards the natural drainage in the area. A diversion berm with dissipation beds should be installed down slope of the mining area to filter out any sediment washed off the site during heavy rainfall.

Proposed Rehabilitation Measures:

On completion of mining, the faces must be sloped to a 1:2 - 1:3 slope and overburden and then topsoil (imported if required) will be spread over the surface of the mining area. The access roads will be ripped. The entire area will be fertilized and seeded with an indigenous grass mix which includes quick-growing pioneers and climax species. The stormwater berms will be retained on closure.

Additionally, near vertical slopes (1:1 to 1:2) should be stabilised by natural rock wall structures using conventional building methods or in forms with slurry forced between the structures. All structures must have a 'natural' look and facilities for plants to grow in.

All areas where the slopes are 1.3 to 1:6 should be logged or otherwise stepped (using stabilisation cylinders or similar) in order to prevent soil erosion. Logs/ cylinders should be laid in continuous lines following the contours and spaced vertically 0.8-1.2 m apart, depending on the steepness of the slope. These logs/ cylinders must be secured by means of steel pegs and wire in rocky areas, and treated wooden pegs in other areas.

Inspections will be undertaken during the project liability period (one year after completion of the contract) to ensure that no erosion has taken place and to monitor the success of the revegetation.

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Should any damage occur, the necessary repair works will be undertaken. The intention is to establish an 80% grass cover within two years of rehabilitation. Should this not be achieved, it may be necessary to lightly rip, fertilise and reseed the site. The fence will be maintained by the contractor until the end of the contracts liability period.

9.11 Need and Desirability

The existing gravel roads in the Amathole District Municipality are in serious need of maintenance and re-gravelling. The proposed maintenance/re-gravelling of the DR08348 will be a benefit to the users of the road by providing proper infrastructure, improving overall road safety and reducing the risk of erosion that is occurring at present. The proposed borrow pits will provide material for the maintenance/re-gravelling of the DR08348. The identification of these sources follows a materials identification/investigation undertaken by Control Civil Services. A number of borrow pits were investigated. A selection process was undertaken whereby the borrow pits having fatal flaws or limited resources were eliminated during the planning process using indicators such as materials present, volume of available material, distances to water courses, land capability, vegetation sensitivity, surrounding erosion, visibility, slopes, etc. A copy of this report is included in Section 21.1. The material from the borrow pits was concluded to be suitable for use and that they would yield high quantities of material for the maintenance of the road. As part of the measures to be taken for the borrow pits, rehabilitation is required on closure of the mining, this rehabilitation would be a benefit as this should improve the overall aesthetics of the borrow pits which are currently a visual scar on the landscape, having had no rehabilitation undertaken on them in the past.

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10 Environmental Setting

10.1 Landform & Geology

10.1.1 General Description:

The sedimentary rocks of the area range from Late Carboniferous or Early Permian to early Triassic in age, and include strata belonging to the Dwyka Formation, the Ecca group and the Beaufort group. Numerous dykes and sills of intrusive dolerite of Jurassic age are present, while scattered Quaternary alluvium and coastal sand deposits cover the older rocks in places. Heavy mineral sands along the coast represent the only potentially economic deposit. These sands contain ilmenite, rutile, zircon and small amounts of monazite. The most important deposits are situated at Morgan Bay, Sandy Point and Kobonqaba, were some lesser deposits are found in the beach sands at Kwelera and Glen Gariff.

10.1.2 Structural Geology:

For most of the area, the strata dip at low angles towards the north, northwest and west. Steeper north-easterly dips are encountered in down faulted blocks along the coast where a series of roughly east-west trending faults with downthrows towards the south have brought down younger strata. These faults all pinch out rapidly inland and are presumably associated with the break-up of the Supercontinent Gondwanaland in the Late Jurassic or Early cretaceous.

10.2 Archaeology, Palaeontology & Heritage Sites

The study area falls within the Adelaide Sub -Group which is Permian (255 million years) to Triassic (237 million years) in age. The first discovery of vertebrate fossils in the Karoo Supergroup was made in 1849 in Fort Beaufort. Since then numerous fossils have been collected. The Adelaide Sub-group contains vertebrate fossils of the *Cistecephalus* and *Daptocephalus* assemblage zones. The anomodont reptile, *Oudenodon baini* is fairly common throughout the succession. Occasional specimens of *Lystrosaurus* occur in red mudstone near the top of the succession. Fragments of silicified wood occur throughout the Adelaide Subgroup.

No general listing of the sites of palaeontological, archaeological and historical significance within the area is available. The South African Heritage Resources Agency does possess a database of National Monuments within each province, but this is only of limited use since it only lists National Monuments (as declared within the Government Gazette), and the vast majority of these occur within urban areas which are unlikely to be impacted upon by borrow pit projects. Through the Amathole Heritage Initiative

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a number of heritage sites have been identified. Four heritage routes were then established. These include:

- King Phalo route,
- King Sandile route,
- Chief Maqoma route
- Makhanda route

To date more than 300 heritage sites have been identified. The sites are available and can be viewed on municipal website.

10.3 Topography and Drainage

The topography of Mnquma municipality is varied, generally characterized by steep and undulating relief with rugged coastal areas. Slope analysis indicates that large areas of Mnquma municipality fall within the category that is greater than 1:5 (20%) and especially the western and southern regions are steep areas above 1:3 (33%). Numerous rivers and streams, most of which are blind for a larger portion of the year, incise though the rolling hills. The topography in the area of the borrow pits tends to be described as strongly undulating irregular land.

The study area falls within the Mzimvubu to Keiskamma Water Management Area (WMA). This water management area consists of three large drainage basins and the catchments of a number of smaller rivers that lie between the major drainage basins and the Indian Ocean. The major drainage basins are the Great Kei (Drainage Region S), the Mbashe (part of Drainage Region T), and the Mzimvubu (part of Drainage Region T). The study area falls within the Drainage Region T. The whole of the central and north-eastern portions of the WMA lie within Drainage Region T, which extends into the Mvoti to Mzimkulu WMA. The study area falls within the Southern Wild Coast region of drainage T which comprises of the coastal catchments between the Kei and Mbashe catchments.

The topography is hilly to mountainous throughout the WMA with the high mountains of the Drakensberg along the north-eastern boundary.

There is a great variation of the quantity of rainfall throughout the WMA. The mean annual precipitation (MAP) along the coastal region ranges from a low of 600 mm in the west to a high of 1 208 mm in the east, and varies from 400 mm to 1 200 mm in the central plateau and along the northern edge of the WMA. The rainfall is generally higher in the east than in the west.

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10.4 Groundwater

The groundwater over most of the water management area is generally of very good quality. However, the groundwater TDS reaches over 300 mg/l where the Katberg wedges out closer to Mtata. The reason for this is because of the pollution of the groundwater from the recharge zone of the Mtata River. This in turn is due to pollution from overflow of sewage from the treatment works in Mtata town into the nearby Mtata River. There are a large number of informal burial sites in the area and this, together with the use of unlined pit latrine sanitary systems, holds a high potential for the contamination of underground water.

10.5 Climate

Due to its location at the confluence of several climatic regimes, the most important of which are temperate and subtropical, the Eastern Cape has a complex climate. There are wide variations in temperature, rainfall and wind patterns, largely as a result of movements of air masses, altitude, mountain orientation and distance from the Indian Ocean. Exceptionally high temperatures may be experienced during berg wind conditions, which occur frequently during the winter, with maximums of well over 30°C not being uncommon. Extreme temperatures also occur during summer, with little accompanying wind. Areas closer to the coast experience cooling due to onshore sea breezes.

The general climate for the area is described as moderate for most of the year, but with hot periods from December to February. The climate ranges from cool, humid and subtropical at the coast to hot and sub-arid inland. Maximum temperatures in summer fall mainly within the 25-27°C range, with the areas on the coast and the north western regions reaching up to 29°C. Small isolated regions in area have maximum temperatures of less than 25°C in summer. The winter minimum temperatures for coastal region are generally above 8°C, while inland the minimum temperature can drop to between 2-4°C in winter.

Although the area receives rainfall throughout the year, it is primarily a summer rainfall region, with the months of June and July being the driest. The mean annual precipitation (MAP) varies from 1 000 mm along the coast to 700 mm inland above Butterworth and 1200 mm in the Amatola mountains.

The relative humidity is higher in summer than in winter. It is generally highest in February (the daily mean ranges from 60% in the north-west to 82% in the south-east) and lowest in July (the daily mean ranges from 50% in the north-west to 72% in the south-east). Average potential mean annual gross evaporation (MAE) (as measured by Symons-pan) for the WMA ranges from 1700mm in the north-west to less than 1200m in the south-eastern parts.

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10.6 Fauna

10.6.1 Reptiles & Amphibians

Of the 480 reptiles recorded from South Africa at least 144 of these occur within the Eastern Cape, and comprise eleven chelians (including sea-turtles, terrapins and tortoises), eighty-two lizards, and forty-six snakes. Reptiles form an important component of vertebrate diversity within the area. This is particularly true in light of their low mobility and high habitat specificity, particularly lizards and tortoises.

Approximately 60 species of reptiles may occur in the area. Whilst some are wide-ranging species (e.g. snakes such as the boomslang and puff adder), others have relatively restricted distributions. Sensitive and localised species may include the common slug-eating snake (*Duberria lutrix*) and the giant legless skink (*Acontias plumbeus*). Venomous snakes in the area include the Boomslang (*Dispholidus typus*), Ringhals (*Hemachatus haemachatus*), Cape Cobra (*Naja nivea*), Common Night Adder (*Causus mombeatus*) and Puff Adder (*Bitis arietans*); however there are few bites to humans and livestock.

The Province contains 19 threatened reptiles, of which 18 are endemic to the Eastern Cape, none of which are included in the SA RDB for reptiles and amphibians.

Species such as the Natal Black Snake (*Macrelaps microlepidotus*), occurring in coastal forests, reaches its southern limit in the East London area, the Green Sea turtle (*Chelonia mydas* – SA RDB status –vulnerable), the Loggerhead Sea Turtle (*Caretta caretta* –SA RDB status – vulnerable), the Hawksbill Sea Turtle (*Eretmochelys imbricate* – SA RDB status – vulnerable) and the Leatherback Sea Turtle (*Dermochelys coriacea* – SA RDB status – vulnerable) occur in the Eastern Cape coastal waters.

There are 102 amphibian species recorded in South Africa and about 47% of these occur in the Eastern Cape. One of these is an Artholeptid (frog), one is a Pipid (aquatic frog), three are Helephrynids (frogs which live in mountain streams and are endemic to South Africa), nine are Bufonids (true frogs) three are Bevicepids (stout bodied frogs), twenty-one are Ranids (frog family) and nine are Hyperolids (reed frogs). The amphibians of the province are an important component of the vertebrate diversity of the province. There are six threatened and four endemic frog species in the Eastern Cape Province. One species, *Heleophryne hewitti*, is critically endangered and known for only four rivers in the Elandsberg range.

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The Pondoland amphibian fauna is relatively poorly known, as is much of that of the former Transkei. This is unfortunate as the region falls at an important transition zone between a southern temperate amphibian fauna, and a tropical fauna that extends along the coastal littoral in association with the warm waters of the Agulhas Current (Poynton, 1990). The known amphibian fauna includes approximately 31 species. New taxa may well still exist in the poorly studied forest patches, river gorges and coastal grasslands. Species currently known only from coastal locations may also have relict inland populations.

10.6.2 Mammals

A total of three hundred and thirty eight mammals are recorded for South Africa, of which 128 (44%) are recorded from the Eastern Cape. Of this 128 species, only one species is endemic to the Eastern Cape. This species is the Giant Golden Mole (*Chrysospalax trevelyani*) that inhabits the indigenous forests of the Eastern Cape and is locally abundant in some regions. A list of recorded mammal species of the Eastern Cape region is presented in Appendix F. Species which have been extirpated within historical times in the Eastern Cape include the cheetah, hunting dog, hippopotamus, lion, warthog and red hartebeest. These have however been extensively reintroduced into the province in provincial and private game reserves. The few large megaherbivores surviving in the region include the ubiquitous bushbuck (*Tragelaphus scriptus*), common duiker (*Sylvicapra grimmia*), and Cape Grysbok (*Raphicerus melanotis*). In addition, Chacma baboon (*Papio ursinus*), Vervet Monkey (*Ceropithecus aethiops pygerythrus*), bush pig (*Potamochoerus porcus koiropotamus*) and a variety of small carnivores (viverids, genets, Cape Clawless Otter, etc) survive in small pockets. All are non-threatened, and many have successfully adapted to surviving in peri-urban areas, where some may become pests.

In the Eastern Cape area the dominant small mammal species associated with Coastal Grasslands and Acacia Savannah are *Rhabdomys pumilio* (Striped mouse) and *Otomys irroratus* (vlei rat). Other relatively common animals include various mole species, mole rats, *Orycteropus afer* (Aardvark) and *Cynictis penicillata* (Yellow Mongoose).

Fifteen threatened large- to medium-sized mammals occur in the Eastern Cape Province (Table 2).

Table 2: Terrestrial mammal Red Data Book (RBD) species.

SPECIES	COMMON NAME	CONSERVATION STATUS
Lycaon pictus	Wild dog	Endangered
Hyaena brunnea	Brown hyena	Rare
Proteles cristatus	Aardwolf	Rare
Felis nigripes	Black-footed cat	Rare
Felis serval	Serval	Rare

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Panthera pardus	Leopard	Rare
Philantomba monticola	Blue duiker	Rare
Mellivora capensis	Honey badger	Vulnerable
Felis lybica	African wild cat	Vulnerable
Orycteropus afer	Aardvark	Vulnerable
Equus zebra	Cape Mountain zebra	Vulnerable
Diceros bicornis	Black rhinoceros	Vulnerable
Ourebia ourebi	Oribi	Vulnerable
Manis temminckii	Pangolin	Vulnerable
Felis nigripes nigripes	Small-spotted cat	Rare

10.6.3 Birds

The former Transkei region has a rich avifauna, with nearly 500 species recorded from the region (approximately half of the species recorded from the subcontinent). They include numerous sensitive and threatened species. The coastal mosaic of grassland and forest habitats serves as an important area for montane species in winter. Many Intra-African summer migrants also use the region both for breeding and in transit to more southerly areas. The Eastern Cape Province contains 62 threatened bird species (Appendix H). Many of them are associated with wetlands or are grassland species, highlighting the declining condition of these ecosystems. As can be expected from this highly mobile group there are no Eastern Cape endemic birds, although nine bird species are South African endemics. Only *Accipter melanoleucus* (Black sparrow hawk) has Red Data Book status, but this species is no longer considered threatened. A list of recorded bird species of the Eastern Cape region is presented in Appendix G.

10.6.4 Invertebrates

Although no regional Red Data Book exists for many invertebrate groups, a number of species in diverse groups have been identified as being of conservation concern and are discussed below.

- A number of rare butterflies from the Pondoland region are included in the South African Butterfly Red Data Book (Henning and Henning, 1989), including:
  - Pondoland Charaxes (*Charaxes pondoensis*) - Rare, Port St. Johns, Mkambati NR. Amakoza Rocksitter (*Durbania amakosa albescens*), Rare, Margate.
  - Southern Aslauga (*Aslauga australis*) - Rare, East London, Mbashe River, Doutza Pass, Port St. John's.
  - Bicolored Abantis (*Abantis bicolor*) - Rare, East London, Mbashe River, Port St. John's.
- Pulmonate Molluscs - Two terrestrial slugs have been indicated as candidates for inclusion in the IUCN 'Red List' of threatened species (Herbert, 1997). These include:
  - Chlamydephorus burnupi - known from a few scattered localities in KwaZulu-Natal, and with a single record from Port St. Johns.

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- Chlamydephorus dimidius - known from a few scattered localities in KwaZulu-Natal, and with a single southern record from Mtamvuna Gorge.

o Cicadas - Due to their long, unusual life cycles, cicadas are known to be sensitive to habitat fragmentation (Rodenhause et al., 1997). These large, noisy and enigmatic insects show high levels of endemism and a number of new, highly-localised species have been described from the former Transkei region (Villet, 1997, 1999). Both are recorded from coastal forest, thicket and forest fringes.

- Stagira pondoensis is known only from Port St John and nearby Vernon Crookes Nature Reserve in KwaZulu-Natal.
- Nyara thanatotica occurs at Port St Johns and Bosbokstrand. This taxon is taxonomically more important as it is a monotypic genus.

o Millipeds - Like cicadas, millipeds often show high levels of endemism. Moreover, the distribution of endemism is often discordant with that of other groups (Burgess et al., 1998). Although there is no updated review of southern African millipeds highlighting threatened taxa, a new species has recently been described from forest habitat in the Lusikisiki District (Alderweireldt, 1998).

o Archaeid spiders - The Afrotropical Archaeidae is a small family of very rare spiders known from southern Africa, Madagascar and Australia. In the subcontinent is represented by two genera and 12 species. *Eriauchenius coronatus* is known from only two specimens and is endemic to the Vernon Crookes Nature Reserve where it inhabits grassland at the forest-grassland ectotone. Two endemic species of *Afrarchaea* have been described (Lotz 2007) from leaf litter in isolated coastal forests in the Eastern Cape, including *A. haddadi* (Komga, Kei Mouth) and *A. woodae* (Komga and Cwebe Nature Reserve).

10.7 Flora

10.7.1 Eastern Cape Biodiversity Conservation Plan

The Eastern Cape is globally recognized for its high biodiversity value and scenic beauty. It has the highest biome diversity of any province, with no less than seven biomes: Forest, Fynbos, Nama Karoo, Savanna, Succulent Karoo and Thicket. The Province is also unique among provinces in that it overlaps with three centres of biological endemism: the Albany Centre, the Drakensberg Centre and the Pondoland Centre. The centre of concern for BCM is the Albany Centre

Recognizing the need to ensure that important natural resources are conserved, the Department of Economic Development and Environment Affairs (DEDEA) together with the Department of Water

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Affairs and Forestry (DWAF) collaborated to draw up the Eastern Cape Biodiversity Conservation Plan (ECBCP).

The ECBCP addresses the urgent need to identify and map critical biodiversity areas and priorities for conservation in the Province. Critical Biodiversity Areas (CBAs) are "terrestrial and aquatic features in the landscape that are critical for conserving biodiversity and maintaining ecosystem functioning".

The ECBCP is a broad-scale biodiversity plan. Its aim is to integrate information from existing biodiversity plans (STEP, SKEP, C.A.P.E., the NSBA, DWAF Forest Conservation Planning, Wild Coast Conservation Plan, Pondoland Systematic Conservation Plan, Grasslands Programmes and the Maloti Drakensberg Transfrontier project), and to fill in the gaps, thereby providing a single, user friendly, biodiversity land use decision support tool for the whole Province (CBA maps). In turn it also provides land use planning guidelines, recommending biodiversity-friendly activities in priority areas. The ECBCP is intended for use by technical users and decision-makers in the spheres of planning (for example integrated development planning & spatial development frameworks (IDP/SDF)), development and environment. Mapped information can be used both reactively and strategically to guide future development away from sensitive and priority biodiversity areas.

However, it is important to note the following: the "ECBCP has no legal status", (it has however been designed to serve as the basic biodiversity layer in Strategic Environmental Assessments, State of Environment Reports, SDFs, Environmental Management Frameworks and Bioregional Plans), "the ECBCP itself is not a bioregional plan", "the information should always be verified with a site visit", "the ECBCP is not a substitute for a full evaluation" and "the ECBCP should not be used for urban and fine-scale planning" (as it is a broad framework plan) (*Eastern Cape Biodiversity Conservation Plan Handbook, 2007*) .

10.7.2 General vegetation description

The landscape within the river valleys of the Eastern Cape can be described as undulating, with steep river valleys and flat-topped ridges. Valley thicket, which is the predominant vegetation type, is found in river valleys with savanna and open grasslands on the plateaus and spurs between the rivers. The grasslands and savanna have been greatly impacted upon by settlements and grazing of domestic animals.

The proposed borrow pits fall within the Eastern Valley Bushveld and Bhisho Thornveld as according to Mucina & Rutherford (2006) (Figure 15).

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The **Eastern Valley Bushveld** is found in KwaZulu-Natal and the Eastern Cape Provinces in deeply incised valleys of rivers, including the lower reaches of the Thukela, Mvoti, Mgeni, Mlazi, Mkhomazi, Mzimkulu, Mzimkulwana, Mtamvuna, Mtentu, Msikaba, Mzimvubu, Mthatha, Mbashe, Shixini, Qhora and Great Kei Rivers. The unit very seldom extends to the coast and generally occurs at an altitude of 100-1000m. This unit mainly consists of semi-deciduous savanna woodlands in a mosaic with thickets which are often succulent and dominated by species of *Euphorbia* and *Aloe*. Most of the river valleys run along a northwest-southeast axis which results in unequal distribution of rainfall on the respective north-facing and south-facing slopes since rain bearing winds blow from the south. The steep north-facing slopes are sheltered from the rain and also receive greater amounts of insolation adding to xerophilous conditions on theses slopes.

The conservation status is seen as “Least Threatened”. Only 0.8% of this unit is statutorily conserved, mainly in the Luchaba Wildlife Reserve. Small patches are also conserved in the Oribi Gorge Nature Reserve. Some 15% is transformed, mainly due to cultivation. Alien plant invasions are a serious threat, with *Chromolaena odorata*, *Lantana camara* and *Caesalpinia decapetala*.

This vegetation unit corresponds closely to ‘Northern Variation of Valley Bushveld’ form the Great Kei River Valley northwards. The area is viewed as transitional to the Lowveld, particularly that part form the Umkomaas River Valley northwards. From the Kei River northwards the unit is more open than the southern variation and includes more grass, fewer succulents and more species of a tropical nature.

The **Bhisho Thornveld** is found in the Eastern Cape: From near Mthatha in a band parallel to but inland of the coast to north of East London, turning to run along the southern side of the Amathole Mountains as far as Fort Beaufort. It is also on dissected hills and low mountains around Grahamstown, especially to the southwest, and in a few fragments in valleys northeast of the Amathole Mountains. Altitude mostly 200 – 700 m. The vegetation unit is located on undulating to moderately steep slopes, sometimes shallow, incised drainage valleys. Open savanna characterised by small trees of *Acacia natalia* with short to medium, dense, sour grassy understorey, usually dominated by *Themeda triandra* when in good condition. A diversity of woody species also occurs, often increasing under conditions of overgrazing.

In terms of its conservation status, it is classified as least threatened. The conservation target of this unit is 25%. Some 20% of the unit is transformed mainly for cultivation, urban development and plantations. Only 0.2% is statutorily conserved in the Doubledrift and Thomas Baines Nature Reserves. About 2% is conserved in private reserves such as Shamwari Game Reseve, Rockdale Game Ranch and Fourie Safaris Game Farm.

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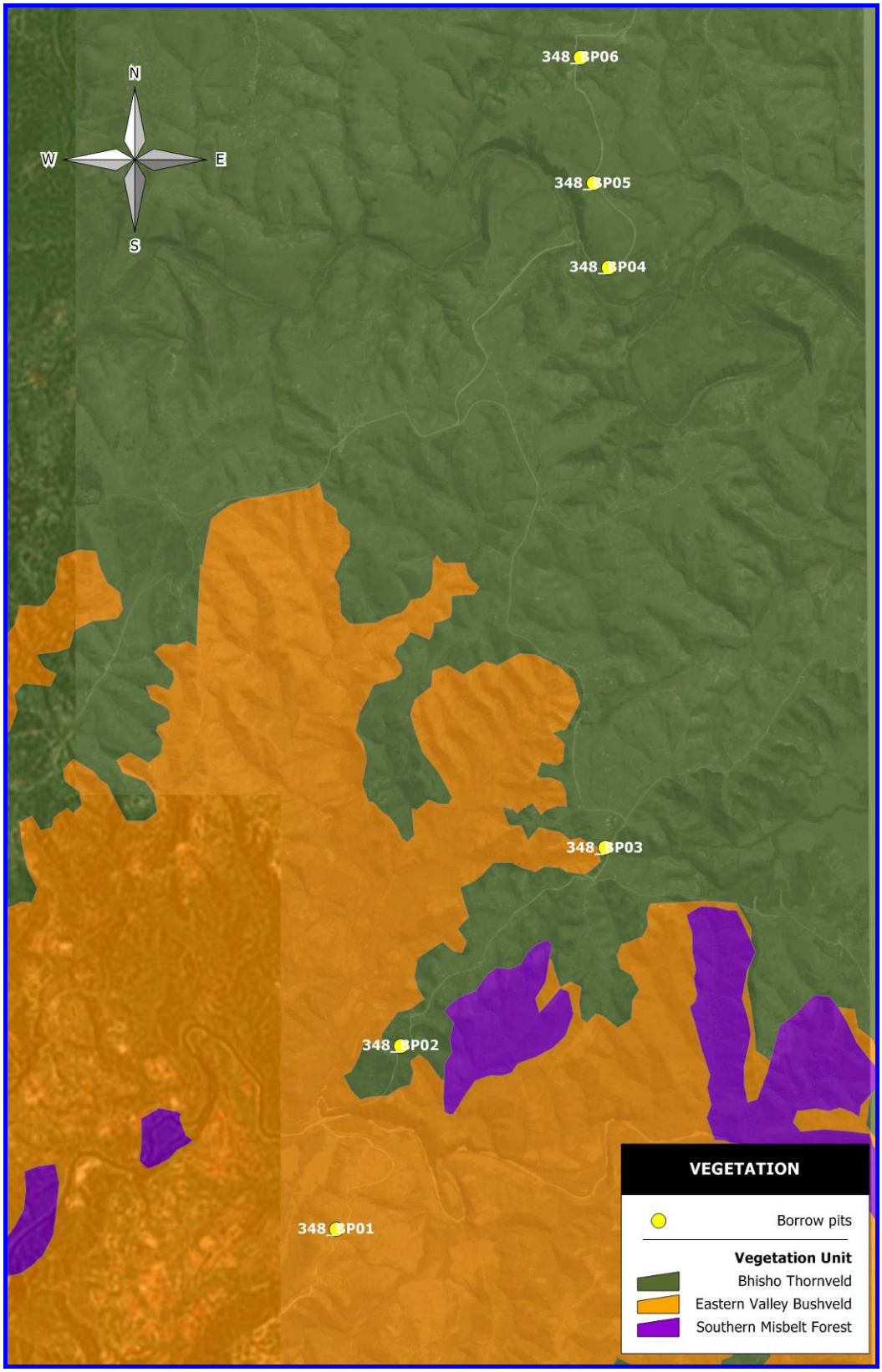

Figure 15: General vegetation and the location of the borrow pits.

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Table 3: Important Taxa – Eastern Valley Bushveld

Tall Trees		
Acacia robusta	*Sclerocarya birrea subsp caffra*	
Small Trees		
Acacia natalitia	*A. nilotica*	*Combretum molle*
Spirostachys africana	*Acacia tortilis subsp heteracantha*	*Berchemia zeyheri*
Boscia albitrunca	*Brachylaena elliptica*	*Cussonia spicata*
Dombeya rotundifolia	*Encephalartos natalensis*	*E. villosus*
Hippobromus pauciflorus	*Schotia brachypetala*	*Ziziphus mucronata*
Succulent Trees		
Euphorbia tirucalli	*Aloe marlothii subsp marlothii*	*A. rupestris*
Euphorbia ingens	*E. triangularis*	
Tall Shrubs		
Dichrostachys cinerea	*Euclea crispa subsp crispa*	*Coddia rudis*
Ehretia rigida subsp rigida	*Calpurnia aurea*	*Grewia occidentalis*
Olea europaea subsp africana		
Succulent Shrubs		
Aloe arborescens	*Euphorbia grandicornis*	*Kleinia fulgens*
Soft Shrubs		
Hypoestes aristata	*Peristrophe cernua*	
Woody Climber		
Acacia brevispica subsp dregeana		
Herbaceous Climber		
Ischnolepsis natalensis		
Graminoids		
Aristida congesta	*Eragrostis curvula*	*Hyparrhenia hirta*
Melinis repens	*Panicum maximum*	*Themeda triandra*
Cymbopogon pospishilii	*Eragrostis superba*	*Heteropogon contortus*
Panicum deustum	*Sporobolus fimbriatus*	*S. pyramidalis*
Tristachya leucothrix	*Urochloa mosambicensis*	
Herbs		
Achyranthes aspera	*Hibiscus pendunculatus*	
Geophytic Herb		
Sansevieria hyacinthoides		

Table 4: Important Taxa – Bhisho Thornveld

Tall Trees		
Acacia natalitia		
Tall Shrubs		
Tephrosia capensis		
Low Shrubs		
Anthospermum rigidum subsp pumilum	*Chrysocoma ciliata*	*Felicia muricata*
Graminoids		
Eragrostis plana	*Heterpogon contortus*	*Hyparrhenia hirta*
Sporobolus africanus	*Themeda triandra*	*Aristida junciformis subsp junciformis*
Bulbostylis humilis	*Cynodon dactylon*	*Digitaria diagonalis*
Digitaria eriantha subsp eriantha	*Elionurus muticus*	*Eragrostis capensis*

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Eragrostis chloromelas	*Eragrostis curvula*	*Kyllinga alata*
Microchloa caffra	*Paspalum dilatatum*	*Schoenoxiphium sparteum*
Herbs		
Centella asiatica	*Commelina africana*	*Gazania linearis*
Gerbera ambigua	*Helichrysum miconiifolium*	*Helichrysum nudifolium*
Helichrysum rugulosum	*Senecio retrorsus*	*Spermacoce natalensis*
Wahlenbergia stellarioides	*Zornia capensis*	
Geophytic Herb		
Hypoxis argentea	*Moraea polystachya*	*Pellaea calomelanos*

10.8 Socio - Economic Environment

In the provincial context, the Eastern Cape is one of the poorer provinces in South Africa. Its economy has been characterised in the Province's 2004-2014 Provincial Growth and Development Plan (PGDP) as having "extreme levels of uneven development". It is situated in the south-east of the country and includes the former Eastern Province, Border, north-eastern Cape areas and the former "homelands" of Transkei and Ciskei. Spatially, it is the second largest province, covering almost 14 % of the total surface area of South Africa.

It has urban industrial manufacturing centres in Buffalo City and the Nelson Mandela Metropolitan Municipality, a well-developed commercial farming sector and high concentrations of developed socioeconomic infrastructure in the western parts. In contrast to this is the undeveloped rural hinterland in the former Transkei and Ciskei homelands, which consist of weak subsistence agriculture and very limited socio-economic growth. The coastal area known as the "Wild Coast" is very sparsely populated, mainly due to limited infrastructure and inadequate access to the coastal nodes.

Annual average economic growth for the provincial economy over the last decade was 2.2 % against the national average of 2.8 %. Farming is an important contributor to household livelihoods in the former Transkei where the proposed toll highway would be developed, but it is largely a subsistence activity. Two harbours, at East London and Port Elizabeth, are located along its coastline and a modern deepwater port has recently been constructed at Coega.

In 2007 the province had a population of about 6.90 million, comprising approximately 14 % of the national population. The province has an average density of 67 – 80 people per km². The Eastern Cape has the third lowest urbanised population, at 42.9 % (Development Bank of Southern Africa - DBSA, 2000).

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The Gross Geographic Product (GGP) of the Eastern Cape was just more than R 81 billion in 2001, equalling 8.2 % of South Africa's Gross Domestic Product (GDP). The three most important sectors at the intra-provincial level are manufacturing, commerce and community services. The province possesses comparative economic advantages with regard to textiles, leather products, rubber products and vehicles.

The Eastern Cape has the highest unemployment rate in South Africa, with almost half of its labour force being unemployed. The unemployment rate of 48.4 % is 14.6 percentage points higher than the national average. These figures exclude large numbers of people who left the province to find employment in other provinces such as the Western Cape and Gauteng. Average annual household income in 2001 for South Africa as a whole was R 46 291, while for the Eastern Cape it was R 28 468 (Stats SA Census, 2001).

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11 The Affected Environment/ Site Description

11.1 Geology and Soils

According to the geology of RSA shapefile and the geological maps (3228 Kei Mouth) the area in which the borrow pits are located falls within the Karoo Supergroup, Beaufort Group, Adelaide Subgroup (Figure 16). The area is underlain by grey & brownish-red mudstone and sandstone. There are also wide spread dolerite intrusion throughout the area.

This Adelaide Subgroup rests conformably on the Ecca Group and consists of mudstone alternating with subordinate fine-grained lithofeldspathic sandstone, forming upward-fining cycles. The sandstones are usually grey, display through cross-bedding, flat-bedding or micro-crosslamination, and are generally a few meters thick. The mudstones are usually massive and greenish-grey, though greyish-red mudstones are found in the middle and at the top of the subgroup.

Due to poor exposure the three formations (Middleton, Balfour, Koonap) found in this subgroup were not mapped separately, although the Middleton formation could be recognised as far north as Mount Ayliff.

A total thickness of 1900m is estimated for the Adelaide Subgroup near Elliotdale, decreasing to 1650m near the northern edge of the area. Exposures along the coast near the Mgazana River mouth have an estimated thickness of 1750m. The presence of lenticular sandstones, upward-fining cycles, massive mudstones, plant impressions and terrestrial reptile remains all point to a fluviatile mode of deposition with streams meandering across extensive muddy flood plains.

The investigation undertaken by Control Civil Services (Section 21.1) indicated that the type of material identified at the borrow pits was shale.

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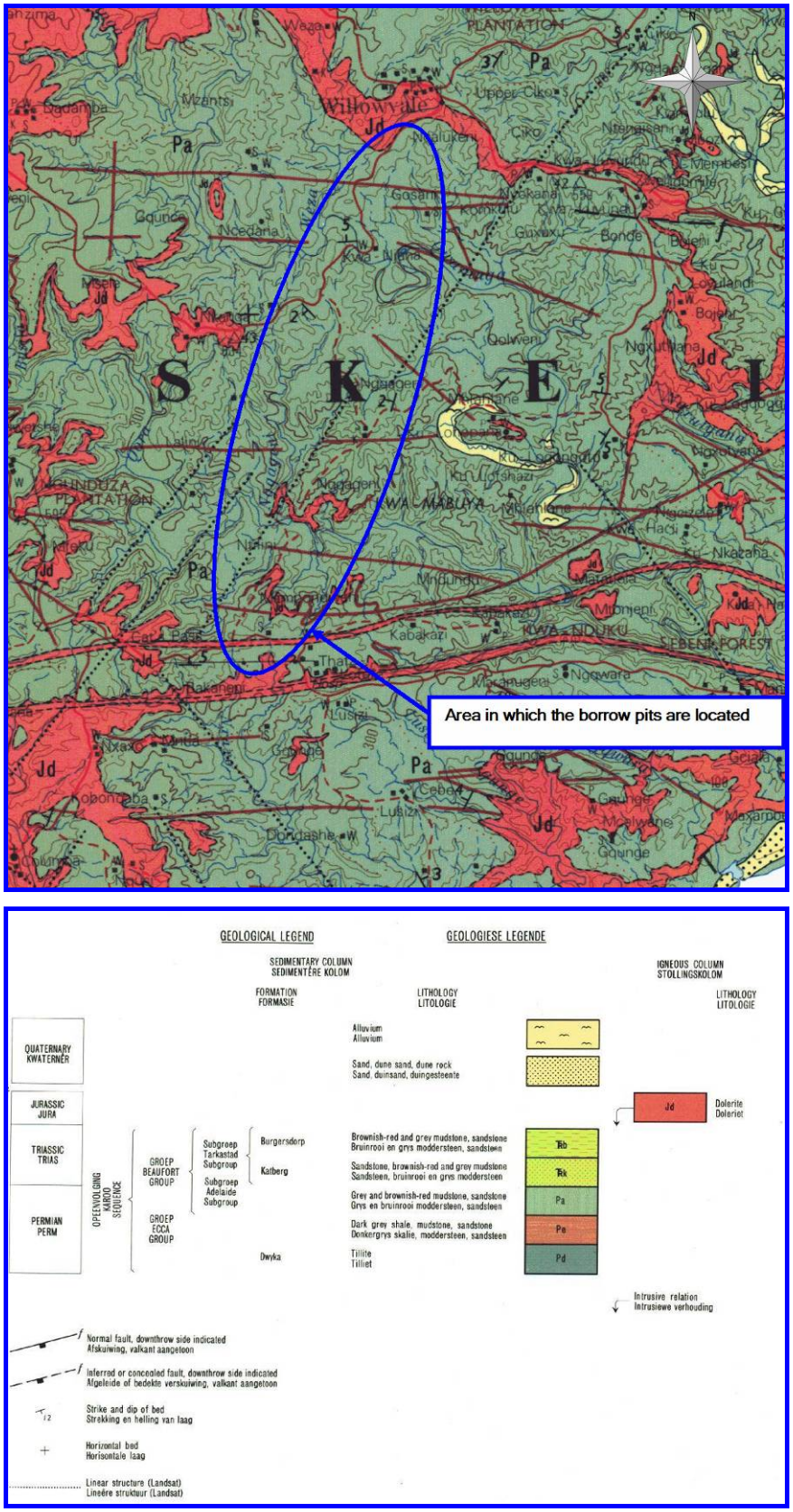

Figure 16: The geology of the area in which the Borrow pits are located (3228 Kei Mouth)

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11.1.1 Erodibility Index

Erodibility of soils can be described as the sensitivity of soils to the effects of wind and water on the soil structure. This property is expressed as an erodibility index, where low values indicate high potential for erosion, and high values correspondingly indicate a low potential for erosion.

The erodibility index is determined by combining the effects of slope and soil type, rainfall intensity and land use. These aspects are represented by terrain morphology, mean annual rainfall and broad land use patterns.

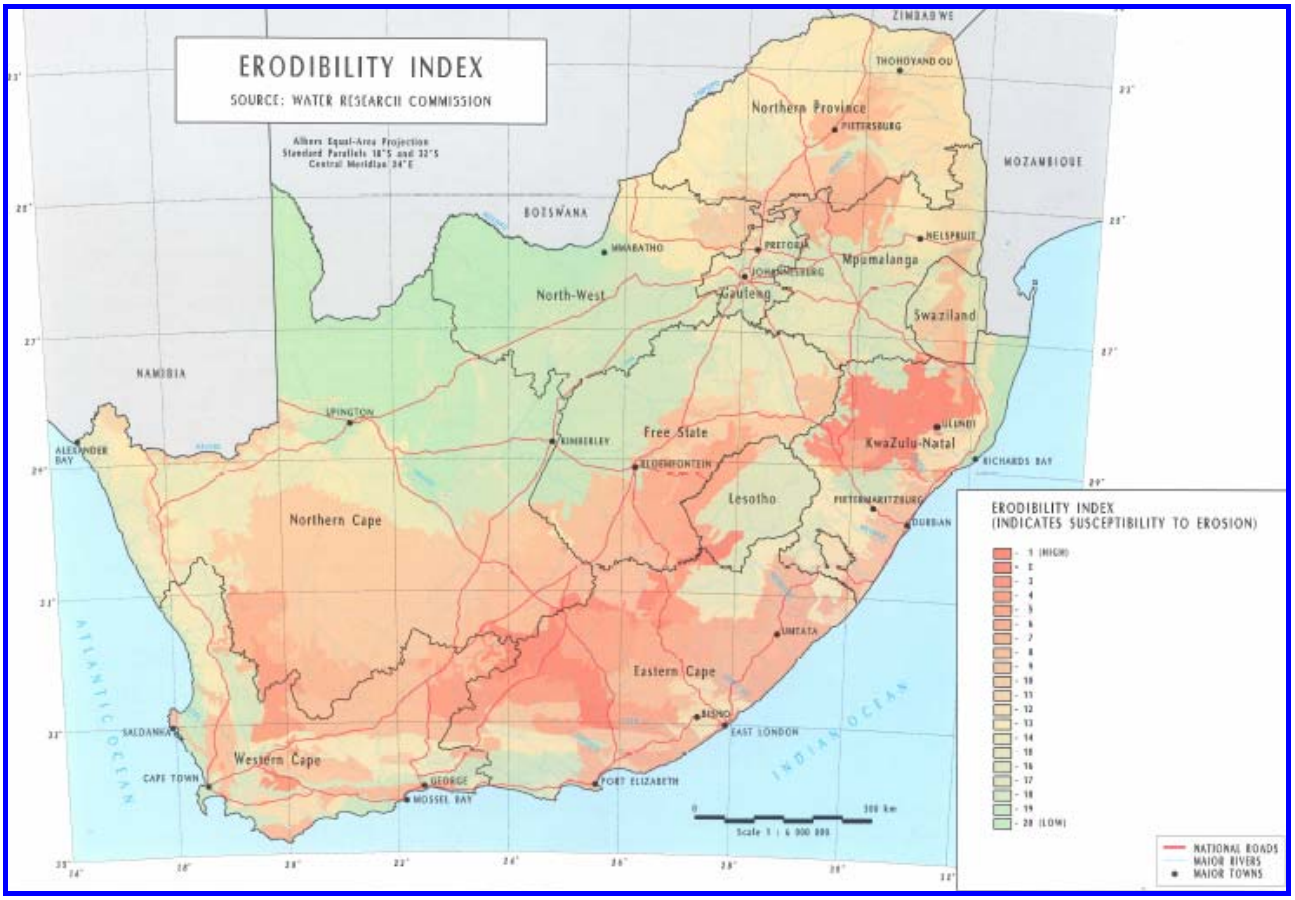

Figure 17: Erodibility Index

According to the Environmental Potential Atlas for South Africa, the study area falls within an Erodibility Index of between 7 and 9, which is at the lower end of the scale (1 being High and 20 being Low), indicating that the area is moderately to highly susceptible to erosion (Figure 17).

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11.2 Archaeology, Palaeontology and Heritage Sites

A Phase 1 Archaeological Impact Assessment was undertaken on the identified borrow pits by Archaeomaps Archaeological Consulting (Section 21.2). The findings of this assessment are as follows:

Rd_Nr_	No_	AIA Finding	AIA Recommendation
DR08348	348_BP01	No archaeological or cultural heritage resources, as defined and protected under the NHRA 1999, were identified on the surface or within exposed sub-surface sections during the Phase 1 AIA assessment of borrow pit 348_BP01.	It is recommended that use of borrow pit 348_BP01 proceeds as applied for without the developer having to comply with additional heritage compliance requirements.
DR08348	348_BP02	No archaeological or cultural heritage resources, as defined and protected under the NHRA 1999, were identified on the surface or within exposed sub-surface sections during the Phase 1 AIA assessment of borrow pit 348_BP02.	It is recommended that use of borrow pit 348_BP02 proceeds as applied for without the developer having to comply with additional heritage compliance requirements.
DR08348	348_BP03	No archaeological or cultural heritage resources, as defined and protected under the NHRA 1999, were identified on the surface or within exposed sub-surface sections during the Phase 1 AIA assessment of borrow pit 348_BP03.	It is recommended that use of borrow pit 348_BP03 proceeds as applied for without the developer having to comply with additional heritage compliance requirements.
DR08348	348_BP04	No archaeological or cultural heritage resources, as defined and protected under the NHRA 1999, were identified on the surface or within exposed sub-surface sections during the Phase 1 AIA assessment of borrow pit 348_BP04.	It is recommended that use of borrow pit 348_BP04 proceeds as applied for without the developer having to comply with additional heritage compliance requirements.
DR08348	348_BP05	No archaeological or cultural heritage resources, as defined and protected under the NHRA 1999, were identified on the surface or within exposed sub-surface sections during the Phase 1 AIA assessment of borrow pit 348_BP05.	It is recommended that use of borrow pit 348_BP05 proceeds as applied for without the developer having to comply with additional heritage compliance requirements.
DR08348	348_BP06	No archaeological or cultural heritage resources, as defined and protected under the NHRA 1999, were identified on the surface or within exposed sub-surface sections during the Phase 1 AIA assessment of borrow pit 348_BP06.	It is recommended that use of borrow pit 348_BP06 proceeds as applied for without the developer having to comply with additional heritage compliance requirements.

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A Palaeontological Assessment was undertaken on the identified borrow pits by Rob Gess Consulting (Section 21.2). The findings of this assessment are as follows:

- 348_BP05 contains calcritised casts of small sinuous invertebrate burrows. It is apparent that this mudstone band overlies a cliff forming, regionally very thick and extensive sandstone layer.
- A number of borrow pits were found to contain plant fossils including leaves of various forms of Glossopterid plants and stems of sphenophytes (c.f. *Phyllotheca*) and other plants. These include 348_BP06 comprising interbedded greenish coarse to fine grained mudstone and fine purplish mudstone, from which samples of *Glossopteris* and c.f. *Phyllotheca* were collected by the Palaeontologist for the Albany Museum.
- A palaeontologist is required to visit 348_BP06, 348_BP05 & 348_BP04 near Willowvale shortly after removal of aggregate is resumed. This will allow sampling of fresh material and will allow the palaeontologist to communicate with the site foreman who may be asked to put any suitable material he may notice on one side.
- In addition the borrow pits containing sedimentary rocks should be resurveyed by a palaeontologist at the end of excavations and prior to any form of rehabilitation. This will allow survey and sampling of freshly exposed palaeontological material and possible recommendations regarding strata to be left unrehabilitated for future access by professionals.

The review comment received from SAHRA supported the recommendations of the specialists and requires the following (Appendix D):

- Inspection by a palaeontologist is required after opening 348_BP04 & 348_BP06 to identify any newly uncovered fossils. A monitoring report must be submitted to SAHRA.
- Prior to any form of rehabilitation, a palaeontologist will be required to resurvey the borrow pits within the sedimentary rocks. A monitoring report from this survey must be submitted to SAHRA.

11.3 Climate and Air Quality

Butterworth normally receives about 596mm of rain per year, with most rainfall occurring mainly during summer. It receives the lowest rainfall (8mm) in June and the highest (89mm) in March. The average midday temperatures for Butterworth range from 19.2°C in July to 25.6°C in February. The region is the coldest during July when the mercury drops to 6.2°C on average during the night.

The Wienerts climatic N number for the area is between 2 and 5, which should indicate that the rocks would decompose implying that chemical weathering would dominate over mechanical weathering.

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The Eastern Cape Province does not appear to be a priority area as far as air quality is concerned, as is evidenced by the number and type of industries in the Province. Monitoring of air quality in the Province is performed on a fragmented basis as no co-ordinated network exists. No comprehensive assessment of air quality is therefore possible.

There is however currently no major sources of air pollution in this region, aside from the contribution that domestic fires and vehicle emissions make along existing roads. Ploughed fields, unpaved roads and unvegetated land are all sources of wind-generated dust. The majority of households, particularly those in the rural areas, rely on fossil fuels such as paraffin and wood for domestic energy. Indoor air pollution is therefore a concern in the area, although it has not been quantified. The air quality of Mnquma is described as very good, as typically the land use is rural types with limited industrial activity. Small pockets of moderate air quality due to quarrying activities close to densely populated areas, particularly in Butterworth do exist.

11.4 Topography and Drainage

The topography of the study area has been described as strongly undulating irregular land.

348_BP01 is located at an elevation of 261 m above mean sea level (amsl). The site is located ontop of hill with the predominant slope towards the north and west. The drainage of the borrow pit is to the south and west towards the non - perennial drainage line which intercepts the Qora River to the north. The Qora River has been classified as a CLASS B – largely natural – river system. The nearest drainage line is located approximately 60 m away from the borrow pit.

348_BP02 is located at an elevation of 314 m above mean sea level (amsl). The site is located on a hill with the predominant slope towards the west and east. The drainage of the borrow pit is to the south east towards the non - perennial drainage line which intercepts the Qora River to the south. The Qora River has been classified as a CLASS B – largely natural – river system. The nearest drainage line is located approximately 50 m away from the borrow pit.

348_BP03 is located at an elevation of 391 m above mean sea level (amsl). The site is located on a hill slope with the predominant slope towards the south east. The drainage of the borrow pit is to the south east towards the non - perennial drainage line which intercepts the Qora River to the south. The Qora River has been classified as a CLASS B – largely natural – river system. The nearest drainage line is located approximately 35 m away from the borrow pit.

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348_BP04 is located at an elevation of 338 m above mean sea level (amsl). The site is located on a hill slope with the predominant slope towards the south. The drainage of the borrow pit is to the south towards the perennial drainage line, the Qwaninga River to the south. The Qwaninga River has been classified as a CLASS B – largely natural – river system. The Qwaninga River intercepts the Qora River to the east. The nearest drainage line is located approximately 100 m away from the borrow pit.

348_BP05 is located at an elevation of 374 m above mean sea level (amsl). The site is located on a hill slope with the predominant slope towards the east. The drainage of the borrow pit is to the east towards the non –perennial perennial drainage line which intercepts the Qwaninga River to the south. The Qwaninga River has been classified as a CLASS B – largely natural – river system. The Qwaninga River intercepts the Qora River to the east. The nearest drainage line is located approximately 30 m away from the borrow pit.

348_BP06 is located at an elevation of 432 m above mean sea level (amsl). The site is located on a hill slope with the predominant slope towards the west. The drainage of the borrow pit is to the west and south towards the non –perennial perennial drainage line which intercepts the Qwaninga River to the south. The Qwaninga River has been classified as a CLASS B – largely natural – river system. The Qwaninga River intercepts the Qora River to the east. The nearest drainage line is located approximately 30 m away from the borrow pit.

As the borrow pits are existing and have been utilised previously, the topography has been altered by the excavation of material from the hill slopes.

The study area falls in the primary drainage area T90. Within this primary drainage borrow pits 1, 2, and 3 fall within the quaternary catchment area of T90D, while borrowpits 4, 5, and 6 fall within quaternary catchment T90E. The mean annual precipitation of T90D quaternary is 808.25 mm with a mean annual runoff of 87.8 mm, while the mean annual precipitation of T90E quaternary is 898.63 mm with a mean annual runoff of 132.70 mm.

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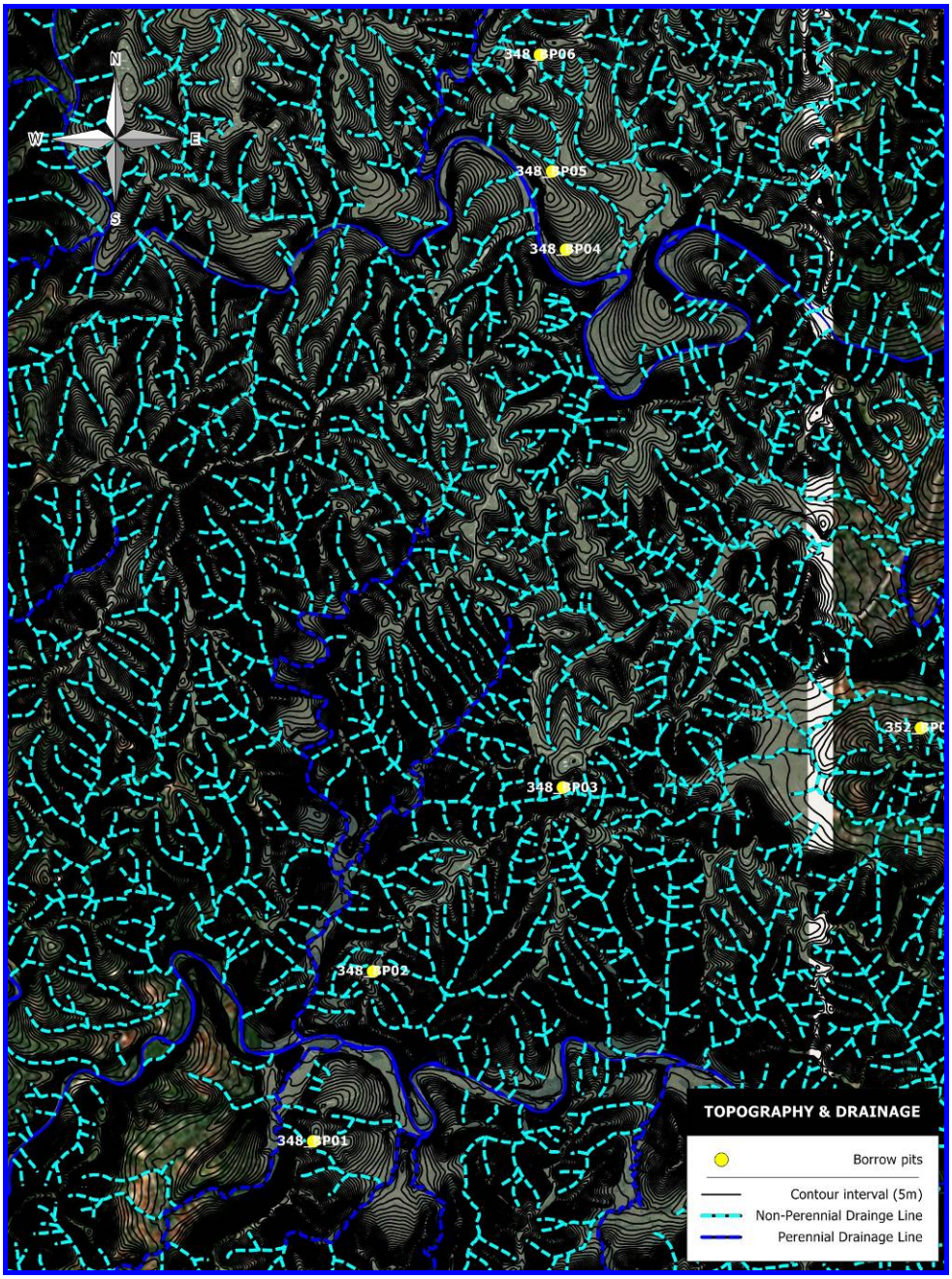

Figure 18: Drainage of the Area in which the proposed borrow pits are located.

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Figure 19: Terrain view indicating the position of the borrow pits in the landscape.

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The topography may be impacted upon by the excavation of the existing borrow pits which in turn could have an effect on the storm water runoff and drainage of the immediate surrounding area. Areas of concentrated storm water runoff could be subject to increased erosion if not mitigated against appropriately by means of erosion control techniques and/or structures dissipating the velocity and flow of storm water runoff. The non-perennial drainage lines are referred to as such due to the fact that they are dry for the majority of the year, and some instance only flow during periods of high rainfall.

11.5 Fauna

Although a detailed faunal assessment was not undertaken, during the site visit the only fauna encountered were livestock in the surrounding lands. The natural diversity of animal species and animal numbers within the site area may have been severely affected by the degradation of habitat, subsistence hunting and trapping as well as from displacement by livestock. There may however be some mammals, reptiles, amphibians in the surrounding areas, especially within areas still presenting natural landscapes. The current land use of the borrow pit sites/areas does not present a unique habitat for rare or endangered fauna and No Red Data List mammals were observed.

The terrestrial mammal, reptile and amphibian fauna are not likely to be further materially impacted on by the proposed activity as the proposed borrow pits are existing borrow pits utilized in the past. However, any such fauna that is present on or near the site is likely to be displaced into the surrounding areas and into the natural areas.

11.6 Flora

11.6.1 Eastern Cape Biodiversity Conservation Plan (ECBCP)

According to the ECBCP the area in which the borrow pits are located is identified as being predominantly Degraded Biodiversity Land Use Management Class 2 (BLMC 2 or CBA 2 – Maintain Near Natural State) and Biodiversity Land Use Management Class 4 (BLMC 4 – Cultivated Land) (Figure 20).

A Biodiversity Land Management Class (BLMC) refers to the desired ecological state that a parcel of land should be kept in so as to ensure biodiversity persistence (designations may be at the scale of habitat patch, landscape or catchment). It can be described using sets of ecosystem condition indicators, referred to as Limits to Acceptable Change indicators (or LACs). LAC values are assigned for each BLMC to describe upper limits for the degree of acceptable ecological change or impact that any proposed land-use change may bring about without compromising the designated ecological state.

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In the table below four BMLC's are defined using Limits to Acceptable Change of six key land-use impact indicators.

Table 5: Limits to Acceptable Change thresholds for six key lands use impact indicators.

BLMC	Permissible transformation (per land parcel considered)	Change in ecosystem structure (fragmentation index)	Change in species composition and dominance	Overall change in natural disturbance regimes (fire, hydrology etc)	Resource extraction (% of Net Primary Production per annum)
Class 1	0%	0%	0%	Little or none	< 5%
Class 2	0% - 10%	0 to 10%	0 to 5%	Some	5 to 30%
Class 3	10 to 70%	10 to 50%	5 to 80%	Significant	> 30%
Class 4	70-100%	> 50%	> 80%	Significant	Any

Terrestrial Critical Biodiversity Area 2 (CBA 2) are areas identified as being endangered vegetation types through the ECBCP systematic conservation assessment, endangered vegetations types from STEP, endangered forest patches in terms of the National Forest Assessment and within the 1km coastal buffer strip. In addition these areas area ecological corridors identified in other studies (e.g. from STEP, Wild Coast, Pondoland, WMA 12 SEA, etc.) and ecological corridors identified by the ECBCP using an integrated corridor design for the whole Province. The land use objective for this Terrestrial BLMC 2 is to maintain biodiversity in near natural state with minimal loss of ecosystem integrity. No transformation of natural habitat should be permitted. It is thus suggested that this land class only be used for purposes such as conservation, game farming and communal livestock.

The land use objective for Biodiversity Land use Management Class 4 is to manage for sustainable development in these already transformed areas. Therefore the guidelines recommend that in this management class a number of land uses are permissible for example: settlement, timber, dairy farming, game farming and conservation to name a few.

The ECBCP may however have significant limitations in that there may be significant differences between the ECBCP description of land use and condition and the actual land use, condition and environmental status. The sites are existing borrow pits utilised in the past and as such the areas have been transformed/disturbed.

It must be noted that while the borrow pits are located in an identified CBA 2 area, not more than 0.98 hectares of indigenous vegetation will be removed from the borrow pit during the mining activities.

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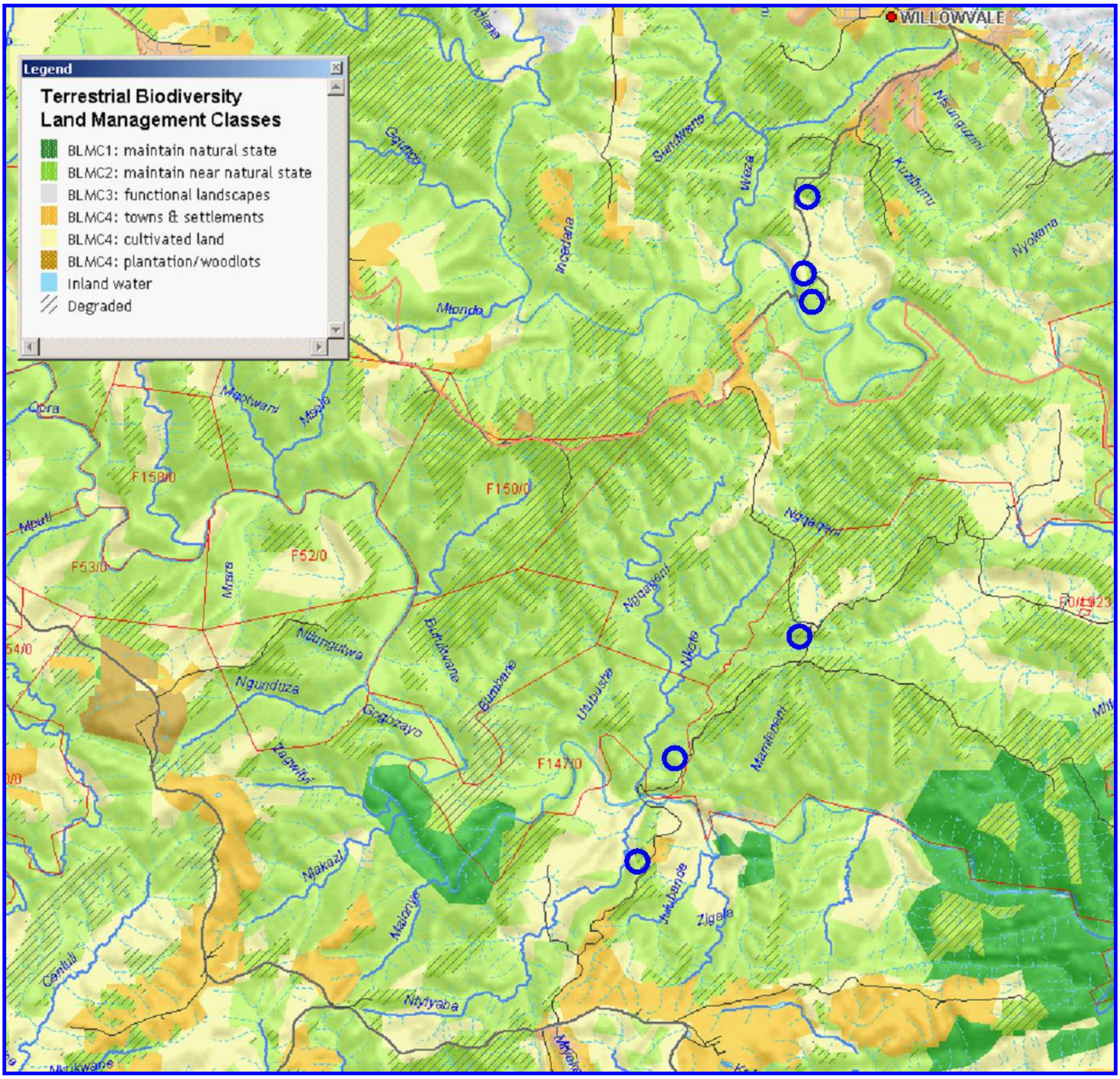

Figure 20: Eastern Cape Biodiversity Conservation plan and the location of the Borrow pit.

11.6.2 Vegetation Description

As the borrow pits are existing, the area has been disturbed significantly. The borrow pits have between 60 - 80 % indigenous vegetation cover. The utilisation of the borrow pits is not expected to have a significant impact on the vegetation of the area.

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The vegetation present in the area of the borrow pits tends to be dominated by a low diversity grassland with a few scattered shrubs and trees (*Acacia spp*). A few of the borrowpits tend to have a denser thicket type vegetation component adjacent to/along the outskirts of the existing borrow pit areas.

11.6.2.1 Protection status and legislation and Species of Special Concern

11.6.2.1.1 Indigenous flora

While only a preliminary botanical investigation was undertaken, it was observed that at all of the borrow pits, except 348_BP03, indigenous vegetation in the area of the borrow pits was not protected or endangered species. It was noted that at 348_BP03 an *Aloe* was present in the borrow pit area. All *Aloe spp*, except *Aloe ferox* and those listed in Schedule 3 are protected under the Cape Nature and Environmental Conservation Ordinance of 1974 and require consent to remove them. Under the Eastern Cape Environmental Conservation Bill of 2002 all aloes except *Aloe arborescens* and *Aloe ferox* and those listed in Schedule 4 are protected. Thus should any aloes require removal as a result of the mining activities, consent will required from the landowner which must be forwarded to DEDEA. No other endangered or protected species under the various schedules where observed in the area and thus the conservation status of the vegetation present in the area of the proposed borrow pits is low.

Borrowpits located in CBA's 2, will not have more than 0.98 hectares of indigenous vegetation removed from these borrow pits during the mining activities.

11.6.2.1.2 Alien Invasive Plant species

Only a few declared alien invasive plant species are present within the area of the borrow pits (Table 6). The borrow pits tended to vary in alien invasive vegetation cover from between 1% to 20%. The borrow pits have a low to moderate density of alien species, thus having a low to moderate overall impact. These invasive species require removal according to the Conservation of Agricultural Resources Act 43 of 1983 and methods of their removal and treatment should be undertaken according to the Working for Water Guidelines.

Table 6: Alien Invasive plants present within the area of the borrow pits.

No.	Botanical Name	Common Name	Family	Category
1	*Lantana camara*	Lantana	Verbenaceae	CARA 1
2	*Cirsium vulgare*	Scotch thistle	Asteraceae	CARA 1
3	*Solanum spp*	-	Solanaceae	-
4	*Solanum sisymbriifolium*	Dense-thorned bitter apple	Solanaceae	CARA 1
5	*Achyranthes aspera*	Burweed	Amaranthaceae	CARA 1

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11.7 Visual Aspects

The Borrow pits have been mined in the past and are located within proximity to public access roads. As a result, these sources are visible and currently have a moderate impact on the aesthetics of the area. The area is typically rural "Transkei" and much of the natural environment has been degraded by human impacts. However the scenery is pleasant.

11.8 Socio – Economic Environment

Land use and settlement patterns of the area are influenced by the previous political division of the area with the right bank of the Great Kei being part of South Africa and the left bank being part of the former Transkei. The right bank of the great Kei is predominantly commercial, privately owned farming while on the left bank the dominant form of settlement is communal, with communal forms of tenure.

The former Transkei is characterized by dispersed rural settlements and communal subsistence farming and grazing. In the proposed study area, Butterworth is the main and largest formal town. Butterworth is the only urban node in the former Transkei area where most services and higher order infrastructure are to be found. The standards of these services have declined in recent years along with the economy of the town. The indigenous population of the Butterworth area is mainly Fingo, whose main farming activities include stock farming and the cultivation of maize.

The proposed borrow pits fall within Ward 25 of the Mnquma Local Municipality and Ward 25 of the Mbhashe Local Municipality. According to Stats SA (Census 2001) the demographics of these wards are as proceeds.

Within ward 25 of the Mnquma Local Municipality, the population group tends to be predominantly African (98%) and as a result the predominantly spoken language in this ward is consequently Xhosa. Unemployment levels within this ward are very high at approximately 47.9%, with a large proportion of the ward being economically inactive. The average annual household income is predominantly no income or between R0 – 19 200.

Within ward 25 of the Mbhashe Local Municipality, the population group tends to be predominantly African (99%) and as a result the predominantly spoken language in this ward is consequently Xhosa. Unemployment levels within this ward are very high at approximately 80%, with a large proportion of the ward being economically inactive. The average annual household income is predominantly no income or between R0 – 9600.

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Thus the surrounding area is predominantly lower income settlement areas occupied by “previously disadvantaged” families.

The proposed project is unlikely to change the socio – economic structure of the wards. However, the labour intensive construction of roads and the utilization of the borrow pit may result in the creation of temporary employment, and will be of particular benefit should the local community be provided with these employment opportunities. The socio-economic benefits of these jobs could also percolate through historically disadvantaged communities. There are thus positive socio-economic impacts in terms of creation of employment opportunities, skills transfer to the local community and providing a higher quality of access to the surrounding residents.

11.9 Existing Land-use

The existing land use in the area of the borrow pit consists of settlement, rural homesteads and subsistence/rural agriculture and open space/natural areas.

Landuse practices have resulted in the degradation of the natural environment in places. The majority of the study area is communal/township allotment. The Department of Rural Development and Land Reform is the legal custodian of the land.

The utilisation of the borrow pit will not impact on any land uses and on closure will be rehabilitated and thus will not impede any landuses.

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12 Potential Issues & Environmental Impacts

The following have been identified as potential environmental impacts associated with the utilisation of the borrow pits. The significance of the identified impacts is assessed in Table 8.

12.1 Geology & Soils

During the construction and operational phase soil loss/topsoil loss may arise as a result of vegetation removal and soil erosion which could impact negatively. The topsoil is a particularly scarce resource in this environment, and must therefore be protected against wind, erosion, compaction, alien invasive plant species and pollution as the topsoil will be needed for rehabilitation purposes.

Activities such as the removal of vegetation and earth moving activities may result in erosion in the area of the proposed borrow pits. During the closure phase, areas disturbed during the operational phase which have not be appropriately rehabilitated, may result in the continued erosion of soils in the area of the proposed borrow pits. Appropriate erosion control must be provided and vegetation cover must be established as quickly as possible following shaping and closure of the sites in order to protect the soil from erosion.

During the construction and operational phases soil pollution as a result of spillages and loss of viability due to compaction may potentially impact negatively. Spillage of hazardous/ chemical substances stored and leakage from construction equipment/machinery as well as the servicing of vehicles on site, washing of vehicles (soaps & greases) etc may result in the contamination of soils. In addition spillage from chemical toilets provided for construction staff will result in soil pollution.

The borrow pits are not normally associated with blasting activities and should therefore not have a significant impact on the geology of the area.

12.2 Topography & Drainage

During the operational phase, the topography may be impacted upon by extensive excavation of sections during mining activities, thus potentially changing the landscape. However it must be noted that the landscape/topography is currently impacted by the past excavation/mining activities of these existing borrow pits. Rehabilitation during the closure phase would improve the topography/landscape from its current state.

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In addition, the excavation activities during the mining activities could in turn have an effect on the storm water runoff and drainage of the immediate surrounding areas.

12.3 Consumption of Non-renewable Resources

The mining activities during the operational phase may impact on the local and regional natural resources as soil and hard rock will be used during construction activities. The proposed quantities mined from the borrow pits can be seen as relatively low and should therefore not deplete local or regional resources significantly.

12.4 Surface Water/ Drainage lines

Surface water may become polluted via point source and/or diffuse discharge such as oil, fuel and chemical spills. Improper disposal of solid waste generated may pollute the aquatic environments. In addition, improper transportation and storage of fuels may potentially result in surface water pollution. Storage and maintenance of the construction machinery may potentially result in surface water pollution.

Construction & Operational activities may also lead to soil erosion, which could lead to sedimentation of the rivers, and subsequently, the water quality. This may lead to an impact on downstream biota of the river/stream. No new mining excavations will take place within 32 m of a water course.

If any surface water is to be abstracted for construction/operational/closure purposes then the contractor must obtain a permit from the Department of Water Affairs prior to any abstraction taking place.

12.5 Groundwater

Groundwater may also become polluted via point source and/or diffuse discharge such as oil, fuel and chemical spills. Petroleum products released to the environment migrate through soil via two general pathways, namely, as bulk flow infiltrating the soil under the forces of gravity and capillary action, and, as individual compounds separating from the bulk petroleum mixture and dissolving in air or water. As the products migrate through the soil column, a small amount of the product mass is retained by soil particles.

The bulk product retained by the soil particles is known as “residual saturation”, and depending upon the persistence of the products, residual saturation can potentially reside in the soil for years. Residual saturation is important as it determines the degree of soil contamination and can act as a continuing

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source of contamination for individual compounds to separate from the bulk product and migrate independently.

If any groundwater is to be abstracted for construction/operation/closure purposes then the contractor must obtain a permit from the Department of Water Affairs prior to any abstraction taking place.

If any groundwater is to be abstracted for construction/operational/closure purposes then the contractor must obtain a permit from the Department of Water Affairs prior to any abstraction taking place.

12.6 Vegetation Removal (Flora) and Habitat Disturbance

The loss of vegetation cover, loss of protected species, spread of alien invasive vegetation and loss of animal habitat during the construction and operational phases may impact negatively. However the borrow pits are existing, and therefore have been disturbed, with the borrow pits showing not more than 80% vegetation cover.

During the construction and operational phase as a result of vegetation clearing the permanent loss of indigenous vegetation will occur. However all construction and operation activities will be within the area already disturbed and where the vegetation to be removed is predominantly of a low sensitivity, thus the impact on indigenous vegetation will be minimal.

As a result of vegetation clearing for the utilisation of the proposed borrow pits, natural habitat may be lost. However all disturbance will be within the area of the existing borrow pit where the habitat has already been disturbed and is predominantly of low sensitivity.

During the construction and operational phase species of special concern (*Aloes*) identified at 348_BP03 may be lost as a result of permanent removal of indigenous vegetation. This impact is seen as minimal. In addition, aloes can be rescued for rehabilitation purposes or left in their current position. No species of special concern were identified within the mining footprint at the remaining borrow pits.

As a result of disturbance during the construction and operational phase, there may be increased risk of alien invasion. However during the construction and operational activities clearing of alien invasives from the proposed borrow pit areas will result in a positive impact. The presence of alien invasives is however low, <20%.

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In a regional context the vegetation units identified are Eastern Valley Bushveld and Bhisho Thornveld, both of which have been identified as being "Least Threatened". ECBCP identified that the borrow pits are located predominantly in a BLMC 2 – CBA 2 – Maintain Near Natural State. It must be noted that while the borrow pits are located in a CBA 2, the area has been disturbed as a result of the past activities/mining activities, thus the impact on the vegetation unit should be minimal.

Most impacts in the above respect are of minor significance and can be managed (i.e. through use of existing pathways and disturbed areas). No impacts of critical significance to the vegetation are present.

Rehabilitation should form an integral part of the post operational phase in order to avoid further soil erosion, vegetation removal and alien invasive weeds.

Mining activities may result in the disruption of habitat and thus disruption to fauna. Noisy construction activities and the increase in human activity on the site are likely to disturb resident faunal species and cause them to leave the area. Animals could also be killed by construction activities if they take cover in their nests in areas where mining activities are taking place and are then destroyed or covered by collapsed material. The construction and operational phase may also result in staff actively hunting, trapping and disrupting fauna. Mining activities will however be limited to the already transformed/disturbed area and therefore impact on fauna should be minimal. The significance of the various issues identified with regards to fauna is anticipated to be low. The surrounding area is disturbed by settlements.

12.7 Air Quality

The air quality may be impacted upon by the mining activities due to dust generation and fugitive emissions from operation, excavation & hauling vehicles. Air quality may be reduced as a result dust generation and emissions from construction vehicles and construction equipment, this impact however is short term.

12.8 Noise

The proposed mining activities will result in increased noise levels as a result of increased construction vehicles and equipment; however this will be restricted to working hours and is relatively short term.

12.9 Visual Impact

Borrow pit activities during the construction and operational phase may lead to dust and noise generation and vegetation removal and change in landform which could have a visual impact on the

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rural character of the area. This however is seen as a short term impact. Visual impact associated with the utilisation of the borrow pits will be more severe to the immediate residents than at distances further than 2 km where the visual impact should be minimal as the topography and the vegetation present should create a visual screen. Areas not rehabilitated and revegetated properly may become unsightly.

Visual impacted will be largely mitigated on closure. Rehabilitation of the existing borrow pits will ultimately improve the aesthetics of the area.

12.10 Archaeology, Palaeontology & Heritage Sites

An Archaeological Impact Assessment was conducted on the proposed borrow pits. Assessment of the borrow pits yielded no archaeological or heritage resources as defined and protected by the NHRA 1999. The palaeontological assessment revealed that:

- 348_BP05 contains calcritised casts of small sinuous invertebrate burrows.
- 348_BP06 comprised of interbedded greenish coarse to fine grained mudstone and fine purplish mudstone, from which samples of *Glossopteris* and c.f. *Phyllotheca* were collected by the Palaeontologist.

12.11 Land use

Impact of mining on existing landuse, where current landuse differs from the proposed mining operations, however the borrow pit is existing, and has therefore been disturbed/transformed. The borrow pits and surrounding areas are currently utilised for agricultural grazing or open land purposes, however the temporary loss is not considered significant. Landuse will be restored on closure. The borrow pits will be restored and rehabilitated on closure thereby enhancing the landuse capabilities.

12.12 Socio-Economic Environment

The project is unlikely to have any significant effects on the socio-economic structure of the area. However the local community could benefit through employment, income generation, skills development and small business enterprises (i.e. fencing companies). These benefits may be enhanced with focused procurement and by employing labour intensive methods during construction, operation and rehabilitation of the borrow pits. Labour should be sourced from the target area so that those affected stand to benefit the most.

The proposed project may impact positively by the creation of temporary employment opportunities to the local community. In addition, the employment of the local community would result in skills development which will impact positively.

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12.13 Health and Safety

During the construction/operational/closure phases there are certain risks posed to human health & safety via exposure to high noise and dust levels, as well as steep and/or unstable faces formed during mining activities. In addition, the use of heavy machinery in close proximity to households also poses a threat. Community health and safety risks should be controlled through the implementation of a Health & Safety Management Plan to be implemented by the contractor. Existing unsafe excavations (with vertical faces) should be "made safe" on closure.

13 Environmental Impact Significance Assessment and Mitigation Measures

13.1 Environmental Impact Risk Assessment Methodology

Environmental impact is assessed using an in-house methodology and software (EIA-RA 05 ©), developed by BESC, which operates a 3-D risk assessment protocol based on severity of impact, duration of impact and confidence of impact occurring.

The first step in assessing any environmental impact to listed possible activities or processes that are likely to occur and then identify any resultant or consequential environmental issue. The potential impact associated with an environmental issue is then identified as is the spatial range that any such impact would effect or take place in. The assessment is undertaken under two primary conditions, namely:

- Degree of impact WITHOUT environmental management protocols in place
- Degree of impact WITH environmental management protocols in place

To achieve this, information on severity of impact, duration of impact and confidence of impact occurring are entered, with a risk assessment output for each environmental impact being computed. The environmental impacts are thus categorised into ten negative impact categories and a four positive impact categories.

The ten negative categories are arranged on a scale of importance from category 1 being most negative and category 10 being least negative. Whilst the positive impact categories are arranged on a similar scale whereas category A is most positive and category D being least positive. In order to place a degree of significance to each impact (positive and negative), significance of impact has been defined as (Table 7).

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Table 7: EIA-RA 05© - Risk Assessment Ratings.

Significance	Categories	Definition
Very High	1 & 2	These impacts would be considered by society as constituting a major and usually permanent change to the (natural and/or social) environment. o **Example**: The loss of a species would be viewed by informed society as being of VERY HIGH significance.
High	3 & 4	These impacts will usually result in long term effects on the social and/or natural environment. Impacts rated as HIGH will need to be considered by society as constituting an important and usually long term change to the (natural and/or social) environment. Society would probably view these impacts in a serious light. o **Example:** The loss of a diverse vegetation type, which is fairly common elsewhere, would have a significance rating of HIGH over the long term, as the area could be rehabilitated.
Moderate	5, 6 & 7	These impacts will usually result in medium to long term effects on the social and/or natural environment. Impacts rated as MODERATE will need to be considered by society as constituting a fairly important and usually medium term change to the (natural and/or social) environment. o **Example:** The loss of a sparse, open vegetation type of low diversity may be regarded as MODERATELY significant.
Low	8, 9 & 10	These impacts will usually result in medium to short term effects on the social and/or natural environment. Impacts rated as LOW will need to be considered by the public and/or the specialist as constituting a fairly unimportant and usually short term change to the (natural and/or social) environment. These impacts are not substantial and are likely to have little real effect. o **Example:** The temporary change in the water table of a wetland habitat, as these systems are adapted to fluctuating water levels. or, There are no primary or secondary effects at all that are important to scientists or the public. o **Example:** A change to the geology of a particular formation may be regarded as severe from a geological perspective, but is of NO significance in the overall context.
Positive	A, B, C, D	Any beneficial impact to the environment: A = Very Beneficial o **Example:** Protection of an environmental asset or removal of an existing/latent negative environmental impact; B = Beneficial o **Example:** Improve management of the environment; C = Moderately Beneficial o **Example:** Removal of alien species from the property; D = Slightly Beneficial o **Example:** Minor improvement that has no material significance to the immediate environment.

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13.2 Sensitivity

An overall sensitivity assessment will be made to include condition or state of degradation, invasion status, extent and relative importance of the vegetation types as well as the degree to which successful rehabilitation can take place. Three sensitivity scores are allocated as follows:

1. Areas scoring a low sensitivity are those areas that tend to be highly degraded and it is unlikely that they could be rehabilitated to a normal functioning state without extreme effort and expense.
2. Areas of moderate sensitivity are those areas that contain reasonably intact habitat with low or no alien infestation.
3. Areas scoring a high sensitivity on site are those having an important ecological function.

13.3 Impacts

Four factors need to be considered when assessing the significance of impacts, namely:

A. the relationship of the impact to temporal scales
B. the relationship of the impact to spatial scales
C. the actual significance of the impact, and
D. the probability of the event occurring

A. The **temporal scale** defines the significance of the impact at various time scales, as an indication of the duration of the impact.

1. **Short term:** less than 5 years. Many construction phase impacts will be of a short duration.
2. **Medium term:** between 5-20 years, the approximate duration of the mining operation.
3. **Long term:** between 20-40 years, and from a human perspective essentially permanent.
4. **Permanent**: over 40 years, and resulting in a permanent and lasting change that will always be there.

B. The **spatial scale** defines physical extent of the impact.

1. **Site**: having an impact only within the confined of the development.
2. **Local**: having an impact within the local area of the development.
3. **Municipal**: having an impact within the municipal area (i.e. the Mnquma & Mbhashe Local Municipality)
4. **Regional**: having an impact within the regional context (Eastern Cape)
5. **National:** having an impact at the National Level (South Africa)

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C. The **Environmental Significance** scale is an attempt to evaluate the importance of a particular impact. This evaluation needs to be undertaken in the relevant context, as an impact can either be ecological or social, or both. The evaluation of the significance of an impact relies heavily on the values of the person making the judgment. For this reason, impacts of especially a social nature need to reflect the values of the affected society. SIGNIFICANCE will need to be evaluated with and without mitigation. In many cases, mitigation will take place, as it will have been incorporated into project design. A five-point significance scale has been applied (Table 7).

D. It is also necessary to state the **probability** with which the likelihood of the event/impact will occur.
   1. **Definite:** More than 90% sure of a particular fact. To use this one will need to have substantial supportive data.
   2. **Probable:** Over 70% likelihood of that impact occurring.
   3. **Possible:** Only over 40% likelihood of an impact occurring.
   4. **Unsure:** Less than 40% likelihood of an impact occurring.

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Table 8: Assessment of Significance of Environmental Impacts.

ASSESSMENT				PRIOR TO MITIGATION					POST MITIGATION					
Environmental Issue	Environmental Impact	Positive or Negative	Phase	Spatial	Severity	Duration	Probability	Significance Assessment	Mitigation Measures	Spatial	Severity	Duration	Probability	Significance Assessment
Geology & Soils	Soil Erosion	Negative	Construction, Operational & Closure	Site Specific	3	4	2	High	Minimise the areas of disturbance or vegetation clearance. Revegetate areas that have been disturbed as soon as possible. Cut and fill slopes shall be made stable and be revegetated as soon as possible during the operational phase.	Site Specific	5	4	2	Moderate
Geology & Soils	Soil Pollution	Negative	Construction & Operational	Site Specific	5	4	2	Moderate	Under no circumstances shall hazardous substances be disposed of on site or into the surrounding environment. Accidental pollution incidents shall be reported to the Project Manager/ECO immediately and shall be cleaned up by the Contractor or a nominated clean-up organisation at the expense of the contractor. Vehicles should be well maintained. Chemical toilets are to be emptied on a regular basis and disposed of at the licensed water treatment facility	Site Specific	5	4	4	Low
Geology & Soils	Soil Compaction	Negative	Construction, Operational & Closure	Site Specific	5	4	2	Moderate	Minimise the areas of disturbance or vegetation clearance. Scarify & Revegetate areas that have been compacted as soon as possible.	Site Specific	5	7	5	Low
Geology & Soils	Topsoil Loss	Negative	Construction, Operational & Closure	Local	3	4	3	Moderate	Minimise the areas of disturbance or vegetation clearance. Topsoil to be stockpiled in designated areas and is to be used during rehabilitation. Topsoil only to be stripped from required areas and done in a way to minimize wind erosion. Stockpiles must be protected from erosion and contamination	Site Specific	5	4	3	Low
Topography & Drainage	Cut & Fill/Excavations	Negative	Construction & Operational	Site Specific	5	3	4	Low	Cut and fill slopes/Excavations shall be made stable and be revegetated as soon as possible	Site Specific	7	6	4	Low

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ASSESSMENT				PRIOR TO MITIGATION					POST MITIGATION					
Environmental Issue	Environmental Impact	Positive or Negative	Phase	Spatial	Severity	Duration	Probability	Significance Assessment	Mitigation Measures	Spatial	Severity	Duration	Probability	Significance Assessment
Topography & Drainage	Increased Stormwater Runoff	Negative	Construction & Operational	Site Specific	5	8	3	Low	All areas of stormwater release must be suitable stabilzed	Site Specific	8	9	5	Low
Topography & Drainage	Increased Soil Erosion	Negative	Construction & Operational	Site Specific	3	4	2	High	Minimise the areas of disturbance or vegetation clearance. Revegetate areas that have been disturbed as soon as possible. Cut and fill slopes/Excavations shall be made stable and be revegetated as soon as possible during the construction phase.	Site Specific	5	7	4	Low
Non-renewable Resources	Consumption of Non-renewable Resource	Negative	Operational	Municipal	3	2	3	High	The proposed quantities mined should not exceed limits specified in the mining plans/permits issued by DMR	Local	5	4	2	Moderate
Non-renewable Resources	Material Resources for roads not imported from far off distances	Positive	Operational	Municipal	5	5	2	Low	No Mitigation Required	N/A				#N/A
Surface Water	Surface water contamination	Negative	Construction & Operational	Local	4	5	5	Low	Areas of spillages and/or contamination shall be cleaned up immediately and disposed of at a licensed landfill site. Release of chemicals directly into the environment is strictly prohibited. Waste is to be removed from the area on a regular basis.	Site Specific	8	5	8	Low
Surface Water	Sedimentation	Negative	Construction & Operational	Local	3	4	3	Moderate	Minimise the areas of disturbance or vegetation clearance. Revegetate areas that have been disturbed as soon as possible. Cut and fill slopes/excavations shall be made stable and be revegetated as soon as possible during the construction phase. A stormwater cut-off berm shall be provided upslope from the mining areas. Gabions shall be provided at stormwater release areas	Site Specific	4	5	5	Low

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ASSESSMENT				PRIOR TO MITIGATION					POST MITIGATION					
Environmental Issue	Environmental Impact	Positive or Negative	Phase	Spatial	Severity	Duration	Probability	Significance Assessment	Mitigation Measures	Spatial	Severity	Duration	Probability	Significance Assessment
Surface Water	Decreased water quality	Negative	Construction & Operational	Local	5	6	5	Low	A stormwater cut-off berm shall be provided upslope from the mining areas. Gabions shall be provided at stormwater release areas	Site Specific	8	5	8	Low
Surface Water	Decrease in Benthic microalgae	Negative	Construction & Operational	Local	5	6	5	Low	A stormwater cut-off berm shall be provided upslope from the mining areas. Gabions shall be provided at stormwater release areas	Site Specific	8	5	8	Low
Surface Water	Decrease in Submerged macrophytes	Negative	Construction & Operational	Local	5	6	5	Low	A stormwater cut-off berm shall be provided upslope from the mining areas. Gabions shall be provided at stormwater release areas	Site Specific	8	5	8	Low
Surface Water	Decraese in Macrobenthos	Negative	Construction & Operational	Local	5	6	5	Low	A stormwater cut-off berm shall be provided upslope from the mining areas. Gabions shall be provided at stormwater release areas	Site Specific	8	5	8	Low
Surface Water	Change in fish community structure	Negative	Construction & Operational	Local	5	6	5	Low	A stormwater cut-off berm shall be provided upslope from the mining areas. Gabions shall be provided at stormwater release areas	Site Specific	8	5	8	Low
Surface Water	Surface water abstraction	Negative	Operational	Local	3	5	2	Moderate	Applications for a water use license must be made in terms of the National Water Act, (Act 36 of 1998). Conditions contained in the approval(s) must be strictly adhered to. Abstraction rates should not exceed those specified in the water use license	Local	4	5	4	Low
Groundwater	Groundwater contamination	Negative	Construction & Operational	Local	4	3	3	Moderate	Areas of spillages and/or contamination shall be cleaned up immediately and disposed of at a licensed landfill site	Site Specific	5	4	5	Low

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ASSESSMENT				PRIOR TO MITIGATION					POST MITIGATION					
Environmental Issue	Environmental Impact	Positive or Negative	Phase	Spatial	Severity	Duration	Probability	Significance Assessment	Mitigation Measures	Spatial	Severity	Duration	Probability	Significance Assessment
Groundwater	Groundwater abstraction	Negative	Operational	Local	3	5	2	Moderate	Applications for a water use license must be made in terms of the National Water Act, (Act 36 of 1998). Conditions contained in the approval(s) must be strictly adhered to. Abstraction rates should not exceed those specified in the water use license	Local	4	5	4	Low
Vegetation and Habitat	Loss of indigenous vegetation	Negative	Construction & Operational	Local	3	4	3	Moderate	Minimise the areas of disturbance or vegetation clearance. Revegetate areas that have been disturbed as soon as possible.	Site Specific	6	5	5	Low
Vegetation and Habitat	Disturbance of habitat	Negative	Construction & Operational	Site Specific	5	4	3	Low	Minimise the areas of disturbance or vegetation clearance. Revegetate areas that have been disturbed as soon as possible. No hunting/trapping of any animals is strictly forbidden.	Site Specific	8	8	5	Low
Vegetation and Habitat	Alien Invasive Plant Species	Negative	Construction, Operational & Closure	Local	3	4	3	Moderate	All alien invasive plant species should be removed accoring to the Conservation of Agricultural Resources Act.	Site Specific	5	7	8	Low
Vegetation and Habitat	Removal of alien invasive species	Positive	Construction, Operational & Closure	Local	7	5	5	Low	No Mitigation Required	N/A				#N/A
Air Quality	Dust Generation	Negative	Construction & Operational	Local	3	5	2	Moderate	Avoid dust generating activities during periods of medium to high winds. Cover and/or maintain appropriate freeboard on trucks hauling any lose material that could produce dust when travelling. Limit the areas that need to be cleared of vegetation. Revegetate disturbed areas as soon as possible after clearing.	Site Specific	4	5	3	Low
Air Quality	Fugitive Emissions	Negative	Construction & Operational	Site Specific	8	8	3	Low	Vehicles should be properly maintained and serviced.	Site Specific	8	8	5	Low

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ASSESSMENT				PRIOR TO MITIGATION					POST MITIGATION					
Environmental Issue	Environmental Impact	Positive or Negative	Phase	Spatial	Severity	Duration	Probability	Significance Assessment	Mitigation Measures	Spatial	Severity	Duration	Probability	Significance Assessment
Noise	Noise Pollution	Negative	Construction & Operational	Local	3	5	2	Moderate	All noise sources shall be controlled at the source; Vehicle silencers should be in good working order and should be maintained. No construction/operational work should be done after working hours or on Sundays and Public Holidays.	Local	4	5	3	Low
Visual	Change in Sense of Place	Negative	Construction, Operational & Closure	Local	3	2	3	High	Borrow Pits are to be rehabilitated to represent the former habitat/surrounding land use character.	Local	5	4	6	Low
Visual	Decreased Visual Quality	Negative	Construction, Operational & Closure	Local	4	2	4	Moderate	Protect and maintain the vegetated slopes as a natural screen. Ensure that any signage (i.e. at entrance gate of construction camp site) is visible but not visually intrusive. Ensure good housekeeping at the construction campsite and control litter and general site cleanliness. Ensure that adequate ablution facilities are in place, that the workforce utilises these facilities and that they are placed where they are not visible to the public.	Local	8	5	6	Low
Visual	Rehabilitation of existing borrow pits	Positive	Closure	Local	4	4	2	Moderate	No Mitigation Required	N/A				#N/A

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ASSESSMENT				PRIOR TO MITIGATION					POST MITIGATION					
Environmental Issue	Environmental Impact	Positive or Negative	Phase	Spatial	Severity	Duration	Probability	Significance Assessment	Mitigation Measures	Spatial	Severity	Duration	Probability	Significance Assessment
Archaeology, Palaeontology & Heritage Sites	Disturbance of sites	Negative	Construction & Operational	Local	4	3	3	Moderate	All finds of human remains shall be reported to the nearest police station. Human remains from the graves of victims of conflict, or any burial ground or part thereof which contains such graves and any other graves that are deemed to be of cultural significance may not be destroyed, damaged, altered, exhumed or removed from their original positions without a permit from the South African Heritage and Resource Agency (SAHRA) Work in areas where artefacts are found shall cease immediately and SAHRA notified. Under no circumstances shall the Contractor, employees, subcontractors or subcontractors' employees remove, destroy or interfere with archaeological artefacts. The Archaeological Assessment identified that there were no sites of importance located at the borrow pits. A palaeontologist is required to visit 348_BP06, 348_BP05 & 348_BP04 near Willowvale shortly after removal of aggregate is resumed. In addition the borrow pits containing sedimentary rocks should be resurveyed by a palaeontologist at the end of excavations and prior to any form of rehabilitation. All recommendations from SAHRA's A&PRC must be implemented.	Local	8	6	7	Low

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ASSESSMENT				PRIOR TO MITIGATION					POST MITIGATION					
Environmental Issue	Environmental Impact	Positive or Negative	Phase	Spatial	Severity	Duration	Probability	Significance Assessment	Mitigation Measures	Spatial	Severity	Duration	Probability	Significance Assessment
Archaeology, Palaeontology & Heritage Sites	Loss of sites	Negative	Construction & Operational	Local	3	3	2	High	All finds of human remains shall be reported to the nearest police station. Human remains from the graves of victims of conflict, or any burial ground or part thereof which contains such graves and any other graves that are deemed to be of cultural significance may not be destroyed, damaged, altered, exhumed or removed from their original positions without a permit from the South African Heritage and Resource Agency (SAHRA) Work in areas where artefacts are found shall cease immediately and SAHRA notified. Under no circumstances shall the Contractor, employees, subcontractors or subcontractors' employees remove, destroy or interfere with archaeological artefacts. The Archaeological Assessment identified that there were no sites of importance located at the borrow pits. A palaeontologist is required to visit 348_BP06, 348_BP05 & 348_BP04 near Willowvale shortly after removal of aggregate is resumed. In addition the borrow pits containing sedimentary rocks should be resurveyed by a palaeontologist at the end of excavations and prior to any form of rehabilitation. All recommendations from SAHRA's A&PRC must be implemented.	Local	5	6	7	Low
Archaeology, Palaeontology & Heritage Sites	Discovery of new/buried sites	Positive	Construction & Operational	Municipal	2	3	5	Moderate	No Mitigation Required	N/A				#N/A
Land Use	Change in land use	Negative	Construction, Operational & Closure	Local	3	3	4	Moderate	Borrow Pit is to be rehabilitated to represent the former habitat/surrounding land use character.	Local	8	4	8	Low

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ASSESSMENT				PRIOR TO MITIGATION					POST MITIGATION					
Environmental Issue	Environmental Impact	Positive or Negative	Phase	Spatial	Severity	Duration	Probability	Significance Assessment	Mitigation Measures	Spatial	Severity	Duration	Probability	Significance Assessment
Socio -Economic	Disturbance to rural character	Negative	Construction, Operational & Closure	Local	5	3	3	Low	Borrow Pit is to be rehabilitated to represent the former habitat/surrounding land use character.	Local	8	5	6	Low
Socio -Economic	Job Creation	Positive	Construction & Operational	Municipal	4	3	3	Moderate	No Mitigation Required	N/A				#N/A
Socio -Economic	Skills Development	Positive	Construction & Operational	Municipal	4	3	3	Moderate	No Mitigation Required	N/A				#N/A
Socio -Economic	Improved Road Quality	Positive	Operational	Municipal	4	3	3	Moderate	No Mitigation Required	N/A				
Socio -Economic	Safety Risk	Negative	Construction & Operational	Local	2	2	3	Very High	The mining area shall be fenced off and access to the site shall be restricted by means of a gate. All Occupational Health & Safety Standards shall be strictly adhered to. Excavations should be made safe prior to closure.	Site Specific	2	2	8	Moderate

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The No-Go Alternative

The “no-go” alternative simply involves leaving the sites in their current condition and not undertaking the proposed mining operations at the borrow pits. This means that the impacts identified as a result of the construction/operational phase would not occur, these being impacts related to vegetation removal, soil erosion and pollution, surface water, groundwater and terrestrial pollution, air quality and visual impacts. Although no negative environmental issues identified for the construction/operational phase would occur, the existing borrow pits would not be rehabilitated thus leaving them in their current visual state and without the use of these sources the financial feasibility to regravel/maintain the district road would be jeopardized, thus potentially resulting in the road remaining in a poor condition, and in all likelihood deteriorating further, resulting in further soil erosion and unsafe road conditions.

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14 Mitigatory Measures & Environmental Management

The guidelines, operating procedures and rehabilitation/pollution control requirements contained in this Environmental Management Plan will be binding on the holder of the mining permit permission after approval of the Environmental Management Plan by the Department of Mineral Resources. It is essential that this portion be carefully studied, understood, implemented and adhered to at all times. The mitigation measures which will apply during the Site Establishment, Operation and Rehabilitation phases are provided in the following Sections.

14.1 Responsibilities of the Role Players

14.1.1 Developer

The Developer (Department of Roads and Public Works in this instance) remains ultimately responsible for ensuring that the activity is implemented according to the requirements of the EMP. Although the developer appoints specific role players to perform functions on his/her behalf, this responsibility is delegated. The developer is responsible for ensuring that sufficient resources (time, financial, human, equipment, etc.) are available to the other role players (e.g. the ECO, ELO and contractor) to efficiently perform their tasks in terms of the EMP. The developer is liable for restoring the environment in the event of negligence leading to damage to the environment. The developer shall ensure that the EMP is included in the tender documentation so that the contractor who is appointed is bound to the conditions of the EMP. The developer shall appoint an independent Environmental Control Officer (ECO) during the planning phase to oversee all the environmental aspects relating to the development.

14.1.2 Consulting Engineer

The Consulting Engineer, is bound to the EMP conditions through his/her contract with the developer, and is responsible for ensuring that she/he adheres to all the conditions of the EMP. The Consulting Engineer shall thoroughly familiarise him/herself with the EMP requirements before coming onto site and shall request clarification on any aspect of these documents, should they be unclear. The Consulting Engineer shall ensure that he/she has provided sufficient budget for complying with all EMP conditions at the tender stage. The Consulting Engineer shall comply with all orders (whether verbal or written) given by the ECO, Project Manager or DMR in terms of the EMP.

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14.1.3 Contractor

The Contractor, as the developer's agent on site, is bound to the EMP conditions through his/her contract with the developer, and is responsible for ensuring that she/he adheres to all the conditions of the EMP. The Contractor shall thoroughly familiarise him/herself with the EMP requirements before coming onto site and shall request clarification on any aspect of these documents, should they be unclear. The Contractor shall ensure that he/she has provided sufficient budget for complying with all EMP conditions at the tender stage. The Contractor shall comply with all orders (whether verbal or written) given by the ECO, Project Manager, Consulting Engineer or DMR in terms of the EMP.

The Department of Mineral Resources have reserved their rights to initiate criminal proceedings against the Consulting Engineer, contractor and/or any sub-contractors.

14.1.4 Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) is appointed by the developer as an independent monitor of the implementation of the EMP. He/she shall form part of the project team and shall be involved in all aspects of project planning that can influence environmental conditions on the site. The ECO shall attend relevant project meetings, conduct inspections to assess compliance with the EMP and be responsible for providing feedback on potential environmental problems associated with the development. In addition, the ECO is responsible for:

- Liaison with relevant authorities;
- Liaison with contractors regarding environmental management; and
- Undertaking routine monitoring and appointing a competent person/institution to be responsible for specialist monitoring, if necessary
- Has the authority to halt any activity or process related directly or indirectly to the project, which in the view of the ECO may have undue or significant impact the environment
- The ECO has the right to enter the site and undertake monitoring, auditing and assessment at any time.

The ECO shall be responsible for liaising with the DMR.

Monitoring of Compliance with the EMP

The ECO shall conduct internal monthly environmental audit reports for the applicant/developer and will supply quarterly audit reports to the authorities. These audit reports shall contain information on the contractor and developer's levels of compliance with the EMP. The audit report shall also include a

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description of the general state of the site, with specific reference to sensitive areas and any matters of non-compliance. The ECO is to suggest corrective action measures to eliminate the occurrence of the non-compliance incidents. In order to keep a record of any non-compliance, an Environmental Incident Record shall be kept.

An Environmental Control Officer (ECO) should be appointed prior to any mining activities commencing in order to ensure compliance with this Environmental Management Plan.

14.1.5 Environmental Liaison Officer (ELO)

The contractor shall appoint an Environmental Liaison Officer (ELO) to assist with day-to-day monitoring of the construction activities. Any issues raised by the ECO shall be routed to the ELO for the contractors' attention. The ELO shall be *permanently* on site during the construction phase to ensure daily environmental compliance with the EMP and shall be ideally be a senior member of the contractor's management team. The ECO shall be responsible for ensuring that all staff members are adequately trained and aware of the EMP. The ELO shall be responsible for undertaking weekly environmental inspections (according to the criteria specified in the EMP), and accompany the ECO during site visits, audits or assessments.

The ECO shall be notified of this appointment and furnished with the contact details of the ELO.

14.2 General Requirements

14.2.1 Mining Plans

- A copy of the mining plan shall be available at the mining site for scrutiny when required.
- A final layout plan must be submitted at closure of the mine or when operations have ceased.

14.2.2 Demarcating the mining area

- The mining area must be clearly demarcated by means of beacons at its corners and by fencing off the mining area.
- Permanent beacons as indicated on the mining plans must be firmly erected and maintained in their correct position throughout the life of the operation.
- Mining operations shall only take place within this demarcated area.
- Mining is to take place according to the proposed mine development plans. Mined out areas are to be used as spoil site thereby facilitating rehabilitation.

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14.3 Infrastructural Requirements

14.3.1 Topsoil Management

- Stripping of topsoil shall be undertaken in such a manner as to minimise erosion by wind or runoff.
- Topsoil shall be stripped to a depth not exceeding 300 mm from the original ground level unless otherwise specified by the Project Manager in consultation with ECO.
- Areas from which the topsoil is to be removed shall be cleared of any foreign material which may come to form part of the topsoil during removal including bricks, rubble, any waste material, litter, excess vegetation and any other material which could reduce the quality of the topsoil.
- The Contractor shall ensure that subsoil and topsoil are not mixed during stripping, excavation, reinstatement and rehabilitation. If mixed with sub-soil the usefulness of the topsoil for rehabilitation of the site shall be lost.
- The topsoil stockpiles shall be clearly demarcated with appropriate signage.
- Topsoil should under no circumstances be used to create diversion berms or for general erosion control measures.
- Soils should be exposed for the minimum time possible once cleared.
- Topsoil shall be temporarily stockpiled, separately from subsoil and rocky materials.
- Topsoil shall be stockpiled in the Top Soil designated storage areas.
- Soil shall not be stockpiled near drainage lines, watercourses or on steep slopes.
- The topsoil removed, shall be stored in a bund wall on the high ground side of the mining area outside the 1:50 flood level within the boundaries of the mining area/ prospecting.
- Topsoil shall not be used for building or maintenance of access roads.
- The topsoil stored in the bund wall shall be adequately protected from being blown away or being eroded.
- Stockpiles shall either be vegetated with indigenous grasses or covered by a suitable fabric to prevent erosion and invasion of weeds.
- Stockpiled topsoil shall not be compacted.
- Topsoil shall be used for rehabilitation of disturbed areas only.

14.3.1.1 Topsoil stripping

- Prior to the stripping of topsoil, as much as possible of the aboveground grass layer shall be removed and stockpiled. This is to be placed on top of the topsoil once the topsoil has been replaced and shall be stored separately from the topsoil. The purpose of using this vegetation material is that it contains grass seed and would therefore assist with re-establishment of the indigenous grasses that naturally occur in the area. Aside from this, the grass covering of the soil

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would also assist in preventing erosion prior to the re-establishment of a dense vegetation covering. Should insufficient grass covering be available to cover the soil, grass cuttings must be obtained from areas of natural grassland in the immediate vicinity of the particular area, with the consent of the affected landowner, or hydroseeding must be conducted.

- Topsoil shall be stripped from all areas that are to be utilised during the mining period and where permanent structures and access' is required. Topsoil shall be stripped after clearing of vegetation and before excavation commences.
- While topsoil is being stripped, it should be scanned for the presence of bulbous plants. Should bulbous plants be detected, they shall be removed from the topsoil and an ecologist shall be contacted to provide advice on suitable habitats and methods for replanting.
- The topsoil is regarded as the top 300mm of the soil profile, unless there is a clearer shallower boundary between the topsoil and subsoil indicated by texture, colour or structure.
- No topsoil which has been stripped shall be buried or in any other way be rendered unsuitable for further use by mixing with spoil or by compaction using machinery.
- Topsoil shall preferably be stripped when it is in a dry condition in order to prevent compaction.

14.3.1.2 Soil stockpiling

- Stripped topsoil shall be stockpiled in areas, which have been approved by the ECO.
- Topsoil stripped from different soil zones shall be stockpiled separately and clearly identified as such.
- Soil stockpiles shall not be higher than 2.5m or stored for a period longer than one month. The slopes of soil stockpiles shall not be steeper than 1 vertical to 5 horizontal.
- No vehicles shall be allowed access onto the stockpiles after they have been placed. Topsoil stockpiles shall be clearly demarcated in order to prevent vehicle access and for later identification when required.
- Soil stockpiles shall not be allowed to become contaminated with oil, diesel, petrol, litter or any other material that may later inhibit the growth of vegetation in the soil.
- After topsoil removal has been completed, the Contractor shall apply soil conservation measures to the stockpiles where and as directed by the Environmental Control Officer. This may include the use of erosion control fabric or grass seeding.

14.3.2 Access to the Borrow Pit Sites

14.3.2.1 Establishment of Access Roads

- The access road to the mining areas and the camp-site/site office must be via existing access roads/ jeep tracks.

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- Should a portion of the access road be upgraded or newly constructed the following must be adhered to:
  - The route shall be selected that a minimum number of bushes or trees are felled and existing fence lines shall be followed as far as possible.
  - Water courses and steep gradients shall be avoided as far as is practicable.
  - Adequate drainage and erosion protection in the form of cut-off berms or trenches shall be provided where necessary.
- No other routes will be used by vehicles or personnel for the purpose of gaining access to the site.

14.3.2.2 Maintenance of Access Roads

- The maintenance of access roads will be the responsibility of the holder of the mining permit.
- Newly upgraded access roads shall be adequately maintained so as to minimize dust, soil erosion or undue surface damage (i.e. adequate storm water control).

14.3.2.3 Dust control on the access and haul roads

- The liberation of dust into the surrounding environment shall be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents.
- The speed of haul trucks and other vehicles must be strictly controlled to avoid dangerous conditions, excessive dust generation or excessive deterioration of the road being used.
- A freeboard of 0.5m shall be maintained by haul trucks. The load should also be covered during travel in order to avoid loss of material and dust generation.

14.3.2.4 Rehabilitation of access roads

- Whenever a mining permit is suspended, cancelled or abandoned or if it lapses and the holder does not wish to renew the permit or right, any access road or portions thereof, constructed by the holder and which will no longer be required by the landowner/tenant, shall be removed and/or rehabilitated in order to represent the former habitat.
- Any gate or fence erected by the holder which is not required by the landowner/tenant, shall be removed and the situation restored to the pre mining situation.
- Roads shall be ripped or ploughed, and if necessary, appropriately fertilized to ensure the regrowth of vegetation. Imported road construction materials which may hamper regrowth of vegetation must be removed and disposed of in an approved manner prior to rehabilitation.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the ECO may require that the soil be analyzed and any deleterious effects on the soil arising

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from the mining operation be corrected and the area be seeded with a seed mix to the ECO specification.

14.3.3 Office/Camp Sites

14.3.3.1 Establishing Office/Camp Sites

- Should any office/ camp sites be established, these are to be established within the boundaries of the mining area.
- No camp or office site shall be located closer than 100 meters from a stream, river, spring, dam or pan.
- The area chosen for these purposes shall be the minimum reasonably required in order to remove as little vegetation as possible.
- Topsoil shall be handled as described in this EMP. This topsoil is to be used for rehabilitation of the area once the office/camp sites have been removed.
- Only gas cooking facilities shall be allowed for purposes of making food. No open fires shall be allowed.
- Lighting and noise disturbance or any other form of disturbance that may have an effect on the public living in the vicinity shall be kept to a minimum by avoiding work after hours.

14.3.3.2 Toilet facilities, waste water and refuse disposal

- The contractor shall provide suitable ablution facilities for employees and proper hygiene measures shall be established.
- Chemical toilet facilities are to be used and sited on the camp site at least 100 meters away from any river/stream/watercourse. The construction of “long drop” toilets is forbidden. Under no circumstances may open areas or the surrounding bush be used as a toilet facility. A minimum of 1 toilet per 20 persons must be provided. Chemical Toilets should be emptied on a regular basis and the contents disposed of at a licensed sewage treatment works.
- All temporary / portable toilets shall be secured to the ground to prevent them toppling due to wind or any other cause. The Contractor shall ensure that no spillage occurs when the toilets are cleaned, or emptied, and that the contents are properly stored and removed from Site. Discharge of waste from toilets into the environment, and burial of waste, is strictly prohibited.
- All effluent water from the camp washing facility shall be disposed of in a properly constructed French drain, situated as far as possible, but not less than 200 meters, from any stream, river, pan, dam or borehole.
- Only domestic type wash water shall be allowed to enter this drain and any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed

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from the site for appropriate disposal at a licensed disposal facility. Records of safe disposal shall be kept on site and presented to the ECO.

- Spills should be cleaned up immediately to the satisfaction of the ECO by removing the spillage together with the polluted soil and by disposing of them at a licensed waste disposal facility.
- Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., shall be stored in a container at a collecting point and collected on a regular basis and disposed of at a licensed waste disposal facility.
- All other waste shall also be removed from site on a regular basis and disposed of at a licensed waste disposal facility.
- Waste containers shall be provided with lids or netting to prevent waste from being disturbed by scavengers or being blown away by wind.
- Specific precautions shall be taken to prevent refuse from being dumped on or in the vicinity of the camp site. This could include environmental awareness training and the provision of a suitable number of refuse bins.
- No burning of refuse is to take place on site.
- Materials shall be appropriately secured to ensure safe passage between destinations. Loads including, but not limited to sand, fine vegetation, refuse and paper shall have appropriate cover to prevent them spilling from the vehicle during transit. The Contractor shall be responsible for any clean-up resulting from the failure of his employees, or suppliers, to properly secure transported materials.

14.3.3.3 Rehabilitation of the office/camp site

- When the mining permit lapses, is cancelled or is abandoned or when any prospecting or mining operation comes to an end, the holder of any such right or permit may not demolish or remove any building, structure, object -
  - which may not be demolished in terms of any other law;
  - which has been identified in writing by the Minister; or
  - which is to be retained in terms of an agreement between the holder and the owner or occupier of the land, which agreement has been approved by the Minister in writing.
- Where office/camp sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
- Areas containing French drains shall be compacted and covered with a final layer of topsoil to a height of 10cm above the surrounding ground surface in order to allow for the settling of the soil.
- The site shall be seeded with an indigenous grass seed mix.

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- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the ECO may require that the soil be analyzed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a seed mix to the ECO specification.
- Photographs of the camp and office sites, before, during and after the mining operations shall be taken by the ECO and/or ELO at selected fixed points and kept on record.

14.3.4 Maintenance Yard & Storage Areas

14.3.4.1 Establishing the vehicle maintenance yard and secured storage areas

- Should a vehicle maintenance yard be required, this vehicle maintenance yard and secured storage areas shall not be located closer than 100 meters from any stream, river, spring, dam or pan, and shall be within the boundaries of the mining area.
- The areas chosen for these purposes shall be the minimum reasonably required and involve the least disturbance to vegetation.
- Topsoil shall be removed from these areas and handled as described in this EMP.
- The vehicle maintenance yard and secured storage areas shall be constructed of impermeable material and bunded.
- Runoff from vehicle maintenance yards and secured storage areas shall be contained on site in a suitable receptacle and removed for appropriate disposal at a licensed waste disposal facility. The receptacle shall be emptied when 75% full. Records of safe disposal shall be kept on site and presented to the ECO.
- Store all materials defined as hazardous within a bunded and secure area (>50L).
- The floor and bund walls should be impervious to the material stored and should be capable of containing 110% of the total volume of hazardous substance stored.
- Fuel or lubricant tanks shall be secured and provided with collision protection.
- Valves shall be locked when not in use, and shall be protected from vandalism and unauthorized use.
- Valves shall be within the confines of the bunded/impervious areas.
- Small quantities of hazardous substances (50L or less) shall be stored in appropriate containers within a secure storage area.
- Base of the storage area shall be impervious and so designed as to ensure that the hazardous substances do not infiltrate into the soil.
- Used fuels, oils, hydraulic fluids, paints and solvents and grease shall be stored in drums or other suitable containers. Care shall be taken to avoid ingress of rain water into containers.
- Once the containers are full then they shall be labeled, sealed and removed from the site to a licensed waste disposal site.

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- The relevant Material Safety Data Sheets (MSDS) shall be available on Site. Procedures detailed in the MSDSs shall be followed in the event of an emergency situation.
- Provide collection systems (i.e. trays or impervious linings) under machinery or equipment that may dispense hazardous substances (i.e. generators and pumps).

14.3.4.2 Maintenance of vehicles and equipment

- The maintenance of vehicles and equipment used for any purpose shall take place only in the maintenance yard areas provided.
- The maintenance yard areas shall be fully contained and impervious.
- Runoff from the maintenance yard areas shall be collected and contained on site in a suitable receptacle and removed for appropriate disposal at a licensed waste disposal facility. The receptacle shall be emptied when 75% full. Records of safe disposal shall be kept on site and presented to the ECO.
- Equipment used in the mining/ process must be adequately maintained so that during operations it does not spill oil, diesel, fuel, or hydraulic fluid.
- Machinery or equipment used on the mining area must not constitute a pollution hazard. The ECO shall order such equipment to be repaired or withdrawn from use if he or she considers the equipment or machinery to be polluting and irreparable.
- The washing of equipment and vehicles shall be restricted to urgent or preventative maintenance requirements only. All washing shall be undertaken in a wash bay area which must be equipped with a suitable impermeable floor and sump / oil trap.

14.3.4.3 Waste disposal

- Suitable waste disposal containers shall be made available at all times and conveniently placed for the disposal of waste.
- Collected waste shall be separated into the different categories of hazardous, general waste and construction rubble.
- Separate waste containers for the different waste categories shall be provided and located in the maintenance areas.
- Containers shall be easily distinguishable (i.e. different colors etc)
- Waste containers shall be provided with lids or netting to prevent waste from being disturbed by scavengers or being blown away by wind.
- Waste shall be removed from site on a regular basis.

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- All used oils, grease or hydraulic fluids shall be placed therein and these receptacles will be removed from the site on a regular basis for disposal at a registered or licensed waste disposal facility. Records of safe disposal shall be kept on site and presented to the ECO.
- All spills should be cleaned up immediately to the satisfaction of the ECO by removing the spillage together with the polluted soil and by disposing of them at a licensed waste disposal facility

14.3.4.4 Rehabilitation of vehicle maintenance yard and secured storages areas.

- On completion of mining operations, the above areas shall be cleared of any contaminated soil, which must be disposed of at a licensed waste disposal facility. Records of safe disposal shall be kept on site and presented to the ECO.
- All buildings, structures or objects on the vehicle maintenance yard and secured storage areas shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002.
- The surface shall be ripped or ploughed to a depth of at least 300mm and topsoil previously removed from these areas shall be spread evenly to its original depth over the whole area.
- The area shall then be fertilized if necessary in order to assist re-establishment of the vegetation and then be seeded with an indigenous grass seed mix.

14.4 Operational Procedures

14.4.1 Limitations on mining

- Mining shall be limited to the areas indicated on the mining plans for each individual borrow pit.
- The contractor shall ensure that operations take place only in the demarcated areas.
- New mining excavations will not be conducted within 32 m of a drainage line.
- Security must be put in place to prevent unauthorised access to the site.
- The entire mining area is to be fenced.
- Appropriate warning signage is to be erected around the mining area.

14.4.2 Water Use License

- If any surface or groundwater abstraction is needed then applications for a water use license must be made in terms of the National Water Act, (Act 36 of 1998)
- Approval(s) must be granted by the Department of Water Affairs prior to any abstraction taking place.
- Conditions contained in the approval(s) must be strictly adhered to.
- The appropriate license forms for each kind of expected water use should be completed together with supporting documentation.

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14.4.3 Excavations

Whenever any excavation is undertaken the following operating procedures shall be adhered to:

- Topsoil shall, in all cases be handled as described in this EMP.
- Excavations shall take place only within the approved demarcated mining area as indicated in the mining plans.
- Overburden rocks and coarse material shall be placed concurrently in the excavations or stored adjacent to the excavation, if practicable, to be used as backfill material once mining operations have ceased.
- Trenches shall be backfilled as soon as possible.
- Areas of expected increased surface runoff along the down-slope borders of the excavation areas (i.e. areas natural runoff may be concentrated) shall be suitable stabilized using gabions and/or rock material. These areas shall be maintained until the borrow pits have been fully rehabilitated.
- Where blasting may be required, the appropriate measures and blasting permits in terms of Explosives Act and Occupation Health and Safety Act (Regulations) must be undertaken.

14.4.4 Rehabilitation of excavation areas

The following operating procedures shall be adhered to during the rehabilitation of excavation areas:

- The excavated area must serve as a final depositing rocks and coarse material not used in the road construction.
- Waste material (general waste, litter, etc) shall not be deposited in the excavations.
- Once excavations have been refilled and profiled with acceptable contours and erosion control measures, the topsoil previously removed shall be returned to form a layer no less than 50mm. If insufficient topsoil is available, then it must be imported from elsewhere is such material is available.
- The area shall be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with an indigenous grass seed mix in order to propagate the locally or regionally occurring vegetation.
- Near vertical slopes (1:1 to 1:2) must be stabilized using natural rock wall structures constructed using conventional building methods or in forms with slurry forced between the structures. All structures must have a 'natural' look and facilities for plants to grow in.
- All areas where the slopes are 1.3 to 1:6 must be logged or otherwise stepped (using stabilization cylinders or similar) in order to prevent soil erosion. Logs/ cylinders must be laid in continuous lines following the contours and spaced vertically 0.8-1.2 m apart, depending on the steepness of the slope. These logs/ cylinders must be secured by means of steel pegs and wire in rocky areas, and treated wooden pegs in other areas.

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- The post-mining area must be fenced off in order to prevent access by livestock until such time that the vegetation has been allowed to establish sufficiently.
- The site must remain fenced with warning signs erected to caution the general public of the altered state of the environment in the area. Drainage structures must also be left intact.
- No dangerous faces which present a safety threat to communities should be left.

14.5 Vegetation Removal and Habitat Disturbance

- Natural features, indigenous flora and fauna within the vicinity of the project works, should be protected and damage or disturbance prevented or minimised, specifically:
    - No plant species outside of the designated mine site and associated areas may be removed.
    - No mining staff may have access to indigenous vegetation outside of the Site.
    - The use of indigenous plants as firewood is prohibited.
    - All fauna (including domestic livestock) within, and surrounding the site, shall be protected. They shall not be caught, poisoned, trapped, snared or killed.
    - The minimum amount of vegetation must be removed. Excessive clearing of a site must be avoided. Disturbance outside of the immediate construction area must be avoided.
    - Where *Aloe spp* are encountered at 348_BP03, or possibly at the other borrow pits, these must either be left alone, or if required to be removed then consent must be obtained from the land owner to remove them and an attempt made to transplant/relocate them.
    - Replanting of these or other indigenous species in disturbed areas will be required, under the guidance of the Environmental Controller.
    - No more than 0.98 ha of indigenous vegetation may be removed at each of the borrow pits.
- Planning and construction must ensure that alien plants are not introduced to the disturbed areas. This can be accomplished by:
    - Utilising the saved topsoil from the construction area and regular monitoring during the revegetation phase and immediately after the revegetation phase.
    - Preventing continuous disturbances of the rehabilitated areas.
    - Alien invader species must be removed from the site and destroyed as per the DWAF Working for Water specifications for that species.
    - Any regrowth must be controlled in the same manner.
    - Soil should not be moved from one part of the site to another unnecessarily.

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14.6 Surface Waters/Drainage Lines

- Site staff shall not be permitted to use the stream/drainage lines/water bodies for the purpose of bathing, washing of clothing or as a water resource.
- The stream/drainage/inland water bodies lines shall not be used for mining activities such as washing of equipment or the disposal of any type of waste.
- Water may not be abstracted from the stream for any reason or use, unless authorised by the Department of Water Affairs.
- All fuel, chemical, oil storage areas shall confined to areas at least 100 meters away from any watercourse and/or drainage line and is to be secured and appropriately stored on bund areas and in storage areas.
- Appropriate structures and methods to confine spillages such as the construction of berms and pans shall be used in order to prevent contamination of the rivers and streams.
- Release of chemicals directly into the environment is strictly prohibited.
- Waste should be managed and removed from site on a regular basis and the use of degreasing agents should be strictly prohibited.
- Illegal dumping of construction material within the Drainage Environment is strictly prohibited.
- No new mining excavations are to be allowed within 32 m of the drainage lines.

14.7 Stormwater Management

The general principal behind stormwater management is to divert runoff away from the mining area in such a manner as to prevent any erosion from resulting and to contain the “dirty” runoff within the mining area before releasing it into the environment.

“Dirty” water runoff refers to stormwater runoff which has collected within the disturbed areas and accumulated a high sediment load as a result of the exposed soils and underlying weathered rock. Other than a high sediment load, there is unlikely to be any other form of contamination of the runoff.

- No rock, silt, petroleum product, timber, vegetation, domestic waste, or any deleterious substance shall be placed or allowed to disperse directly into the drainage lines.
- Halt construction activity on exposed soil during events of high rainfall intensity and runoff.
- Minimise vegetation cover removal on all the cleared areas - i.e. only clear those areas where mining and stockpiling is currently taking place.
- A cutoff-berm must be located above the borrow pit face, protecting the active mining area and topsoil and overburden stockpiles from erosion. This storm water will then be channelled towards the natural drainage in the area.

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- Soil erosion shall not be tolerated on the Site. Uncontrolled erosion will cause siltation and pollution of the downstream areas and result in loss of valuable topsoil. The Contractor should take all reasonable measures to prevent soil erosion and protect areas susceptible to erosion. Erosion prevention measures must be implemented to the satisfaction of the ECO and DMR.
- Areas particularly susceptible to erosion include:
  - areas stripped of topsoil,
  - soil stockpiles, and
  - steep slopes (gradients>8%).
- Where erosion does occur, the Contractor shall reinstate such areas to the satisfaction of the DMR through the construction of contour berms, cut-off drains, or planting of grass sods / ground cover, as may be necessary. Topsoil that has been washed away shall be replaced.
- The berms will remain in place after closure in order to allow for the protection of the downstream environment from sedimentation and erosion which may arise during the rehabilitation period prior to the establishment of adequate grass cover.

14.8 Air Emissions

- Minimise areas of exposed soil by only clearing those areas where mining or stockpiling is activity taking place and by revegetating mining and stockpiling areas progressively where possible.
- Fine material must be kept to a minimum by practicing good housekeeping. All fines should be removed to the spoils area and covered with overburden and vegetated accordingly.
- Employ dust suppression measures on dry dusty surfaces. This may involve the spraying of water from water carts.
- Ensure fine materials being stored or transported are covered with tarps or equivalent material.
- Ensure that the district road accessing the site is maintained in a good condition with a suitable gravel surface. Heavy trucks may lead to the pulverizing of the gravel and increase the amount of dust produced.
- Operators exposed to high levels of dust (including cement dust) must be equipped with dust masks. This is a heath and safety requirement and must be managed via the mine's Health and Safety Plan.
- Ensure all equipment is in good operating order, and fitted with standard air emission control devices.
- Wet methods must be enforced when rock breaking, drilling and loading take place.
- Minimise idling of engines at all times.

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14.9 Noise Management

- No nighttime activities are to take place.
- All activities with high noise levels should be restricted to daylight hours on weekdays. Working hours are Monday to Friday 6 am - 6.00 pm and Saturdays 7am - 2pm. No mining activities may occur on Sundays or Public Holidays.
- All operators exposed to noise in excess of 85dB will be equipped with hearing protection devices.
- The Contractor shall take the necessary measures to limit noise levels on site to within legally acceptable limits. The regulations framed under the Machinery and Occupational Safety Act, 1983 (Act No. 6 of 1983) apply.
- All vehicles to be kept in a serviceable condition and fitted with silencers.
- Any warning hooters be so designed that they are only effective in the area of concern.
- Where possible physical barriers are to be placed between noise sources and the community.

14.10 Visual Quality

- Protect and maintain the vegetation not required to be removed as a natural screen.
- Ensure that any signage (i.e. at entrance gate of construction camp site) is visible but not visually intrusive.
- Ensure good housekeeping and control litter and general site cleanliness. The construction camp should be so sited so as to limit its visual impact.
- Ensure that adequate ablution facilities are in place, that the workforce utilises these facilities and that they are placed where they are not visible to the public.
- Workforce shall be dressed in appropriate neat and safe construction uniforms.
- Bright colours shall only be used for the safety issues for which they are intended.
- Safety lighting should only be used for the safety issues for which they are intended.
- Only emergency after-hours work should be done.
- Rehabilitation of Borrow pits after utilisation must be undertaken to decrease visual impact

14.11 Health and Safety (safety of all contractors, employees and the general public)

- The Contractor shall have a first aid box and a trained First Aider (as required by the OHS Act) available on site at all time.
- Potable (human drinking quality) drinking water shall be provided to all construction crews at all times.
- The Contractors (and all sub-contractors) shall provide all their employees (permanent, contracted or casual) with:
    - Overall that have a reflective strip across the back, and around both legs

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- Steel capped safety boots
- Hard hats
- These are to be worn on the site at all times

- The Project Manager shall ensure that there are White Hard hats and reflective vests (yellow with reflective strip) available for use by any visitors, other project consultants and authorities.
- The contractor shall ensure that all construction vehicles using public roads are in a roadworthy condition, they adhere to speed limits, their loads are secured and that all other regulations are adhered to.
- The mining area must be placed out of bounds to members of the public and other unauthorised persons.
- Security must be put in place to prevent unauthorised access to the site.
- The entire mining area is to be fenced.
- Appropriate warning signage is to be erected around the mining and processing area.
- The contractor will be required to develop a Health and Safety Plan identifying all potential health and safety hazardous and providing a plan and programme for the management and monitoring of these risks.

14.12 Emergency Procedures & Remediation

- Emergency procedures must be developed for the following incidents:
  - Fire
  - Spillage of Hazardous Materials (fuel, chemicals, sewage etc)
- It is the Contractor's responsibility to develop the emergency action plans. These must be checked and approved by the ECO and by DMR.

14.13 Fire Risk & Burning

- The Contractor shall take all the necessary precautions to ensure that fires are not started on site.
- The Contractor shall develop a Fire Management Procedure and present it to the ECO for review.
- The Contractor shall ensure that the risk of fire at any location on site is kept to a minimum.
- The Contractor shall ensure that all construction staff are aware of these procedures.
- The Contractor shall supply fire fighting equipment in proportion to the fire risk presented by the type of activity and materials used on site.
- This equipment shall be kept in good working order.
- No open fires shall be allowed on site or on the route. Gas cylinder shall be provided for daily cooking. A designated facility must be established to serve as a kitchen/food preparation area.

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- Any welding or other sources of heating shall be done in a controlled environment and under appropriate supervision, in such a manner as to minimise the risk of veld fires and/or injury to staff.
- Occupational Health & Safety Act requirement relating to fire precautions and fire control shall be implemented.
- All waste bins shall be kept away from fuel tank installations.
- Smoking near refuelling depots or near any flammable substances shall be prohibited.

14.14 Accidental leaks & spillages

- An Emergency Action Plan and Procedure for the prevention and remediation of spillages of hazardous substances shall be developed by the Contractor. This must include clear roles & responsibilities.
- The Contractor shall ensure that his employees are aware of the procedure to be followed for dealing with spills and leaks, which shall include the immediate notification of the Project Manager, ECO and the relevant authorities.
- The Contractor shall ensure that the necessary materials and equipment for dealing with spills and leaks is available on site at all times.
- Potentially hazardous materials shall be handled and stored on site in containers with tight lids that shall be sealed and disposed of at an appropriately permitted hazardous waste disposal site.
- The Contractor shall maintain a hazardous materials register which must document the use, storage, final destination and method of disposal of all hazardous substances.
- The contractor shall submit copies of Material Safety Data Sheets (in accordance with the requirements of the OHS Act – i.e. sixteen point MSDS format) to the ECO. Copies shall also be kept on site.
- Treatment and remediation of the spill areas shall be undertaken to the reasonable satisfaction of the DMR.
- In the event of a hydrocarbon spill, the source of the spillage shall be isolated and contained (i.e. be protected from rainfall and surface runoff). The Contractor shall ensure that there is always a supply of absorbent material readily available to absorb / breakdown spilt hydrocarbon material and where possible, materials designed to encapsulate minor hydrocarbon spillage. This is particularly relevant in the fuel storage and dispensing area.
- The quantity of such materials shall be able to handle a minimum of 200liters of hydrocarbon liquid spill.

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- The telephone numbers for the closest Hazardous Materials Emergency Response offices should be prominently displayed as bitumen and diesel spillage frequently occur on mining sites. A swift cleanup procedure is critical in order to prevent contamination.

14.15 Archaeology, Palaeontology & Heritage Sites

- All recommendations as stated in the SAHRA A&PRC (Appendix D, section 11.2) and Phase 1 Archaeological Assessment and Paleontological Assessment in Section 11.2 & 21.2 must be adhered to.
- A palaeontologist is required to visit 348_BP06, 348_BP05 & 348_BP04 near Willowvale shortly after removal of aggregate is resumed.
- Borrow pits containing sedimentary rocks should be resurveyed by a palaeontologist at the end of excavations and prior to any form of rehabilitation.
- All finds of human remains shall be reported to the nearest police station.
- Human remains from the graves of victims of conflict, or any burial ground or part thereof which contains such graves and any other graves that are deemed to be of cultural significance may not be destroyed, damaged, altered, exhumed or removed from their original positions without a permit from the South African Heritage and Resource Agency (SAHRA)
- Work in areas where artifacts are found shall cease immediately and SAHRA notified.
- Under no circumstances shall the Contractor, employees, subcontractors or subcontractors' employees remove, destroy or interfere with archaeological artifacts.
- Any person who causes intentional damage to archaeological or historical sites and/or artifacts could be penalized or legally prosecuted in terms of the national Heritage Resources Act 25 of 1999.
- A fence of at least 3m outside the extremities of the site shall be erected to protect archaeological sites.
- All known and identified archaeological sites shall be left untouched.
- In terms of the National Heritage Resources Act (Act 25 of 1999), in the event that any object or material of archaeological or palaeontological importance is noted during the construction & operational process, work in the immediate area should be immediately stopped and SAHRA notified without delay. Should any such sites be identified (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, marine shell and charcoal/ash concentrations), unmarked human burials or other categories of heritage resources are found during the proposed activities, SAHRA APM Unit (Mariagrazia Galimberti, Tel: 021 462 4502) must be alerted immediately, and an accredited professional archaeologist must be contacted as soon as possible to inspect the findings.

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- Should substantial fossil remains (notably articulated vertebrate skeletons or skulls) be exposed during construction, however, the ECO should safeguard these - in situ, where feasible. SAHRA and / or a professional palaeontologist should then be alerted as soon as possible so that appropriate mitigation measures can be implemented.

14.16 Socio-economic

- A targeted procurement policy to be implemented at the mine whereby goods and services should be sourced locally if possible.
- Labour where feasible should be drawn from the affected community.

14.17 Community Relations

- The Contractor shall keep a “Complaints Register” on Site. The Register shall contain all contact details of the person who made the complaint, information regarding the complaint itself, and measures taken to address the complaint.

14.18 Work Stoppage

The DMR shall have the right to order work to be stopped in the event of significant infringements of the Environmental Specifications. Work will only be allowed to restart once the situation is rectified in compliance with the specifications.

14.19 Site Closure/Decommissioning

The Applicant, the Department of Roads and Public Works, shall be responsible for the complete rehabilitation of the sites, access roads, site camp / office, stockpile area, ablution facilities and storage areas.

- All site infrastructure, equipment, plant, and other items used during the mining period will be removed from the site in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 and those areas will be ripped and then covered with a 50mm thick layer of topsoil. Those areas will then be hydroseeded with a mix of grasses indigenous to the area.
- All waste shall be removed from site. It will not be permitted to be buried or burned on the site.
- All access roads or portions thereof, constructed by the holder and which will no longer be required by the landowner/tenant, shall be removed/ripped and/or rehabilitated in order to represent the former habitat.
- Foreign materials, which may hamper the re-growth of the vegetation, must be removed prior to rehabilitation and disposed of at a licensed waste disposal site.

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- All cleared sites are rehabilitated with indigenous grass species.
- The mine must conform to the designed closure specifications, including drainage, slope stability, topsoiling and tree / grass planting.
- Drainage structures must be left intact.
- Areas showing signs of erosion due to mining activities shall be suitably stabilized or rehabilitated.
- All ablution facilities shall be removed from site.
- The mine area will be fenced with a stockproof fence to prevent access by livestock until such time that the vegetation has been allowed to recover. No dangerous faces which present a safety threat to communities will be left.
- All signs relating to the mining activates shall be removed.
- All areas, devoid of vegetation or where solids have been compacted due to traffic, shall be scarified or ripped before rehabilitation to allow penetration of roots and water.
- Remaining boulders and spoil will be pushed up against the slopes of the mine face. That rock material will be covered with overburden (decomposed rock) and a 50cm thick layer of topsoil and then seeded.
- Slopes must be made safe; slopes must at least be sloped to a ratio of 1:3.
- Final rehabilitation shall be completed within a period specified by DMR and should take cognizance of the season.

15 Quantum of Financial Provision for Rehabilitation

The Quantum of Financial Provision shall be calculated using DME's Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provision Provided by a Mine (2005).

In terms of this guideline the borrow pits classify as Class C Mines (low risk) of low to moderate sensitivity.

Table B.11: Rates (per hectare) to determine the quantum for financial provision (Class C mines)

	Environmental sensitivity of mine area		
	Low	Medium	High
Rate per hectare to determine the quantum (rands)	20 000.00	50 000.00	80 000.00
Minimum amount	R 10 000.00		

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16 Environmental Awareness

The ECO shall be responsible for compiling and implementing an Environmental Awareness Training Programme for all staff members that aims at explaining the mitigation measures described in this report. Before commencing with any work, all staff members shall attend the Environmental Awareness Training Programme. After attending the Environmental Awareness Training Programme, all contractors and sub-contractors shall sign an Environmental Training register as proof of their training.

17 Monitoring & Performance of the EMP

In order to ensure that this Environmental Management Plan is effectively implemented, it is important that regular external audits of the Environmental Management Plan are conducted.

The Department of Roads and Public Works must appoint an independent Environmental Control Officer (ECO) in order to oversee compliance with the EMP by undertaking monthly site inspections, quarterly audits and post construction/operation site visits. The audits shall aim at addressing environmental issues identified on site and to provide recommendations through the audit reports.

Audit Reports shall be provided to Department of Roads and Public Works, the Project Managers/Engineers, and the Department of Mineral Resources (DMR).

18 Environmental Objectives and Goals

18.1 Mine Closure

The overall Environmental Objective for mine closure is as follows:

To render the mining area in a safe and environmentally acceptable condition on completion of the mining, rehabilitation and closure activities.

Specific Environmental Goals include:

- To return the mining area, as closely as possible, to its original condition and land use through the shaping and landscaping of the surface and through the establishment of an indigenous grass cover emulating the surrounding environment.
- To minimize the residual impacts through ensuring that erosion is controlled, the slopes are stable, the vegetation cover is established satisfactory and that the area is left in a condition which does not pose a safety hazard to humans, livestock and indigenous fauna.

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- To minimize the visual impacts of the mine on closure by way of landscaping and the establishment of an indigenous grass cover emulating the surrounding environment
- To obtain the necessary Mine Closure Certificates from the Department of Mineral Resources.

18.2 Socio-Economic Aspects

The specific objective related to the Socio-Economic aspects is as follows:

To contribute significantly and meaningfully towards the economic and social development of the surrounding communities within the Amathole District Municipality.

Specific goals include:

- To maximize the benefits to the local economy through the provision of employment opportunities and support of local service providers and suppliers wherever possible.
- To institute a training programme for all staff members in order to improve skills development in the area.
- To improve the safety aspects of the road for road users and pedestrians.
- To encourage further economic development through exploring partnerships with local individuals and groups in the establishment of further beneficiation businesses.

18.3 Archaeological, Palaeontological & Heritage Aspects

The specific objective related to the Archaeological, Palaeontological & Heritage Aspects is as follows:

"To identify, protect and preserve any sites of cultural, religious, palaeontological or archaeological significance"

Specific goals include:

- To ensure that any identified sites are properly protected in accordance to the National Heritage Resources Act.
- To ensure that any further sites that may be discovered are identified timeously and protected in accordance to the National Heritage Resources Act.

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19 Public Participation

The public participation process for the utilisation of the borrow pits identified on DR08348 was held in conjunction with the public participation process for all the identified road sections and their relevant identified borrow pits.

19.1 Advertisement

- Public participation was initiated by the placement of a Legal Notice (English and Xhosa) in the local daily newspaper, The Daily Dispatch on 25 March, 2011 (Appendix B). The general pubic were given 30 days (from 25 March, 2011) to register as Interested & Affected Parties and to submit any issues / concerns they might have regarding this proposed project.
- 1 x Signboard, in English and Xhosa, was erected halfway down the DR08348 at the intersection with the DR08352, adjacent to the DR08348, in order to notify the general public/community and passers-by of the proposed activity (Appendix C). The date of advertisement on the Signboard was 25 March, 2011.

19.2 Key Interested and Affected Parties

- A Letter of Notification and the Background information documents were hand delivered to the legal custodian of the land, Department of Rural Development and Land Reform – Amathole District Manager Mr M. Hlopekazi, in which the proposed borrow pit is located informing him of the proposed activity on 24 March, 2011.
- Notice of the activity and a background information document was posted via parcel mail to Mr Parkade, the Municipal Manager for Mnquma Local Municipality on 23 March, 2011.
- Notice of the activity and a background information document was posted via registered mail to Adv. Siphiwo Sohena, the Municipal Manager for Mbhashe Local Municipality on 23 March, 2011.
- Notice of the activity and a background information document was posted via registered mail to Mr Mlokoti, the Municipal Manager for the Amathole District Municipality on 23 March, 2011.
- Background Information Documents were posted via registered mail to the Mnquma Local Municipality for Cllr Hanabe, the Mnquma Local Municipality Ward Councillor for ward number 25 and to the Mbhashe Local Municipality for Cllr Qasana, the Mbhashe Local Municipality Ward Councillor for Ward 25 (the wards in which the proposed borrow pits are located), on 23 March, 2011.

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- Identified Key Interested and Affected Parties (Table 9) were either posted via registered or parcel mail or hand delivered notification of the proposed activity and the Background Information Document for this project on 23/24 March, 2011.
- All email and/or hard copy correspondence received from and issued to key I & AP's is retained in Appendix D.

Table 9: Identified Key Interested & Affected Parties.

ADM Borrow Pits - Key I & AP's – DR08348							
	Name		Tel/Fax		Mobile/Email	Postal	Comments
1	Mr. N Parkade	Tel:	(047) 491 3586	Mbl:		Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	Mnquma Local Municipality - Municipal Manager
		Fax:	(047) 491 0195	Eml:	npakade@mnquma.gov.za		
2	Mr. Z. Ngovela	Tel:	(047) 491 3586	Mbl:		Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	Mnquma Local Municipality - Director of the Department of Infrastructural Development and Planning
		Fax:	(047) 491 0195	Eml:	hngovela@mnquma.gov.za		
3	Cllr Hanabe	Tel:		Mbl:	082 575 8586	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	Mnquma Local Municipality - Ward 25 Councillor
		Fax:		Eml:			
4	Advocate Siphiwo Sohena	Tel:	(047) 489 5800	Mbl:		Mbhashe Local Municipality, PO Box 25, INDUTYWA, 5000	Mbhashe Local Municipality – Municipal Manager
		Fax:	(047) 489 1137	Eml:			
5	Cllr Qasana	Tel:		Mbl:	073 270 2964	Mbhashe Local Municipality, PO Box 25, INDUTYWA, 5000	Mbhashe Local Municipality - Ward 25 Councillor
		Fax:		Eml:			
6	Ms Deidre Watkins	Tel:	041 396 3900	Mbl:	-	Department of Minerals and Energy Private Bag X6076 Port Elizabeth 6000	Deputy Director : Mine Environment Management
		Fax:	041 396 3945	Eml:	Deidre.Watkins@dme.gov.za		
7	Jimmy Calder, Phillip Wilkinson	Tel:	043 748 6246	Mbl:	082 900 0840	P O Box 2909, Beacon Bay 5205	WESSA
		Fax:		Eml:	Jimmy [jimjan@iafrica.com], phillip@wessabk.co.za		
8	Dr. Mariagrazia Galimberti	Tel:	(0)21 462 4502	Mbl:		South African Heritage Resources Agency, PO Box 4637, Cape Town 8000	APM Impact Assessor
		Fax:	(0)21 462 4509	Eml:	mgalimberti@sahra.org.za		
9	Andrew Lucas/ Ms Lizna Fourie	Tel:	043 701 0291	Mbl:		Department of Water Affairs and Forestry PO BOX 7019, EL, 5200	Department of Water Affairs - Eastern Cape
		Fax:	043 722 6152	Eml:	FourieL4@dwa.gov.za		
10	Mr. Nico Jonker	Tel:	043 701 4000	Mbl:		Amathole District Municipality, P O Box 320, East London, Eastern Cape, South Africa, 5200	ADM Director:Engineering
		Fax:	043 742 0337	Eml:	nicoj@amatoledm.co.za		

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ADM Borrow Pits - Key I & AP's – DR08348							
	Name		Tel/Fax		Mobile/Email	Postal	Comments
11	Sr.Nomvula Solomon	Tel:	043 701 4000	Mbl:		Amathole District Municipality, P O Box 320, East London, Eastern Cape, South Africa, 5200	ADM Director:Health & protection
		Fax:	043 742 0337	Eml:	nomvulas@amatoledm.gov.za		
12	Vuyo Mlokoti	Tel:	043 701 4000	Mbl:		Amathole District Municipality, P O Box 320, East London, Eastern Cape, South Africa, 5200	ADM: Municipal Manager
		Fax:	043 742 0337	Eml:			
13	Mr M. Hlopekazi	Tel:	043 722 1762	Mbl:		Department of Rural Development & Land Reform P.O.BOX 1958 East London 5201	Department of Rural Development & Land Reform: Amathole District Manager
		Fax:	043 722 1788	Eml:	mhlopekazi@ruraldevelopment.gov.za		
14	Briant Noncembu	Tel:	043 707 4000	Mbl:		Private bag X 9060 East London 5200	DEDEA - Amathole Region
		Fax:		Eml:	Briant.Noncembu@deaet.ecape.gov.za		

19.3 Registered Interested and Affected Parties

No Interested and Affected Parties registered in response to the notifications, advertisements or signage.

19.4 Public Draft Environmental Management Plan Report

The public draft Environmental Management Plan Report was made available to key and registered (if any) I&AP's for a 30-day commenting period, this period commenced from date of mailing/ hand delivery, 16 August 2011, and ended on 16 September 2011. All hard copy correspondence issued to I & AP's during the public draft review period is retained in Appendix D.

No comments were received from I & AP's during this public draft review commenting period.

BESC were informed on 15 September 2011 by Mnquma Local Municipality that the ward councilors to which the public draft EMP's were posted for review, were no longer the current ward councilors at Mnquma Local Municipality and that new ward councilors had taken position since June 2011. As such we were informed that the public draft EMP's would be distributed to the new ward councilors in Mnquma Local Municipality for the relevant ward areas. The new ward councilors for the Mnquma Local Municipality wards in which the identified borrow pits are located are as follows:

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ADM Borrow Pits – New Ward Councillors – DR08348							
Name			Tel/Fax		Mobile/Email	Postal	Comments
1	Cllr. Madikane	Tel:		Mbl:	078 570 0576	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	Mnquma Local Municipality - Ward 25 Councillor
		Fax:		Eml:			

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20 Mining Plans

Electronic Adobe PDF Version Only

DOUBLE CLICK the PAPER CLIPS here to access the Mining Plans.

348_01: Mining plan	
348_02: Mining plan	
348_03: Mining plan	
348_04: Mining plan	
348_05: Mining plan	
348_06: Mining plan	

Hardcopy/Paper Version - See overleaf

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21 Specialist Report

21.1 Preliminary Materials Identification Investigation

Electronic Adobe PDF Version Only

DOUBLE CLICK the PAPER CLIPS here to access the reports.

DR08348 - Report	
BP01_DR08348	
BP02_DR08348	
BP03_DR08348	
BP04_DR08348	
BP05_DR08348	
BP06_DR08348	

Hardcopy/Paper Version - See overleaf

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21.2 Archaeological, Palaeontological & Heritage Assessments

Electronic Adobe PDF Version Only

DOUBLE CLICK the PAPER CLIPS here to access the reports.

AIA-Amathole BP1, EC - Archaeomaps	
PIA – Amathole Borrow pits – Rob Gess	

Hardcopy/Paper Version - See overleaf

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22 Appendix A: Letters of Confirmation, Retention Monies & Undertaking

Electronic Adobe PDF Version Only

DOUBLE CLICK the PAPER CLIPS here to access

Letter of Confirmation – EC Department of Roads and Public Works	
Letter for Retention Monies – EC Department of Roads and Public Works	
Letter of Undertaking - EC Department of Roads and Public Works	

Hardcopy/Paper Version - See overleaf

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23 Appendix B: Advertisement placed in Daily Dispatch

Daily Dispatch, Friday, March 25, 2011

Legal Notices | Legal Notices

NOTICE/ ISAZISO

Notice is hereby given in terms of the Regulations of the Minerals and Petroleum Resources Development Act (No. 28 of 2002) of intent to carry out the following activity/Esi saziso sikhutshwa phantsi kwesaziso somgaqo ka ne Minerals akunge ne Petroleum Resources Development Act (No. 28 of 2002) nezihlomelo zawo zokwenza oku kulandelayo:

Activity/Umsebenzi ozakwenziwa: The Department of Roads & Public Works proposes to utilize borrow pits for road upgrade/re-gravelling projects located throughout the Amathole District Municipality / Isebe lezendlela ne zemisebenzi kawonke-wonke icela ubuhlobo nentsebenziswana yokuboleka umlindi. Iqweba ukwenyusa isinga lezemisebenzi yezendlela zonke ne Amathole District Municipality.

List of Roads/Uluhlu ka indlela:

Road #	Area	Number of borrow pits
DR08049	CENTANE	2
DR08182	NQAMAKWE	1
DR08344	BUTTERWORTH	5
DR08348	WILLOWVALE	6
DR08352	WILLOWVALE	1
DR08355	CENTANE	3
DR08356	CENTANE	2
DR08359	MAZEPPA BAY	1
DR08371	BUTTERWORTH	5
DR08372	BUTTERWORTH	4
DR08386	NQAMAKWE	8
DR08395	BUTTERWORTH	1
DR08401	IDUTWYA/NQAMAKWE	4
DR08408	BUTTERWORTH	1
DR08486	BUTTERWORTH	2

Proponent/Abanikazi zimemo:
Department of Roads & Public Works
(Eastern Cape)
Private Bag X0023
Bhisho
5605

Consultant/Umniki macebiso:
BESC
PO Box 8241, Nahoon, 5210, East London.
Mr. Conroy van der Riet/Ms. Lee-Anne Proudfoot
Tel: (043) 726 4242
Fax: (043) 726 3199
E-mail: conroy@besc.co.za/lee-anne@besc.co.za

In order to ensure that you are identified as an interested and affected party, please submit your name, contact information, and interest in the project, to the Consultant within 30 days of this advertisement/ Ukuba unqwenela ukyubandakanywa njenomnye onomdla nochapahzelekayo, nceda faka igama lakho, nenkcukacha apho unokuqhagamisheleka khone, nento ekutsalayo nekuchaphazelayo koluphuhliso, uyigqithise kumniki- Macebiso zingadlulanga iintsuku ezi mashumi mathathu (30 days) sibhengeziwe esi saziso.

Date of advertisement:
March 25, 2011

Figure 21: Daily Dispatch Notice.

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24 Appendix C: Signboard

Figure 22: Image of the Signboard erected for DR08348

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25 Appendix D: Public Participation - Correspondence

25.1 Correspondence issued to and received from Key I & AP's during the Public Participation

BIOTECHNOLOGY & ENVIRONMENTAL SPECIALIST CONSULTANCY CC

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Leaders in Industrial Ecology, Environmental Impact & Site Assessments
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March 2, 2011

Ms. Deidre Watkins
Deputy Director: Mine Environment Management
Department of Minerals and Energy
C/o of Mount & Diaz Roads
Mount Croix
Port Elizabeth
6001
Tel: (041) 3963934
Fax: 086 576 8004

RE: The proposed utilisation of existing borrow pits for the resurfacing/regravelling/maintenance of district roads located in the Amathole District Municipality, Eastern Cape.

BESC have been appointed by the Department of Roads and Public Works to prepare the Environmental Management Plans (EMP) required for the utilisation of the identified borrow pits in Amathole District in the Eastern Cape, for the maintenance/regravelling/resurfacing of the identified district roads.

Twenty - one District Roads requiring routine maintenance/resurfacing/regravelling have been identified within the Amathole District. These are as follows:

					AMATOLE DISTRICT MUNICIPALITY			
					Start Co-ordinates		End Co-ordinates	
No.	Road Number	Kilometers	LMA	Comments / Priority	S	E	S	E
1	DR08043	28.5	Mnquma	Regravelling	32° 12' 24"	27° 56' 08"	32° 20' 01"	28° 08' 26"
2	DR08047	57.4	Mnquma	Patch gravelling	32° 17' 22"	28° 12' 43"	32° 18' 33"	28° 13' 43"
3	DR08049	17.4	Mnquma	Regravelling	32° 30' 18"	28° 18' 52"	32° 25' 28"	28° 24' 9"
4	DR08181	6.7	Mnquma	Regravelling	32° 25' 32"	28° 27' 56"	32° 25' 18"	28° 31' 53"
5	DR08182	7.5	Mnquma	Patch gravelling	32° 12' 05.8"	27° 56' 19.7"	32° 09' 23.4"	27° 53' 47.2"
6	DR08344	31.4	Mnquma	Patch gravelling	32° 17' 40"	28° 13' 10"	32° 9' 12"	28° 27' 33"
7	DR08348	26.0	Mnquma	Patch gravelling	32° 25' 33"	28° 26' 40"	32° 16' 10"	28° 30' 52"
8	DR08352	10.1	Mnquma	Regravelling	32° 21' 47"	28° 29' 34"	32° 21' 36"	28° 34' 08"
9	DR08355	23.4	Mnquma	Patch gravelling	32° 28' 40"	28° 22' 56"	32° 35' 09"	28° 31' 22"
10	DR08356	19.3	Mnquma	Patch gravelling	32° 29' 10"	28° 24' 03"	32° 32' 39"	28° 33' 57"
11	DR08359	10.6	Mnquma	Patch gravelling	32° 26' 05"	28° 31' 42"	32° 29' 22"	28° 34' 39"
12	DR08362	3.8	Mnquma	Patch gravelling	32° 21' 50"	28° 13' 56"	32° 19' 56"	28° 14' 27"
13	DR08367	11.3	Mnquma	Patch gravelling	32° 21' 50"	28° 13' 55"	32° 24' 16"	28° 8' 48"
14	DR08368	7.3	Mnquma	Patch gravelling	32° 25' 48.7"	28° 14' 49.9"	32° 27' 11"	28° 11' 00"
15	DR08371	28.8	Mnquma	Regravelling	32° 20' 56"	28° 02' 07"	32° 30' 17"	27° 58' 52"
16	DR08372	21.5	Mnquma	Regravelling	32° 20' 01"	28° 08' 29"	32° 23' 06"	28° 02' 12"
17	DR08386	35.4	Mnquma	Patch gravelling	32° 13' 06"	27° 56' 11"	32° 12' 15"	27° 40' 54"
18	DR08395	2.8	Mnquma	Patch gravelling	32° 22' 56"	27° 59' 58"	32° 22' 44"	27° 58' 17"
19	DR08401	40.8	Mnquma	Patch gravelling	32° 10' 49"	27° 56' 51"	32° 04' 56"	27° 15' 22"
20	DR08408	10.1	Mnquma	Regravelling	32° 16' 13"	28° 11' 56"	32° 16' 06"	28° 06' 38"
21	DR08486	8.1	Mnquma	Patch gravelling	32° 18' 55"	28° 10' 52"	32° 16' 14"	28° 11' 50"

Page 1 of 4

Malcolme Logie

B.Sc. Hons. (Botany), M.Sc. (Botany), Ph.D. (Biotechnology), (Rhodes)
CEAP-SA; MSAIE & ES; MIAIA; *Pr.Sci.Nat.(Environ.Sci.)*
CK 95.10210/23

Located along each district road is a number of borrow pits which have been identified for the sourcing of material for the routine maintenance/resurfacing/regravelling of these roads. Of these twenty –one road sections, borrow pits are still to be identified along six of these road sections, these being the DR08043, DR08047, DR08181, DR08362, DR08367 & DR08368. Please see the attached table for the position of the identified borrow pits on the remaining 15 road sections where the borrow pits have been identified. When the positions of the borrow pits become available along the mentioned six district roads these will be forwarded to the department.

It is our intended approach to prepare an environmental management plan per district road identified in the above table which will cover the identified borrow pits along these sections of roads, thus twenty-one EMP's will be prepared for submission and approval by DMR. As confirmed telephonically, the Department of Roads and Public Works has received exemption from the provisions of sections 16, 20, 22 and 27 of the M&PRDA, 2002, in respect of any activity to remove any mineral for the construction and maintenance of dams, harbours, roads and railway lines and as such the utilisation of the material sources is subject to the preparation, submission and approval of an Environmental Management Plan compiled in accordance with requirements of the M&PRDA. It is the Department of Roads and Public Works preference to proceed in this manner, i.e. separate application/environmental management plan for the borrow pits identified per district road, as there is a considerable distance between the identified district roads and to circumvent any possible delays which may arise during the process and which would then result in the delay of the entire project.

Please could you assist me in determining if any of these identified borrow pits have already been previously permitted.

In addition, as there are 21 road sections identified and a total of approximately 59 borrow pits, as with the Chris Hani Region, we would like to put the following forward in terms of the public participation process:

- Legal Notice in respective newspapers.
- As the number of borrow pits are high, to place signboards at each particular borrow pit seems impractical, therefore we propose to group road sections and place signboards at main intersections/entrances of roads to be regravelled.
- Notifying the Relevant Municipal and Government Departments
- Notifying the Department of Rural Development as the custodian of the rural land (thereby notifying surrounding communities for borrow pits located in communal land)
- Notifying the Municipal Ward Councilors
- Where applicable notify Relevant Landowners of Private Land

Please would you confirm if this would suffice, if not please suggest practical steps to be taken.

Your assistance in the above regard will be much appreciated. Please feel free to contact me directly for any further queries.

Yours Sincerely
Lee-Anne Proudfoot
(Pr.Sci.Nat – Environmental Scientist)
Senior Environmental Consultant

Mobile: +27 83 421 3991
Email: lee-anne@besc.co.za

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Table of Identified Borrow pit locations in Amathole District

Rd_Nr_	No_	Lat (S)	Long (E)
DR08049	049_BP02	-32.4786	28.34289
DR08049	049_BP03	-32.4808	28.36456
DR08182	182_BP02	-32.1563	27.89664
DR08344	344_BP01	-32.2786	28.22408
DR08344	344_BP02	-32.2584	28.25361
DR08344	344_BP03	-32.2528	28.26256
DR08344	344_BP04	-32.233	28.33956
DR08344	344_BP05	-32.1748	28.43431
DR08348	348_BP01	-32.4004	28.46061
DR08348	348_BP02	-32.3839	28.4675
DR08348	348_BP03	-32.3662	28.48936
DR08348	348_BP04	-32.3139	28.48969
DR08348	348_BP05	-32.3064	28.48808
DR08348	348_BP06	-32.295	28.48675
DR08352	352_BP03	-32.3604	28.53064
DR08355	355_BP02	-32.5033	28.40503
DR08355	355_BP03	-32.5304	28.43386
DR08355	355_BP05	-32.5622	28.466
DR08356	356_BP01	-32.5004	28.43122
DR08356	356_BP02	-32.5101	28.46978
DR08359	359_BP01	-32.4835	28.56783
DR08371	371_BP01	-32.3836	28.03903
DR08371	371_BP02	-32.3963	28.03064
DR08371	371_BP03	-32.3946	28.04722
DR08371	371_BP05	-32.4531	28.51381
DR08371	371_BP06	-32.458	28.05247
DR08372	372_BP01	-32.3723	28.12203
DR08372	372_BP02	-32.3908	28.11656
DR08372	372_BP03	-32.3964	28.11069
DR08372	372_BP04	-32.416	28.09158
DR08386	386_BP01	-32.2304	27.88539
DR08386	386_BP03	-32.23	27.865
DR08386	386_BP04	-32.2303	27.82344
DR08386	386_BP05	-32.2277	27.77997

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DR08386	386_BP06	-32.2188	27.76961
DR08386	386_BP07	-32.2308	27.74672
DR08386	386_BP08	-32.2433	27.74942
DR08386	386_BP10	-32.2246	27.69731
DR08395	395_BP01	-32.3803	27.97919
DR08401	401_BP02	-32.1242	28.02417
DR08401	401_BP03	-32.1076	28.08017
DR08401	401_BP04	-32.1062	28.07856
DR08401	401_BP07	-32.104	28.22328
DR08408	408_BP01	-32.2698	28.17414
DR08486	486_BP01	-32.3015	28.17281
DR08486	486_BP02	-32.2848	28.17817

Page 4 of 4

Leaders in Industrial Ecology, Environmental Impact & Site Assessments & Safety, Health & Environmental Management Systems

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E-mail: info@besc.co.za; Website: http://www.besc.co.za

From: Deidre Watkins [Deidre.Watkins@dmr.gov.za]
Sent: 02 March 2011 02:30 PM
To: Siyanda Lurwenga; lee-anne@besc.co.za
Subject: FW: Borrow pits - Amathole District
Dear Lee-Anne,

The Department of Mineral resources hereby confirms receipt of your email dated 02nd March 2011, with thanks. I have perused the contents thereof, and the Department is content with the efforts that will be made with respect to the public participation process. I am also satisfied with the approach for a EMP for each district road.
Should you have any further queries, please do not hesitate to contact this office. Thanks.
Best regards,
Deidre

From: Siyanda Lurwenga [Siyanda.Lurwenga@dmr.gov.za]
Sent: 07 March 2011 09:50 AM
To: lee-Anne Proudfoot
Subject: FW: Borrow pits - Amathole District
Good Day Lee-Anne,

I have completed the spatial search, and according to our records the ONLY sites with authorized borrow pits are the ones proposed for Road Number DR038371, No_ 371_BP01 and Road Number DR08401, No_401_BP02 both issued to the Department of Roads and Transport. There are other proposed sites as well where the Department received applications, however those applications were refused like for instance site No_ 049_BP03 for road DR08049, there was an application lodged over the relative area but it was refused.

Should you have any unanswered questions please do not hesitate to contact this office. Thanks.

Regards
Siyanda

From: Siyanda Lurwenga [Siyanda.Lurwenga@dmr.gov.za]
Sent: 10 March 2011 10:48 AM
To: lee-Anne Proudfoot
Subject: RE: Borrow pits - Amathole District
Good Day Lee-Anne

As per your request; kindly receive the attached spread sheet for your perusal. please note I have only put in information only on those site where there were application and the rest there are no existing nor are there any pending applications to which the proposed sites relates. With regards to expirer dates I am not quite sure whether we are allowed to give such information. For future purposes there is available information on our web site which shows all the received and processed applications and it is accessible to every one. The web site is www.dmr.gov.za , then on your left hand side of the screen, you must go to mining rights applications and all the instructions you need to follow are there. Thanks

Sorry for the inconvenience caused.

Regards
Siyanda

Leaders in Industrial Ecology, Environmental Impact & Site Assessments & Safety, Health & Environmental Management Systems

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BESC

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Leaders in Industrial Ecology, Environmental Impact & Site Assessments
& Safety, Health & Environmental Management Systems

March 23, 2011

Ms. Deidre Watkins
Deputy Director: Mine Environment Management
Department of Minerals and Energy
C/o of Mount & Diaz Roads
Mount Croix
Port Elizabeth
6001
Tel: (041) 3963934
Fax: 086 576 8004

RE: Background Information Documents for the utilisation of borrow pits in the Amathole District Municipality, Eastern Cape.

As per previous correspondence, the Department of Roads & Public works proposes to utilize borrow pits for road upgrade/re-gravelling projects (21 road sections) located throughout the Amathole District Municipality. BESC have been appointed to compile the Environmental Management Plans for these borrow pits.

The permitting of the materials sources required for the project will be undertaken in accordance with the Minerals and Petroleum Resources Development Act (M&PRDA) (No. 28 of 2002). As previously confirmed, since the proponent, Department of Roads and Public Works, has been exempted in terms of the provisions of the M & PRDA Environmental Management Plans will be compiled for submission and approval from the DMR for the utilisation of the identified borrow pits, per the 21 roads sections.

Accompanying this letter for your records is a CD containing the Background Information Document(s) (BID'(s)) for fifteen of the road sections identified, which are to be distributed during the public participation process. Please refer to the attached table for the borrow pits and road sections.

Please feel free to contact BESC if you have any further queries.

Yours Sincerely
Lee-Anne Proudfoot
(Pr.Sci.Nat – Environmental Scientist)
Senior Environmental Consultant
Mobile: +27 83 421 3991
Email: lee-anne@besc.co.za

Page 1 of 3

Malcolme Logie

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CEAP-SA; MSAIE & ES; MIAIA; *Pr.Sci.Nat.(Environ.Sci.)*
CK 95.10210/23

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Leaders in Industrial Ecology, Environmental Impact & Site Assessments
& Safety, Health & Environmental Management Systems

March 15 – March 18, 2011

NOTICE –Landowners and/or Surrounding Landowners (Occupiers)

Notice is hereby given in terms of the Environmental Impact Assessment Regulations of the National Environmental Management Act 1998 (Act No. 107 of 1998) as amended and in terms Regulations of the Minerals and Petroleum Resources Development Act (No. 28 of 2002) of intent to carry out the following activity:

The Department of Roads & Public works proposes to utilize borrow pits for road upgrade/re-gravelling projects located throughout the Amathole District Municipality. BESC have been appointed to conduct the Environmental Impact Assessments and/or Environmental Management Plans for these borrow pits. Attached is a list of the roads, properties and borrow pit locations.

You are hereby invited to participate in the Public Participation Process. In order to ensure that you are identified as an interested and affected party, please submit your name, contact information, and interest in the project (on the attached form), to the Consultant within 30 days of this notice.

Please feel free to contact BESC if you have any further queries.

Yours sincerely,

Mr. Conroy van der Riet
(Cand. Sci. Nat. - Environmental Scientist)
Senior Environmental Consultant
Tel: 043 726 4242
Fax: 043 726 3199
Email:conroy@besc.co.za

Lee-Anne Proudfoot
(Pr.Sci.Nat – Environmental Scientist)
Senior Environmental Consultant
Email: lee-anne@besc.co.za

Malcolme Logie

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CK 95.10210/23

ISAZO – Nngqogileyo Umnini-mhlaba

Esi saziso sikhutshwa phantsi kwesaziso somgaqo ka Environmental Impact Assessment Regulations ka National Environmental Management Act 1998 (Act No. 107 of 1998) ne Minerals akunge ne Petroleum Resources Development Act (No. 28 of 2002) nezihlomelo zawo zokwenza oku kulandelayo:

Isebe lezendlela ne zemisebenzi kawonke-wonke icela ubuhlobo nentsebenziswana yokuboleka umlindi. Iqweba ukwenyusa isinga lezemisebenzi yezendlela zonke ne Amathole District Municipality. BESC bona ilungiselwe kakuhle i Environmental Impact Assessment ne/okanye Environmental Management Plans ukuboleka umlindi. Nokuzimanya kulhlu lwezendlela, nezindlu kunye nemoleko umlindi.

Ukuba unqwenela ukubandakanywa njenomnye onomdla nochabhazelekayo, nceda faka igama lakho, nenkcukacha zakho ughagamsheleka khona, nento ekutsalayo nekuchaphazelayo koluphuhliso, uyigqithise kumniki- Macebiso zingadlulanga iintsuku ezi mashumi mathathu (30 days) sibhengeziwe esi saziso.

Yours sincerely,

Mr. Conroy van der Riet
(Cand. Sci. Nat. - Environmental Scientist)
Senior Environmental Consultant
Tel: 043 726 4242
Fax: 043 726 3199
Email:conroy@besc.co.za

Lee-Anne Proudfoot
(Pr.Sci.Nat – Environmental Scientist)
Senior Environmental Consultant
Email: lee-anne@besc.co.za

Road #	Borrow Pit #	Latitude	Longitude	Municipal Area	Ward	Farm #/Allotment Name
DR08049	049_BP02	-32.478556	28.342889	MNQUMA LM	26	RE/94
DR08049	049_BP03	-32.480833	28.364556	MNQUMA LM	26	RE/147
DR08182	182_BP02	-32.156333	27.896639	MNQUMA LM	16	SOBEKWA
DR08344	344_BP01	-32.278611	28.224083	MNQUMA LM	22	GWADANA
DR08344	344_BP02	-32.258417	28.253611	MNQUMA LM	22	GWADANA
DR08344	344_BP03	-32.252833	28.262556	MNQUMA LM	22	RE/295
DR08344	344_BP04	-32.233028	28.339556	MBHASHE LM	11	RE/299
DR08344	344_BP05	-32.174778	28.434306	MBHASHE LM	10	RE/303
DR08348	348_BP01	-32.400444	28.460611	MNQUMA LM	25	RE/140
DR08348	348_BP02	-32.383944	28.4675	MNQUMA LM	25	RE/333
DR08348	348_BP03	-32.366167	28.489361	MNQUMA LM	25	RE/333
DR08348	348_BP04	-32.313944	28.489694	MBHASHE LM	25	COMMUNAL (KWANYANA LOC 14)
DR08348	348_BP05	-32.306389	28.488083	MBHASHE LM	25	COMMUNAL (KWANYANA LOC 14)
DR08348	348_BP06	-32.295028	28.48675	MBHASHE LM	25	COMMUNAL (KWANYANA LOC 14)
DR08352	352_BP03	-32.360361	28.530639	MBHASHE LM	25	COMMUNAL (MHLAHLANE LOC 5)
DR08355	355_BP02	-32.50325	28.405028	MNQUMA LM	28	RE/154
DR08355	355_BP03	-32.530444	28.433861	MNQUMA LM	28	RE/155
DR08355	355_BP05	-32.562167	28.466	MNQUMA LM	28	RE/155
DR08356	356_BP01	-32.500361	28.431222	MNQUMA LM	28	RE/157
DR08356	356_BP02	-32.510111	28.469778	MNQUMA LM	28	RE/137
DR08359	359_BP01	-32.4835	28.567833	MNQUMA LM	27	RE/135
DR08371	371_BP01	-32.383583	28.039028	MNQUMA LM	9	CEGCUANA
DR08371	371_BP02	-32.396333	28.030639	MNQUMA LM	12	TONGWANA
DR08371	371_BP03	-32.394611	28.047222	MNQUMA LM	10	TONGWANA
DR08371	371_BP05	-32.453111	28.513806	MNQUMA LM	11	NDABAKAZI
DR08371	371_BP06	-32.458	28.052472	MNQUMA LM	11	NDABAKAZI
DR08372	372_BP01	-32.372306	28.122028	MNQUMA LM	9	BUTTERWORTH MISSION
DR08372	372_BP02	-32.39075	28.116556	MNQUMA LM	10	TONGWANA
DR08372	372_BP03	-32.396389	28.110694	MNQUMA LM	10	TONGWANA
DR08372	372_BP04	-32.415972	28.091583	MNQUMA LM	10	TONGWANA
DR08386	386_BP01	-32.230444	27.885389	MNQUMA LM	16	NOBANDA
DR08386	386_BP03	-32.23	27.865	MNQUMA LM	15	HEBEHEBE
DR08386	386_BP04	-32.230278	27.823444	MNQUMA LM	15	HEBEHEBE
DR08386	386_BP05	-32.227722	27.779972	MNQUMA LM	15	MBATSHA
DR08386	386_BP06	-32.218806	27.769611	MNQUMA LM	15	MBATSHA
DR08386	386_BP07	-32.23075	27.746722	INTSIKA YETHU LM	13	MBULU
DR08386	386_BP08	-32.24325	27.749417	AMAHLATHI LM	13	MFULA
DR08386	386_BP10	-32.224639	27.697306	AMAHLATHI LM	13	MBULU
DR08395	395_BP01	-32.38025	27.979194	MNQUMA LM	12	TOLENI
DR08401	401_BP02	-32.124194	28.024167	MNQUMA LM	17	MAXEGWANAS
DR08401	401_BP03	-32.107611	28.080167	MNQUMA LM	19	SHOSHA
DR08401	401_BP04	-32.106194	28.078556	MNQUMA LM	19	SHOSHA
DR08401	401_BP07	-32.104	28.223278	MNQUMA LM	21	MAZAMISA
DR08408	408_BP01	-32.269806	28.174139	MNQUMA LM	7	GCUWA
DR08486	486_BP01	-32.301472	28.172806	MNQUMA LM	7	GCUWA
DR08486	486_BP02	-32.284778	28.178167	MNQUMA LM	7	GCUWA

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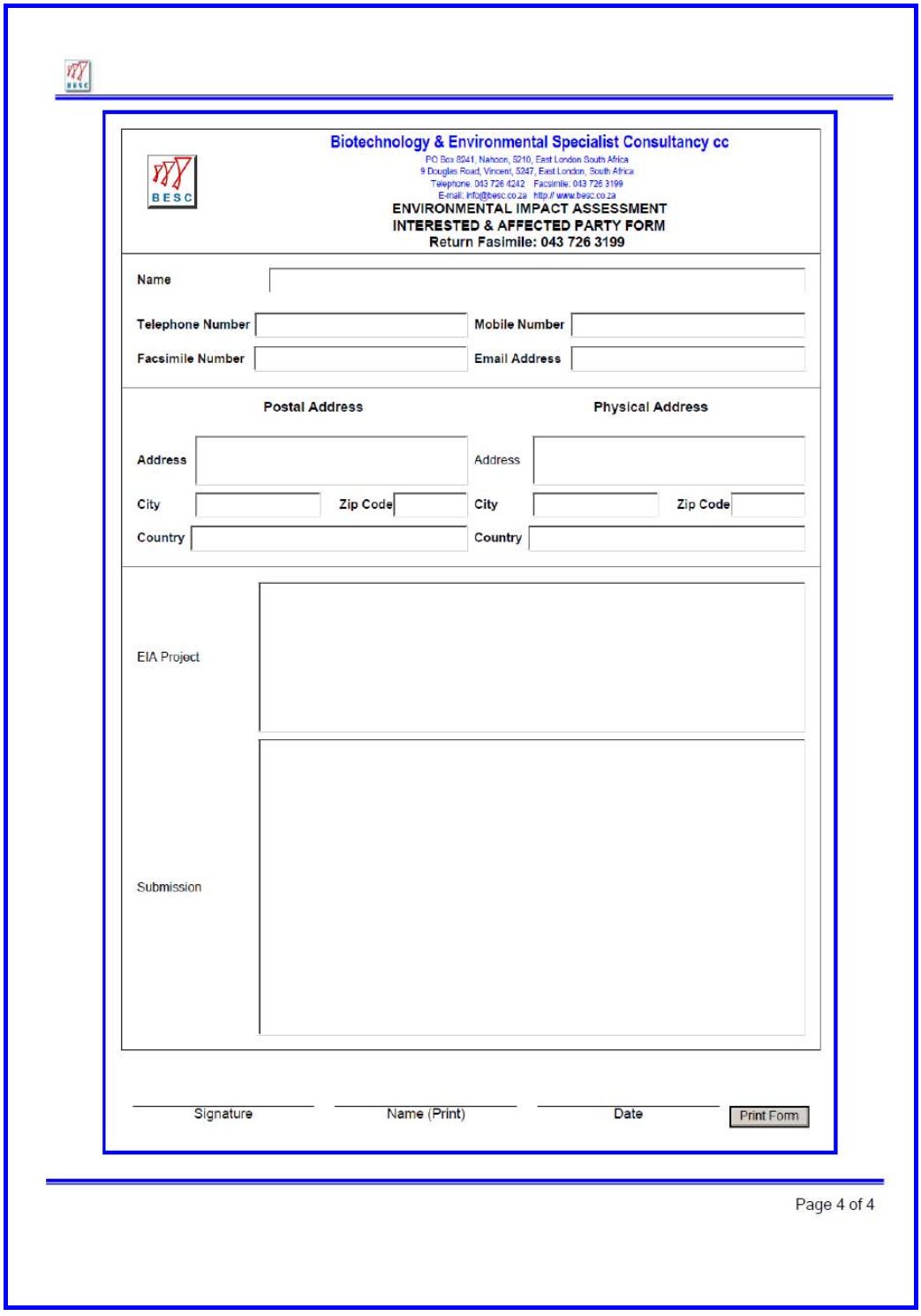

Biotechnology & Environmental Specialist Consultancy cc

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ENVIRONMENTAL IMPACT ASSESSMENT
INTERESTED & AFFECTED PARTY FORM
Return Fasimile: 043 726 3199

Name

Telephone Number | Mobile Number

Facsimile Number | Email Address

Postal Address	Physical Address
Address	Address
City / Zip Code	City / Zip Code
Country	Country

EIA Project

Submission

Signature | Name (Print) | Date | Print Form

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Leaders in Industrial Ecology, Environmental Impact & Site Assessments & Safety, Health & Environmental Management Systems

March 23, 2011

Attention: Mr. Hlopekazi
Regional Manager – Amathole District
Department of Rural Development & Land Reform
P.O.BOX 1958
East London
5201

Tel: 043 722 1762
Fax: 043 722 1788

RE: Notification of the compilation of Environmental Management Plans for the utilisation of borrow pits in the Amathole District Municipality, Eastern Cape.

Notice is hereby given in terms of the Regulations of the Minerals and Petroleum Resources Development Act (No. 28 of 2002) of the intent to carry out the following activity:

The Department of Roads & Public works proposes to utilize borrow pits for road upgrade/re-gravelling projects (15 road sections) located throughout the Amathole District Municipality. The permitting of the materials sources required for the project will be undertaken in accordance with the Minerals and Petroleum Resources Development Act (M&PRDA) (No. 28 of 2002). The Department of Roads & Public Works have been exempted from provisions in terms of Section 106(1) of the M&PRDA, and thus exploration of any materials sources would be subject to the preparation, submission and approval of an Environmental Management Plan compiled in accordance with Section 39(1) of the M&PRDA and Regulation 52 of the M&PRDA regulations. BESC have been appointed to compile the Environmental Management Plans for these borrow pits.

A number of these borrow pits are located on rural/communal land or state owned land. The purpose of this letter is to notify and inform you, the custodian/landowner of all rural / communal land and the identified state owned land of the proposed utilisation of these borrow pits.

You have been identified as a Key Interested & Affected Parties (I&AP's). Accompanying this letter is a CD containing the Background Information Document(s) (BID'(s)) pertaining to the relevant proposed borrow pits and roads sections in the Amathole District Municipality. Please refer to attached table for the borrow pits and road sections.

Please feel free to contact BESC if you have any further queries.

Malcolme Logie

B.Sc. Hons. (Botany), M.Sc. (Botany), Ph.D. (Biotechnology), (Rhodes)
CEAP-SA; MSAIE & ES; MIAIA; *Pr.Sci.Nat.(Environ.Sci.)*
CK 95.10210/23

Yours Sincerely
Lee-Anne Proudfoot
(Pr.Sci.Nat – Environmental Scientist)
Senior Environmental Consultant
Mobile: +27 83 421 3991
Email: lee-anne@besc.co.za

Mr. Conroy van der Riet
(Cand. Sci. Nat. - Environmental Scientist)
Senior Environmental Consultant
Mobile: 083 993 1243
Email:conroy@besc.co.za

Road #	Borrow Pit #	Latitude	Longitude	Municipal Area	Ward	Farm #/Allotment Name
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DR08049	049_BP03	-32.480833	28.364556	MNQUMA LM	26	RE/147
DR08182	182_BP02	-32.156333	27.896639	MNQUMA LM	16	SOBEKWA
DR08344	344_BP01	-32.278611	28.224083	MNQUMA LM	22	GWADANA
DR08344	344_BP02	-32.258417	28.253611	MNQUMA LM	22	GWADANA
DR08344	344_BP03	-32.252833	28.262556	MNQUMA LM	22	RE/295
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Leaders in Industrial Ecology, Environmental Impact & Site Assessments & Safety, Health & Environmental Management Systems

March 23, 2011

Attention: Mr Briant Noncembu
Regional Manager: DEDEA – Amathole Region
Palm Square Business Park,
Beacon Bay
East London

RE: Notification of the compilation of Environmental Management Plans for the utilisation of borrow pits in the Amathole District Municipality, Eastern Cape.

Notice is hereby given in terms of the Regulations of the Minerals and Petroleum Resources Development Act (No. 28 of 2002) of the intent to carry out the following activity:

The Department of Roads & Public works proposes to utilize borrow pits for road upgrade/re-gravelling projects (15 road sections) located throughout the Amathole District Municipality. BESC have been appointed to compile the Environmental Management Plans for these borrow pits.

Please note that in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998): Listing Notices 1, 2 & 3 (GN 544, GN 545 & GN546, 2010), no listed activities will be triggered by the above mentioned utilisation of the identified borrow pits.

You have been identified as a Key Interested & Affected Parties (I&AP's). Accompanying this letter is a CD containing the Background Information Document(s) (BID'(s)) pertaining to the relevant proposed borrow pits and roads sections in the Amathole District Municipality. Please refer to attached table for the borrow pits and road sections.

Please feel free to contact BESC if you have any further queries.

Yours Sincerely
Lee-Anne Proudfoot
(Pr.Sci.Nat – Environmental Scientist)
Senior Environmental Consultant
Mobile: +27 83 421 3991
Email: lee-anne@besc.co.za

Mr. Conroy van der Riet
(Cand. Sci. Nat. - Environmental Scientist)

Page 1 of 3

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CK 95.10210/23

Senior Environmental Consultant
Mobile: 083 993 1243
Email:conroy@besc.co.za

Road #	Borrow Pit #	Latitude	Longitude	Municipal Area	Ward	Farm #/Allotment Name
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DR08344	344_BP01	-32.278611	28.224083	MNQUMA LM	22	GWADANA
DR08344	344_BP02	-32.258417	28.253611	MNQUMA LM	22	GWADANA
DR08344	344_BP03	-32.252833	28.262556	MNQUMA LM	22	RE/295
DR08344	344_BP04	-32.233028	28.339556	MBHASHE LM	11	RE/299
DR08344	344_BP05	-32.174778	28.434306	MBHASHE LM	10	RE/303
DR08348	348_BP01	-32.400444	28.460611	MNQUMA LM	25	RE/140
DR08348	348_BP02	-32.383944	28.4675	MNQUMA LM	25	RE/333
DR08348	348_BP03	-32.366167	28.489361	MNQUMA LM	25	RE/333
DR08348	348_BP04	-32.313944	28.489694	MBHASHE LM	25	COMMUNAL (KWANYANA LOC 14)
DR08348	348_BP05	-32.306389	28.488083	MBHASHE LM	25	COMMUNAL (KWANYANA LOC 14)
DR08348	348_BP06	-32.295028	28.48675	MBHASHE LM	25	COMMUNAL (KWANYANA LOC 14)
DR08352	352_BP03	-32.360361	28.530639	MBHASHE LM	25	COMMUNAL (MHLAHLANE LOC 5)
DR08355	355_BP02	-32.50325	28.405028	MNQUMA LM	28	RE/154
DR08355	355_BP03	-32.530444	28.433861	MNQUMA LM	28	RE/155
DR08355	355_BP05	-32.562167	28.466	MNQUMA LM	28	RE/155
DR08356	356_BP01	-32.500361	28.431222	MNQUMA LM	28	RE/157
DR08356	356_BP02	-32.510111	28.469778	MNQUMA LM	28	RE/137
DR08359	359_BP01	-32.4835	28.567833	MNQUMA LM	27	RE/135
DR08371	371_BP01	-32.383583	28.039028	MNQUMA LM	9	CEGCUANA
DR08371	371_BP02	-32.396333	28.030639	MNQUMA LM	12	TONGWANA
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DR08371	371_BP06	-32.458	28.052472	MNQUMA LM	11	NDABAKAZI
DR08372	372_BP01	-32.372306	28.122028	MNQUMA LM	9	BUTTERWORTH MISSION
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DR08386	386_BP01	-32.230444	27.885389	MNQUMA LM	16	NOBANDA
DR08386	386_BP03	-32.23	27.865	MNQUMA LM	15	HEBEHEBE
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DR08401	401_BP03	-32.107611	28.080167	MNQUMA LM	19	SHOSHA
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DR08408	408_BP01	-32.269806	28.174139	MNQUMA LM	7	GCUWA
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Leaders in Industrial Ecology, Environmental Impact & Site Assessments & Safety, Health & Environmental Management Systems

March 23, 2011

Attention: Key Interested and Affected Parties

RE: Notification of the compilation of Environmental Management Plans for the utilisation of borrow pits in the Amathole District Municipality, Eastern Cape.

Notice is hereby given in terms of the Regulations of the Minerals and Petroleum Resources Development Act (No. 28 of 2002) of the intent to carry out the following activity:

The Department of Roads & Public works proposes to utilize borrow pits for road upgrade/re-gravelling projects (15 road sections) located throughout the Amathole District Municipality. BESC have been appointed to compile the Environmental Management Plans for these borrow pits.

You have been identified as a Key Interested & Affected Parties (I&AP's). Accompanying this letter is/are the Background Information Document(s) (BID'(s)) pertaining to the proposed borrow pits and roads sections relevant to your area of jurisdiction. Please refer to attached table for relevant borrow pits and road sections.

Please feel free to contact BESC if you have any further queries.

Yours Sincerely
Lee-Anne Proudfoot
(Pr.Sci.Nat – Environmental Scientist)
Senior Environmental Consultant
Mobile: +27 83 421 3991
Email: lee-anne@besc.co.za

Mr. Conroy van der Riet
(Cand. Sci. Nat. - Environmental Scientist)
Senior Environmental Consultant
Mobile: 083 993 1243
Email:conroy@besc.co.za

Page 1 of 2

Malcolme Logie

B.Sc. Hons. (Botany), M.Sc. (Botany), Ph.D. (Biotechnology), (Rhodes)
CEAP-SA; MSAIE & ES; MIAIA; *Pr.Sci.Nat.(Environ.Sci.)*
CK 95.10210/23

Road #	Borrow Pit #	Latitude	Longitude	Municipal Area	Ward	Farm #/Allotment Name
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DR08049	049_BP03	-32.480833	28.364556	MNQUMA LM	26	RE/147
DR08182	182_BP02	-32.156333	27.896639	MNQUMA LM	16	SOBEKWA
DR08344	344_BP01	-32.278611	28.224083	MNQUMA LM	22	GWADANA
DR08344	344_BP02	-32.258417	28.253611	MNQUMA LM	22	GWADANA
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Leaders in Industrial Ecology, Environmental Impact & Site Assessments & Safety, Health & Environmental Management Systems

March 23, 2011

Attention: Key Interested and Affected Parties

RE: Notification of the compilation of Environmental Management Plans for the utilisation of borrow pits in the Amathole District Municipality, Eastern Cape.

Notice is hereby given in terms of the Regulations of the Minerals and Petroleum Resources Development Act (No. 28 of 2002) of the intent to carry out the following activity:

The Department of Roads & Public works proposes to utilize borrow pits for road upgrade/re-gravelling projects (15 road sections) located throughout the Amathole District Municipality. BESC have been appointed to compile the Environmental Management Plans for these borrow pits.

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Please feel free to contact BESC if you have any further queries.

Yours Sincerely
Lee-Anne Proudfoot
(Pr.Sci.Nat – Environmental Scientist)
Senior Environmental Consultant
Mobile: +27 83 421 3991
Email: lee-anne@besc.co.za

Mr. Conroy van der Riet
(Cand. Sci. Nat. - Environmental Scientist)
Senior Environmental Consultant
Mobile: 083 993 1243
Email:conroy@besc.co.za

Page 1 of 2

Malcolme Logie

B.Sc. Hons. (Botany), M.Sc. (Botany), Ph.D. (Biotechnology), (Rhodes)
CEAP-SA; MSAIE & ES; MIAIA; *Pr.Sci.Nat.(Environ.Sci.)*
CK 95.10210/23

From: lee-Anne Proudfoot [mailto:lee-anne@besc.co.za]
Sent: 30 June 2011 03:13 PM
To: Lucas Andrew (ELS)
Cc: Kama Bolekwa (ELS); Fourie Lizna (ELS)
Subject: RE: 2 Notification of the compilation of Environmental Management Plans for the utilisation of borrow pits in the Amathole District Municipality, Eastern Cape.

Dear Mr Lucas,

The notification and BID's for the utilisation of borrow pits have been sent to you as a commenting party for Department of Water Affairs. They were not sent to the water use licensing department (Ms Fourie) as no water use license/general authorisation applications are required for any of the borrow pits at this stage .

Should it become evident during our investigations that water use license/general authorisation applications are required; then these reports and applications will be forwarded to Ms Fourie.

As such please could you confirm for future reference who the primary contact person for the department is as a commenting authority on these projects during our public participation process.

Regards

Lee-Anne

Ms Lee-Anne Proudfoot
Senior Environmental Consultant
(Pr. Sci. Nat. – Environmental Scientist)

Biotechnology & Environmental Specialist Consultancy cc
PO Box 8241, Nahoon, 5210, East London, South Africa
9 Douglas Road, Vincent, 5247, East London, South Africa

Mobile: +27 83 421 3991
Direct Email: lee-anne@besc.co.za

From: Fourie Lizna \(ELS\)
To: lee-Anne Proudfoot; Lucas Andrew \(ELS\)
Cc: Kama Bolekwa \(ELS\)
Subject: RE: 2 Notification of the compilation of Environmental Management Plans for the utilisation of borrow pits in the Amathole District Municipality, Eastern Cape.
Date: 01 July 2011 08:28:51 AM

Dear Lee-Anne

All new developments as well as applications must please be submitted through my office. We records all new developments and applications

Regards

Lizna

BIOTECHNOLOGY & ENVIRONMENTAL SPECIALIST CONSULTANCY CC

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Leaders in Industrial Ecology, Environmental Impact & Site Assessments
& Safety, Health & Environmental Management Systems

March 23, 2011

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Please note that a Phase 1 Archaeological and Heritage Assessment is currently being undertaken by Ms Karen van Ryneveld (Archaeomaps) for the identified borrow pits.

Please feel free to contact BESC if you have any further queries.

Yours Sincerely
Lee-Anne Proudfoot
(Pr.Sci.Nat – Environmental Scientist)
Senior Environmental Consultant
Mobile: +27 83 421 3991
Email: lee-anne@besc.co.za

Mr. Conroy van der Riet
(Cand. Sci. Nat. - Environmental Scientist)
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SOUTH AFRICAN HERITAGE RESOURCES AGENCY
111 HARRINGTON STREET, CAPE TOWN, 8000
PO BOX 4637, CAPE TOWN, 8000
TEL: (021) 462 4502 FAX: (021) 462 4509

DATE: 6 April 2011
ENQUIRIES: Dr Mariagrazia Galimberti
Archaeology, Palaeontology and Meteorite Unit
E-mail: mgalimberti@sahra.org.za
Web site: www.sahra.org.za

OUR REF: 9/2/503/0001

Ms Lee-Anne Proudfoot
Biotechnology and Environmental Specialist Consultants CC
PO Box 8241
Nahoon
5210

Dear Ms Proudfoot,

REQUEST FOR A HERITAGE IMPACT ASSESSMENT: NOTIFICATION OF COMPILATION OF EMPS FOR THE UTILIZATION OF BORROW PITS IN THE AMATHOLE DISTRICT MUNICIPALITY, EASTERN CAPE

Thank you for your indication that development is to take place in this area.

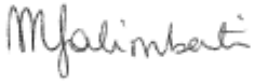
In terms of the National Heritage Resources Act, no 25 of 1999, heritage resources, including archaeological or palaeontological sites over 100 years old, graves older than 60 years, structures older than 60 years are protected. They may not be disturbed without a permit from the relevant heritage resources authority. This means that before such sites are disturbed by development it is incumbent on the developer to ensure that a **Heritage Impact Assessment** is done. This must include the archaeological component (Phase 1) and any other applicable heritage components. Appropriate (Phase 2) mitigation, which involves recording, sampling and dating sites that are to be destroyed, must be done as required.

In your notification it is stated that an Archaeological Impact Assessment has already being commissioned. Please make sure that also a Palaeontological Impact Assessment is undertaken.

If the property is very small or disturbed and there is no significant site the specialist may choose to send a letter to the heritage authority to indicate that there is no necessity for any further assessment.

Any other heritage resources that may be impacted such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and cultural landscapes or viewscapes must also be assessed.

Yours sincerely



PP Mrs Nonofho Ndobochani
SAHRA: Archaeology, Palaeontology and Meteorite Unit
For: CHIEF EXECUTIVE OFFICER

Copy: PHRA Eastern Cape Office

From: Karen van Ryneveld [kvanryneveld@gmail.com]
Sent: 08 June 2011 11:02 AM
To: Mariagrazia Galimberti; Lee-Anne Proudfoot; Conroy van der Riet; Thanduxolo Lungile
Subject: AIA - Utilization of borrow pits, Amathole Municipal District, EC

Attachments: AIA-Final-Amathole BP1, EC.pdf
Hi Mariagrazia, Thanduxolo, Lee-Anne and Conroy,

Attached please find the Phase 1 AIA report for the proposed Utilization of borrow pits - Amathole Municipal District, Eastern Cape project. Hard copies of the report will be forwarded to the SAHRA APM Unit - Cpt and BESC.

Regards,
Karen
--
Karen van Ryneveld
ArchaeoMaps

Tel: 043 740 2370
Fax to e-mail: 086 515 6848
Cell: 084 871 1064
Postal address: Postnet Suite 239, Private Bag X3, Beacon Bay, 5205
E-mail: kvanryneveld@gmail.com

lee-Anne Proudfoot

From: lee-Anne Proudfoot [lee-anne@besc.co.za]
Sent: 12 August 2011 08:27 AM
To: 'MARIAGRAZIA GALIMBERTI'
Subject: PIA - Utilization of borrow pits, Amathole Municipal District, EC
Attachments: Palaeontological survey and report for borrow pits in the Amathole district.pdf

Dear Mariagrazia,

Please find attached for SAHRA's review and comment the Palaeontological Assessment undertaken by Rob Gess for the proposed utilisation of borrow pits in the Amathole District Municipality. The Phase 1 Archaeological Impact Assessment which was undertaken by Karen van Ryneveld (ArchaeoMaps) has already been submitted to SAHRA on 08 June 2011, please see correspondence below. Should you require me to send this AIA to you again please do not hesitate to let me know.

Please acknowledge receipt of the attached Palaeontological Assessment Report. Should you have any queries please do not hesitate to contact me.

Kind Regards

Lee-Anne

Ms Lee-Anne Proudfoot
Senior Environmental Consultant
(Pr. Sci. Nat. – Environmental Scientist)

Biotechnology & Environmental Specialist Consultancy cc
PO Box 8241, Nahoon, 5210, East London, South Africa
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Mobile: +27 83 421 3991
Direct Email: lee-anne@besc.co.za

From: MARIAGRAZIA GALIMBERTI
To: lee-Anne Proudfoot
Subject: Re: PIA - Utilization of borrow pits, Amathole Municipal District, EC
Date: 12 August 2011 03:20:44 PM

Dear Lee-Anne,

many thanks for the palaeontological assessment, which you have just sent to us, and for the archaeological report which was received on the 8th of June.
We will comment on them as soon as possible

Kind regards
Mariagrazia

SOUTH AFRICAN HERITAGE RESOURCES AGENCY
111 HARRINGTON STREET, CAPE TOWN, 8001
PO BOX 4637, CAPE TOWN, 8000
TEL: 021 462 4502 FAX: 021 462 4509

FOR ATTENTION: **PHRA: Eastern Cape**

FOR OFFICIAL USE ONLY:
SAHRA File No: **9/2/053/0001**
Date Received: **8 June 2011 (AIA)** .....
12 August 2011 (PIA)
Date of Comment: **20 September 2011**.....
Sent to Peer Review: .....
Date to Peer Review: .....
SAHRA Contact Person: **Dr Mariagrazia Galimberti**
DMR Ref. no:

REVIEW COMMENT ON ARCHAEOLOGICAL AND PALAEONTOLOGICAL IMPACT ASSESSMENTS

BY ARCHAEOLOGY/ PALAEONTOLOGY UNIT OF THE HERITAGE RESOURCES AGENCY

South Africa has a unique and non-renewable archaeological and palaeontological heritage. Archaeological and palaeontological sites are protected in terms of the National Heritage Resources Act (Act No 25 of 1999) and may not be disturbed without a permit. Archaeological Impact Assessments (AIAs) and Palaeontological Impact Assessments (PIAs) identify and assess the significance of the sites, assess the potential impact of developments upon such sites, and make recommendations concerning mitigation and management of these sites. On the basis of satisfactory specialist reports SAHRA or the relevant heritage resources agency can assess whether or not it has objection to a development and indicate the conditions upon which such development might proceed and assess whether or not to issue permission to destroy such sites.
AIAs and PIAs often form part of the heritage component of an Environmental Impact Assessment or Environmental Management Plan. They may also form part of a Heritage Impact Assessment called for in terms of section 38 of the National Heritage Resources Act, Act No. 25, 1999. They may have other origins. In any event they should comply with basic minimum standards of reporting as indicated in SAHRA Regulations and Guidelines.
This form provides review comment from the Archaeologist of the relevant heritage resources authority for use by Heritage Managers, for example, when informing authorities that have applied to SAHRA for comment and for inclusion in documentation sent to environmental authorities. It may be used in conjunction with Form B, which provides relevant peer review comment.

A. PROVINCIAL HERITAGE RESOURCES AUTHORITY: **Eastern Cape** .....

B. AUTHOR(S) OF REPORT: **Ms Karen van Ryneveld**
C. ARCHAEOLOGY CONTRACT GROUP: **Archaeomaps**
D. CONTACT DETAILS: **Postnet Suite 239, Private Bag X3, Beacon Bay, 5205, email: kvanryneveld@gmail.com**
E. DATE OF REPORT: **May 2011**
F. TITLE OF REPORT: **Utilization Of Borrow Pits – Amathole District Municipality, Eastern Cape, South Africa**

B. AUTHOR(S) OF REPORT: **Dr Robert Gess**
C. ARCHAEOLOGY CONTRACT GROUP: **Bernard Price Institute for Palaeontological Research, Wits**
D. CONTACT DETAILS: **PO Box 40, Bathurst, 6166, email: robg@imaginet.co.za**
E. DATE OF REPORT: **August 2011**
F. TITLE OF REPORT: **Palaeontological survey and report for borrow pits in the Amathole district centred on Nqamakwe, Butterworth, Idutywa, Centane and Willlowvale.**

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G. Please circle as relevant: Archaeological and Palaeontological components of EIA / **EMP** / HIA / CMP/ Other (Specify).....

H. REPORT COMMISSIONED BY (**CONSULTANT** OR DEVELOPER): **Ms Lee-Anne Proudfoot,**

I. CONTACT DETAILS: **Biotechnology & Environmental Specialist Consultancy cc, PO Box 8241, Nahoon, 5210, East London, South Africa**

J. COMMENTS: .....

Please see comment on next page.....

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REVIEW COMMENT ON ARCHAEOLOGICAL AND PALAEONTOLOGICAL IMPACT ASSESSMENTS

Ms Karen van Ryneveld

Dated: 6 May 2011, Received: 8 June 2011

Utilization Of Borrow Pits – Amathole District Municipality, Eastern Cape, South Africa

Dr Robert Gess

Dated: August 2001, Received: 12 August 2011

Palaeontological survey and report for borrow pits in the Amathole district centred on Nqamakwe, Butterworth, Idutywa, Centane and Willlowvale.

INTRODUCTION

The Department of Roads and Public Works applied to the Department of Mineral Resources for the mining rights for 57 borrow pits in the Amathole District Municipality. The intent is to upgrade and resurface about 20 roads in the municipality.

In accordance with the legislative requirements, the independent environmental assessment practitioner required that a Heritage Impact Assessment be undertaken for the borrow pits. Both an archaeologist and a palaeontologist undertook a field survey and their reports were submitted to SAHRA for comments.

DISCUSSION

In terms of archaeology and palaeontology, the area affected by the proposed development has not been previously widely researched, with much of the existing knowledge on this municipality deriving from Cultural Resources Management work undertaken in the last few years.

Despite the expectations, the study area proved not to be archaeologically sensitive, with no Stone Age sites identified in the proximity of the 57 borrow pits. From an Iron Age perspective, remains of households are often recorded in the area, witnessing a continuous occupation of the sites, however, in this instance, only one Iron Age site was identified. Other recorded resources of cultural significance, not necessarily related to archaeology are: a colonial period church complex, the Cunningham Mission Church and Homestead, a contemporary memorial stone and a contemporary tribal court building in the village of Luxeni. The colonial period church complex is erected in close proximity to the Iron Age site, which comprises one rectangular stock enclosure and five huts, some with daga walls still visible. The Iron Age site, which has previously been disturbed by power lines, is not expected to be impacted by the activities of the borrow pit.

Palaeontologically, the area is vastly underlain by the Adelaide Formation, which is here often intruded by dolerite. Very few borrow pits are located within the fossiliferous Katberg and Balfour Formation of the Beaufort Group.

During his survey, Dr Gess identified few palaeontological occurrences, amongst which were many burrows of different species of invertebrates found for instance at 348_BP05, 386_BP01 and 182_BP02. Glassopterid plant fossils and stems of sphenophytes and other plants were recorded at borrow pits close to Willowvale, including 248_BP06 and adjacent, 367_BP01, 371_BP01 and 386_BP05 and 06. Some of these palaeontological occurrences present unique or rare characteristics within the palaeontology of the country, therefore their preservation and protection is of great importance and they should not be impacted without a permit from SAHRA.

SAHRA RECOMMENDATIONS

SAHRA supports the recommendations of the authors and requires that:

- Since the Iron Age site is located within 20m from the borrow pit 182_BP02, a Phase 2 Archaeological Impact Assessment in the form of recording and test excavation is

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recommended. The number of test excavations will be decided by the archaeologist after the recording process is completed. The archaeologist requires a mitigation permit from SAHRA in terms of s. 35 of the National Heritage Resources Act (Act 25 of 1999). On receipt of a satisfactory mitigation (Phase 2) permit report from the archaeologist, SAHRA will make further recommendations on the future of the site.

- Invertebrate burrows from the occurrences of pit 182 BP02 are rescued for research before exploitation of the borrow pit commences. The removal of the burrows must be undertaken by a professional palaeontologist. The specialist will require a mitigation permit from SAHRA. On receipt of a satisfactory mitigation (Phase 2) permit report from the palaeontologist, the heritage authority will make further recommendations in terms of the site.
- It is suggested that other aspects of heritage, such as living heritage, are considered. The community must be consulted in the development of borrow pits 047_BP02 and 368_BP01 since a contemporary memorial stone and a tribal court building are located in proximity of these proposed borrow pits. The integrity of these cultural heritage resources may be compromised by the activities surrounding the borrow pits.
- Inspection by a palaeontologist is required after opening for borrow pit 182_BP02, 344_BP05, 348_BP06 and 348_BP04, as well as 371_BP01 to identify potential newly uncovered fossils. Should new material be discovered, the specialist will require a collection permit from the relevant Heritage Resources Authority. A monitoring report must be submitted to SAHRA.
- At the end of their usage and prior to any form of rehabilitation, a palaeontologist will be required to resurvey the borrow pits within the sedimentary rocks of the study area. This will allow survey and sampling of freshly exposed palaeontological material and will result in possible recommendations regarding strata to be left unrehabilitated for future access by professionals. A monitoring report from this survey must be submitted to SAHRA.

CONCLUSION

If the recommendations made in the specialist's reports and in this comment are adhered to, the SAHRA Archaeology, Palaeontology and Meteorites Unit has no objection to the development (in terms of the archaeological and palaeontological components of the heritage resources). If any new evidence of archaeological sites or artefacts, palaeontological fossils, graves or other heritage resources are found during mining activities, SAHRA (Tel: 021 462 4502) and a professional archaeologist or palaeontologist, according to the findings, must be alerted immediately.

SIGNATURE OF ARCHAEOLOGIST PROCESSING REPORT: .....

EMAIL: mgalimberti@sahra.org.za .....

SIGNATURE OF SAHRA HEAD ARCHAEOLOGIST: .....

EMAIL: nndobochani@sahra.org.za .....

NAME OF HERITAGE RESOURCES AGENCY: SAHRA .....

PLEASE NOTE THAT THE COMMENT (ABOVE OR APPENDED) CONSTITUTES THE COMMENT OF THE HERITAGE RESOURCES AGENCY ARCHAEOLOGIST AND THAT ANY DEVELOPMENT THAT INVOLVES DESTRUCTION OF ANY ARCHAEOLOGICAL/PALAEONTOLOGICAL SITE IS STILL SUBJECT TO A PERMIT/PERMISSION FOR DESTRUCTION OF SUCH SITE GIVEN TO THE DEVELOPER BY THE RELEVANT HERITAGE RESOURCES AGENCY ARCHAEOLOGICAL AND PALAEONTOLOGICAL PERMIT COMMITTEE (THIS WILL BE SUBJECT TO APPROVAL OF THE PHASE 2 OR ARCHAEOLOGICAL/ PALAEONTOLOGICAL MITIGATION AS NECESSARY). THIS REPORT MAY BE TAKEN ONLY AS APPROVAL IN TERMS OF SECTION 35 OF THE NATIONAL HERITAGE RESOURCES ACT. THE PROVINCIAL MANAGER OF THE HERITAGE RESOURCES AUTHORITY MUST ADVISE AS TO APPROVAL IN TERMS OF HERITAGE ISSUES ENCOMPASSED BY OTHER ASPECTS OF THE LEGISLATION, SUCH AS ISSUES OF THE BUILT ENVIRONMENT (STRUCTURES (E.G. FARM HOUSES), OVER 60 YEARS), INDIGENOUS KNOWLEDGE SYSTEMS OR OF CULTURAL LANDSCAPES AS THIS IS NOT WITHIN THE SCOPE OF THE ARCHAEOLOGIST.

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Lee-Anne Proudfoot

From: Lee-Anne Proudfoot <lee-anne@besc.co.za>
Sent: 23 September 2011 08:15 AM
To: 'MARIAGRAZIA GALIMBERTI'
Subject: RE: Amathole Borrow Pits

Dear Mariagrazia,

Thank you for this. All recommendations and comments will be incorporated into our EMP's for the identified borrow pits.

Kind Regards

Lee-Anne

Ms Lee-Anne Proudfoot
Senior Environmental Consultant
(Pr. Sci. Nat. - Environmental Scientist)

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25.2 Correspondence issued to and received from Key & Registered Interested Affected Parties during the Public Draft Review Commenting Period.

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Leaders in Industrial Ecology, Environmental Impact & Site Assessments
& Safety, Health & Environmental Management Systems

August 15, 2011

Attention: Key Interested & Affected Parties

Public Draft Environmental Management Plan Reports – Utilization of Borrow Pits, Amathole District Municipality

In terms of the Minerals and Petroleum Resources Development Regulations (Government Notice No. 527) under the Minerals and Petroleum Resources Development Act (M&PRDA) (No. 28 of 2002) and the Promotion of Administrative Justice Act (Act 3 of 2000 and as amended) the following is present to you:

The Department of Roads & Public works proposes to utilize borrow pits for road maintenance/re-gravelling projects (20 road sections) located throughout the Amathole District Municipality. BESC have been commissioned to prepare Environmental Management Plan Reports in terms of the Minerals and Petroleum Resources Development Regulations (Government Notice No. 527) under the Minerals and Petroleum Resources Development Act (M&PRDA) (No. 28 of 2002) for the proposed utilization of Borrow Pits throughout the Amathole District Municipality.

Accompanying this letter is a Compact Disc containing the Public Draft Environmental Management Plan Report(s) pertaining to the proposed borrow pits and roads sections identified in the Amathole District Municipality.

These public draft Environmental Management Plan Reports are released for review and comment for a 30-day period from date of mailing. Whereas you may want to provide comments and/or suggestions for inclusion into this assessment/ the final EMP reports, please ensure that such is received in writing by the offices of BESC before 17H00, September 16, 2011; either via email (conroy@besc.co.za/ lee-anne@besc.co.za), facsimile (043 726 3199), or post (BESC, P.O. Box 8241, Nahoon, 5210).

Yours sincerely,
Mr. Conroy van der Riet/Ms. Lee-Anne Proudfoot
Tel: (043) 726 4242
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Page 1 of 1

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Leaders in Industrial Ecology, Environmental Impact & Site Assessments
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August 15, 2011

Attention: Key Interested & Affected Parties

Public Draft Environmental Management Plan Reports – Utilization of Borrow Pits, Amathole District Municipality

In terms of the Minerals and Petroleum Resources Development Regulations (Government Notice No. 527) under the Minerals and Petroleum Resources Development Act (M&PRDA) (No. 28 of 2002) and the Promotion of Administrative Justice Act (Act 3 of 2000 and as amended) the following is present to you:

The Department of Roads & Public works proposes to utilize borrow pits for road maintenance/re-gravelling projects (20 road sections) located throughout the Amathole District Municipality. BESC have been commissioned to prepare Environmental Management Plan Reports in terms of the Minerals and Petroleum Resources Development Regulations (Government Notice No. 527) under the Minerals and Petroleum Resources Development Act (M&PRDA) (No. 28 of 2002) for the proposed utilization of Borrow Pits throughout the Amathole District Municipality.

Accompanying this letter is a Compact Disc containing the Public Draft Environmental Management Plan Report(s) for your relevant area.

These public draft Environmental Management Plan Reports are released for review and comment for a 30-day period from date of mailing. Whereas you may want to provide comments and/or suggestions for inclusion into this assessment/ the final EMP reports, please ensure that such is received in writing by the offices of BESC before 17H00, September 16, 2011; either via email (conroy@besc.co.za/ lee-anne@besc.co.za), facsimile (043 726 3199), or post (BESC, P.O. Box 8241, Nahoon, 5210).

Yours sincerely,
Mr. Conroy van der Riet/Ms. Lee-Anne Proudfoot
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CK 95.10210/23

NAME	POSTAL ADDRESS	TRACE & TRACK
Mr. N Parkade (Mnquma Local Municipality: Municipal Manager)	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	ORDINARY PARCEL PE 408 068 089 ZA CUSTOMER COPY
Mr. Z. Ngovela (Mnquma Local Municipality: Director of the Department of Infrastructural Development and Planning)	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	ORDINARY PARCEL PE 408 068 075 ZA CUSTOMER COPY
Jimmy Calder, Phillip Wilkinson (WESSA)	WESSA PO Box 2909, Beacon Bay 5205	ORDINARY PARCEL PE 408 068 061 ZA CUSTOMER COPY
Mr. Nico Jonker (ADM: Director:Engineering)	Amathole District Municipality P O Box 320, East London, 5200	ORDINARY PARCEL PE 408 068 058 ZA CUSTOMER COPY
Sr.Nomvula Solomon (ADM: Director:Health & protection)	Amathole District Municipality P O Box 320, East London, 5200	ORDINARY PARCEL PE 408 068 044 ZA CUSTOMER COPY
Vuyo Mkoti (ADM: Municipal Manager)	Amathole District Municipality P O Box 320, East London, 5200	ORDINARY PARCEL PE 408 068 035 ZA CUSTOMER COPY
Mr M. Hlopekazi (Department of Rural Development & Land Reform: Amathole District Manager)	Department of Rural Development & Land Reform P.O.BOX 1958 East London, 5201	ORDINARY PARCEL PE 408 068 027 ZA CUSTOMER COPY
Mpilo Mbambisa (Chris Hani DM: Municipal Manager)	Chris Hani District Municipality Private Bag x7121 Queenstown, 5320	ORDINARY PARCEL PE 408 068 013 ZA CUSTOMER COPY
Makhaya Dungu (CHDM Director:Engineering)	Chris Hani District Municipality Private Bag x7121 Queenstown, 5320	ORDINARY PARCEL PE 408 068 000 ZA CUSTOMER COPY
Francois Nel (Chris Hani DM: Acting Director: Health and Community Services)	Chris Hani District Municipality Private Bag x7121 Queenstown, 5320	ORDINARY PARCEL PE 408 067 993 ZA CUSTOMER COPY
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Ms Feziwe Martha Shoba (Municipal Manager - Amahlati Local Municipality)	Amahlati Local Municipality Private Bag X2, STUTTERHEIM, 4930	ORDINARY PARCEL PE 408 067 976 ZA CUSTOMER COPY
Advocate Siphiwo Sohena (Mbhashe Municipality: Municipal Manager)	Mbhashe Local Municipality, PO Box 25, IDUTYWA, 5000	ORDINARY PARCEL PE 408 067 962 ZA CUSTOMER COPY
Gwen Sgwabe (Department of Forestry – Regional Officer)	Dept of Forestry, Private Bag X7485, King Williams Town, 5600	ORDINARY PARCEL PE 408 067 959 ZA CUSTOMER COPY
Cllr Mbebe (Mnquma Local Municipality: Ward 7 Councillor)	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	ORDINARY PARCEL PE 408 067 945 ZA CUSTOMER COPY

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Cllr Mbusi (Mnquma Local Municipality: Ward 8 Councillor)	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	ORDINARY PARCEL PE 408 067 931 ZA CUSTOMER COPY 301016
Cllr Ntobongwane (Mnquma Local Municipality: Ward 9 Councillor)	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	ORDINARY PARCEL PE 408 067 928 ZA CUSTOMER COPY 301016
Cllr Mvalo (Mnquma Local Municipality: Ward 10 Councillor)	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	ORDINARY PARCEL PE 408 067 914 ZA CUSTOMER COPY 301016
Cllr Mgogoshe (Mnquma Local Municipality: Ward 11 Councillor)	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	ORDINARY PARCEL PE 408 067 905 7 A CUSTOMER COPY 301016
Cllr Pikela (Mnquma Local Municipality: Ward 12 Councillor)	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	ORDINARY PARCEL PE 408 067 891 ZA CUSTOMER COPY 301016
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Cllr Sijadu (Mnquma Local Municipality: Ward 16 Councillor)	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	ORDINARY PARCEL PE 408 067 874 ZA CUSTOMER COPY 301016
Cllr Buso (Mnquma Local Municipality: Ward 17 Councillor)	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	ORDINARY PARCEL PE 408 067 865 ZA CUSTOMER COPY 301016
Cllr Gade (Mnquma Local Municipality: Ward 18 Councillor)	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	ORDINARY PARCEL PE 408 067 857 ZA CUSTOMER COPY 301016
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Cllr Ntanja (Mnquma Local Municipality: Ward 21 Councillor)	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	ORDINARY PARCEL PE 408 067 830 ZA CUSTOMER COPY 301016
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Cllr Mgcineni (Mnquma Local Municipality: Ward 23 Councillor)	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	ORDINARY PARCEL PE 408 067 812 ZA CUSTOMER COPY 301016
Cllr Mapangwana (Mnquma Local Municipality: Ward 24 Councillor)	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	ORDINARY PARCEL PE 408 067 809 ZA CUSTOMER COPY 301016
Cllr Hanabe (Mnquma Local Municipality: Ward 25 Councillor)	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	ORDINARY PARCEL PE 408 067 790 ZA CUSTOMER COPY 301016
Cllr Ponopo (Mnquma Local Municipality: Ward 26 Councillor)	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	ORDINARY PARCEL PE 408 067 786 ZA CUSTOMER COPY 301016

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Cllr Ntshoko (Mnquma Local Municipality: Ward 27 Councillor)	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	ORDINARY PARCEL PE 408 067 772 ZA CUSTOMER COPY
Cllr Mbesi (Mnquma Local Municipality: Ward 28 Councillor)	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	ORDINARY PARCEL PE 408 067 769 ZA CUSTOMER COPY
Cllr Makwetu (Mnquma Local Municipality: Ward 31 Councillor)	Mnquma Local Municipality, PO Box 36, BUTTERWORTH, 4960	ORDINARY PARCEL PE 408 067 755 ZA CUSTOMER COPY
Cllr Peter (Ward 10 Councillor - Mbhashe Local Municipality)	Mbhashe Local Municipality, PO Box 25, IDUTYWA, 5000	ORDINARY PARCEL PE 408 067 741 ZA CUSTOMER COPY
Cllr A.T. Magoda (Ward 11 Councillor - Mbhashe Local Municipality)	Mbhashe Local Municipality, PO Box 25, IDUTYWA, 5000	ORDINARY PARCEL PE 408 067 738 ZA CUSTOMER COPY
Cllr Qasana (Ward 25 Councillor - Mbhashe Local Municipality)	Mbhashe Local Municipality, PO Box 25, IDUTYWA, 5000	ORDINARY PARCEL PE 408 067 715 ZA CUSTOMER COPY
Cllr M. Mahali (Intsika Yethu Local Municipality: Ward 13 Councillor)	Intsika Yethu Local Municipality Private Bag X1251, COMFIMVABA, 5380	ORDINARY PARCEL PE 408 067 724 ZA CUSTOMER COPY
Cllr Mzamo (Amahlati Local Municipality: Ward 13 Councillor)	Amahlati Local Municipality, Private Bag X2, STUTTERHEIM, 4930	ORDINARY PARCEL PE 408 068 101 ZA CUSTOMER COPY

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DOCUMENT/REPORT RECEIPT FORM

TITLE OR DESCRIPTION OF DOCUMENT/REPORT	
EMP's- Utilisation of Borrow pits:Amathole District Municipality	
REPORT NUMBER	2011-R492 - 2011 - R526
DATE OF REPORT	August 11, 2011

PARTICULARS OF RECEIVING PERSON/AUTHORITY	
Name	Lizna Fourie
Organisation	D.W.A. - Eastern Cape

SIGNATURES		
	Recieved by	Delivered by
Name	L. Fourie	L. Pagdoot
Signature		
Date	15/8/2011	15/8/2011
Time		
Place	East London	EAST LONDON

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TITLE OR DESCRIPTION OF DOCUMENT/REPORT	
EMP's- Utilisation of Borrow pits:Amathole District Municipality	
REPORT NUMBER	2011-R492 - 2011 - R526
DATE OF REPORT	August 11, 2011

PARTICULARS OF RECEIVING PERSON/AUTHORITY	
Name	Briant Noncembu
Organisation	DEDEA - Amathole Region

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Name	BONGIWE	L. PRAMFOOT
Signature		
Date	15/08/2011	15/08/2011
Time	12:05	11:05
Place	DEDEAT	DEDEA

26 Appendix E: Site Photographs

26.1 Borrow pit 348_BP01

Figure 23: Borrow Pit # 348-BP01.

26.2 Borrow pit 348_BP02

Figure 24: Borrow Pit # 348-BP02.

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26.3 Borrow pit 348_BP03

Figure 25: Borrow Pit # 348-BP03.

26.4 Borrow pit 348_BP04

Figure 26: Borrow Pit # 348-BP04.

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26.5 Borrow pit 348_BP05

Figure 27: Borrow Pit # 348-BP05.

26.6 Borrow pit 348_BP06

Figure 28: Borrow Pit # 348-BP06.

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27 Appendix F: Mammal species of the Eastern Cape region

Species	Common name
Aethoys namaquensis	Namaqua rock mouse
Alelerix frontalis	Southern African hedgehog
Amblysomus hottentotus	Hottentot golden mole
Aonyx capensis	Clawless otter
Atilax paludlnosus	Water mongoose
Canis mesomelas	Black-backed jackal
Cephalophrus monticola	Blue duiker
Cercopithecus aethiops	Vervet monkey
Cercopithecus mitis	Samango monkey
Chrysospalax trevelyani	Giant golden mole
Cicidura falvescens	Greater mush shrew
Crocidura cyanea	Reddish-grey mush shrew
Cryptomys hottentotus	Common mole rat
Cynictis penicillata	Yellow mongoose
Damaliscus dorcas phillipsi	Blesbuck
Dasumys incomtus	Water rat
Dendomus mesomelas	Brant's climbing mouse
Dendrohyrax arboreus	Tree dassie
Dendromus melanotis	Grey climbing mouse
Dendromus mystacalis	Chestnut climbing mouse
Elephantus edwardii	Cape rock elephant shrew
Epomophorus wahlbergi	Walberg's epauletted fruit bat
Eptesicus capensis	Cape serotine bat
Eptesicus hottentotus	Long-tailed serotine bat
Felis caracal	Caracal
Felis lybica	African wild cat
Felis serval	Serval
Galerella pulverulenta	Small grey mongoose
Genetta genetta	Small-spotted genet
Genetta tigrina	Large-spotted genet
Georychus capensis	Cape mole rat
Grammomys dolichurus	Woodland mouse
Graphiurus murinus	Woodland dormouse
Graphiurus ocularis	Spectacled dormouse
Herpestes ichneumon	Large grey mongoose
Hipposideros caffer	Sundevall's leaf-nosed bat
Hysterix africaeaustralis	Porcupine
Ichneumia albacaudia	White-tailed mongoose
Ictonyx striatus	Striped polecat
Kerivoula lanosa	Lesser woolly bat
Lepus saxatilis	Scrub hare
Malacothrix typical	Long-eared mouse
Mastomys coucha	Multi-mammate mouse
Mastomys natalensis	Natal multi-mammate mouse
Mellivora capensis	Honey badger
Miniopterus schreibersii	Schreiber's long-fingered bat
Minipterus fracterculus	Lesser long-fingered bat
Mus minutoides	Pygmy mouse

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Species	Common name
Mus musculus	House mouse
Myotis tricolor	Temminck's hair bat
Mysorex cafer	Dark-footed forest shrew
Mysorex varius	Forest shrew
Mystromys albicaudatus	White-tailed rat
Nycteris thebaica	Egyptian slit-faced bat
Orycteropus afer	Antbear (aardvark)
Otmys irroratus	Vlei rat
Otomys saundersiae	Saunder's vlei rat
Papio ursinus	Chacma baboon
Pedetes capensis	Springhare
Philantomba monticola	Blue duiker
Pipistrellus kuhlii	Kuhl's pipistelle
Poecilogate albinuchu	Stripped weasel
Potamohoerus larvatus	Bushpig
Procavia capensis	Rock dassie
Pronolagus crassicaudatus	Natal red hare
Pronolagus rupestris	Smith's red hare
Proteles cristatus	Aardwolf
Raphicerus campestris	Steenbok
Raphicerus melanotis	Cape grysbok
Rattus norvegicus	Brown rat
Rattus rattus	House rat
Redunca arundinum	Reedbuck
Rhabdomys pumilio	Stripped mouse
Rhinolophus clivosus	Geoffrey's horseshoe bat
Rhinolophus swinnyi	Swinny's horseshoe bat
Rousettus aegyptiacus	Egyptian fruit bat
Sccostomus campestris	Pouched mouse
Scotophlus borbonicus	Lesser yellow house bat
Suncus infiitesimus	Least dwarf shrew
Suncus varilla	Lesser dwarf shrew
Sylvicarpa grimmia	Common duiker
Tadarida aegyptiaca	Egyptian free-tailed bat
Tadarida condylura	Angolan free-tailed bat
Taphozous mauritianus	Mauritian tomb bat
Thryonomys swinderianus	Greater cane rat
Traglahus scriptus	Bushbuck
Vulpes chama	Cape fox

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28 Appendix G: Bird species of the Eastern Cape region

Species	Common name	Robarts N#
Accipiter melanelous	Black sparrow hawk	158
Accipiter minullus	Little sparrow hawk	157
Accipiter tachio	African goshawk	160
Acridotheres tristis	Indian myna	758
Acrocephalus palustris	European marsh warbler	633
Actophilomus africanus	African jacana	240
Alcedo cristata	Malachite kingfisher	431
Alcedo semitorquata	Half-collared kingfisher	430
Alopochen aegyptiacus	Egyptian goose	102
Amblyospiza abifrons	Thick-billed weaver	807
Anas sparsa	African black duck	105
Anas undulate	Yellow bulled duck	104
Andropadus imprtunus	Somber bulbul	572
Anhinga melanogaster	Darter	60
Anthreptes collaris	Collard sunbird	793
Anthus lineiventris	Stripped pipit	720
Anthus novaeseelandiae	Richard's pipit	716
Apalis flavida	Yellow-breasted apalis	648
Apalis thoracica	Bar-throated apalis	645
Apalodema narina	Narina trogon	427
Aplopelia larvata	Cinnamon dove	360
Apus affinis	Little swift	417
Apus barbatus	Black swift	412
Apus caffer	White-rumped swift	415
Ardeola railodides	Squacco heron	72
Ardrea cinera	Grey heron	62
Ardrea melancephala	Black-beared heron	63
Aviceda cuculoides	Cucco hawk	128
Balearica regulorum	Crowned quail	209
Batis capensis	Cape batis	700
Bostrychia hagedash	Hadeda	94
Bradyoterus baboecala	African sedge warbler	638
Bradypterus barratti	Barret's warbler	639
Bradypterus sylvaticus	Knysna warbler	640
Bubo africanus	Spotted eagle owl	401
Burhinus capensis	Spotted dikkop	297
Burhinus vermiculatus	Water dikkop	298
Buteo buteo	Steppe buzzard	149
Buteo rufofucus	Jackal buzzard	152
Bycanister bucinator	Trumpeter hornbill	455
Calandrella cinerea	Red-capped lark	507
Calidrus capensis	Sanderling	281
Camaroptera brachyuran	Bleating warble	657
Campephraga flava	Black cuckoo shrike	538
Campethera notata	Knysna woodpecker	484
Centro superciliosus	Burchell's cuckoo	391
Ceryle maxima	Giant kingfisher	429

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Species	Common name	Robarts N#
Ceryle rudis	Pied kingfisher	428
Charadruis marginatus	White-fronted plover	246
Charadruis pecuaris	Kittilz's plover	248
Charadruis tricollaris	Three-banded plover	249
Chrysococcyx capruis	Diederik's cuckoo	386
Chrysococcyx cupreus	Emerald cuckoo	384
Chrysococcyx klaas	Klaas's cuckoo	385
Circaetus cinereus	Brown snake eagle	142
Circus macrourus	Pallid harrier	167
Circus maurus	Black harrier	168
Circus ranivorus	African marsh hawk	165
Cisticola aberrans	Laz cisticola	679
Cisticola ayersii	Ayre's cisticola	667
Cisticola fulvicapilla	Neddick cisticola	681
Cisticola tinniens	Le Vallant's cisticola	677
Colius striatus	Speckled mousebird	424
Columba arquatrix	Rameron pigeon	350
Columba guinea	Rock pigeon	349
Coracias garrulous	European roller	446
Coracina caesia	Grey cuckoo shrike	540
Cossypha caffra	Cape robin	601
Cossypha dichroa	Chorister robin	598
Coturnix conturnix	Common quail	200
Crovus albicolis	Whiter-necked raven	550
Crovus albus	Pied crow	548
Crovus capensis	Black crow	547
Cypsiurus parvus	Palm swift	421
Dendrocygna viduata	White-faced duck	99
Dicrurus adsimilis	Fork-tailed drongo	541
Dryscopus cubia	Puff-back	740
Egretta garzetta	Little egret	67
Elanus caerulen	Black-shouldered kite	127
Erythropygia leucophrys	White-browed robin	613
Erythropygia signata	Brown robin	616
Estilda astrid	Common waxbill	846
Estrilda melanotisquartin	Swee waxbill	850
Euplectes capensis	Yellow-rumped widow	827
Falco biarmicus	Lanner falcon	172
Falco subuteo	Hobby falcon	173
Falco tinnunculus	Rock kestrel	181
Fulica cristata	Red-nobbed coot	228
Haiaetus vocifer	African fish eagle	148
Halyco albiventris	Brown-hooded kingfisher	435
Hieraaetus pennatus	Booted eagle	136
Hirundo abyssinica	Lesser stripped swallow	527
Hirundo albigularis	White-throated swallow	520
Hirundo cucullata	Greater stripped swallow	526
Hirundo dimidiate	Pearl-breasted swallow	523
Hirundo fuligula	Rock martin	529
Hirundo rustica	European swallow	518
Indicator indicator	Greater honey guide	474
Indicator variegates	Scarlet-throated honey guide	475

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Species	Common name	Robarts N#
Ispidima picta	Pygmy kingfisher	432
Lagonosticta rubricate	Blue-billed fire finch	840
Lamprotomis corrusus	Black-billed starling	768
Laniarius ferrugineus	Southern boubou	736
Lanius colaris	Fiscal shrike	732
Lopeatus occipitalis	Long-crested eagle	139
Lybius leucomelas	Pied barbet	465
Lybius torquatus	Black-collared barbet	464
Macronyx capensis	Orange-throated longclaw	727
Malaconotus blanchoti	Grey-headed bush shrike	751
Malaenomis pammelaina	Black flycatcher	694
Merops apiaster	European bee-eater	438
Mesopicus griseocephalus	Olive woodpecker	488
Milvus migrans	Yellow-billed black kite	126
Motacilla aguimp	African pied wagtail	711
Motacilla capensis	Cape wagtail	713
Motacilla ciara	Long-taied wagtail	712
Muscicupa adjusta	Dusk flycatcher	690
Muscicupa caerulescens	Blue-grey flycatcher	691
Nectainia veroxii	Gery sunbird	789
Nectarine amethystine	Black sunbird	792
Nectarinia afra	Greater double-collared sunbird	785
Nectarinia chalybea	Lesser double-collared sunbird	783
Nycticorax nicticorax	Black crowned night heron	76
Oena capensis	Namaqua dove	356
Oriolus larvatus	Black-headed oriole	545
Oriolus oriolus	European golden oriole	543
Parus niger	Southern black tit	554
Permis apivorus	Hone buzzard	130
Phalacrocorax afrianus	Reed cormorant	58
Phalacrocorax capensis	Cape cormorant	56
Phalacrocorax carbo	White-breasted cormorant	55
Phoeniculus purpureus	Red-billed wood hoopoe	452
Phyllasterphus terrestris	Terrestrial bulbul	569
Phylloscopus trochilus	Willow warbler	643
Plectropterus gambensis	Spurwinged goose	116
Ploceus bicolor	Forest weaver	808
Ploceus capensis	Spectacled weaver	810
Ploceus capensis	Cape weaver	813
Ploceus subaureus	Yellow weaver	817
Podica senegalensis	African finfoot	229
Pogoniulus pusillus	Red-fronted tinker barbet	469
Pogonocichia stellata	Starred robin	606
Poicephalus robustus	Cape parrot	362
Polyboroides typus	Gymnogene	169
Prinia maculosa	Spotted prina	686
Prinia sublava	Tawn-flanked prinia	683
Psalioprocne holomelas	Black saw-winged swallow	536
Pyncnonotus barbatus	Black-eyed bulbul	568
Sagittarius serpentarius	Secretary bird	118
Sarothrura affinis	Stripped flufftail	221
Sarothrura rufa	Red-chested flufftail	217

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Species	Common name	Robarts N#
Saxicola toquata	Stone chat	596
Scopus unbretta	Hammerkop	81
Seicercus ruficapillus	Yellow-throated warbler	644
Serinus gulasris	Streak-headed canary	881
Serinus mazambicus	Yellow-eyed canary	869
Serinus scotops	Forest canary	873
Sigelus silens	Fiscal flycatcher	698
Sorathrura elegans	Buff-spotted flufftail	218
Spermestes cuccullatus	Bronze manikin	857
Stephanoaetus coroatus	Crowned eagle	141
Streptopelia capicola	Cape turtle dove	354
Streptopelia semitorquata	Red-eyed dove	352
Streptopelia senegalensis	Laughing dove	355
Sturnus vulgaris	European starling	757
Tachybaptus ruficolis	Little grebe, dabchick	8
Tadoma cana	South African shell duck	103
Tauraco corythaix	Knysna lourie	370
Tchagra tchagra	Grey-breasted tchagra	742
Telephorus zeylonus	Bokmakierie	746
Telphorus olivaceus	Olive bush shrike	750
Tersiphone viridis	Paradise flycatcher	710
Thalassomis leuconotus	White-backed duck	101
Thamnolea cinnamomeivent	Mocking chat	577
Threskiomis aethiopus	Sacred ibis	91
Tokus alboterminatus	Crown hornbill	460
Tringa hypoleucos	Common sandpiper	264
Trochocercus cynomelas	Blue-mantled flycatcher	708
Turdus olivaceus	Olive thrush	577
Turtur chalcospilos	Green-spotted dove	358
Turtur tympanistria	Tambourine dove	359
Tyto alba	Barn owl	392
Tyto capensis	Grass owl	393
Upupa epopos	Hoopoe	451
Vanellus armatus	Blacksmith plover	258
Vanellus coronatus	Crowned plover	255
Vanellus melanopteris	Black-winged plover	257
Zosterops pallidus	Cape white-eye	796

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29 Appendix H: Threatened Birds of the Eastern Cape

Common name	Species name	Conservation status	Endemicity
Bearded Vulture	*Gypaetus barbatus*	Endangered	
Bittern	*Botaurus stellaris*	Critical	
Black Harrier	*Circus maurus*	Near-threatened	SA Endemic
Black Oystercatcher	*Haematopus moquini*	Near-threatened	
Black Stork	*Ciconia nigra*	Near-threatened	
Blackbellied Korhaan	*Eupodotis melanogaster*	Near-threatened	
Blackbrowed Albatross	*Diomedea melanophris*	Near-threatened	
Blackwinged Plover	*Vanellus melanopterus*	Near-threatened	
Blue Crane	*Anthropoides paradisea*	Vulnerable	SA Endemic
Blue Korhaan	*Eupodotis caerulescens*	Near-threatened	SA Endemic
Broadtailed Warbler	*Schoenicola brevirostris*	Near-threatened	
Bush Blackcap	*Lioptilus nigricapillus*	Near-threatened	SA Endemic
Cape Cormorant	*Phalacrocorax capensis*	Near-threatened	
Cape Gannet	*Morus capensis*	Vulnerable	
Cape Parrot	*Poicephalus robustus*	Endangered	
Cape Vulture	*Gyps coprotheres*	Vulnerable	SA Endemic
Caspian Tern	*Hydroprogne caspia*	Near-threatened	
Chestnutbanded	*Charadrius pallidus*	Near-threatened	
Corncrake	*Crex crex*	Vulnerable	
Crowned Eagle	*Stephanoaetus coronatus*	Near-threatened	
Damara Tern	*Sterna balaenarum*	Endangered	
Delegorgue's Pigeon	*Columba delegorguei*	Vulnerable	
Finfoot	*Podica senegalensis*	Vulnerable	
Grass Owl	*Tyto capensis*	Vulnerable	
Greater Flamingo	*Phoenicopterus rubber*	Near-threatened	
Grey Petrel	*Procellaria cinerea*	Near-threatened	
Ground Hornbill	*Bucorvus leadbeateri*	Vulnerable	
Halfcollared Kingfisher	*Alcedo semitorquata*	Near-threatened	
African Penguin	*Spheniscus demersus*	Vulnerable	
Knysna Warbler	*Bradypterus sylvaticus*	Vulnerable	SA Endemic
Knysna Woodpecker	*Campethera notata*	Near-threatened	SA Endemic
Kori Bustard	*Ardeotis kori*	Vulnerable	
Lanner	*Falco biarmicus*	Near-threatened	
Lesser Flamingo	*Phoenicopterus minor*	Near-threatened	
Lesser Kestrel	*Falco naumanni*	Vulnerable	
Ludwig's Bustard	*Neotis ludwigii*	Vulnerable	
Mangrove Kingfisher	*Halcyon senegaloides*	Vulnerable	
Marabou	*Leptoptilos crumeniferus*	Near-threatened	
Marsh Harrier	*Circus ranivorus*	Vulnerable	
Martial Eagle	*Polemaetus bellicosus*	Vulnerable	SA Endemic
Melodious Lark	*Mirafra cheniana*	Near-threatened	
Orange Thrush	*Turdus gurneyi*	Near-threatened	
Painted Snipe	*Rostratula benghalensis*	Near-threatened	
Pallid Harrier	*Circus macrourus*	Near-threatened	
Peregrine	*Falco peregrinus*	Near-threatened	
Roseate Tern	*Sterna dougallii*	Endangered	
Rudd's Lark	*Mirafra ruddi*	Critical	
Secretary bird	*Sagittarius serpentarius*	Near-threatened	

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Common name	Species name	Conservation status	Endemicity
Shy Albatross	*Diomedea cauta*	Vulnerable	
Southern Giant Petrel	*Macronectes giganteus*	Near-threatened	
Stanley's Bustard	*Neotis denhami*	Vulnerable	
Striped Flufftail	*Sarothrura affinis*	Vulnerable	
Tawny Eagle	*Aquila rapax*	Vulnerable	
Wandering Albatross	*Diomedea exulans*	Vulnerable	
Wattled-Crane	*Burgeranus carunculatus*	Endangered	
White Pelican	*Pelecanus onocrotalus*	Near-threatened	
Whitebacked Night Heron	*Gorsachias leuconotus*	Vulnerable	
Whitebellied Korhaan	*Eupodotis cafra*	Vulnerable	
Whitechinned Petrel	*Procellaria aequinoctialis*	Near-threatened	
Whitecrowned plover	*Vanellus albiceps*	Near-threatened	
Yellowbilled Stork	*Mycteria ibis*	Near-threatened	
Yellowbreasted Pipit	*Anthus chloris*	Vulnerable	SA Endemic

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30 Appendix I: Borrow pit Information

Rd_Nr_	No_	E	S	Farm/Allotment Name	SG Code/Region Code/ComLandName	Municipal Area	Ward
DR08348	348_BP01	28.460611	-32.400444	RE/140	C09400000000014000000	Mnquma LM	25
DR08348	348_BP02	28.4675	-32.383944	RE/333	C11200000000033300000	Mnquma LM	25
DR08348	348_BP03	28.489361	-32.366167	RE/333	C11200000000033300000	Mnquma LM	25
DR08348	348_BP04	28.489694	-32.313944	Communal	KWANYANA LOC 14	Mbhashe LM	25
DR08348	348_BP05	28.488083	-32.306389	Communal	KWANYANA LOC 14	Mbhashe LM	25
DR08348	348_BP06	28.48675	-32.295028	Communal	KWANYANA LOC 14	Mbhashe LM	25

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31 Appendix J: Curriculum Vitae

31.1 Dr Malcolme Logie

Dr. Malcolme Logie
Principal and Managing Director
MSc (Botany); PhD (Biotechnology), Rhodes

Malcolme Logie has over 12 years experience in the field of Environmental Management with extensive experience in the fields of Industrial Environmental Management; Safety, Health & Environmental Management Systems; and Environmental Auditing and Assessments (environmental site assessments, environmental impact assessments, systems certification), in South Africa, Mocambique, Namibia, Angola, Ghana, Zambia, Egypt, The Czech Republic, The Slovak Republic and Romania.

Malcolme has wide-ranging experience primarily in the following sectors:

- Automotive sector
- Beverages
- Chemicals & chemical products
- Civil and mechanical engineering
- Electricity & water supply
- Metals refining & processing
- Mining & quarrying
- Pulp & paper
- Telecommunications

Malcolme's project experience largely falls into the following broad areas:

Safety, Health & Environmental Management Systems

Malcolme's experience includes management system design and implementation and also certification audits across a wide range of industrial and mining sectors in South Africa, Mocambique, Angola, Zambia and Romania.

Environmental Site Assessments

Malcolme has been the project leader on many Phase I and II ESA's that have been undertaken in accordance with the ASTM standards, at several industrial facilities in South Africa.

Environmental Auditing

Malcolme's auditing experience includes ISO 14001, OHSAS 18001 and ISO 9001 certification level audits; legal compliance, and environmental performance audits across a wide range of industrial and mining sectors in South Africa, Mocambique, Namibia, Angola, Ghana, Zambia, Egypt, The Czech Republic and Romania.

Environmental Impact Assessments

Malcolme has managed a broad range of environmental impact assessments ranging from: industrial facilities, telecommunication networks, electrification networks, transportation infrastructure, waste sites and water supply.

Professional Affiliations & Registrations

- Registered as a Professional Natural Scientist (Environmental Scientist) with the South African Council of Natural Scientific Professions (SACNASP).
- Professional Member of the South African Institute of Ecologists and Environmental Scientists (SAIE&ES)
- Certification Board of Environmental Assessment Practitioners of South Africa
- International Association of Impact Assessors (IAIASA)
- Royal Society of South Africa
- South African Association of Botanists (SAAB)
- Phycology Society of South Africa (PSSA)
- South African Auditor & Training Certification Association (SAATCA) – EMS Verification Auditor
- Bureau Veritas Quality International – Lead EMS Auditor

South African Council of Natural Scientific Professions

- Malcolme is a member of the Education Committee of South African Council of Natural Scientific Professions (SACNASP) for the registration of Professional Natural Scientist.

Rhodes University Investec Schools of Business

- Malcolme sits on the Advisory Board for the Rhodes University Investec Schools of Business which provides advice and directs the strategic planning and continual development of the business school.
- Malcolme lectures at the MBA class at the Rhodes University Investec Schools of Business on safety, health environmental management in the industrial and business environments.

Fields of Competence

- Safety, Health & Environmental Management Systems
- Industrial Environmental Management
- Environmental Site Assessments

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- Environmental Impact Assessments

Education

- PhD (Biotechnology) 1995
- MSc (Botany), 1992
- BSc Honours (Botany), 1990
- BSc (Plant Science & Biochemistry), 1989

Key Projects

Recent key projects include:

South African Breweries Millers (SAB Miller)

- Ursus Breweries, Romania (SAB Miller), where Malcolme is responsible for the development and implementation of a Safety, Health & Environmental Management System at four breweries and a depot.
- Plzeňský Prazdroj, Czech Republic (SAB Miller), where Malcolme is responsible for the development and implementation of an integrated Safety, Health & Environmental Management System at three breweries.
- Dreher Sörgyárak Zrt, Hungary (SAB Miller), where Malcolme is responsible for the development and implementation of an integrated Safety, Health & Environmental Management System at this brewer.
- Ibhayi Brewery (Port Elizabeth) where an Environmental Management System was designed and implemented at this new state-of-art brewery. During the construction of the brewery Malcolme reviewed all the plans to ensure environmental sustainability

BHP Billiton (MOZAL), Mocambique

- Malcolme designed and co-ordinated the implementation of the Environmental Management System at this BHP Billiton aluminium smelter in Maputo, and continues to service this organization environmental management needs.

Coca-Cola Company

- Malcolme is the appointed SHE Management System Consultant to Coca-Cola Company Southern Africa, responsible for advising of the implementation of a SHE MS compliant with ISO 14001:2004, OHSAS 18001:1999 and the Coca-Cola Worldwide E3 programme.
- Malcolme is guiding to process for the development and implementation of an integrated SHE Management System at Coca-Cola Fortune (Polokwane & Bloemfontein). The management system is based on the requirements of ISO 14001:2004 and OHSAS 18001:1999.

Lonmin Platinum, South Africa

- Malcolme co-ordinated the design and implementation of the Environmental and Quality Management System at Lonmin's Western Platinum Refinery in Johannesburg, and also revised and re-establish the EMS at this platinum producers smelter and base metal refinery near Rustenburg.

Dorbyl Automotive Technologies, South Africa.

- For the past eight years Malcolme has been the exclusive environmental management and environmental management systems consultant to this automotive components producer. The production facilities include: foundries, forges, machine shops and manufacturing units.

Telkom SA Ltd, South Africa.

- Malcolme was instrumental in establishing the internal environmental assessment guidelines for this national telecommunication service provider, for the placement of telecommunication masts and associated infrastructure. He has also undertaken more than 120 environmental impact assessments of individual telecommunication masts throughout South Africa.

Environmental Site Assessments

- Malcolme has been the project leader on many Phase I and II ESA's that have been undertaken in accordance with the ASTM standards, at several industrial facilities in South Africa.

SHEQ Management Systems Auditing

- Malcolme has in excess of 8600 hours of SHEQ Management Systems auditing. He has audited companies in South Africa, Mocambique, Namibia, Angola, Ghana, Zambia, Egypt, The Czech Republic, The Slovak Republic and Romania.

European Scope of Accreditation

Malcolme has competency in the following Industrial Sectors:

1	Agriculture, forestry, fisheries	20	Ship building
2	Mining & quarrying	21	Aerospace
3	Beverages & foodstuff industries	22	Other transport equipment (automotive, rail)
4	Textile industries	23	Manufacturing (not classified elsewhere)
5	Leather & leather products	24	Recycling
6	Wood industries	25	Electricity supply
7	Pulp, paper & paper products	26	Gas supply
10	Mineral-oil processing	27	Water supply
12	Chemicals & chemical products	28	Construction
13	Pharmaceuticals	30	Hotels & restaurants
14	Rubber & plastic goods	31	Transport & communication
15	Glass, ceramics, processing of minerals & ores	34	Research & development
16	Production of cement, lime, gypsum & concrete, lime and gypsum products	35	Business services
17	Metals refining & processing, & production of metals	37	Education
18	Mechanical engineering	39	Other social services

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31.2 Ms Lee-Anne Proudfoot

Ms. Lee-Anne Proudfoot
Senior Environmental Consultant
MSc (Marine Biology)

Lee-Anne Proudfoot has experience in the fields of Marine and Coastal Ecology , Geographical Information Systems (GIS), Environmental Impact Assessments, Environmental Site Assessments, Environmental Management Plans, Environmental Auditing, Visual Impact Assessments, Aquatic Impact Assessments and Project Management.

Lee-Anne's project experience includes:

Environmental Impact Assessments
Lee-Anne assisted in and managed a broad range of scoping & environmental impact assessments ranging from: agri-industrial & industrial facilities, residential & resort developments, golf estates, renewable energy technologies, storm water management, water supply, desalinisation and sewage.

Environmental Site Assessments
Lee-Anne has experience in site assessments, field sampling & monitoring, permit applications and in the compilation of reports for prospective land buyers.

Environmental Management Plans
Lee-Anne has experience in compiling and monitoring the Environmental Management Plans for a wide range of developments.

Environmental Auditing
Lee-Anne has experience in auditing the environmental compliance of and compiling environmental auditing reports.

Geographical Information Systems (GIS)
Lee-Anne has experience in using ArcView, Idrisi and Manifold software in assessing & producing maps, site plans, aerial photographs, etc.

Visual Impact Assessments (VIA)
Lee-Anne has experience in conducting VIA's and compiling VIA reports.

Aquatic Impact Assessments (AIA)
Lee-Anne has experience in conducting SASS5 Bio-rapid assessments for Aquatic Impact Assessments.

Project Management
Lee-Anne has experience in managing projects for a wide range of developments.

Professional Affiliations & Registrations
- Registered as a Professional Natural Scientist (Environmental Scientist) with the South African Council of Natural Scientific Professions (SACNASP).
- International Association of Impact Assessors, South Africa

Fields of Competence
- Environmental Impact Assessments
- Environmental Site Assessments
- Environmental Management Plans
- Environmental Auditing
- Geographical Information Systems (GIS)
- Visual Impact Assessments (VIA)
- Aquatic Impact Assessments (AIA)
- Project Management

Education
- M.Sc. (Marine Biology), Rhodes, 2006
- B.Sc. Honours (Marine Biology), Rhodes, 2003
- B.Sc. (Zoology and Ichthyology), Rhodes, 2002

Key Projects

African Dune Investments (Pty) Ltd
Lee-Anne is currently undertaking the environmental impact assessment and managing the environmental authorization process for the proposed Woodlands Golf Estate.

ABSA Development Company/Bigen Africa
Lee-Anne is the project manager for the environmental management component of the Albany Regional Water Services Project

African Dune Investments (Pty) Ltd
Lee-Anne is currently managing the scoping and environmental impact assessment for the environmental authorization of a proposed Wind Turbine Farm.

Amatola Green Power (Pty) Ltd

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Lee-Anne is currently managing the environmental impact assessment for the proposed extraction of landfill gas from three BCM Landfill Sites for the purposes of electricity generation.

The Environmental Law Consultancy

Lee-Anne assisted in the compilation of a Legal Register for a Chrome Tanning Salts Plant in Merebank, with her focus pertaining to the relevant Occupational Health and Safety legislation.

International Finance Corporation

Lee-Anne co-ordinated and reviewed the specialist environmental studies required for the environmental impact assessment for the proposed Kalakundi Copper & Cobalt Mine in the Democratic republic of Congo.

Carpano Investments (Pty) Ltd

Lee-Anne was responsible for the environmental management component of the Spatial Development Framework for the proposed Rock Cliff development area south-east of East London

Kempston Leisure (Pty) Ltd

Lee-Anne managed the environmental authorization process for a proposed motor city

Edcot Trust (Pty) Ltd

Lee-Anne managed the environmental authorization process for a proposed motor city

Kempston Leisure (Pty) Ltd

Lee-Anne is the Environmental Control Officer for the proposed motor city development.

Wild Coast Ski Boat Club

Lee-anne undertook the renewal application for a boat launching permit and prepared the requested environmental management plan for the Hole in the Wall Launch Site

Wild Coast Fishing Co-operative

Lee-Anne conducted and managed the environmental authorization process for a proposed aquaculture facility

Wild Coast Fishing Co-operative

Lee-Anne conducted and managed the scoping assessment for a proposed fish processing factory

Alvitex 103 (Pty) Ltd

Lee-Anne assisted on the environmental impact assessment for the proposed resort development.

Rakel (Pty) Ltd

Lee-Anne managed the environmental impact assessment for desalination plants servicing the proposed resort developments

Alvitex 103 (Pty) Ltd

Lee-Anne managed the environmental impact assessment for desalination plants servicing the proposed resort developments

Leisure Homes for Senior Citizens

Lee-Anne managed the environmental authorization process for the proposed extension of a retirement village

Fire Ring

Lee-Anne was involved in the compilation of a site assessment report for the prospective purchasing of land

Blue Beacon Investments (Pty) Ltd

Lee-Anne conducted and managed the environmental authorization process for the Connemara Housing Complex

Buffalo City Municipality – Waste Management

Lee-Anne assisted in the environmental audit process on the Buffalo City Regional Waste Disposal Site, focussing on issues such as operations and water-quality monitoring.

Buffalo City Development Agency

Lee-Anne was responsible for the environmental assessment component of the Nahoon Mouth and Sports Precinct Local Spatial Framework Plan.

Southern Palace Investments 414 (Pty) Ltd

Lee-Anne conducted and managed the scoping and environmental impact assessment for environmental authorization for a proposed mixed use development for the purposes of a hospital, retirement village and church.

Nuffield Trust

Lee-Anne conducted and managed the environmental impact assessment for the environmental authorization of a proposed Yellowwood Heights Residential Development

Riverleigh VII

Lee-Anne conducted and managed the Scoping Assessment for a proposed mixed use development for the purposes of entry level residential, office and retail.

True Group Building (Pty) Ltd

Lee-Anne conducted and managed the environmental impact assessment for the environmental authorization of a proposed light industrial site.

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31.3 Mr Conroy van der Riet

Mr. Conroy van der Riet
Senior Environmental Consultant
BSc Honours (Environmental Geography)

Conroy van der Riet has more than 4 years experience in the fields of Marine and Terrestrial Ecology, Geography, Geographical Information Systems (GIS), Mining, Environmental Impact Assessments, Environmental Site Assessments, Environmental Management Plans, Environmental Management Systems, Environmental Auditing, Visual Impact Assessments, Site Rehabilitation, Water Use Licensing, Waste Licensing and project management throughout South Africa.

Conroy's project experience includes:

Environmental Impact Assessments
Conroy assisted in and managed a broad range of environmental impact assessments ranging from: agri-industrial & industrial facilities, residential & resort developments, golfing estates, informal settlement planning & formalisations, storm water management, water supply, desalinisation and sewage.
Environmental Site Assessments
Conroy has experience in many Phase I and II site assessments in accordance with ASTM Standards, SASS 5 freshwater aquatic systems assessments, field sampling & monitoring, permit applications and in the compilation of reports for prospective land buyers.
Environmental Management Plans
Conroy has experience in compiling and monitoring the Environmental Management Plans for a wide range of developments.
Environmental Management Systems
Conroy's experience includes Environmental Management System design and implementation, legal compliance audits, and risk assessments in compliance with relevant ISO Standards.
Environmental Auditing
Conroy's auditing experience includes ISO 14001, OHSAS 18001 and ISO 9001 certification level audits; legal compliance, and environmental performance audits across a wide range of industrial sectors in South Africa.
Geographical Information Systems (GIS)
Conroy has experience in using ArcView, Idrisi and Manifold software in assessing & producing environmental sensitivity maps, site plans, aerial photographs, satellite imagery, etc.
Visual Impact Assessments (VIA)
Conroy has experience in conducting VIA's and compiling VIA reports.
Site Rehabilitation
Conroy has experience in the rehabilitation of a variety of disturbed areas.
Water Use Licensing
Conroy has experience in a range of Water Use License application and related projects.
Waste Licensing
Conroy has experience in Waste License Applications for a range of projects
Project Management
Conroy has experience in managing projects for a wide range of developments.

Professional Affiliations & Registrations
- Registered as a Professional Natural Scientist (Environmental Scientist) with the South African Council of Natural Scientific Professions (SACNASP).
- International Association of Impact Assessors, South Africa

Fields of Competence
- Environmental Impact Assessments
- Environmental Management Plans
- Environmental Site Assessments
- Environmental Management Systems
- Environmental Auditing
- Geographical Information Systems (GIS)
- Visual Impact Assessments (VIA)
- Site Rehabilitation
- Water Use Licensing
- Waste Licensing
- Project Management

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Education

- BSc Hons (Environmental Geography) NMMU, 2006
- BSc (Zoology and Geography) NMMU, 2005

Employment Record

- Biotechnology & Environmental Specialist Consultancy cc: 2006 – Present:

Key Projects

PG Bison
Conroy assisted in the preparation of an Environmental Aspects Register, inclusive on significance assessment and proposed mitigation/management strategies for all the PG Bison activities at the board plant in Ugie, Eastern Cape for purposes of implementation of an Environmental Management System.

Kraft Foods SA
Conroy conducted the Phase I Environmental Site Assessment n in accordance with the ASTM standards, and assisted in the preparation of an Environmental Aspects Register, inclusive on significance assessment and proposed mitigation/management strategies for all the Kraft Foods SA – Tunney Plant's activities for purposes of implementation of an Environmental Management System.

Goodyear SA
Conroy managed the Scoping process for the proposed installation of Underground Storage Vessels at the Goodyear SA factory.

Pragma Africa (Pty) Ltd
Conroy managed the environmental authorization process for the removal of underground fuel storage vessels.

Buffalo City Municipality – Waste Management
Conroy assisted in the environmental audit process on the Buffalo City Regional Waste Disposal Site, focussing on issues such as construction, operations and air-quality monitoring.

SANRAL
Conroy is managed the environmental authorization process for the proposed improvement of National Route 02, Section 18 for the South African National Roads Agency Limited. Conroy is also managing the mining permit applications of the borrow pits for the proposed road improvement, and has been appointed to act as Environmental Control Officer for the implementation of the project.

Bigen Africa (Pty) Ltd & Ndlambe Local Municipality
Conroy managed the environmental authorization process for the proposed Port Alfred Waste Water Treatment Works upgrade project. Conroy has also been appointed to act as the Environmental Control Officer for the implementation of the project.

Uhambiso
Conroy managed the environmental authorization and Waste License Application process for the proposed Tsolo Waste Water Treatment Works upgrade project.

Chris Hani District Municipality – Bulk Services
Conroy is currently managing the environmental authorization and Waste License Application process for the proposed upgrading of the Bulk Services for the proposed Rathwick Development, Queenstown, inclusive of the Waste Water Treatment Works, Water Treatment Works, Stormwater and associated infrastructure.

Chris Hani District Municipality – Water Supply
Conroy is currently managing the environmental authorization process for the Water Supply Backlog projects in the Cluster 2 area of the Chris Hani District Municipality.

Alvitex 103 (Pty) Ltd
Conroy managed the environmental authorization process for a proposed golfing estate development and assisted in the environmental authorization for the sewage works servicing the proposed resort developments, and.

African Dune Investments
Conroy assisted in the environmental authorization for the proposed golf estate development.

Thynk Property Partners (Pty) Ltd
Conroy managed the environmental authorization process for the proposed retail & residential development.

Eskom
Conroy is currently managing the environmental authorization process for the proposed upgrading of the Qumbu Substation and associated infrastructure.

Buffalo City Municipality – Planning and Economic Development
Conroy managed the environmental authorization for various settlement planning & formalization projects in the Amathole district.

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The Diocese of Grahamstown
Conroy managed the environmental authorization for the proposed rezoning and residential development of the St Lukes Mission Land.
Bunker Hills Investments (Pty) Ltd
Conroy managed the environmental management plan for the proposed residential development.
Rakel (Pty) Ltd
Conroy assisted in managing the environmental authorization for the proposed residential development and assisted in the environmental impact assessment for the proposed desalination plant servicing the proposed residential development.
Rapitrade (Pty) Ltd
Conroy assisted in managing the environmental management plan for the proposed residential development and managed the applications to the South African Heritage Resources Agency (SAHRA) and the Department of Water Affairs & Forestry.
Golden Falls (Pty) Ltd
Conroy assisted in the environmental authorization and the environmental management plan for the proposed residential development.
Beautiful Connections (Pty) Ltd
Conroy managed the environmental authorization for a proposed wildlife resort in the Queenstown area and the proposed development of Eco-Type chalets in the East London area.
Riverleigh VII cc
Conroy managed the environmental authorization process for the proposed warehousing and light industrial manufacturing processes developments.
Purple Moss 29 (Pty) Ltd
Conroy managed the rehabilitation of the Quenera River bank on the site and the environmental authorization process for the proposed township establishment consisting of business, mixed use and residential areas.
Silicon Smelters (Pty) Ltd (FerroAtlantica)
Conroy managed the environmental impact assessment process and CAPCO permit applications for various charcoal burners in the East Cape, West Cape, Free State, North-West, Limpopo and Gauteng Provinces.
Wild Coast Fishing Co-operative
Conroy assisted in the environmental authorization for the proposed fish works factory.
ELGC
Conroy managed the EIA Process and prepared the rehabilitation management plan for the proposed realignment of the 6th fairway & minor upgrades in order to upgrade the East London Golf Club (ELGC).

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