



**PROPOSED EXPANSION OF
BORROWPIT BP 27-8 KM 32.6 RHS 6.2
IN THE CALVINIA AREA**

**AMENDMENT ENVIRONMENTAL
MANAGEMENT PROGRAMME REPORT**

Prepared for:
**Department of Mineral Resources
Private Bag X6093
KIMBERLEY, 8300**

On behalf of:
**Aurecon SA (Pty) Ltd for
South African National Roads Agency SOC Limited
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Approved by:

Date of Approval:



UNDERTAKING

Undertaking in terms of Regulation 51 (b)(viii) of the Minerals and Petroleum Resources Development Act, 2002 (MPRDA; Act No. 28 of 2002):

The South African National Roads Agency SOC Limited (SANRAL) hereby undertakes to:

1. Comply with the specifications in this Environmental Management Programme, and
2. Comply with the provisions of the MPRDA and the Regulations thereto.

Signed at **Bellville** on the 29 day of APRIL 2015.

For and on behalf of the South African National Roads Agency SOC Limited



Signature of Authorised Representative

Print name: J.C. VAN DER WALT

As Witnesses:

1. 

2. 

PROJECT INFORMATION

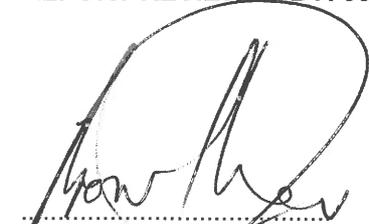
TITLE	Amendment Environmental Management Programme Report (EMPR) for the proposed expansion of Borrowpit BP 27-8 KM 32.6 RHS 6.2 in the Calvinia area
APPLICANT	South African National Roads Agency SOC Limited (SANRAL)
ENVIRONMENTAL CONSULTANTS	CCA Environmental (Pty) Ltd
REPORT REFERENCE	AUR14R27/Amendment EMPR/1
DMR REFERENCE	NC 30/5/1/3/3/2/1 (5004) EM
REPORT DATE	29 April 2015

REPORT COMPILED BY: Ena de Villiers



Ena de Villiers
Environmental Consultant

REPORT REVIEWED BY: Jonathan Crowther



Jonathan Crowther (Pr.Sci.Nat.; CEAPSA)
Managing Director

EXPERTISE OF ENVIRONMENTAL ASSESSMENT PRACTITIONER

NAME	Jonathan Crowther
RESPONSIBILITY ON PROJECT	Project management and quality control.
DEGREE	B.Sc. Hons (Geol.), M.Sc. (Env. Sci.)
PROFESSIONAL REGISTRATION	Pr.Sci.Nat., CEAPSA
EXPERIENCE IN YEARS	27
EXPERIENCE	Jonathan Crowther has been involved in environmental consulting since 1988 and is currently the Managing Director of CCA Environmental (Pty) Ltd. He has expertise in a wide range of environmental disciplines, including Environmental Impact Assessments (EIA), Environmental Management Plans / Programmes, Environmental Planning & Review, Environmental Auditing & Monitoring, Environmental Control Officer, Public Consultation & Facilitation. He has project managed a number of offshore oil and gas EIAs for various exploration and production activities in South Africa and Namibia. He also has extensive experience in projects related to roads, property developments and waste landfill sites.

NAME	Ena de Villiers
RESPONSIBILITY ON PROJECT	Project consultant and report writing.
DEGREE	B.A. Hons (Philosophy), B.A. Hons (Demography), M.Phil (Environmental Ethics)
PROFESSIONAL REGISTRATION	-
EXPERIENCE IN YEARS	7
EXPERIENCE	Ena de Villiers has worked as an environmental assessment practitioner since 2008 and has been involved in a number of projects covering a range of environmental disciplines, including Basic Assessments (BA), Environmental Impact Assessments and Environmental Management Plans/Programmes and Environmental Control Officer. She has been exposed to a range of projects relating to mining (e.g. mineral prospecting and borrow pit development), property development and infrastructure (e.g. bridges, roads, waste water treatment works).

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PART A: ENVIRONMENTAL MANAGEMENT PROGRAMME APPROACH AND METHODOLOGY

A1 INTRODUCTION

In 2011, the South African National Roads Agency SOC Limited (SANRAL) applied for approval to develop borrowpits to provide materials for the proposed strengthening (partial reconstruction) of the R27 Sections 7 and 8 between the Western/Northern Cape border (km 40.0) and Calvinia (km 70.0) in the Hantam Local Municipality.

On 19 April 2012 the Department of Mineral Resources (DMR) granted approval for the development of borrowpits at the following three locations:

1. BP R27-8 KM 32.6 RHS 6.2 situated along the R364 approximately 6 km south-west of the R27, on Portion 1 of Farm Bloedzuigerfontein North 782 ("Merino");
2. BP R27-8 KM 45.0 RHS 0.2 situated along the R27 approximately 23 km west of Calvinia, on the Remainder of Portion 1 of Farm Buffelskopfontein 773 (Doega B"); and
3. BP R27-8 KM 61.6 RHS 1.0 situated approximately 7 km south-west of Calvinia on the Remainder of Portion 1 of Farm Enkelde Wilgenboom 768 near the Calvinia Airfield (see Appendix 1 and Figures A1 and A2 on pages A9 and A10).

Subsequently, in June 2012, SANRAL applied for the expansion of BP R27-8 KM 32.6 RHS 6.2 to provide additional material for the road strengthening project. DMR granted approval for this expansion on 2 August 2012 (see Appendix 1). The construction phase of the R27 road strengthening project has subsequently been completed.

SANRAL is now proposing the further expansion of BP R27-8 KM 32.6 RHS 6.2 on the same property (see Figures A3 to A5 on pages A11 and A12). This would entail further excavation in phases to serve as a strategic long-term source of road building material as required for the ongoing maintenance as well as possible further development of the provincial and national road network in the area. The expected lifespan of the borrowpit is approximately 30 years.

The proposed project requires compliance with the Environmental Impact Assessment (EIA) Regulations 2014 promulgated in terms of the National Environmental Management Act (No. 108 of 1998; NEMA), as amended, in order to obtain approval for an amendment of the Environmental Management Programme that had previously been approved in terms of the Mineral and Petroleum Resources Development Act (No. 28 of 2002; MPRDA), as amended. CCA Environmental (Pty) Ltd (CCA) has been appointed to act as the independent environmental assessment practitioner (EAP) to undertake the necessary process to compile an Environmental Management Programme Report (EMPR) for the amendment application to DMR.

A2 STRUCTURE OF REPORT

This report consists of four parts, the contents of which are outlined below.

Part A	Introduction and Environmental Management Programme approach and methodology Provides the background to the project; explains the report structure; outlines the key legislative requirements; outlines the methodology and public participation process followed in the study to date; provides the motivation for and benefit of the proposed project; and describes the consideration of borrowpit alternatives.
Part B	Project Description Provides an overall project description; description of the surrounding environment; and impact assessment for the proposed expanded borrowpit.

Part C	Environmental Management Programme Presents the EMP for the proposed expanded borrowpit.
Part D	Appendices to the Report
Appendix 1	DMR approval for borrowpit development in 2012
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Appendix 7	Specialist report: Desktop palaeontological impact assessment

A3 APPROACH AND METHODOLOGY

This section provides a description of the legislative framework within which this EMPR was conducted and outlines the methodology and public participation process followed in the study.

A3.1 LEGISLATIVE FRAMEWORK

This section presents the main legislative requirements of direct relevance to the proposed project.

A3.1.1 Mineral and Petroleum Resources Development Act (No. 28 of 2002)

The Mineral and Petroleum Resources Development Act (No. 28 of 2002; MPRDA) provides for the control of mining activities such as the development of borrowpits and prevents any mining activity without the appropriate right and/or permit as issued by the Minister of Mineral Resources. Such right and/or permit may only be issued once there has been compliance with the regulations promulgated in terms of the MPRDA and the National Environmental Management Act (No.107 of 1998; NEMA).

Government Notice (GN) R762, in terms of Section 106(1) of the MPRDA, exempts certain organs of state (including SANRAL) from applying for such rights and/or permits. However, at the time of the initial borrowpit application in 2012, Section 106(2) of the MPRDA required organs of state to submit an Environmental Management Programme (EMP) for approval by the Minister.¹

The approval DMR granted on 2 August 2012 for BP R27-8 KM 32.6 RHS 6.2 entailed the excavation of material in a defined area. In terms of Section 102 of the MPRDA, as amended, an EMP "... may not be amended or varied (including by extension of the area covered by it or by the addition of minerals or shares or seams, mineralised bodies or strata, which are not at the time the subject thereof) without the written consent of the Minister". An Amendment EMPR must therefore be submitted to DMR as formal application to amend the approval for this borrowpit.

¹ It should be noted that Section 106(2) of the MPRDA has subsequently been amended with effect from 7 December 2014 as follows: "Despite subsection (1), the organ of state so exempted must submit relevant environmental reports required in terms of Chapter 5 of the National Environmental Management Act, 1998, to obtain an environmental authorisation."

A3.1.2 National Environmental Management Act (No.107 of 1998)

In 2007/2008, DMR and the Department of Environmental Affairs (DEA) agreed that environmental regulation would be removed from the scope of MPRDA and would be regulated under NEMA. This would give rise to a “One Environmental System” for the country relating to mining and related activities. The implementation of this was given effect by the National Environmental Management Amendment Act, 2008 (No. 62 of 2008) (NEMAA) and the Mineral and Petroleum Resources Development Amendment Act, 2008 (No. 49 of 2008) (MPRDAA).

In terms of Section 14(2) of NEMAA, any provision relating to prospecting, mining, exploration and production would only come into operation on a date 18 months after the date of commencement of Section 2 of NEMAA or the MPRDAA, whichever is the later. As the MPRDAA was the later enactment coming into effect on 7 June 2013, any provision relating to prospecting, mining, exploration and production and related activities would come into effect on 8 December 2014. This meant that the requirement for both an Environmental Authorisation under NEMA for any relevant listed activities and an EMP under the MPRDA were to remain in place until 8 December 2014.

The 18 month period was, however, deleted by the promulgation of the National Environmental Management Laws Amendment Act, 2014 (No. 25 of 2014) (NEMLA 3) on 2 September 2014. Thus any provision relating to prospecting, mining, exploration and production and related activities in NEMAA also effectively came into effect on this date. However, as the effective implementation of the “One Environmental System” was dependent on various related regulations being in place, DEA issued a media statement on 3 September 2014 stating that the South African Government had taken a decision to only implement the “One Environmental System” from 8 December 2014, when the whole suite of legislation and subordinate legislation necessary for the implementation of the “One Environmental System” is in effect.

The “One Environmental System” is now in place and has a number of following implications for this proposed project. The EIA Regulations 2014 promulgated in terms of Sections 24(5) and 44 of NEMA in Government Notice (GN) R. 982 provide for the control of certain activities. Activities listed in GN R. 983, R. 984 and R. 985 are prohibited until written Environmental Authorisation is obtained from the competent authority. In addition, GN R. 982 stipulates transitional arrangements applicable to the continuation of actions undertaken and authorisations issued under previous regulations. Thus EIA Regulation 54(2) states: “An application submitted after the commencement of these Regulations for an amendment of an Environmental Management Programme, issued in terms of the Mineral and Petroleum Resources Development Act, 2002, must be dealt with in terms of Part 1 or Part 2 of Chapter 5 of these Regulations (EIA Regulations 2014)”.

Chapter 5 of GN R. 982 deals *inter alia* with the amendment of Environmental Authorisations and Environmental Management Programmes. Part 1 prescribes the approach in the case of amendments where no change in scope or a change of ownership occur, while Part 2 does the same in the case of amendments where a change in scope occurs. As this amendment would entail a change in scope, this EMPR amendment application is being undertaken in terms of Part 2, as described in EIA Regulations 2014 Sections 31 to 33.

A3.1.3 National Heritage Resources Act (No. 25 of 1999)

Section 38(1) of the National Heritage Resources Act (NHRA) (No. 25 of 1999) lists development activities that would require authorisation by the responsible heritage resources authority. The activity applicable to the proposed project is the following:

“(c) Any development or other activity which will change the character of a site: (i) exceeding 5 000 m² in extent.”

The NHRA requires that a person who intends to undertake a listed activity must notify the relevant heritage authority at the very earliest stages of initiating such as development. The relevant heritage authority would then, in turn, notify the person whether a Heritage Impact Assessment Report should be submitted. However, according to Section 38(8) of the NHRA, a separate report would not be necessary if an evaluation of the impact of such development on heritage resources is required in terms of any other applicable legislation. The decision-making authority should, however, ensure that the heritage evaluation fulfils the requirements of the NHRA and take into account in its decision-making any comments and recommendations made by the relevant heritage resources authority.

Heritage studies have been undertaken in compliance with the NHRA as required and lodged with the South African Heritage Resources Authority (SAHRA) as the competent heritage authority. The initial specialist archaeological assessment for the proposed strengthening of the R27 between Nieuwoudtville and Calvinia, which included an investigation of Borrowpit R27-8 32.6 RHS 6.2 (Halkett & Hart, 2011) is lodged as Case Id 3835 on SAHRIS, the SAHRA computerised information system. A desktop palaeontological impact assessment (Pether, 2012) undertaken for the first amendment application as well as the heritage impact assessment undertaken for the purpose of this amendment application (Webley, 2014) have also been lodged on SAHRIS (Case Id 3835).

A3.1.5 Legislation relating to human graves

During the construction phase of projects, including the development of borrowpits, human remains may be exposed through the disturbance of lost graveyards, prehistoric burials or illegal burials. Such remains are protected by a set of legislation including the Human Tissues Act (Act No 65 of 1983), the Exhumation Ordinance of 1980 and the National Heritage Resources Act (Act No 25 of 1999) which applies to graves and their contents which are greater than 60 years of age.

In the event of human bones being found on site, the South African Police Services and SAHRA must be informed immediately. If it is apparent that the remains are an illegal burial and foul play is suspected, the police will need to open a murder docket and the remains placed within the chain of custody. If the remains appear to be very old or are from a legal burial greater than 60 years of age, they must be removed by an archaeologist under an emergency permit at the cost of the developer.

While no graves were identified in the study area during the archaeological investigation, there is always a low possibility that unmarked illegal or historic graves could occur.

A3.2 ENVIRONMENTAL MANAGEMENT PROGRAMME METHODOLOGY

A3.2.1 EMP amendment application process

As mentioned in Section A3.1.2, this EMP amendment application is being undertaken in terms of Regulation 31 (GN R. 982) of the EIA Regulations 2014, therefore the process stipulated in Regulation 32(1) has been undertaken, as follows:

- An Application Form has been completed and was submitted to DMR on 21 April 2015;
- This EMPR will be submitted within 90 days of receipt by DMR of the application, thus by no later than 23 July 2015 (including three additional days to cover intervening public holidays).
- The content of this Amendment EMPR complies with Section 32(1)(a) (see Table A1); and
- The report is being subjected to the required public participation (refer to Section 3.2.3).

Regulation 32(1) (GN R. 982) of the EIA Regulations 2014 lists the necessary content of an Amendment Report. Table A1 lists these content requirements and indicates where such information can be found within this report.

Table A1: Requirements of an Amendment Report, in terms of the EIA Regulations 2014

Regulation 32 (1)(a)	Content of Amendment Application Report	Report section
(i)	An assessment of all impacts related to the proposed change	B4
(ii)	Advantages and disadvantages associated with the proposed change	A4 and A5
(iii)	Measures to ensure avoidance, management and mitigation of impacts associated with such proposed change	B3 and B4; C2 and C3
(iv)	Any changes to the EMP	Part C

A3.2.2 Specialist studies and site visits

Specialist studies were undertaken in May 2011 to assess the potential impacts related to the vegetation, heritage and freshwater ecology of the road strengthening project, and all the potential borrowpit sites that were initially considered.

Three specialists carried out an initial borrowpit investigation of seven potential borrowpit sites during May 2011 to familiarise themselves with the sites and to identify potential impacts associated with the proposed borrowpits. Ms Antonia Belcher, an aquatic scientist, investigated the environmental significance of the sites from the freshwater ecological perspective; Dr David McDonald of Bergwind Botanical Surveys & Tours CC investigated the botanical significance of the sites; and Mr Timothy Hart and Mr David Halkett of ACO Associates CC investigated the archaeological and heritage significance of the sites. Potential impacts identified during site visits were then assessed according to pre-defined rating scales (see Appendix 3). Specialists also recommended appropriate mitigatory or control measures to minimise potential impacts or enhance potential benefits.

When the first proposed expansion of BP R27-8 KM 32.6 RHS 6.2 was considered in 2012, it was concluded that a supplementary botanical study of the expanded area would suffice. Dr McDonald thus undertook a second site visit on 22 May 2012 to assess the botanical impact of the proposed borrowpit expansion and provided an addendum to his initial specialist report. Dr John Pether also undertook a palaeontological impact assessment in July 2012 as required by SAHRA.

A similar methodological approach has subsequently been followed in respect of the proposed further expansion of BP R27-8 KM 32.6 RHS 6.2. The same specialists and/or firms were appointed in August 2014 to undertake a freshwater ecology, vegetation and heritage specialist study. In each case the study entailed a site visit and provided a report documenting the identification of potential impacts, the assessment thereof according to pre-defined rating scales and recommendations regarding appropriate mitigation or control measures to minimise potential impacts or enhance potential benefits (see Appendices 4, 5 and 6).

A3.2.3 Public participation process

The public participation process undertaken during the preparation of this Amendment EMPR commenced in August 2014 before the formal commencement of "One Environmental System" on 8 December 2014. However, as the latter now applies, the public participation process is being concluded to comply with the NEMA EIA Regulations 2014 as described in Section A3.2.1.

The public participation process builds on the initial processes undertaken for the proposed road strengthening project in 2011 and the first borrowpit expansion application in respect of BP R27-8 KM 32.6 RHS 6.2 in 2012.

Steps undertaken and to be completed to ensure adequate public consultation include the following:

- The process to be followed to apply for further expansion of the borrowpit in terms of the NEMA EIA Regulations 2014 was confirmed in March 2015 by means of a telephone conversation and follow-up e-mail communication with the DMR representative based in the Kimberley Regional Office (see Appendix 2.1).
- The landowner of the property on which BP R27-8 KM 32.6 RHS 6.2 is situated was contacted by telephone on 19 and 21 August 2014 to inform him of the proposed borrowpit expansion and to confirm his contact particulars. On 1 September 2014 a notification letter was sent (both by e-mail and by registered mail) to the landowner to formally notify him of the proposed borrowpit expansion (see Appendix 2.2).
- The landowner submitted a completed acknowledgment form dated 20 March 2015, which indicated that he had been made aware of the location and extent of the proposed borrowpit expansion and that access would be required across the property. He also used this form to submit comments and raise issues of concern (see Appendix 2.2). The relevant comments and responses have been included in the detailed description of the proposed borrowpit in Part B (see Section B2.15).
- A site notice (in Afrikaans) was erected at the borrowpit site on 25 August 2014. See Appendix 2.3 for a copy of the site notice and photographs of the notice *in-situ*.
- An advertisement (in Afrikaans) announcing the proposed expansion of the borrowpit and inviting the public and/or organisations to register as an I&AP and/or to comment on the proposed project was placed in the local newspaper, the “Noordwester/Messenger” of 29 August 2014 (see Appendix 2.3). It should be noted that no request for registration or other comments were received in reaction to this advertisement.
- The project databases developed for the related projects undertaken in 2011 and 2012 served as a basis to develop an updated project database. The list of Interested and Affected Parties (I&APs) includes the landowner, authorities, councillors, community organisations such as farmers associations and other key stakeholders. To date 25 I&APs have been registered on the project database (see Appendix 2.4).
- The Amendment EMPR has been released for a 30-day comment period from 8 May 2015 to 8 June 2015. Copies of the Revised BAR have been made available at the following locations:
 - Calvinia Public Library;
 - Offices of CCA Environmental (Pty) Ltd (CCA); and
 - On the CCA website (www.ccaenvironmental.co.za).
- A notification letter was sent to the landowner to inform him of the availability of the Amendment EMPR for review and to request him to provide his written response within 30 days (see Appendix 2.5).
- An I&AP notification letter (in English and Afrikaans) was sent to I&APs on the project database to inform them of the availability of the Amendment EMPR for review and of the opportunity to provide written comments (see Appendix 2.5).
- Copies of the Amendment EMPR have also been made available to the following Organs of State for their review and comment:
 - Department of Water & Sanitation;
 - Northern Cape Department of Agriculture and Land Reform;
 - Northern Cape Department of Environment and Nature Conservation;
 - SAHRA;
 - Hantam Local Municipality; and
 - Namaqua District Municipality.

- A copy of the Amendment EMPR has also been submitted to DMR to request their comment as required in terms of Regulations 32(1)(i) and (ii) (GN R. 982).
- After the closure of the comment period, the Comments received on the Amendment EMPR will be collated and responded to in a Comments and Responses Report that will be included in the Amendment EMPR, which will be submitted to DMR.

A3.2.4 Way forward

The updated Amendment EMPR will be submitted to the Northern Cape DMR for consideration and decision-making. The Minister's delegated authority, the Regional Manager, is required to make a decision within 107 days of receipt of an Amendment EMPR. After DMR has reached a decision and informed the Applicant, all I&APs on the project database will be notified of the outcome of the application and the reasons for the decision. A statutory Appeal Period in terms of National Appeal Regulations, 2014 will follow the issuing of the decision.

A4 MOTIVATION FOR AND BENEFITS OF THE PROPOSED PROJECT

The initial motivation for the proposed development of BP R27-8 KM 32.6 RHS 6.2 in 2012 was to supply material for the strengthening (partial reconstruction) of the R27 between the Western/Northern Cape border and Calvinia. The rationale for strengthening the R27 was to improve the safety levels and road condition of Section 8 of the R27, i.e. between the Western/Northern Cape border west of Niewoudtville and Calvinia.

The motivation for further expanding BP R27-8 KM 32.6 RHS 6.2 is to ensure the availability of a long-term source of road building material. The borrowpit would serve as a strategically available cost-effective source of hard rock material for the ongoing maintenance as well as possible future development of the national road network in the area. Hard rock material sourced from a borrowpit area is required when rehabilitating and/or upgrading existing roads as well as when constructing new roads, usually to provide a crushed layer of material as base or subbase layers to improve the quality of the road pavement in terms of load carrying capacity and longevity. The hard rock material would also be used for the aggregate required for the surfacing or re-surfacing of roads during the maintenance, rehabilitation or upgrading of roads.

Obtaining the required quality crushed material from a commercial source would be expensive, especially in this area. The closest commercial source for crushed material is situated in Vredendal at a distance of approximately 75 km from Niewoudtville. Substantial cost savings would accrue to future SANRAL projects by eliminating the cost of transportation of large volumes of material along the road from Vredendal. Added advantages would be that the life span of the provincial and national road network road would not be shortened as a result of the increase in heavy traffic; road safety would not be negatively impacted by the presence of haul vehicles, especially on the steep Vanrhyns Pass road section; and air pollution due to trucks burning large quantities of diesel on long distance haulage would be avoided.

A5 CONSIDERATION OF BORROWPIT ALTERNATIVES

A5.1 BORROWPIT SITES

Various site alternatives were considered for the initial proposed borrowpit development. These included eight potential borrowpit sites identified by the design engineers in November 2010. A further more detailed investigation was undertaken into only seven of the eight potential borrowpit areas, during which each borrowpit was assessed according to various criteria (e.g. quantity and type of material, botanical, heritage and freshwater ecology sensitivity). Four of the potential seven borrowpit areas were rejected for reasons indicated in the summary table below (see 1, 2, 4 and 6 in Table A2). The remaining three borrowpits were subsequently approved for development for the purpose of strengthening the R27 (see 3, 5 and 7, shaded in Table A2). As the materials obtained from BP R27-8 KM 32.6 RHS 6.2 (3 in Table A2), met the needs to complete the required works, no mining operations were undertaken at the other two approved borrowpits, i.e. 5 and 7 in Table A2. Application was made for their closure at the conclusion of the construction contract in 2014, while SANRAL is now applying for the continued use of BP 27-8 KM 32.6 RHS 6.2 for strategic purposes.

With regards to further alternative consideration, the conclusion of the botanical specialist, Dr D McDonald, in his assessment of the proposed further expansion of BP 27-8 KM 32.6 RHS 6.2 is as follows: "Given the strategic need for road-building material, from a botanical viewpoint it is highly desirable to contain the extraction of such material in a single limited area rather than to excavate numerous borrow pits or quarries at different locations. This in itself is a mitigation measure and therefore the future quarry operation at Merino should be supported". During the initial borrowpit selection process in 2011, Dr McDonald found one of the potential borrowpit sites identified for the excavation of hard rock (dolerite) material to be unsuitable due to the botanical sensitivity of the site – refer to Borrow Pit 1 (BP R27-7 km 51 LHS 7.1) in Table A1 below. Thus BP R27-8 KM 32.6 RHS 6.2 has been confirmed as the most suitable source of hard rock material in the area in comparison to other possible alternatives.

Table A2: Potential borrowpit sites initially investigated for development

No.	Borrowpit Name	Location		Finding
		Latitude	Longitude	
1	BP R27-7 KM 51.0 LHS 6.9	S 31° 20' 01.3"	E 19° 07' 06.1"	Unsuitable due to botanical sensitivity: <ul style="list-style-type: none"> Located within the mapped Critical Biodiversity Areas for the Hantam Local Municipality; Highly sensitive vegetation, namely Nieuwoudtville-Roggeveld Dolerite Renosterveld, which harbours a very high concentration of endemic geophytic (bulb) species, and is thus an extremely important repository for plant biodiversity.
2	BP R27-8 KM 9.5 LHS 0.2	S 31° 23' 57.7"	E 19° 12' 40.3"	Unsuitable due to sub-standard material quality. Unsuitable due to botanical sensitivity: <ul style="list-style-type: none"> Located within the mapped Critical Biodiversity Areas for the Hantam Local Municipality; Future excavation would impact undisturbed natural succulent-dominated shrubland.
3	BP R27-8 KM 32.6 RHS 6.2	S 31° 32' 15.4"	E 19° 24' 11.9"	Suitable material. Approval was granted in terms of MPRDA on 2 August 2012.
4	BP R27-8 KM 39.6 LHS 0.1	S 31° 29' 26.4"	E 19° 29' 28.3"	Unsuitable due to sub-standard material quality.
5	BP R27-8 KM 45.0 RHS 0.2	S 31° 29' 43.7"	E 19° 32' 44.7"	Suitable material. Approval was granted in terms of MPRDA on 19 April 2012.
6	BP R27-8 KM 50.4 LHS 0.1	S 31° 29' 43.0"	E 19° 36' 08.2"	Unsuitable due to sub-standard material quality.
7	BP R27-8 KM 61.6 RHS 1.0	S 31° 30' 35.3"	E 19° 43' 00.0"	Suitable material. Approval was granted in terms of MPRDA on 19 April 2012.

A5.2 MINING METHODS

The borrowpit site and associated activities and infrastructure would be carefully planned, to ensure that the footprint is kept to a minimum – refer to Section B3 for more details in this regard.

Controlled blasting would be undertaken to arrive at the hard rock material in the proposed quarry area. The blasting would be undertaken in stages of approximately 10 000 m³ per blast. The blasted rock would be excavated, loaded onto dumpers and dispatched to an on-site crusher where it would be processed for use as road material. After crushing, the material would be stockpiled on the site. Stockpiled material would be loaded and transported when required.

As the mining method described above is the only feasible approach to excavate hard rock material in a cost-effective manner, alternative approaches were thus not considered.

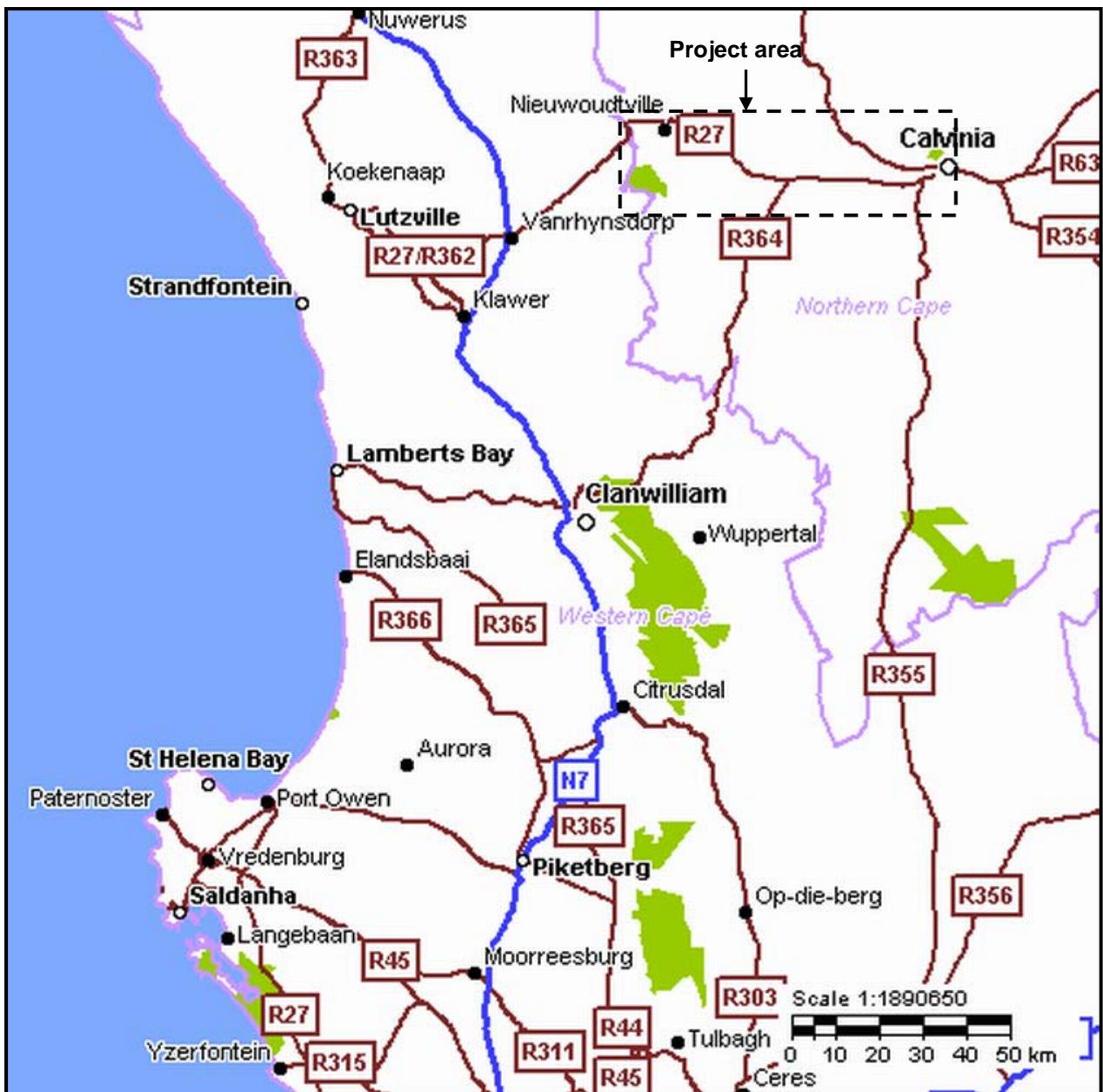


Figure A1: Locality map showing the initial project area between the Western/Northern Cape border (border shown in purple) and Calvinia along the R27.

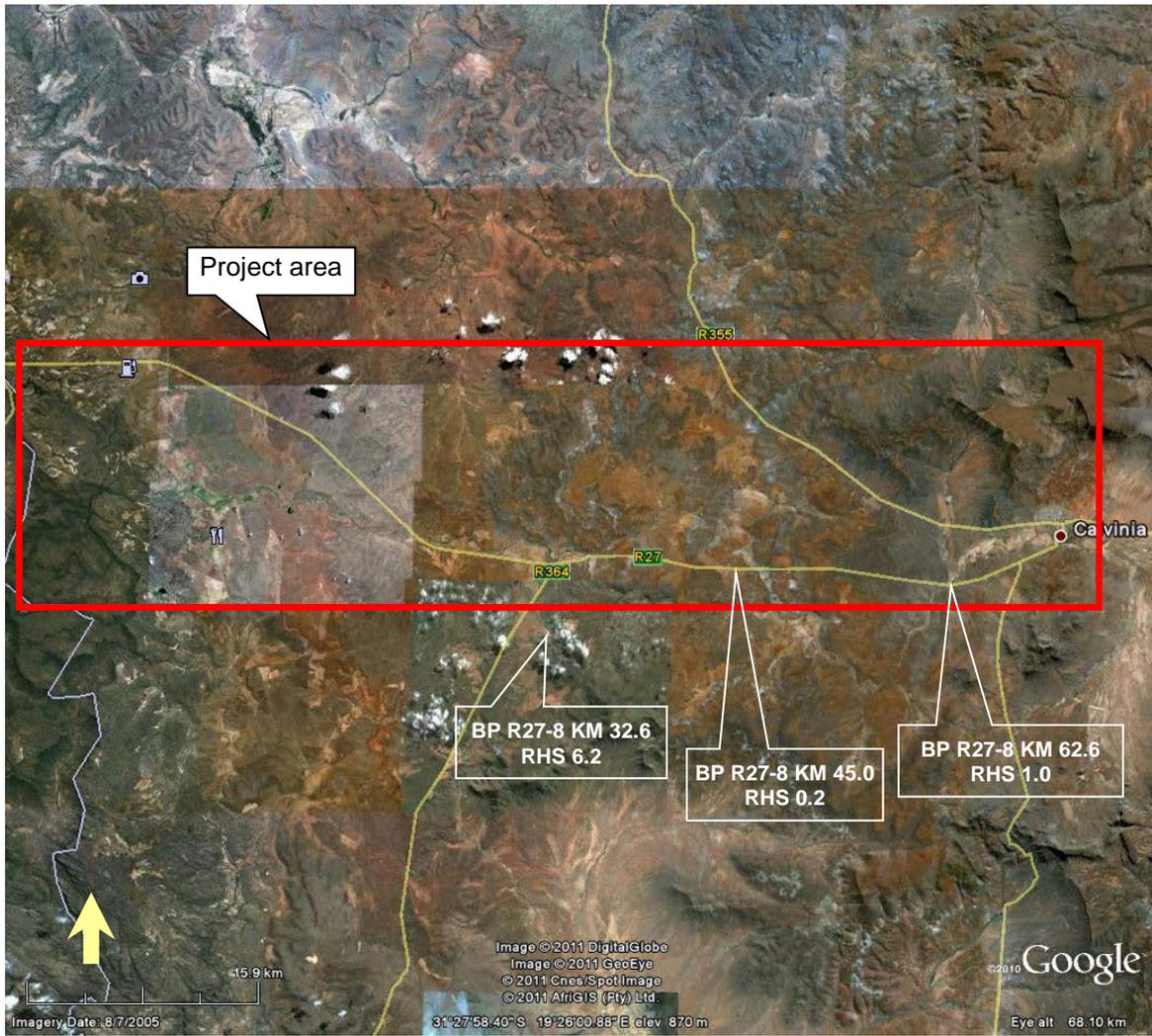


Figure A2: Google Earth image showing the locality of the three borrowpits approved in 2012

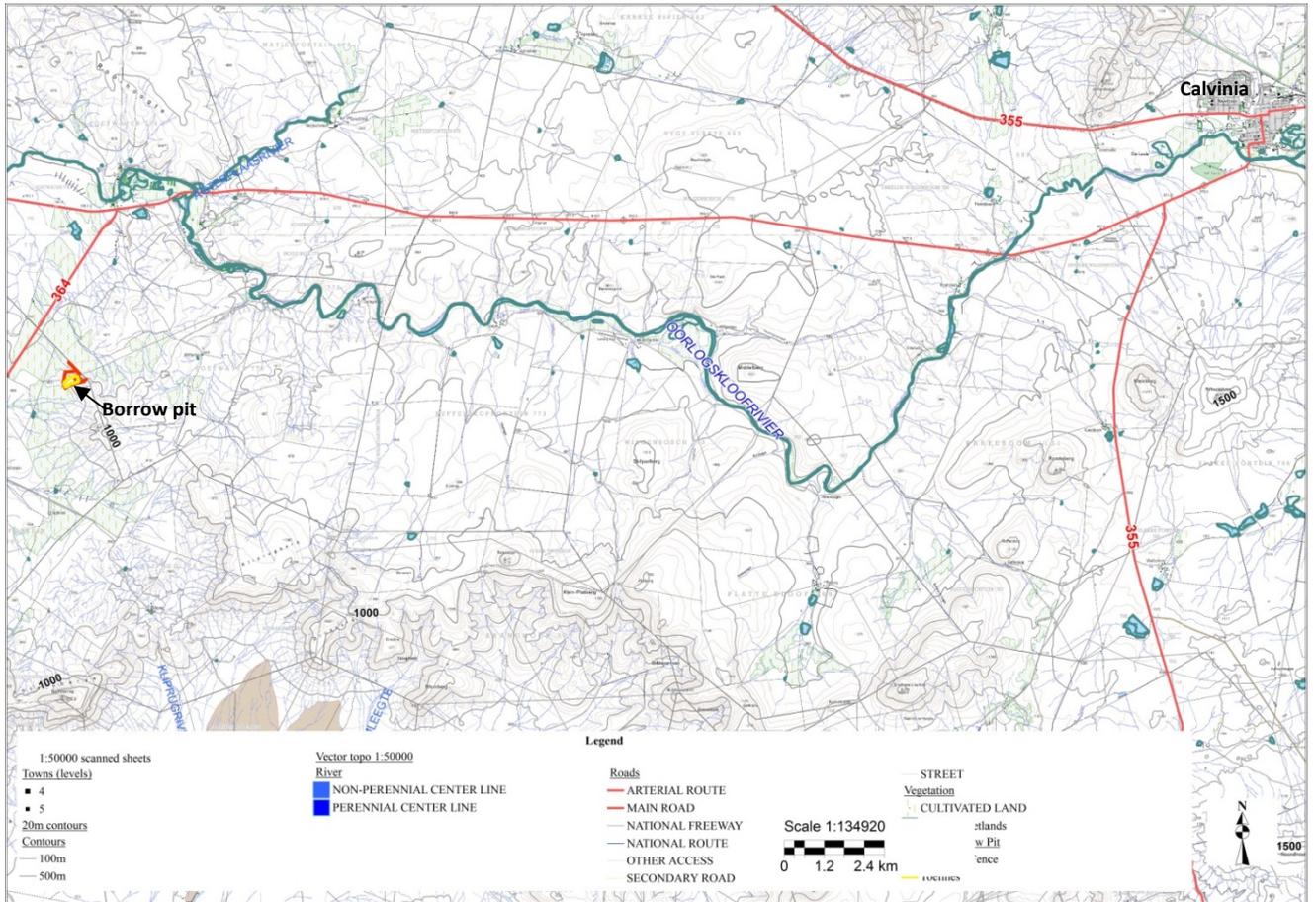


Figure A3: Topographical map (3119 AD, BC, BD, CB, DA & DB) showing the locality of BP 27-8 KM 32.6 RHS 6.2 (map provided by A Belcher)



Figure A4: Google Earth image showing the locality of BP 27-8 KM 32.6 RHS 6.2 (red circle) within the surrounding study area



Figure A5: Google Earth image showing the locality of the BP 27-8 KM 32.6 RHS 6.2 (red circle) (zoomed-in)

PART B: EXPANSION OF BORROWPIT BP R27-8 KM 32.6 RHS 6.2

B1 BRIEF PROJECT DESCRIPTION

B1.1 MINE OWNER AND MINE MANAGER/RESPONSIBLE PERSON

SANRAL is currently the holder of the mining right for BP R27-8 KM 32.6 RHS 6.2 and would remain responsible for the expanded borrowpit portion. SANRAL would appoint a mine manager and contractor to undertake the management and further excavation of the borrowpit in future when road building material is required for specific road maintenance/rehabilitation and/or construction projects in the area. As work would be related to specific projects, different mine managers and contractors may be appointed from time to time for limited periods during the lifetime of the mine. However, SANRAL would remain the mine owner and, as such, would be responsible for the ongoing administrative management of the borrowpit. Further detail regarding the administration of the EMP is described in Section C1.

B1.2 NAME AND ADDRESS OF THE APPLICANT FOR THE MINING AUTHORISATION

Applicant: South African National Roads Agency SOC Limited
Contact person: Mr D Wilson
Address: Private Bag X19, Bellville, 7530
Telephone: (021) 957 4600

B1.3 NAME AND ADDRESS OF LANDOWNER AND TITLE DEED DESCRIPTION

Farm name: Portion 1 of the Farm Bloedzuigerfontein Noord 782, Northern Cape Province
Landowner: FJ Strauss Family Trust
Contact person: Dr FJ Strauss
Address: PO Box 309, Clanwilliam, 8135
Telephone: 027 482 1629 / 083 230 4767
Fax number: 027 482 1179
E-mail address: fstrauss@telkomsa.net
Title deed information: Title Deed No of Property: T53016/1993
Size of the property: 1420.8053 ha

B1.4 REGIONAL SETTING

Portion 1 of the Farm Bloedzuigerfontein Noord 782, known as Merino, is situated approximately 36 km south-west of Calvinia adjacent to the R364, which links the R27 and Clanwilliam. It is located in the Hantam Local Municipality, which forms part of the Namakwa District Municipality in the Northern Cape Province. The borrowpit area is at the site of an abandoned Iceland Spar (a variety of calcite) mine, situated approximately 1.8 km from the R364 at the foot of a hill (see Figures A3 to A5). Co-ordinates of the approved borrowpit area, including the access road, crusher site and stockpile area, are presented in Table B1 (see Figure B1 on page B14 for a layout plan of the area). Co-ordinates of the total proposed expanded area are presented in Table B2 (see Figure B2 on page B15 for a layout plan of the expansion area).

TableB1: Co-ordinates of approved borrowpit area (System WGS 84 Lo 19°)

Point	"-Y"	"+X"
A	37,164.05	3,489,277.78
B	38,590.12	3,490,783.99
C	38,522.61	3,490,847.91
D	38,408.75	3,490,800.00
E	38,358.70	3,490,653.73
F	38,404.12	3,490,611.08
G	37,154.79	3,489,291.55

Table B2: Co-ordinates of proposed borrowpit expansion area (System WGS 84 Lo 19°)

Point	"-Y"	"+X"
Q1	38,333.186	3,490,536.165
Q2	38,404.074	3,490,611.122
Q3	38,358.696	3,490,653.727
Q4	38,408.750	3,490,800.000
Q5	38,522.606	3,490,847.912
Q6	38,590.120	3,490,783.993
Q7	38,156.880	3,490,928.467
Q8	37,976.897	3,491,041.659
Q9	37,933.806	3,490,945.034
Q10	37,919.231	3,490,862.889
Q11	37,980.660	3,490,563.030

B2 DESCRIPTION OF THE BORROWPIT ENVIRONMENT

B2.1 CLIMATE

The Hantam Karoo region climate is semi-arid as reflected in the high mean annual potential evaporation of 2 558 mm. It is a climate of relative extremes with hot summers and cold winters. Daytime summer (December to February) temperatures are on average 30°C, dropping overnight to around 13°C. Daytime winter (June to August) temperatures average 18°C and drop to a low 4°C in the evenings. Incidence of frost is high. Extreme temperatures can reach up to 37°C in summer and drop below freezing between the months of May and September.

The Hantam region is subject mainly to winter rainfall but also benefits from occasional rain showers and thunderstorms in the summer. Rainfall peaks between March and August, with mean annual precipitation averaging 189 mm per year. Rainfall does occur in summer (September to February), averaging 12 mm per month.

B2.2 TOPOGRAPHY

The study area is located on the Niewoudtville/Onder Bokkeveld Plateau between Calvinia and Niewoudtville at an elevation of approximately 800 metre above mean sea level (m.a.m.s.l.). The area lies within the Olifants-Doring River catchment, with the Oorlogskloof River and its tributaries flowing parallel to the R27 road. The general surround topography is relatively flat within the wide river valley of

the Oorlogskloof, with the Hantam Mountains in the east and the escarpment on the Bokkeveld Mountains in the west.

The borrowpit site is located on the north side of a dolerite hill, at an altitude of between 860 and 920 m.a.m.s.l. The topography of the site has been significantly transformed as a result of mining in the past for Iceland Spar and the more recent excavations associated with the existing borrowpit. The existing borrowpit is located along a northward sloping hill. The contours of the proposed expansion area are presented in the borrowpit layout plan in Figure B2.

B2.3 GEOLOGY AND SOIL

The broader study area is characterised by various geological formations. To the west of Niewoudtville the R27 is underlain by thick bedded sandstone of the Nardouw Formation (Table Mountain Group). The area between Nieuwoudtville and the midpoint of Section 8 of the R27, approximately 35 km to the east, is underlain by tillite of the Dwyka Group. A combination of shale, siltstone and sandstone of the Prince Albert and Tierberg Formations underlay the area from this point eastwards to Calvinia. The dominant form of weathering is disintegration. These relatively flat lying beds overlie more ancient, folded and metamorphosed rocks of the Gariiep and Nama Groups, which formed between 600 and 500 million years ago as a result of sedimentation and continental collision. Karoo dolerite intrusions occur across the area.

Clay-rich red soils of the Arcadia Form, derived from weathered dolerite, are found on level land surfaces. On steeper slopes shallow soils of the Glenrosa and Hutton Form developed since weathering is more limited. The dolerite-derived soils are base-saturated with a neutral pH as a result of the low rainfall in the Hantam.

At the borrowpit site shallow soil of the Mispah Form is found over bedrock. The site is a proven source of suitable hard rock material in the form of hard, weather-resistant dolerite.

B2.4 PRE-MINING LAND CAPABILITY AND LAND USE

The main commercial activity in the surrounding area is stock farming, with an economic boost provided from tourism during the spring flower season.

The approved borrowpit area is highly disturbed with high exposed vertical rock faces as a result of previous mining activities and to a lesser extent, the previous borrowpit operation. The proposed expansion area is located within surrounding lands where the natural Hantam Karoo vegetation cover has been subjected to intense grazing by sheep.

B2.5 VEGETATION

Biogeographically the study area falls within the Succulent Karoo Biome, with Hamtam Karoo vegetation ("Least threatened" status) the dominant natural vegetation type. Hantam Karoo vegetation occurs on the clay-rich soils towards Calvinia and beyond. According to the Critical Biodiversity Areas (CBA) map for the Namaqua District Municipality, BP R27-8 KM 32.6 RHS 6.2 does not fall within any designated CBAs and Ecological Support Area (ESAs) (see Figure B3 on page B16).

Hantam Karoo vegetation is described as a dwarf karoo shrubland with nearly equal proportions of succulent elements and low small-leaved karroid shrubs, particularly of the family Asteraceae. However,

the botanical specialist found the vegetation of the borrowpit site somewhat atypical of this vegetation as it rather reflects shrubby plant communities found on upland, well-drained rocky sites with shallow soils.

Two plant communities are present at the site, the first of which occurs on the upper north-facing slope on shallow soils with a high component of rock and gravel. However, bedrock is generally absent at the surface. Shrubs are low, ranging from 0.5 m to 1 m in height, and cover approximately 20% of the surface, with a sparse lower stratum of herbaceous plants found amongst the shrubs. This vegetation is well grazed by sheep, which has resulted in an abundance of herbaceous species that reflect disturbance such as annual Asteraceae. Although geophytes occur, they are not abundant (see Figure B4 on page B16). Some areas of this plant community have already been disturbed by excavation and it is likely that a major part of this community would be affected in the proposed future borrowpit expansion.

The second plant community occurs in the south-western sector of the study area on rocky slopes with bedrock exposed at the surface and shallow soil in pockets amongst the rocks. Tall shrubs such as *Didelta spinosa* and *Searsia cf. undulata* dominate while herbaceous plants are generally confined to cracks amongst the rocks where they benefit from moisture trapped in the cracks. Geophytes in the rock cracks are also protected from porcupines reaching the bulbs (see Figure B5 on page B17).

Aloe microstigma plants were observed at various points in the borrowpit area (see Figures B6 and B7 on page B17). This is not an uncommon species and is not threatened; however, it should be noted that all *Aloe* species are protected in the Northern Cape Province and a permit would be required for their removal or relocation.

The vegetation at the toe of the north-facing slope consists of an herbaceous layer (including some geophytes) with a low to mid-high shrub stratum. Species occurring in this area include *Aptosimum* sp.; *Asparagus capensis*; *Dorotheanthus* sp.; *Eriocephalus microphyllus*; *Hermannia paucifolia*; *Lebeckia cytisoides*; *Mesembryanthemum (Psilocalon) cf. junceum*; *Pentzia incana*; *Pteronia divaricate*; *Stachys rugosa*; *Searsia cf. undulata*; *Tetragonia cf. sarcophylla*; and *Zygophyllum chrysopteron*.

The botanical specialist concluded that the vegetation in the area proposed for expansion of the borrowpit is not sensitive and no sensitive or threatened species of conservation concern were encountered in the botanical survey.

B2. 6 FAUNA

No faunal species were seen on site.

B2. 7 HYDROLOGY

The borrowpit is situated within the catchment of the Oorlogskloof River in the Olifants/Doring River System. The Oorlogskloof River originates in the Roggeveld Mountains and flows westwards past Calvinia and Niewoudtville. South of Niewoudtville it enters the Koebee Mountains, flowing through a deep riverine gorge where it is known as the Koebee River. It flows southwards to its confluence with the Doring River, a major tributary of the Olifants River which enters the Atlantic Ocean on the west coast.

A number of small drainage lines are located within the area in which the borrowpit would be expanded. These drainage lines form the upper reaches of a minor tributary of the Oorlogskloof River (see Figures B8 to B10 on pages B18 and B19). The tributary of the Oorlogskloof River is in a moderately modified ecological state, due to farming within the riparian zone (removal of riparian vegetation and

tramping of livestock within the river channel); channel modification as a result of the existing borrowpit; and a low density of invasive alien vegetation growth (*Prosopis* sp.) and old man saltbush (*Atriplex nummularia*). The Oorlogskloof Tributary is considered to be of low ecological importance and sensitivity.

The drainage lines would carry runoff only sporadically, immediately after rainfall events and do not sustain an aquatic ecosystem. Disturbance or loss of these drainage features would thus not result in any loss of aquatic ecosystems. The most significant impact of the proposed expansion to the borrowpit would be as a result of the need to divert the runoff from the hillside around the borrowpit. This would result in an intensification of the flow in the diverted drainage channel which would increase the risk of erosion within this drainage feature. Thus, the freshwater features in the form of the small drainage lines within the area that is proposed for the expansion of the borrowpit are not considered a constraint to the proposed activities. These features would, however, have to be diverted around the borrowpit and mitigation measures would have to be implemented to prevent erosion of the drainage channel(s) downstream of the borrowpit.

The proposed borrowpit is not located close to any dams or other surface water sources.

B2.8 GEOHYDROLOGY

No groundwater has been found during excavations in the borrowpit to date nor is any expected to be present in the rock strata proposed for future mining.

B2.9 AIR QUALITY

The air quality in the study area is relatively good. No local residents live in close proximity to the borrowpit site, i.e. within a 1 km radius. It is also not likely that dust from the borrowpit operation would affect traffic along the R364, as the borrowpit is approximately 1.5 km from the R364. However, haulage of material along the access route and R364 could potentially generate dust as these roads are not tarred.

B2.10 NOISE

The site is not currently exposed to direct noise from traffic on any major roads. No local residents live in close proximity to the borrowpit site.

B2.11 ARCHAEOLOGY AND HERITAGE

B2.11.1 Archaeology

The Hantam Mountains to the north of Calvinia have not been subjected to any systematic archaeological research programmes or surveys in the past and therefore virtually nothing is known of this area. There are numerous web pages which report on the rock art of the Oorlogskloof Nature Reserve, which is located 70 km south-west from Calvinia, but very few published reports. During a contract survey for the upgrading of railway infrastructure north of Loeriesfontein, a specialist discovered a small shelter with a Middle Stone Age scatter on the Krom River. Other consultants conducting two small surveys in the Calvinia district reported no finds of significant archaeological material.

Previous archaeological investigations of proposed borrowpits in the Calvinia area did not find any artefacts of heritage significance.

No archaeological remains were identified in the proposed borrowpit expansion area. The slope of the hill is too steep for pre-colonial settlement and there are no suitable rocks or overhangs for engravings or paintings.

A scatter of four stone artefacts, including one upper grindstone, was recovered in old ploughed lands at the base of the hill outside the proposed borrowpit expansion area. Since the identified material is typical and found elsewhere, it is considered of low significance (see Appendix 6).

No known human graves are located in the area; however, the heritage specialist recommended that should any human remains be uncovered during the mining of the hill, work should be stopped in that area and SAHRA notified.

The heritage specialist also recommended that, should any further expansion of the borrowpit area in a westerly direction be considered in the future, a further archaeological assessment should be undertaken of the cluster of hills to the west of the proposed expansion area to ensure that there are no archaeological remains

B2.11.2 Colonial period history

Although Calvinia was officially named in 1851 and became a municipality in 1904, the earliest farms in the area were already allocated to farmers in 1813. The farm Bloedzuigersfontein North 782 was surveyed by the Government Land Surveyor in August 1916. The proposed borrowpit expansion area contains no buildings.

B2.12 SENSITIVE LANDSCAPE

The landscape between Calvinia and Nieuwoudtville in the Northern Cape forms part of the high Karoo plateaux above the great escarpment. It is characterised by open plains punctuated by hills and mountains. The landscape qualities of the study area are dominantly rural and natural with no important sites or places of heritage significance close to the proposed borrowpit expansion area.

B2.13 VISUAL ASPECTS

The proposed borrowpit expansion area is adjacent to an existing borrowpit site with excavated exposed high vertical rock faces along a hill, which is visible from the R364. The proposed expansion area is situated along the rocky slopes of the northward sloping hill. Excavation would extend across the hill and would expose additional vertical rock faces. However, the top section of the hill would remain intact. During rehabilitation the extent of the near vertical slopes would be reduced by placing oversize rock material that could not be crushed against such slopes and reshaping the slopes to correspond as far as possible to the surrounding landscape. In addition, a berm area to be retained along the northern boundary of the excavation area along the toe of the slope would obscure the view of the excavated area to some extent.

The borrowpit area would remain visible to passing traffic along the R364.

B2.14 REGIONAL SOCIO-ECONOMIC ENVIRONMENT

The study area is situated in the Northern Cape Province, the largest but most sparsely populated of South Africa's nine provinces. Even though it covers almost 30% of the total South African land mass, the Northern Cape Province houses only about 2.2 % of the country's total population at a population density of less than 2.5 people per km² and has the smallest economy of the nine provinces. The arid climate and semi-desert landscape that characterise much of the Province cannot support large-scale economic activities that would provide livelihoods to large populations. Nevertheless, the Gross Geographic Product (GGP) per capita for the Province is higher than the national average, which indicates that it provides reasonable levels of economic activity to sustain its population. Mining and agriculture dominates the provincial economy, with the mining sector contributing most to the provincial GGP, while the agricultural sector provides the most employment opportunities. Limited processing of primary commodity output in mining and agriculture takes place in the Northern Cape.

The study area falls under the jurisdiction of the Hantam Local Municipality, which, in turn, forms part of the Namakwa District Municipality. The Namakwa District Municipality is located in the north-western corner of South Africa, bordering the Atlantic Ocean to the west and Namibia to the north. It is the largest district municipality in the country, covering an area of 126 747 km² area which stretches over 1 000 km from Fraserburg in the south-east to Alexander Bay in the north-west of the Northern Cape Province. The Namakwa District Municipality, with its headquarters in Springbok, accommodates a total population in the order of 126 500 people in the six local municipalities across the area.

The Hantam area is characterised by a sparse population living on open plains punctuated by hills and mountains. The main commercial activity is farming, mainly sheep, wool, lucerne and rooibos tea. The region experiences a seasonal economic boost with the annual influx of tourists during the spring flower season.

The Hantam Local Municipality is responsible for the main towns of Brandvlei, Calvinia, Loeriesfontein, Middelpos and Niewoudtville in an area covering approximately 30 000 km². The total population was estimated at just under 20 000 people in 2011. Literacy levels are generally low, with only 13% of the workforce having completed high school and less than 2% post-matric qualifications. Unemployment has been identified as the main problem in all the towns, with the official unemployment rate approximately 26%. The general lack of economic opportunities is associated with very low personal and household incomes among the young, economically active population. The majority of the economically active population is reported to earn less than R 1 000 per month.

B2.15 INTERESTED AND AFFECTED PARTIES

The public participation process undertaken as part of the Amendment EMP is presented in detail in Section A3.2.2. It should be noted that a notification letter was sent to the representative of the landowner, Dr FJ Strauss, informing him of the proposed project and that a borrowpit had been identified on the property. Dr Strauss was asked to complete an acknowledgement form (which is included in Appendix 2) to indicate that he was notified of the location and extent of the proposed borrowpit expansion and that access to the area may be required across the property, as well as to raise any issues of concern. Dr Strauss had the following comments.

Table B3: I&AP Comments and Responses

I&AP	Comment	Response
Dr FJ Strauss, 20 March 2015	There is still a number of iron/scrap items on the site, as well as a bulldozer. This remains the property of FJ Strauss.	This comment has been noted. However, it is recommended that the landowner should remove all movable property belonging to him from the expanded borrowpit site if the application is approved to limit any possible dispute in future if the property has been temporarily expropriated.
	No permanent or semi-permanent settlement of people on the site.	This request from the landowner has been included as a provision in the EMP (refer to Section C2.1.1).

B3 DETAILED DESCRIPTION OF THE PROPOSED BORROWPIT EXPANSION

B3.1 SURFACE INFRASTRUCTURE

There would be no permanent surface infrastructure for the proposed borrowpit. However, a crusher would be established on site when required to break down blasted rock. The existing temporary access road would remain in use to the borrowpit area via the existing R364 to the rest of the provincial and national road network in order to reach the specific areas where road building material would be required. The fence along the access road and the gate at the entrance point along the R364 would be maintained to control access to the borrowpit. The total borrowpit area would be fenced off from the rest of the property and the fencing maintained as long as the borrowpit is in operation.

B3.2 WASTE MANAGEMENT

Material that is not suitable as road building material would be stockpiled and used to reshape the disturbed areas during rehabilitation. Any domestic waste would be collected in a waste bin and disposed of at a municipal waste site.

B3.3 WATER MANAGEMENT

The borrowpit is located in a dry, low rainfall area on the slopes of a natural hill with low risk of runoff accumulating in the proposed excavation for extended periods. It is proposed that the floor of the borrowpit be sloped in a north-westerly direction (see Figure B2).

The water requirements for the proposed borrowpit operations are expected to be minimal (e.g. dust suppression on access roads and borrowpit area). The Contractor appointed for a specific construction project would be responsible for identifying appropriate water sources to supply the total water use requirements for each project. The Contractor would also have to ensure that the necessary water use permits are in place. It is likely that municipal water sources supplemented by existing boreholes and dams on privately owned farms would be used to supply the total monthly water use requirements for each specific project

B3.4 TRANSPORT

This would consist of haul vehicles transporting the road building material from the borrowpit to the area of the road(s) earmarked for maintenance, rehabilitation or construction. The existing access road between the borrowpit area and the R364 would be maintained to link to the provincial and national road network.

B3.5 BORROWPIT LAYOUT AND DEVELOPMENT

The proposed site layout plan is presented in Figure B2.

The total borrowpit area currently approved for temporary expropriation is 13.9 ha. Thus includes a total area of 2.26 ha approved for excavation, of which only 0.754 ha has been utilised to date, as well as a crusher and stockpile area located to the north of the pit at the foot of the hill.

It is proposed to increase the total area to be leased (through a long term wayleave agreement) to 23.672 ha, which would include the existing approved borrowpit area, the quarry area, the crusher and stockpiles area and the access road area. The total excavation area (quarry area) would increase to 4.762 ha in extent (also including the area currently approved for excavation). The excavation depth would not exceed 15.0 m. Near vertical rock faces would result from the excavation. The proposed expansion would be undertaken to the south and west of the existing borrowpit and would comprise four phases coinciding with the four expansion areas shown in Figure B2 and indicated in Table B4. Topsoil and overburden stockpiles would be placed on the north-western extent of the excavation boundary.

Table B4: Proposed expansion of the borrow pit area

Expansion Area	Surface Area (m ²)	Total cut volume (m ³)	Overburden – 1 m (m ³)	Effective volume of material (m ³) (rounded figure)
Existing Area 1	7 540	176 828	7 540	169 300
Expansion Area 2	11 590	371 133	11 590	359 600
Expansion Area 3	7 660	146 526	7 660	138 900
Expansion Area 4	7 310	145 770	7 310	138 500
Expansion Area 5	13 520	301 234	13 520	287 700
Total	47 620	1 141 490	40 310	1 094 000

The extent of mining would be determined by the volume of material required at the time. As mentioned above, mining would be undertaken in phases, as indicated on the lay-out plan and in Table B4 above. Rehabilitation would be undertaken for each phase as soon as excavation of that particular phase has been completed. It should be noted that the portion of the existing approved borrowpit which had already been excavated (Existing Area 1 in Figure B2 and in Table B4), has not yet been rehabilitated as it would be required to serve as an access ramp to reach proposed Expansion Area 2. Once excavation of the latter area has been completed, both Areas 1 and 2 would be rehabilitated at the same time.

Prior to commencement of the operation, invasive vegetation would be cleared from the site. Topsoil is to be stripped to a maximum depth of 300 mm and stockpiled in the areas indicated on the layout plan to a height not exceeding 2 m (see Figure B2). In order to assist rehabilitation of the borrowpit area at the end of construction, topsoil would be spread along the area.

The road building material would be blasted, excavated with an excavator and loaded onto haul vehicles for transportation to the crusher area. The material would be processed by the crusher after which it

would be temporarily placed on stockpiles. When required for a particular activity or project, the material would be removed from the stockpiles, placed in haul vehicles and delivered to the road maintenance or construction area.

Table B5: Borrowpit details

Total borrowpit area	23.672 ha, including the access road, crusher site and stockpile areas
Borrowpit area to be mined, including the portion already excavated	4.762 ha
Maximum depth	Approximately 15.0 m
Material type	Road subbase and base material and surfacing stone
Total cut volume (m³) (estimate)	1 141 490 m ³
Overburden – 1 m (m³) (estimate)	40 310 m ³
Total: Effective volume of material (m³) (estimate – rounded figure)	1 094 000 m ³

B4 ENVIRONMENTAL IMPACT ASSESSMENT

This section provides an assessment summary table of the impacts that would result from the further expansion of the proposed borrowpit. Mitigation measures are proposed that would ameliorate negative impacts or enhance potential benefits. Impacts were assessed according to pre-defined rating scales as shown in Appendix 3.

The impacts arising from the borrowpit development are presented in Table B6.

Table B6: Impacts arising from the proposed expansion of Borrowpit BP 27-8 km 32.6 RHS 6.2

Environmental Aspect	Extent	Duration	Intensity	Probability	Confidence	Significance (before mitigation)	Proposed mitigation	Significance (after mitigation)
Geology	Local	Permanent	Low	Definite	Medium	Low	-	LOW
Topography	Local	Permanent	Medium	Definite	Medium	Medium	The slope changes must be finished off so that flowing curves that blend with the surrounding landscapes are formed in preference to sharp angles, in as far as is possible.	MEDIUM
Soils	Local	Short-term	Medium	Highly probable	High	Very Low	Stockpile topsoil and utilise during rehabilitation.	VERY LOW
Land capability	Local	Short-term	Medium	Probable	High	Very Low	<ul style="list-style-type: none"> • Demarcate and fence off total borrowpit area from rest of the property. • Maintain the fence along the access road and gate at entrance point along R364. • No-go areas are all areas outside of the fenced off area. • Land disturbed shall be rehabilitated. 	VERY LOW
Land use	Local	Short-term	Low	Definite	High	Very Low	Land disturbed shall be rehabilitated.	VERY LOW
Natural vegetation	Local	Short to Medium term	Low	Definite	High	Medium	<ul style="list-style-type: none"> • Land disturbed shall be rehabilitated. • Any <i>Aloe microstigma</i> species found within the boundaries of the proposed borrowpit should be relocated to a safe site on the same hill-slope. As all aloes are protected species in the northern Cape Province, a permit would be required for relocation of these plants. 	LOW
Animal life	Local	Short-term	Low	Probable	High	Very Low	Land disturbed shall be rehabilitated.	VERY LOW
Surface water	Local	Long-term	Medium	Probable	High	Low	<ul style="list-style-type: none"> • Divert and shape drainage lines within the borrowpit expansion area such that these channels would not be disturbed again during the further expansion of the borrowpit, • Monitor the re-established channels regularly in order to: <ul style="list-style-type: none"> ○ Manage any occurrence of erosion; and ○ Prevent the invasion of the channels at and downstream of the site by invasive alien 	VERY LOW

Environmental Aspect	Extent	Duration	Intensity	Probability	Confidence	Significance (before mitigation)	Proposed mitigation	Significance (after mitigation)
							<p>plants.</p> <ul style="list-style-type: none"> • Keep the diverted drainage channels free of stockpiled material and rubble. • Prevent contaminated run-off from borrowpit from entering the drainage channels. • Store and contain all material on the site appropriately to prevent contamination of drainage channels. • Once use of the borrowpit has ceased, the site should be shaped and rehabilitated to allow revegetation in order to reduce the risk of erosion of the drainage channels. 	
Groundwater	Local	Short-term	Low	Improbable	High	Very Low	All machinery and equipment shall be properly maintained, so that leaks do not appear and so that during servicing all oil, grease, etc. is disposed of correctly.	VERY LOW
Air quality	Local	Short-term	Medium to High	Highly probable	High	Low	<ul style="list-style-type: none"> • Spray water and/or other dust suppression agents to reduce dust. • Retain vegetation cover as long as possible to reduce size of areas where wind could generate dust. • Protect excavated material stockpiles against wind erosion. • Suitably cover and secure material loads during transportation. • Haul vehicles should comply with speed limits. 	VERY LOW
Noise	Local	Short-term	High	Highly probable	High	Very Low	The contractor shall be required to be familiar with and adhere to any local by-laws and regulations regarding the generation of noise and hours of operation.	VERY LOW
Archaeology/heritage	Local	Short-term	Low	Improbable	Medium	Very low	<ul style="list-style-type: none"> • Land disturbed shall be rehabilitated. • Should any human remains be uncovered during the mining of the hill, work should be stopped in that area and SAHRA notified. 	VERY LOW

Environmental Aspect	Extent	Duration	Intensity	Probability	Confidence	Significance (before mitigation)	Proposed mitigation	Significance (after mitigation)
Sensitive landscapes	No impact							
Visual aspects	Local	Long-term	Medium	Highly probable	High	Medium	<ul style="list-style-type: none"> • Use overburden material to re-shape the excavated areas to blend in with the surrounding environment. • Push stockpiled oversize rock up against the near vertical slopes formed by excavation to reduce the extent of such slopes. • Revegetate the borrowpit areas. 	MEDIUM
Regional socio-economic: Employment	Local	Short-term	Low	Highly probable	High	Very Low (Positive)	Local labour shall be sourced.	VERY LOW (POSITIVE)
Regional socio-economic: Safety	Local	Short-term	High	Highly probable	High	Low	<ul style="list-style-type: none"> • The movement of construction vehicles shall be limited to daylight hours. • The risk associated with the movement of large haulage vehicles shall be clearly sign-posted in both directions on the R364 leading up to the proposed borrowpit. 	LOW

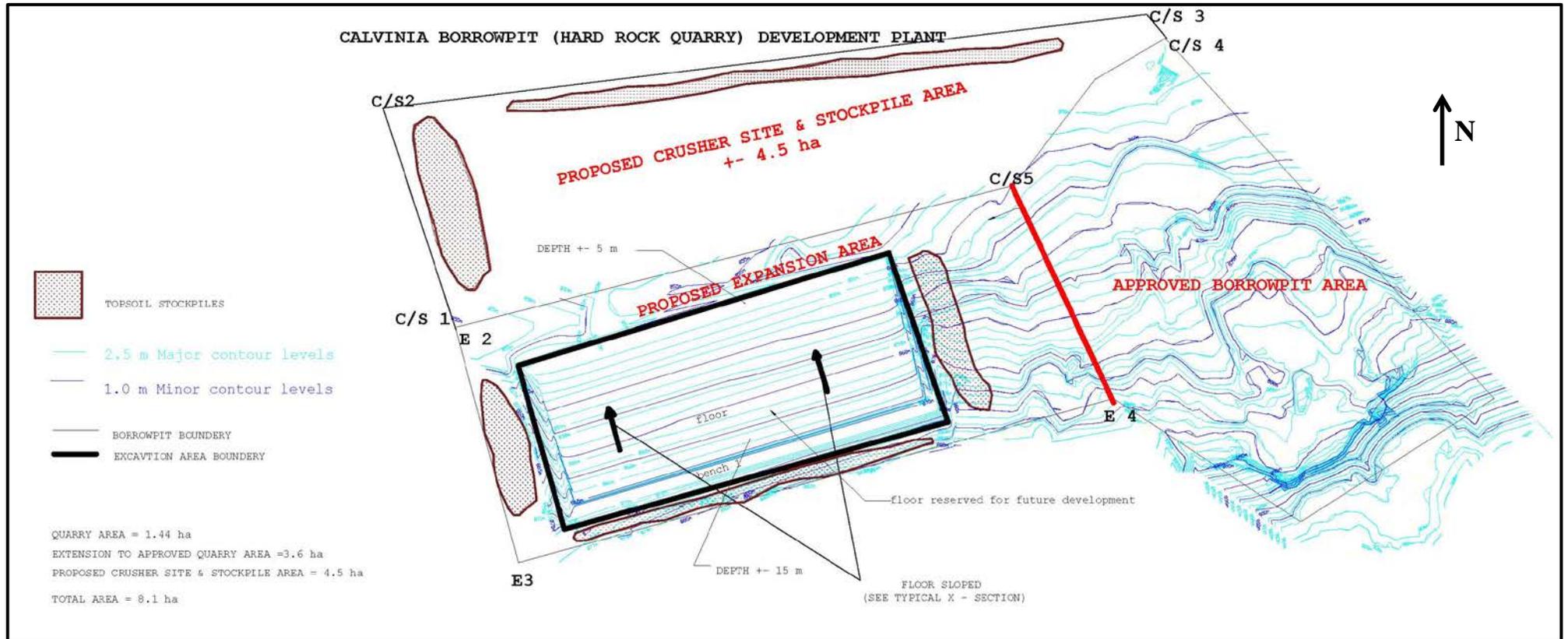


Figure B1: Lay-out plan of the total area approved for the development of Borrowpit BP R27-8 KM 32.6 RHS 6.2 (not to scale)

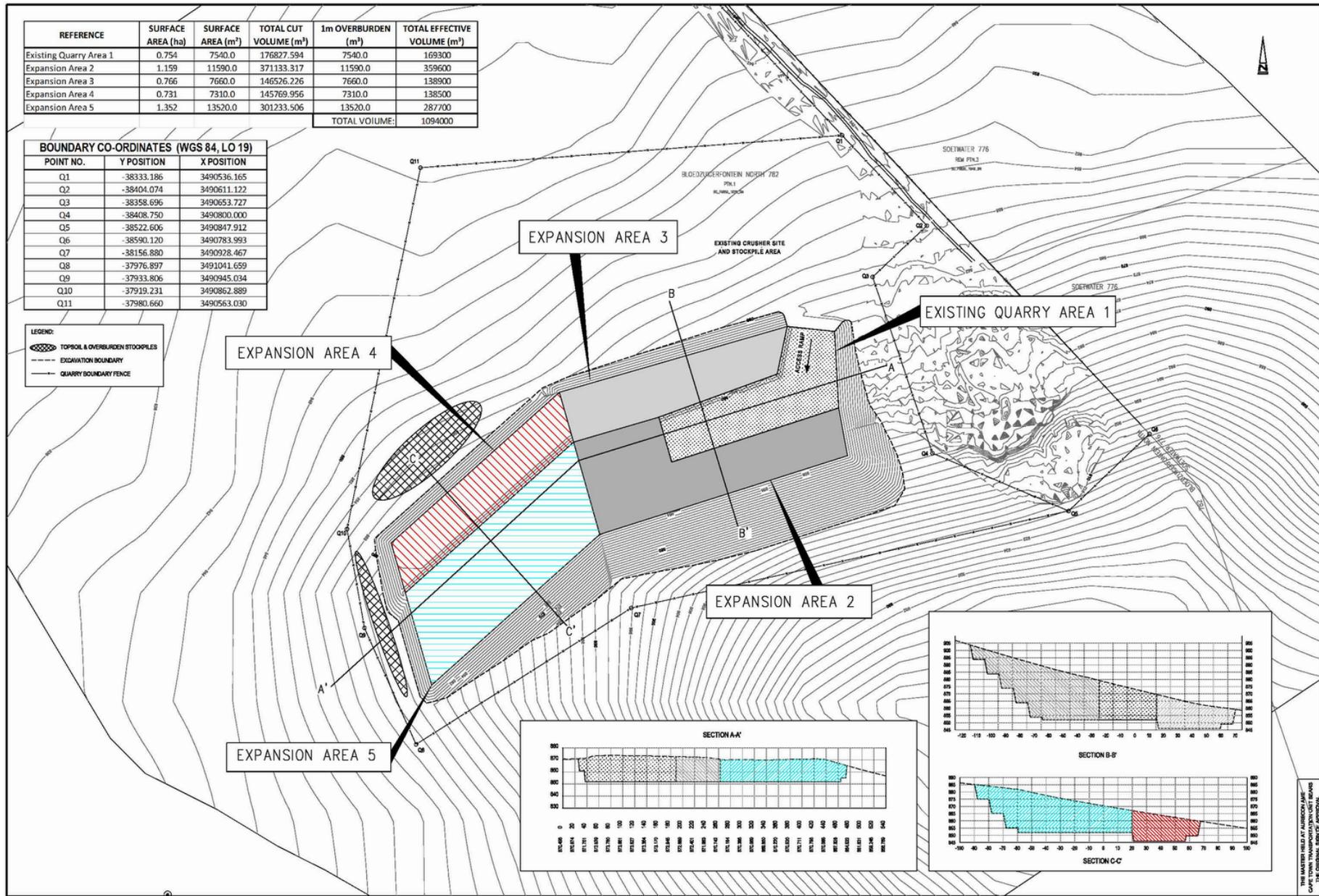


Figure B2: Lay-out plan of the proposed expansion area for Borrowpit BP R27-8 KM 32.6 RHS 6.2 (not to scale)

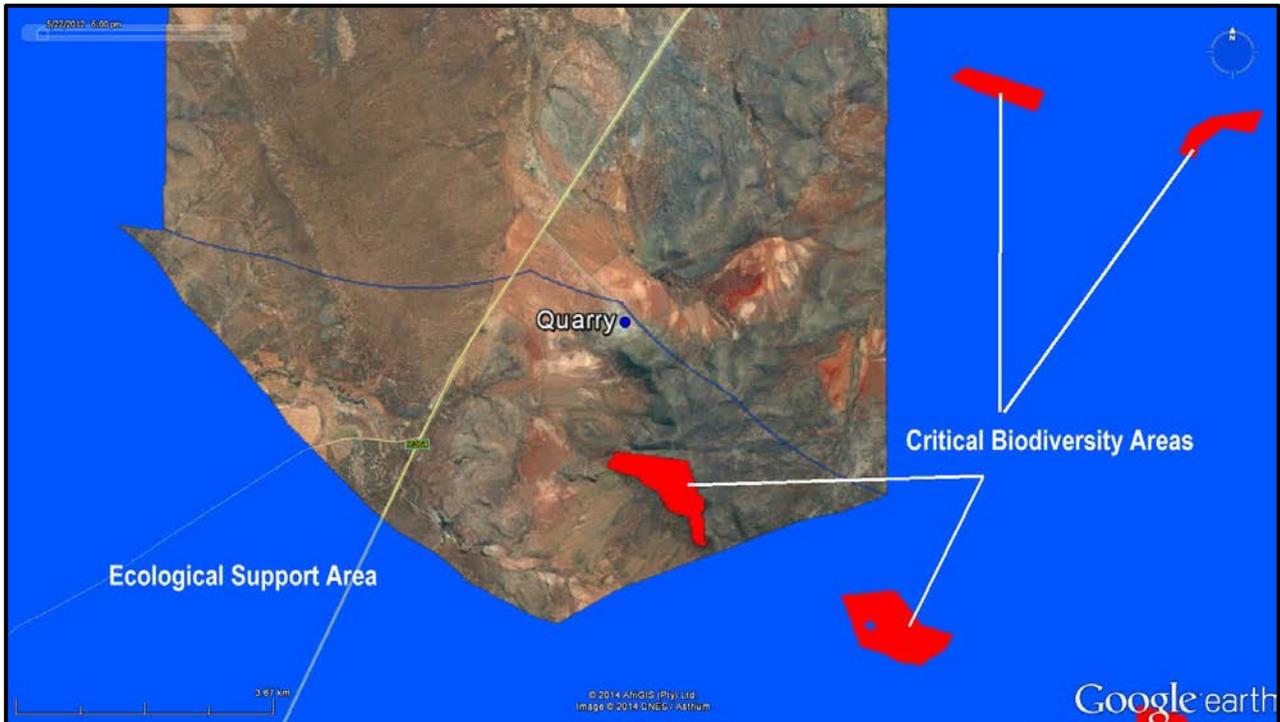


Figure B3: Google Earth image showing CBAs and ESAs for the Namaqua District Municipality (mapped by Desmet and Marsh, 2008) superimposed in relation to the location of the existing borrowpit (marked as Quarry) (image provided by D McDonald).



Figure B4: View of low, open shrubland with a lower stratum of herbaceous plants and succulents occurring along the north-facing slopes at the borrowpit site on areas with shallow soils with a high component of rock and gravel (image provided by D McDonald)



Figure B5: View of medium to tall shrubs occurring among the dolerite boulders on rocky slopes with soil between the exposed bedrock (image provided by D McDonald)



Figure B5: View of typical vegetation found on the bedrock and among large boulders at the borrowpit site, including *Aloe microstigma* (image provided by D McDonald)



Figure B7: View of *Aloe microstigma* occurring at the borrowpit site (image provided by D McDonald)

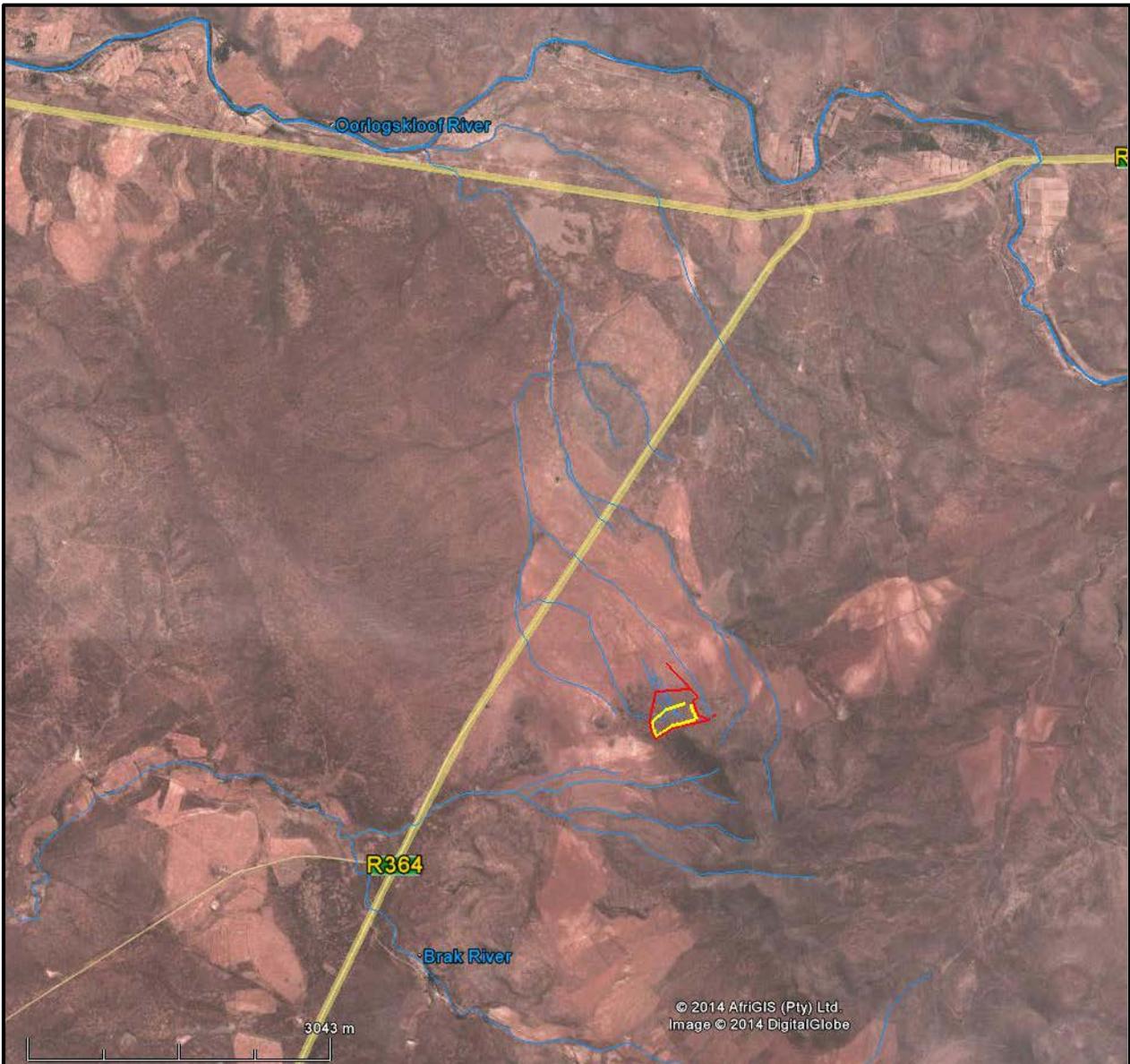


Figure B8: Google Earth image showing the freshwater features in the area in relation to the borrowpit site (image provided by A Belcher)



Figure B9: View of tributary of the Oorlogskloof River near the borrowpit site (image provided by A Belcher)



Figure B10: View of a minor drainage line at the borrowpit site (image provided by A Belcher)

PART C ENVIRONMENTAL MANAGEMENT PROGRAMME

C1 ENVIRONMENTAL MANAGEMENT PROGRAMME ADMINISTRATION

C1.1 INTRODUCTION

As mentioned above, SANRAL would appoint a mine manager and contractor to undertake the management and further excavation of the borrowpit when future road building material is required for specific road maintenance/rehabilitation and/or construction projects in the area. As work would be related to specific projects, different mine managers and contractors may be appointed from time to time for limited periods during the lifetime of the mine. However, SANRAL would remain the mine owner and, as such, would be responsible for the ongoing administrative management of the borrowpit.

Copies of this EMP shall be kept at the borrowpit as well as the main construction camp(s) and shall be distributed to all senior contract personnel. All senior personnel shall be required to familiarise themselves with the contents of this document.

C1.2 MANAGEMENT STRUCTURE

The implementation of this EMP requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during the borrowpit development phase. These roles and responsibilities are discussed in detail below. Details of the organisational structure are presented in Figure C1. The structure illustrates the reporting procedures for stakeholders in the implementation of this EMP.

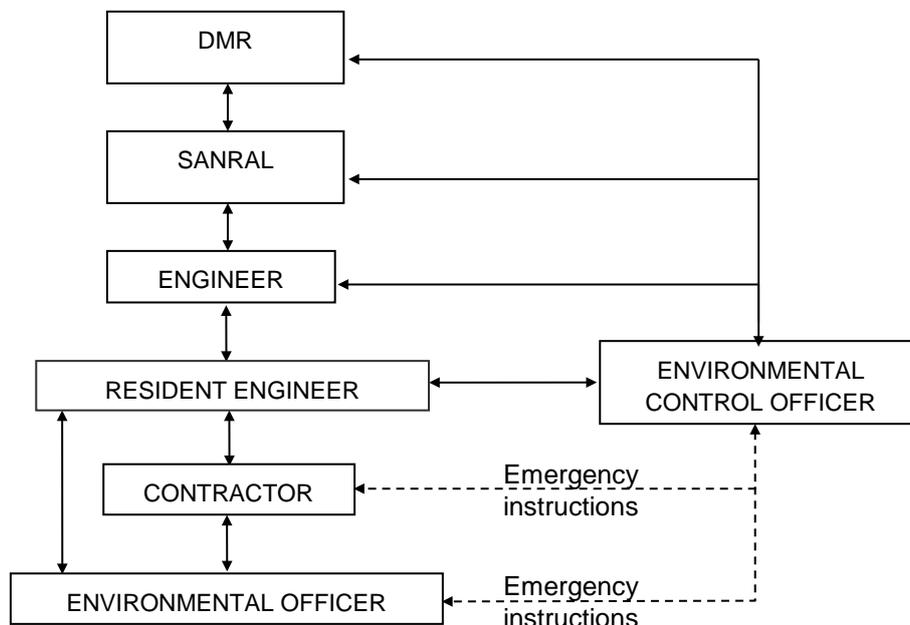


Figure C1: EMP implementation organisational structure

C1.2.1 Department of Mineral Resources (DMR)

DMR is the designated authority responsible for authorising the borrowpit development and for the associated EMP. DMR would have overall responsibility for ensuring that the Applicant (SANRAL) complies with the conditions of the borrowpit authorisation as well as the associated EMP.

C1.2.2 South African National Roads Agency SOC Limited (SANRAL)

The Applicant is accountable for the potential impacts of activities that are undertaken and is responsible for managing these impacts. SANRAL as the Applicant and Employer therefore has overall environmental responsibility to ensure compliance with the relevant legislation and for the implementation of the EMP and the financial cost of all environmental control measures. SANRAL must ensure that any person acting on their behalf complies with the conditions/specifications contained in this EMP. SANRAL is also responsible for the appointment of the Engineer, Contractor and Environmental Control Officer (ECO).

SANRAL shall address any site problems pertaining to the environment at the request of the Engineer and/or the ECO.

C1.2.3 Engineer

The Engineer shall oversee the planning, design and construction phases of the project. The Engineer shall appoint a Resident Engineer or Engineer's Representative (referred to as the RE) to act as the on-site implementing agent.

The Engineer shall address any site problems pertaining to the environment at the request of the RE and/or the ECO.

C1.2.4 Contractor

The Contractor shall have the following responsibilities:

- To implement all provisions of the EMP. If the Contractor encounters difficulties with specifications, he must discuss alternative approaches with the RE and/or the ECO prior to proceeding.
- To ensure that all staff are familiar with the EMP.
- To monitor and verify that the environmental impacts are kept to a minimum.
- To make personnel aware of environmental problems and ensure they show adequate consideration of the environmental aspects of the project.
- To prepare the required Method Statements (see Section C1.3).
- To report any incidents of non-compliance with the EMP to the RE and the ECO.
- To rehabilitate any sensitive environments damaged due to the Contractor's negligence. This shall be done in accordance with the Engineer's and ECO's specifications.

Failure to comply with the EMP may result in fines (see Section C1.5) and reported non-compliance may result in the Engineer suspending the operation causing the non-compliance.

C1.2.5 Resident Engineer (RE)

The RE would act as SANRAL's on-site implementing agent and has the responsibility to ensure that their responsibilities are executed in compliance with the EMP. Any on-site decisions regarding environmental management are ultimately the responsibility of the Engineer or the RE in accordance with their delegated authorities. The RE shall assist the ECO where necessary and shall have the following responsibilities in terms of the implementation of this EMP:

- Regular site inspections.
- Reviewing and approving the Contractor's Method Statements with input from the ECO where necessary (see Section C1.3).
- Monitoring and verifying that the EMP and Method Statements are adhered to at all times and taking action if specifications are not followed.
- Keeping a photographic record of borrowpit activities on site.
- Assisting the Contractor in finding environmentally responsible solutions to problems with input from the ECO where necessary.
- Recommending to the Engineer the removal of person(s) and/or equipment not complying with the EMP specifications.
- Recommending to the Engineer the issuing of fines for transgressions of the EMP.
- Recommending to the Engineer delaying any borrowpit activity if he/she believes the integrity of the environment has been or is likely to be seriously jeopardised.
- Providing input into the ECO's ongoing internal review of the EMP.
- The RE shall communicate environmental issues to the Environmental Officer.

C1.2.6 Environmental Control Officer (ECO)

The appointment of an Environmental Control Officer (ECO) is required for each maintenance/construction project which would utilise material derived from this borrowpit. The ECO will be an independent environmental consultant appointed by the Engineer to act as the representative of the Applicant/Employer to monitor and review the on-site environmental management and implementation of this EMP by the Contractor. The ECO shall undertake regular site inspections, as agreed by the Employer, for the duration of the maintenance/construction contract.

The ECO's duties shall include, *inter alia*, the following:

- Ensuring the necessary environmental authorisations and permits, if any, have been obtained.
- Advising the Contractor and/or the RE on environmental issues within the defined borrowpit.
- Reviewing Method Statements (see Section C1.3).
- Undertaking regular site visits to ensure compliance with the EMP and verifying that environmental impacts are kept to a minimum throughout the contract.
- Completing environmental checklists during site visits.
- Keeping a photographic record of progress on site from an environmental perspective.
- Assisting the Contractor and/or the RE in finding environmentally acceptable solutions to borrowpit development problems.
- Recommending additional environmental protection measures should this be necessary.
- Keeping a register of complaints and recording and dealing with any community issues or comments pertaining to contract environment issues.

- Providing a report back on the environmental issues to be tabled at site meetings.
- Reporting any incidents that may have caused damage to the environment or breaches of the EMP to DMR.
- Preparing an environmental audit report at the conclusion of each maintenance/construction project.

The ECO shall communicate directly with the RE. Should problems arise on site that cannot be resolved between the ECO and the RE, the ECO shall take the matter up with the Engineer and/or SANRAL. If SANRAL does not respond the ECO shall take the matter up with DMR.

C1.2.7 Environmental Officer (EO)

The Contractor shall appoint, at its own cost, a competent individual as its on-site Environmental Officer (EO) to ensure that the EMP is implemented and that all environmental specifications and EMP requirements are met at all times. The EO shall be responsible for monitoring, reviewing and verifying the Contractor's compliance with the EMP. The EO may also act as a Traffic Safety Officer.

The EO's duties in this regard shall include, *inter alia*, the following:

- Inspecting the site on a regular basis, at least once a week, with regard to compliance with the EMP.
- Keeping accurate and detailed records of these inspections.
- Monitoring and verifying that the EMP and Method Statements are adhered to at all times and taking action if specifications are not followed.
- Monitoring and verifying that environmental impacts are kept to a minimum.
- Assisting the RE and ECO in finding environmentally responsible solutions to problems.
- Reporting any incidents of non-compliance with the EMP to the RE and/or the ECO.
- Keeping a register of complaints on site and recording community comments and issues, and the actions taken in response to these complaints.

C1.3 METHOD STATEMENTS

The Contractor shall submit written Method Statements to the RE and ECO for all environmentally sensitive aspects of the work. As a minimum the following method statements are required:

- MS1: Lay-out and establishment of the relevant borrowpit area to be utilised during the specific maintenance/construction contract (Section C2.2.1).
- MS2: Invasive vegetation eradication plan (Section C2.3.1).
- MS3: Blasting (Section C2.3.3).
- MS4: Handling of hazardous substances (Section C2.6).
- MS5: Solid waste (Section C2.7.2).
- MS6: Diversion of drainage lines (Section C2.9).
- MS7: Fire control (Section C2.11).
- MS8: Revegetation (Section C3.4.4).

The RE and/or the ECO shall specify any additional Method Statements that may be required.

A Method Statement Control Sheet, signed by the Contractor, must accompany each Method Statement (a pro forma Control Sheet is provided in Annexure C1). Method Statements shall cover applicable details with regard to:

- Borrowpit development procedures.
- Materials and equipment to be used.
- Getting equipment to and from site.
- How the equipment/material will be moved while on site.
- How and where material will be stored.
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur.
- Timing and location of activities.
- Compliance/non-compliance with the specifications.
- Any other information deemed necessary by the Engineer/RE/ECO.

Method Statements shall be submitted to the RE and ECO **at least five (5) days prior** to the commencement of operations. It should be noted that Method Statements must contain sufficient information and detail to enable the RE and ECO to apply their minds to the potential impacts of the works on the environment. The Contractor will also need to thoroughly understand what is required of him/her in order to undertake the works.

Work shall not commence until the Engineer has accepted Method Statements. Failure to submit Method Statements may cause the Engineer to order the Contractor to suspend part or all of the works concerned until a Method Statement has been submitted and accepted. Failure to submit Method Statements at least five days prior to commencing the relevant activity may result in a fine (see Section C1.5). Any damage caused to the surrounding environment by work done without prior acceptance shall be rehabilitated at the Contractor's cost.

C1.4 ENVIRONMENTAL AWARENESS TRAINING

Before the commencement of any work on site, the Contractor's site management staff shall attend an environmental awareness training course, presented by the ECO and RE. The Contractor shall liaise with the ECO prior to the commencement date to fix a date and venue for the course. The Contractor shall provide a suitable venue with facilities, and ensure that the specified employees attend the course.

The information presented at the course shall be communicated by the Contractor to the rest of his employees on the site, to any new employees coming onto site after the initial training course and to his/her suppliers. The presentation shall be conducted, as far as is possible, in the employees' language of choice. As a minimum, training shall include:

- Explanation of the importance of complying with the EMP.
- Discussion of the potential environmental impacts of borrowpit development activities.
- Explanation of the management structure of individuals responsible for matters pertaining to the EMP.
- Employees' roles and responsibilities, including emergency preparedness.
- Explanation of the mitigation measures that must be implemented when carrying out their activities;
- Explanation of the specifics of the EMP and its specification.
- Explanation of the Environmental Do's and Don'ts (see Annexure C2).

The Contractor shall keep records of all environmental training sessions, including names of attendees, dates of their attendance and the information presented to them. Records of environmental training sessions shall be submitted to the ECO.

C1.5 FINES

A system of fines shall be implemented to ensure compliance with the EMP (see Annexure C3). Where the Contractor inflicts non-repairable damage upon the environment or fails to comply with any of the environmental specifications of the EMP the Contractor may be liable to pay a fine. The Contractor is deemed not to have complied with the EMP if:

- There is evidence of contravention of the EMP specifications, including any non-compliance with an approved Method Statement.
- Borrowpit activities take place outside the defined boundaries of the site.
- Environmental damage ensues due to negligence.
- The Contractor fails to comply with corrective or other instructions issued by the RE within a specific time period.
- The Contractor fails to respond adequately to complaints from the public.

If excessive infringement with regard to any of the above is registered, then SANRAL reserves the right to terminate the Contractor's contract.

The system of fines shall be implemented in the following way:

- Fines shall be issued per incident at the discretion of the Engineer.
- Fines shall be issued in addition to any remedial costs incurred as a result of non-compliance with the environmental specifications.
- The Engineer shall inform the Contractor of any contravention, the contravening individual's identity and the amount of the fine, and will deduct the total amount from the amounts due to the Contractor.
- Where there are ranges for fees shown in Annexure C3, the amount shall depend on the severity and extent of the damage done to the environment.

Failure by any employee of the Contractor or their Sub-contractors to show adequate consideration to the environmental aspects of the contract shall be considered sufficient cause for the ECO to recommend to the RE to have that employee removed from the site. The ECO may, through the Engineer, also order the removal of equipment that is causing continual environmental damage.

C1.6 INTERNAL REVIEW AND AUDITING

The Contractor and EO shall establish an internal review procedure to monitor the progress and implementation of the EMP.

Where necessary, and upon the recommendation of the RE and/or the ECO, procedures that require modification may be changed to improve the efficiency of the EMP. All significant modifications to the EMP shall be approved by DMR before these changes or adjustments to the EMP are implemented. Any changes or adjustments to the EMP shall be registered in the daily records of the RE. Adjustment and update of the original EMP document is not required when these *ad hoc* changes are made.

At the conclusion of each specific maintenance/construction project an environmental audit report shall be compiled and submitted to DMR within 30 days of completion of the maintenance/construction project borrowpit rehabilitation phase (refer to Section C3.4). This report shall be compiled by the ECO, in collaboration with the RE, EO and the Contractor. It shall outline the implementation of the EMP, and highlight any problems and issues that arose during the maintenance/construction period to report, on a formal basis, the lessons learned on this project. The audit report shall be prepared in compliance with

Regulation 34 and Appendix 7 (GN R.982) of the NEMA EIA Regulations 2014.

It should be noted that an application for a closure certificate in terms of Section 43 of the MPRDA would entail a Basic Assessment process (see Section C4).

C2 BORROWPIT DEVELOPMENT PHASE

C2.1 SITE ESTABLISHMENT

C2.1.1 Lay-out and establishment of borrowpit

The layout and extent of the borrowpit shall be planned, designed and managed in such a manner that environmental impacts are minimised. Temporary structures and facilities shall be decommissioned to the satisfaction of the Engineer and the ECO and clean-up after each phase of material removal activities shall be effectively undertaken.

Care shall be taken to limit the extent of the area disturbed during material removal activities. In this regard, the borrowpit site and associated activities and infrastructure shall be carefully planned, to ensure that the footprint is kept to a minimum.

Care shall be taken to ensure that the placement of any temporary infrastructure that may be required does not adversely affect the environment or result in soil erosion. It should be noted that no personnel are allowed to live at the borrowpit site on a permanent or semi-permanent basis.

The borrowpit site, access point(s) and access road shall be properly demarcated and fenced off. No personnel shall be allowed outside the fenced off area. Vehicle movement shall be limited to defined tracks and areas that will be excavated.

Land disturbed by material removal activities shall be rehabilitated as described in Section C3.

MS1: The Contractor shall submit a Method Statement indicating the preparation and layout of the borrowpit area to be utilised for the specific maintenance/construction project.

C2.1.2 Toilet Facilities

The Contractor shall provide suitable sanitary arrangements (e.g. chemical toilets) at the borrowpit site. There should be one toilet for every 15 workers on site. Toilet(s) must be easily accessible and shall be secured in order to prevent them from blowing over.

Toilet(s) shall be sited away from drainage channels, and shall be sited in consultation with the RE and ECO.

Toilets shall be chemical and shall be emptied on a regular basis. The Contractor shall ensure that there is no spillage when the chemical toilets are cleaned or during normal operation and that the contents are properly removed from site.

The Contractor shall be responsible for enforcing the use of the facilities. Performing ablutions outside of established toilet facilities is strictly prohibited.

C2.1.3 Eating Areas

The Contractor shall establish eating areas, as agreed with the RE. These areas shall provide adequate temporary shade to ensure that employees do not move off site to eat.

The Contractor shall provide adequate refuse bins at all eating areas to the satisfaction of the RE and shall ensure that all eating areas are cleaned up on a daily basis. Collected waste shall be stored in a central waste area within the borrowpit area that has been approved by the RE and ECO.

Any cooking of food on site shall be done using gas cookers.

C2.1.4 Provision of water

The Contractor shall be responsible for ensuring that there is access to clean drinking water for all employees on site. If water is stored on site, drinking water and multi-purpose water storage facilities shall be clearly distinguished and demarcated.

C2.1.5 General Aesthetics

The borrowpit area shall be kept neat and tidy at all times. Different materials and equipment must be kept in designated areas and storing/stockpiling shall be kept orderly.

D2.1.6 Lights

The Contractor shall ensure that any lighting installed on the site for his/her activities does not interfere with road traffic or cause a reasonably avoidable disturbance to the surrounding community.

C2.2 SITE DEMARCATION AND NO-GO AREAS

The borrowpit site refers to the total expansion area approved by DMR. The total borrowpit area, including the access road, would be permanently fenced off from the rest of the property for the duration of the borrowpit's lifetime. The Contractor shall be responsible to ensure that boundary fencing is maintained in proper order during the particular maintenance/contract period for which he/she has been appointed and is left intact at the end of the period. The gate at the entrance point along the R364 shall be closed and locked at the end of each day the Contractor's staff work on site.

Areas where borrowpit activities (including traffic movement) are prohibited are referred to as No-go areas. All areas outside of the outer boundaries of the borrowpit site are No-go areas.

The Contractor shall be allowed to utilise only the area/phase of the borrowpit earmarked for the particular maintenance/construction contract as agreed with SANRAL.

Environmentally sensitive areas shall be demarcated as No-go areas to ensure these areas are not impacted by borrowpit activities. Areas of special features identified by the RE and/or the ECO shall be marked on a site layout plan prior to any works commencing on site. Such No-go areas shall be demarcated by fencing or similar appropriate demarcation methods, the position of which will be agreed by the RE and ECO, and appropriate signage. The Contractor shall maintain such demarcation fencing in

good repair for the duration of the maintenance/construction period. The removal, damage or disturbance of flora, fauna, avifauna, outcrops or any other natural features shall be forbidden in all demarcated No-go areas or specified environmentally sensitive areas, unless prior permission has been given by the RE and the ECO.

The RE may declare No-go areas at any time during the maintenance/construction contract period as deemed necessary and/or at the request of the ECO.

The Contractor shall be responsible for any clean-up and/or rehabilitation of all areas impacted outside the demarcated borrowpit site.

C2.3 SITE CLEARING AND EXCAVATION

C2.3.1 Vegetation clearing

Before clearing of vegetation, the Contractor shall ensure that all litter and organic material is removed from the area to be cleared. No vegetation clearing shall take place without the prior approval of the RE.

All invasive (indigenous or exotic) plants and weedy species should be removed from the entire area/phase of the borrowpit earmarked for the particular maintenance/construction contract as agreed with SANRAL at the start of that particular maintenance contract period to inhibit further spread of these species in these areas as a result of the borrowpit activities. Weedy species to be removed and controlled include *Galenia africana* (kraalbos), *Atriplex semibaccata*, *Atriplex lindleyi* subsp. *Inflate* (blasiebrak), *Prosopis glandulosa* (mesquite) and especially *Salsola kali* (Russian tumbleweed; rolbos).

Any existing patches of invasive vegetation shall be removed by manual cutting of plants to ground level. The Contractor shall not use heavy machinery to remove such patches of vegetation.

The Contractor shall compile an invasive vegetation eradication plan and submit it to the RE for approval. The plan shall cover the area/phase of the borrowpit earmarked for the particular maintenance/construction contract as agreed with SANRAL. The plan shall indicate the location(s), methods and frequency of invasive vegetation control throughout the duration of the maintenance/contract project period, including the defects notification period. It is recommended that the Contractor appoint a Landscaping Contractor/Horticulturalist to undertake the rehabilitation of the borrowpit area utilised for the particular maintenance/construction contract (see Section C3).

Vegetation clearing shall take place in a phased manner in order to retain vegetation cover as long as possible. This approach is necessary in order to reduce the size of areas where dust can be generated by wind and erosion may occur.

Any *Aloe microstigma* species found within the boundaries of the area/phase of the borrowpit earmarked for the particular maintenance/construction contract as agreed with SANRAL shall be relocated to an area on the same hill-slope that would not be impacted by any future borrowpit development. It should be noted that, as all aloes are protected species in the northern Cape Province, a permit would be required for relocation of these plants.

All cut vegetation shall be disposed of off-site at an approved disposal site. Stockpiling of cut vegetation shall only be permitted in areas indicated by the RE and/or the ECO. No cut vegetation shall be burnt on site.

MS2: The Contractor shall submit an invasive vegetation eradication plan, detailing the locations, methods and frequency of invasive vegetation control in relation to the area/phase of the borrowpit earmarked for the particular maintenance/construction contract as agreed with SANRAL.

C2.3.2 Topsoil

Topsoil shall be removed up to a depth of 300 mm depending on the actual topsoil present and stockpiled (not exceeding 2 m in height) separately from overburden and other material for use during rehabilitation of the site. The locations of topsoil stockpiles shall be clearly indicated on the final site layout plan for the area/phase of the borrowpit earmarked for the particular maintenance/construction contract as agreed with SANRAL.

Topsoil stockpiles shall, where necessary, be protected from wind and water erosion by seeding or placement of hay bales or shade cloth screens or covered with hessian or geofabric. Berms or cut-off trenches shall be considered for the prevention of erosion, if necessary. Stockpiles shall not be covered with plastic sheets that may cause it to compost or kill the seed bank. Stockpiles shall not be left for more than eight months before being used for rehabilitation, as soil chemistry and natural processes decline after time, resulting in poor rehabilitation success.

Any topsoil contaminated by hazardous substances shall not be used but shall be disposed of at a permitted landfill site.

Material that is not suitable for use as road building material shall be retained in uncompacted stockpiles. This material shall be used for the reshaping of the area before topsoil is spread during rehabilitation.

C2.3.3 Blasting activities

Wherever blasting activity is required on the site, the Contractor shall rigorously adhere to the relevant statutes and regulations that control the use of explosives. In addition, the Contractor shall, prior to any drilling of holes in preparation for blasting, supply the RE with a locality plan of the blast site on which shall be shown the zones of influence of the ground and air shock-waves and expected limits of fly-rock. The plan shall show any dwelling, structure and service within the zones of influence and record all details of the dwellings/structures/services including existing positions, lengths and widths of cracks, as well as the condition of doors, windows, roofing, wells, boreholes etc. The Contractor, alone, shall be responsible for any costs that can be attributed to blasting activities, including the collection of fly-rock from adjacent lands and fields. The submission of such a plan shall not in any way absolve the Contractor from his/her responsibilities in this regard.

The Contractor shall also indicate the manner in which he/she intends to advertise to the adjacent residents/communities and/or road users the scheduled times for each individual blast as well as potential traffic delays to be expected, if any.

MS3: The Contractor shall submit a Method Statement to the RE for review **at least 10 days prior** to each blasting event.

C2.3.4 Archaeological material

If any archaeological material, palaeontological artefacts or human remains are discovered during earth moving activities, all borrowpit activities must be stopped immediately and the site clearly demarcated. The

Contractor must inform the RE and ECO as soon as possible in order to establish relevant procedures for notifying SAHRA. Should any unmarked human remains be disturbed, exposed or uncovered during borrowpit operations, all excavation work shall also be stopped immediately and the find reported to SAHRA and Heritage Northern Cape.

The Contractor shall be required to abide by the specifications as set out by SAHRA and Heritage Northern Cape or the heritage specialist appointed to investigate the find.

The Contractor may not, without a permit issued by the relevant heritage resources authority, move, destroy, damage, excavate, alter, deface or otherwise disturb archaeological material.

C2.4 MATERIALS HANDLING AND STORAGE

The potential environmental impact of handling, use, storage and disposal of materials used during borrowpit activities shall be minimised.

C2.4.1 Transportation and handling of material

The Contractor shall ensure that all his/her staff operating machinery are aware of procedures and restrictions (e.g. No-go areas) in terms of this EMP.

The Contractor shall ensure that all materials are appropriately secured to ensure safe passage between destinations. Loads 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 by his employees or suppliers to properly secure transported materials. The Contractor shall ensure that these delivery drivers are supervised during off-loading.

The movement of construction vehicles shall be limited to daylight hours as far as possible. The dangers associated with the movement of large haulage vehicles shall be clearly sign-posted in both directions leading up to the borrowpit area.

Vehicles leaving the borrowpit shall not deposit/shed mud or sand as they drive to the area under maintenance/construction. Loads shall be covered with a tarpaulin or similar to prevent nuisances to other road users on days when winds are strong.

C2.4.2 Storage of construction equipment, materials and hazardous substances

Storage of construction equipment, materials, fuel, oil or other hazardous substances shall be limited to the essential requirements for the development of the borrowpit site. All plant, construction equipment, vehicles or other items shall be stored within Contractor's construction camp established for the purposes of the particular maintenance/construction contract, unless prior arrangements have been made with the RE or ECO.

Drip trays shall be provided for stationary plant (such as compressors, pumps, generators, etc.) and for "parked" plant (e.g. mechanised equipment).

C2.5 REFUELLING AND MAINTENANCE

C2.5.1 Refuelling

Where reasonably practical, plant and vehicles shall not be refuelled at the borrowpit site. If this is not reasonably practical, then refuelling shall be undertaken by means of a mobile tanker. The surface under the temporary refuelling area shall be protected against pollution (e.g. the use of drip trays) to the reasonable satisfaction of the RE and/or the ECO prior to any refuelling activities. No refuelling shall be permitted within 32 m of any local drainage channels.

The Contractor shall ensure that there is always a supply of absorbent material readily available to absorb/breakdown spills and where possible is designed to encapsulate minor hydrocarbon spillage. This material must be accepted by the RE prior to any refuelling or emergency maintenance activities.

C2.5.2 Maintenance

All vehicles and equipment shall be kept in good working order and serviced regularly. Leaking equipment shall be repaired immediately or removed from the site.

Routine maintenance activities shall not be undertaken at the borrowpit site. Maintenance activities shall be allowed on site only in the case of unavoidable emergencies with the prior approval of the RE and ECO. No maintenance activities shall be allowed within 32 m of any local drainage channel.

When servicing equipment, drip trays shall be used to collect the waste oil and other lubricants. All hazardous waste from maintenance activities shall be disposed of as specified in Section C2.7.1.

No washing of equipment shall be allowed at the borrowpit site.

C2.6 ACCIDENTAL LEAKS AND SPILLS

The Contractor shall prevent pollution of surface or groundwater, which could result from their activities. Such pollution could result from the release, accidental or otherwise, of oils, fuels, sewage, etc.

The Contractor shall ensure that his/her employees are aware of the procedure to be followed for dealing with spills and leaks. Any accidental leak or spill of fuel, oil or other hazardous substances shall be reported to the RE or EO immediately so that the best remediation method can be implemented promptly.

Drip trays shall be used for all pumps, generators, etc. in order to prevent soil and water contamination as a result of fuel spills or leaks. The Contractor shall ensure that the necessary materials and equipment for dealing with spills and leaks are available on site at all times.

In the event of a hydrocarbon spill, the source of the spillage shall be isolated and the spillage contained. The area shall be cordoned off and secured. The Contractor shall ensure that there is always a supply of absorbent material readily available to absorb/breakdown and where possible is designed to encapsulate minor hydrocarbon spillage. Prior to any refuelling or emergency maintenance activities the RE must accept this material. Hydrocarbon contaminated material/soil shall be collected and stored in a bunded area until future disposal.

The Contractor shall be liable to arrange for professional service providers to clear the area affected by the spill, if required.

MS4: The Contractor shall submit a Method Statement detailing the precautions that shall be implemented to limit spills and leakage of hydrocarbon and other hazardous substances.

C2.7 WASTE MANAGEMENT

C2.7.1 Hydrocarbon and hazardous waste

All hydrocarbon (e.g. fuel, oils and contaminated soil/materials) and other hazardous waste resulting from spills, refuelling and maintenance activities shall be disposed of in a formally licensed hazardous waste site or, where possible, sold to an approved used-oil recycling company. The Contractor shall provide disposal certificates issued by the hazardous waste disposal facility to the RE.

Used oil, lubricants, cleaning materials, etc. from the maintenance of vehicles and machinery may be collected in (a) holding tank(s) prior to disposal. However, such holding tanks shall be located within the Contractor's construction camp established for the purposes of the particular maintenance/construction contract and not at the borrowpit site.

No hydrocarbon and hazardous waste shall be burnt or buried on site. Under no circumstances shall the spoiling or burial of tar or bituminous products be allowed on site. Unused or rejected tar or bituminous products shall be returned to the supplier's production plant.

C2.7.2 Solid waste

Solid waste includes all construction waste (cement bags, old cement, tags, wrapping materials, timber, cans, wire, nails, etc.) and surplus food, food packaging, organic waste, etc. The Contractor shall be responsible for the establishment of a solid waste control and removal system that is acceptable to the RE and ECO in order to prevent the spread of waste in, and beyond, the borrowpit site. Wherever possible, an integrated waste management approach shall be used, based on the principles of waste minimisation, reduction, reuse and recycling of materials. Containers for glass, paper, metals and plastics shall be provided..

The Contractor shall provide vermin and weatherproof bins (with lids) of sufficient number and capacity to store solid waste produced on a daily basis. The lids shall be kept firmly on the bins at all times. Bins are to be located outside floodplains and/or drainage lines, with waste to be removed from the waste bins weekly, or more often as required, and disposed of at an approved landfill site. The Contractor shall ensure that the borrowpit site is cleaned up on a daily basis. The general cleanliness of the site shall form part of the RE's and ECO's inspections.

Stockpiling of solid waste shall not be allowed at the borrowpit site. No waste material or litter shall be burnt or buried on site.

MS5: The Contractor shall submit a Method Statement detailing a solid waste control system (storage, provision of bins, site clean-up schedule, bin clean-out schedule, etc.).

C2.7.3 Wastewater

The Contractor shall prevent pollution of surface or groundwater from the release, accidental or otherwise of contaminated water (including contamination with chemicals, oils, fuels, cement, sewage, construction

water, water carrying products, etc.) on site.

The Contractor shall be responsible for the construction and operation of necessary collection facilities in order to prevent such pollution and/or settlement of suspended matter, and shall dispose of the collected waste as approved by the RE.

Temporary stormwater drainage and detention from the works shall be designed in collaboration with the RE and ECO.

No wastewater shall be disposed of directly into any surface water bodies.

C2.8 SOIL EROSION CONTROL

The Contractor shall, as an ongoing exercise during the maintenance/construction period, including the defect liability period, provide appropriate erosion control at the borrowpit site. The Contractor shall implement measures to prevent the migration of material (fines) from the works into drainage lines and any stormwater and sewage systems. This may include the use of a cut-off trench, straw bales or geofabric siltation barriers constructed across the site at specific points.

In areas where borrowpit activities have been completed and where no further disturbance is envisaged, rehabilitation and revegetation shall commence as soon as possible.

C2.9 DRAINAGE

A number of small drainage lines associated with a minor tributary of the Oorlogskloof River are located within the area in which the borrowpit would be expanded. The Contractor shall divert and shape these drainage lines as approved by the RE and ECO in order to ensure that these channels would not be disturbed again during the further expansion of the borrowpit. The Contractor shall ensure that diverted drainage channels are kept free of stockpiled material and rubble during borrowpit operations and shall prevent contaminated run-off from the borrowpit from entering the drainage channels. All material on the site shall be appropriately stored to prevent contamination of drainage channels.

The Contractor shall shape the borrowpit floors in accordance with the borrowpit layout plan to ensure that water does not accumulate within the borrowpit.

MS6: The Contractor shall submit a Method Statement detailing the diversion and shaping of the relevant drainage lines before commencement of any material excavation activities.

C2.10 PROTECTION OF NATURAL FEATURES, FLORA AND FAUNA

C2.10.1 Protection of natural features

The Contractor shall not deface, paint, damage or mark any natural features situated in or around the site for survey or other purposes unless agreed beforehand with the RE. Any features affected by the Contractor in contravention of this clause shall be restored/rehabilitated to the satisfaction of the RE and ECO.

C2.10.2 Protection of flora and fauna

The removal, damage or disturbance of flora, fauna or avifauna is forbidden outside the immediate borrowpit area without the written approval of the RE. The clearing of vegetation shall be undertaken as specified in Section C2.3.1.

The Contractor shall ensure that no hunting, trapping, shooting, poisoning or otherwise disturbance of any fauna takes place. The feeding of any wild animals is prohibited. No domestic pets or livestock are permitted on site.

The use of herbicides and pesticides is prohibited unless approved by the RE and ECO.

Land disturbed during borrowpit development shall be rehabilitated as described in Section C3.

C2.11 FIRE CONTROL

No open fires shall be allowed on site for the purpose of cooking or warmth.

The Contractor shall take all reasonable steps to prevent the accidental occurrence or spread of fire. The Contractor shall appoint a fire officer who shall be responsible for ensuring immediate and appropriate action in the event of a fire. The Contractor shall ensure that all site personnel are aware of the procedure to be followed in the event of a fire.

The Contractor shall ensure that there is basic fire-fighting equipment on site at all times. This equipment shall include fire extinguishers and beaters. The Contractor shall pay the costs incurred by organisations called to put out fires started by himself/herself, his/her staff or any sub-contractor. The Contractor shall also pay the costs incurred to reinstate burnt areas as deemed necessary by the RE.

In order to reduce the risk of fires, smoking is not allowed on site, other than at designated smoking points where the fire risk is considered to be acceptably low.

MS7: Prior to the commencement of borrowpit development activities, the Contractor is to ascertain the fire requirements of the local authority and must submit a fire contingency plan Method Statement to the RE.

C2.12 DUST CONTROL

The Contractor shall ensure that the generation of dust is minimised and shall implement a dust control programme to maintain a safe working environment, minimise nuisance for surrounding agricultural activities, residential areas/dwellings, etc. The Contractor shall take all reasonable measures to minimize the generation of dust as a result of borrowpit activities. Appropriate dust suppression measures, to the satisfaction of the RE, shall be used when dust generation is unavoidable, particularly during prolonged periods of dry weather. Such measures shall also include the use of temporary stabilising measures (e.g. chemical soil binders, straw, brush packs, chipping etc.).

The Contractor shall ensure that exposed areas and material stockpiles are adequately protected against erosion (whether by wind or water). A water tanker shall be continuously available for the control of dust while other options such as covering of material stockpiles should be considered. The location of stockpiles shall take into consideration the prevailing wind directions and locations of potential sensitive receptors.

Material loads shall be suitably covered and secured during transportation. Construction vehicles shall comply with speed limits and haul distances shall be minimised.

Vegetation clearing shall take place in a phased manner in order to retain vegetation cover for as long as possible with the purpose of reducing the size of areas where dust can be generated by wind.

C2.13 NOISE AND HOURS OF OPERATION

The Contractor shall be familiar with and adhere to any local by-laws and regulations regarding the generation of noise and hours of operation. In addition, the provisions of SANS 10103 regarding the generation of noise shall apply to all areas within audible distance of residents whether in urban, peri-urban or rural areas.

The Contractor may not work outside of "normal working hours" without prior approval of the Engineer. The Contractor shall negotiate for any permits requiring deviation from local by-laws and/or regulations with the local authority. However, the Contractor shall advise the RE and ECO in writing of such intention prior to negotiating for these permits. The Contractor shall be held responsible for any complaints received from the authority and/or public with respect to any contravention of the agreed conditions.

C2.14 ACCESS ONTO PRIVATE PROPERTY

The Contractor shall contact and notify the landowner(s) prior to undertaking any borrowpit-related activities on his/her property as per the defined works.

The Contractor shall ensure that his/her staff does not enter private properties adjacent to the borrowpit site under any circumstances except on official business.

C2.15 STOCKPILES

The Contractor shall plan his activities so that materials excavated from the borrowpit, in so far as possible, can be transported directly to and placed at the point where it is to be used. Temporary stockpiling of excavated material shall be limited to the requirements for the maintenance/construction contract. The areas for stockpiling excavated material shall be indicated and demarcated on the site plan submitted in writing to the RE for approval, together with the Contractor's proposed measures for prevention, containment and rehabilitation against environmental damage. No material of any description shall be stockpiled in any drainage channel.

The areas chosen shall have no naturally occurring indigenous trees and shrubs present that may be damaged during operations. Care shall be taken to preserve all vegetation in the immediate area of these temporary stockpiles. During the life of the stockpiles the Contractor shall at all times ensure that they are:

- (1) Positioned and sloped to create the least visual impact;
- (2) Constructed and maintained so as to avoid erosion of the material and contamination of surrounding environment; and
- (3) Kept free from all alien/undesirable vegetation.

After the stockpiled material has been removed, the site shall be re-instated to its original condition. No foreign material generated/deposited during the maintenance/construction contract period shall remain on site. Areas affected by stockpiling shall be landscaped, top-soiled, grassed and maintained until clearance

from the Engineer and the relevant authority is received.

In all cases, the RE shall approve the areas for stockpiling before any operation commences and shall approve their closure only when they have been satisfactorily rehabilitated.

C2.16 TRAFFIC ACCOMMODATION

The EO may also act as a Traffic Safety Officer (TSO). The TSO shall be required to ensure that borrowpit activities do not obstruct traffic and that adequate traffic accommodation measures are put in place. Warning signs and traffic control notifications shall be displayed well in advance on either side of the borrowpit activities. In general, the TSO shall ensure that regular road users are not unreasonably delayed due to borrowpit activities. The TSO shall make adequate provision to accommodate cyclists and pedestrian traffic where appropriate.

C2.17 VISUAL ASPECTS

The exposure of bare soil through the removal of vegetation prior to mining shall be restricted to those areas required for access roads and the establishment of the borrowpits. Rehabilitation shall take place as soon as possible after mining of each phase is completed. Land disturbed by borrowpit activities shall be rehabilitated as described in Section C3.

C2.18 REGIONAL SOCIO-ECONOMIC ASPECTS

To ensure that previously disadvantaged individuals benefit from the proposed project during the maintenance/construction phase, local Black Enterprise (BE) service providers and local labour from the surrounding community should be employed as far as possible.

Those successful in obtaining employment should be provided with the appropriate training.

C3 PHASED BORROWPIT REHABILITATION

C3.1 REHABILITATION OBJECTIVES

The objective of rehabilitation of each of phase of borrowpit development is to restore disturbed areas as closely to their original state (whether natural or agricultural) as possible through rehabilitation. However, it must be noted, that due to the use of the source in phases, some parts/slopes of the excavation could be left unrehabilitated after each phase in order to allow for further expansion during the next phase of use.

C3.2 INFRASTRUCTURE AREAS

On completion of each specific maintenance/construction contract period, the Contractor shall ensure that all structures, equipment, materials, waste, rubble, notice boards and temporary fences (with the exclusion of borrowpit boundary fences which need to remain in place until final closure) used during the borrowpit operation are removed with minimum damage to the surrounding area. The Contractor shall clean and clear the site to the satisfaction of the RE.

All waste is to be disposed of at a licensed waste disposal site. In the case of accidental spills of oil or chemicals in the borrowpit area, the affected soil shall be dug out and removed from site for disposal at a hazardous waste site and replaced with fresh topsoil.

After closure, temporary access roads established specifically for the project shall be rehabilitated by scarifying the surface and rehabilitating the areas to the recommended specification. However, the main access road as well as any access roads and areas within the borrowpit boundaries that may be required to provide access to further phases of borrowpit development shall remain intact as agreed with the Engineer and SANRAL.

C3.3 BORROWPIT RESIDUE DEPOSITS

Excavated material intended for routine road maintenance purposes shall be retained in neat stockpiles in the area intended for this purpose, as indicated by SANRAL at the end of the maintenance/construction contract period. No other residue deposits shall be left at the borrowpit site. Stockpiled overburden shall be used to re-shape the excavated areas to blend in with the surrounding environment. Topsoil shall be spread over the borrowpit area to be rehabilitated during the particular maintenance/construction phase.

C3.4 SHAPING AND REVEGETATION

It is recommended that a Landscaping Contractor/Horticulturist be appointed to undertake the rehabilitation and revegetation of all borrowpit areas earmarked for rehabilitation at the end of the maintenance/construction contract, as identified by the Engineer and SANRAL in consultation with the ECO.

C3.4.1 Timing and implementation

The rehabilitation programme shall be implemented as soon as possible after completion of each phase of the borrowpit operations. As much of the revegetation as possible shall take place at the start of the rainy season to maximise water availability and minimise the need for watering. If revegetation takes place during the dry season, irrigation of planted areas may be necessary.

C3.4.2 Slope and contouring

It should be noted that near vertical slopes will be created by the excavation and particularly along the hill, i.e. the southern border of the borrowpit excavation. All oversize rock that could not be crushed shall be used to reduce the extent of the near vertical slopes by pushing the oversize material up against such slopes. These slope changes shall be finished-off so that flowing curves that blend into the surrounding landscape are formed in preference to sharp angles. The surface of the access roads shall be ripped to a depth of at least 30 cm. All overburden material shall be placed on the excavation slopes and reshaped so as to correspond as far as possible to the surrounding landscape. Topsoil (which includes mulched vegetation material removed during vegetation clearing, but excluding invasive species), removed and stockpiled during operation, shall be spread evenly over the disturbed areas to a depth of at least 10 cm.

Prior to completion of the works and/or de-establishment of earthmoving plant, the Contractor shall obtain written confirmation from SANRAL that they are satisfied with the shaping of all borrowpit areas earmarked for rehabilitation at the end of each maintenance/construction contract.

C3.4.3 Erosion control measures

Precautions should be taken to prevent soil erosion during rehabilitation. Erosion control measures (e.g. application of straw mulches or soil binders to exposed soil) shall be put in place in all rehabilitated areas, including access roads, stockpiles and any other disturbed areas associated with the borrowpit operations. If necessary, wind protection measures such as shade cloth screens shall be erected to protect the soil and vegetation.

C3.4.4 Revegetation

It is recommended that the Contractor shall appoint a suitably experienced Landscaping Contractor/Horticulturist who is familiar with the local vegetation. His/her appointment shall be approved by the RE. The Landscaping Contractor/Horticulturist shall compile a vegetation rehabilitation plan that shall detail search and rescue, seed collection, seed mixing, seeding methods, planting and vegetation establishment in all borrowpit areas. The recommended method for rehabilitating disturbed areas is by collecting seed from plants in the same community in nearby undisturbed vegetation for sowing on disturbed areas. Hydroseeding using commercially available seed must be avoided.

The Contractor shall submit the vegetation rehabilitation plan to the RE for approval. The RE shall consult the ECO on the appropriateness of the rehabilitation plan, and may also consult a botanical specialist for expert advice.

The vegetation rehabilitation plan shall include the following:

- Seed requirements, harvesting methods and locations, seed storage methods;
- Search and rescue;
- Handling of plant material rescued (translocation areas, propagation, etc.);
- Establishment and maintenance of a project-specific nursery, if required;
- Topsoil, mulch, fertiliser, soil stabiliser and irrigation requirements and application;
- Landscaping and revegetation methods for each area, i.e. hydromulching, planting, including locations and timing;
- Procurement requirements and a list of species of plants to be procured, if any;
- Vegetation establishment and maintenance requirements (irrigation, etc.) for all revegetated areas; and
- The use of any herbicides, pesticides and other poisonous substances, if required.

MS8: The Contractor shall submit a vegetation rehabilitation plan, detailing search and rescue, seed collection, seed mixing, seeding methods, planting and vegetation establishment in all borrowpit areas.

C3.5 MAINTENANCE AND MONITORING

The borrowpit site requires ongoing maintenance and monitoring until formal closure is obtained in compliance with the MPRDA.

The borrowpit site shall remain fenced off until the final rehabilitation process is complete. The areas shall not be grazed until such time as the area is stabilised.

The invasion of alien vegetation shall be monitored and controlled by undertaking an alien eradication programme up until the end of the Contractor's defects notification period. The frequency of the eradication

programme shall be a minimum of annually or more frequently as determined in consultation with the Engineer and ECO.

After the Contractor's defects notification period, SANRAL shall be responsible for the alien eradication programme until final borrowpit closure is obtained. The frequency of the eradication programme shall be at least annually. It is recommended that the responsibility for the alien eradication programme is included in the ongoing road maintenance contract for the road section.

C4 FINAL DECOMMISSIONING

After use of the borrowpit has ceased and final rehabilitation of all disturbed areas had been completed, SANRAL will apply for a closure certificate in terms of Section 43 of the MPRDA. Decommissioning of any activity requiring such a closure certificate is a listed activity in terms of the NEMA EIA Regulations 2014 (Activity 22 of Listing Notice – R. 983), which would require a Basic Assessment process to be undertaken to obtain Environmental Authorisation.

C5 PROPOSED TIMING

The proposed lifetime of the borrowpit is for a thirty (30) years period until 30 April 2044. This would coincide with the duration of a wayleave agreement into which SANRAL has entered with the landowner.

C6 FINANCIAL PROVISION

In terms of the agreement between SANRAL and DMR, each maintenance/construction contract which would utilise the borrowpit would include a 10% retention (up to a limit of R1.5 million) which is to be withheld until all work (inclusive of a rehabilitation work set out in the EMP for that particular borrowpit phase) has been completed to the satisfaction of the engineering team and DMR.

ANNEXURE C1

METHOD STATEMENT CONTROL SHEET

PROJECT TITLE: _____

Contract No. _____

METHOD STATEMENT CONTROL SHEET

[THIS CONTROL SHEET IS TO BE ATTACHED TO ALL METHOD STATEMENTS]

MS Number:

THIS SECTION TO BE COMPLETED BY CONTRACTOR/METHOD STATEMENT AUTHOR ONLY

TITLE:
DESCRIPTION:
SUBMITTED BY:

DATE REQUESTED BY RE: DATE SUBMITTED:
DATE RESPONSE REQUIRED BY: DATE WORK START:

REVIEW SCHEDULE		
DATE	AUTHORITY	COMMENTS

DISTRIBUTION AND AUTHORISATION			
	RE	ECO	CONTRACTOR
Name			
Signature			
Date			

CONTRACTOR NOTE: METHOD STATEMENTS SHOULD ADDRESS THE FOLLOWING:

WHAT	Brief description of the work to be undertaken
HOW	Detailed description of the process of work, methods and materials
WHERE	Description/sketch/map of locality of work (where applicable)
WHEN	Due commencement date and completion date estimate (day/night work)

ANNEXURE C2
ENVIRONMENTAL DO'S AND DON'TS

MOETS EN MOENIES



Werkers en gereedskap moet ten alle tye binne die terreingrense bly.



Moenie van strome drink of daarin swem nie.
Moenie olie, petrol, diesel, sement of rommel in strome gooi nie.
Moenie in strome werk sonder direkte instruksie nie.
Moenie stroomoewers en plantegroei beskadig nie.



Beskerms diere op die konstruksieterrein.
Vra u toesighouer of Kontrakbestuurder om diere van die terrein te verwyder.



Moenie enige plante of bome beskadig of afsny sonder toestemming nie.
Moenie blomme pluk nie.



Gooi sigaretstompies in 'n asblik.
Moenie rook naby gas, verf of petrol nie.
Moenie sonder toestemming enige vure maak nie.
Weet waar brandbestrydingstoerusting gestoor word
Meld alle vure onmiddelik aan.
Moenie rommel verbrand sonder toestemming nie.



Werk slegs in gemerkte areas met petrol, olie & diesel.
Meld alle petrol, olie en diesel lekkasies aan.
Gebruik 'n drupbak onder voertuie en masjienerie.
Maak drupbakke leeg na reën, maar nie in riviere nie



Probeer om nie stof te maak nie.
Maak droë grond nat met water.



Moenie harde geluide maak op die terrein nie, veral naby skole en huise.
Meld raserige voertuie aan of herstel dit.



Gebruik die toilette wat voorsien is.
Meld vol of lekkende toilette aan.



Eet slegs in gemerkte gebiede.
Moenie naby riviere of strome eet nie.
Gooi verpakking en orige kos in vullisblikke.



Moenie vullis rondstrooi nie - gooi alle vullis (veral sementsakke) in vullishouers.
Mel vol vullishouers aan by u toesighouer.
Vullishouers moet gereeld leeggemaak word.



Moet nooit die spoedperk oorskry nie.
Bestuurders - gaan voertuie na en meld lekkasies of rokerige voertuie aan.
Maak seker dat alle vragte stewig is en nie mors nie.



Maak seker dat u alle nood telefoonnommers ken.



Boetes tussen R20 en R2000
Verwydering vanaf die konstruksieterrein.
Konstruksie mag gestop word.



Meld alle brekasies, vure, vloede, lekkasies en beserings aan by u toesighouer.
Vra vrae!

DO'S AND DON'T'S



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



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



Protect animals on the site
Ask your supervisor or Contract's Manager to remove animals found on site



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



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



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



Try to avoid producing dust - wet dry ground & soil



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



Use the toilets provided
Report full or leaking toilets



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



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



Always keep to the speed limit
Drivers - check & report leaks
Ensure loads are secure & do not spill



Know all the emergency phone numbers



Spot fines of between R20 and R2000
Removal from site
Construction may be stopped



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

EMAZENZIWE NE MAZINGENZIWA



Abasebenzi nezixhobo abazisebenzisayo mabangaphumi nazo ngaphaya kwesayiti



Sukuqubha okanye usele amanzi omlambo
Sukugalela ioil, petrol, diesel, concrete okanye inkukuma emlanjeni
Sukonakalisa iindonga (zomlambo) okanye izintyalo



Khusela izilwanyana ezilapho esayitini
Xelela isupervisor ukuba zimkiswe ezozilwanyana



Ungonakalisi okanye ugawule imithi ngaphandle kwemvume
Sukwemba izityalo



Xa ugqibile ukutshayo galela emgqomeni (izitompi zecuba)
Sukutshaya kufuphi negesi, ipeyinti ne petroli
Sukubasa umlilo ngaphandle kwemvume
Zazi izicima mlilo apho zikhoyo
Sukutshisa inkukuma naaphandle kwemvume



Sebenzisa ipetrol, oil ne diesel endaweni yayo
Faka isitya sokukhongozela phansi kwemashini
Ungagaleli oil emlanjeni



Zama ungenzi uthuli fefa ngamanzi emhlabeni



Sukwenza ingxolo eshayitini ngakumbi kufuphi nesikolo nezi ndlu
Yazisa ulungise isithuthi esonakeleyo



Sebenzisa itoilet (izindlu zangasese)
Xela xa zizeleyo



Tyela kwindawo eyenzelwe oko
Sukutyela kufuphi nomlambo
Lahla emgqomeni yonke inkukuma



Sulahla inkukuma phantsi
Galela emgqomeni yonke inkukuma xela xa izele imigqomo
Xela xa umgqomo uzele



Gcina isantya
umqhubi makayilungise inqwelo xa yonakele
Qononondisa umthwalo ubotshiwe enqweleni



Zazi inombolo zengozi



Intlawulo ngokwaphula umthetho yi R20 - R2000
Okanye ugxothwe emsebenzini
Contract leyo imiswe



Ripota wonke umanakalo ofana nokuqhekeza, isiphango umlilo, ukuvuza kwemashini nengozi kwi supervisor
Buza xa unombuzo

ANNEXURE C3

LIST OF FINES

LIST OF FINES

SCHEDULE OF FINES FOR ENVIRONMENTAL DAMAGE OR EMP TRANSGRESSIONS		
EMP TRANSGRESSION OR RESULTANT ENVIRONMENTAL DAMAGE	MIN. FINE	MAX. FINE
Failure to report environmental damage or EMP transgressions to the ECO or RE	R1000	R2000
Failure to carry out instructions of the ECO or RE regarding the environment or the EMP	R2000	R4000
Failure to comply with prescribed administration, storage or handling of hazardous substances	R500	R1000
Failure to comply with fuel storage, refuelling, or cleanup prescriptions	R500	R4000
Failure to comply with prescriptions for solid waste management (incl. paint chips, cement and concrete)	R500	R5000
Failure to comply with prescriptions to prevent water pollution	R1000	R5000
Failure to comply with prescriptions regarding silt, debris and other obstruction removal	R500	R5000
Failure to comply with prescriptions regarding water diversion and drainage	R500	R5000
Failure to comply with prescriptions regarding erosion and sedimentation control and scour protection	R500	R5000
Failure to comply with prescriptions regarding tree and vegetation removal/damage	R5000	R20000
Failure to comply with prescriptions regarding method statements	R500	R5000
Failure to comply with prescriptions regarding demarcation and enforcement of 'No-go' areas	R500	R5000
Failure to comply with prescriptions regarding control of vehicles and plant on access routes	R500	R1000
Failure to comply with prescriptions regarding protection of natural features	R500	R5000

For each subsequent similar offence committed by the same individual, the fine shall be doubled in value to a maximum value of R50,000.