Environmental Management Plan for Borrow Pit 12 on the Farm Cassel 511- Draft

For Northern Cape Department of Roads and Public Works

Compiled by: Green-Box Consulting
Physical Address: 51 Willie du Plessis Street, Fichardpark,
Postal Address: P.O. Box 37738, Langenhovenpark, 9330
Cell phone: 083 412 1705
Contact Person: Niël Badenhorst

GREEN-BOX CONSULTING
INTEGRATED ENVIRONMENTAL MANAGEMENT

mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

NAME OF APPLICANT: Department of Roads and Public Works, Northern Cape

TEL NO: 053-861 9687

FAX NO: 053-839 2291

POSTAL ADDRESS: PO Box 3132, Kimberley, 8300

PHYSICAL ADDRESS: 9-11 Stokroos Street

Squarehill Park

Kimberley

8301

FILE REFERENCE NUMBER SAMRAD:

FILE REFERENCE NUMBER SAMRAD:

KEY BORROW PIT DETAILS

BORROW PIT NUMBER	:	Borrow Pit 12
FARM NAME	:	Cassel 511
MAGISTERIAL DISTRICT	:	Kudumane Sub District
ACCESS ROAD	:	Current MR 950 road
LANDOWNER	:	Mr. Kgosi Bakang
TYPE OF MATERIAL	:	Calcrete and Chert
CURRENT STATUS	:	Dormant- existing old borrow pit applicable on site
POTENTIAL FOR FUTURE USE:		Application for new Borrow Pit for road building purposes

KEY RISKS

SOCIAL	:	None
ENGINEERING	:	None
ENVIRONMENTAL	:	Natural area, existing old borrow pit located on south-western border
SAFETY AND HEALTH	:	No fencing along road or borrow pit area
OTHER	:	None
OVERALL RISK PROFILE	:	Low

ABBREVIATIONS USED IN THIS REPORT

DMR	:	Department of Mineral Resources
DRPW	:	Department of Roads and Public Works
DWS	:	Department of Water and Sanitation
ECO	:	Environmental Control Official
EIA	:	Environmental Impact Assessment
EMP	:	Environmental Management Programme
NC	:	Northern Cape
IAP	:	Interested and Affected Parties
LOM	:	Life of Mine
MPRDA	:	Minerals and Petroleum Resources Development Act
NEMA	:	National Environmental Management Act
SAHRA	:	South African Heritage Resources Agency
SAPS	:	South African Police Services

1. IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining “will not result in unacceptable pollution, ecological degradation or damage to the environment”.

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

2. OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

The objective of the basic assessment process is to, through a consultative process—

(a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;

(b) identify the alternatives considered, including the activity, location, and technology alternatives;

(c) describe the need and desirability of the proposed alternatives,

(d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage , and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on the these aspects to determine:

(i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and

(ii) the degree to which these impacts—

(aa) can be reversed;

(bb) may cause irreplaceable loss of resources; and

(cc) can be managed, avoided or mitigated;

(e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—

(i) identify and motivate a preferred site, activity and technology alternative;

(ii) identify suitable measures to manage, avoid or mitigate identified impacts; and

(iii) identify residual risks that need to be managed and monitored.

PART A
SCOPE OF ASSSSMENT AND BASIC ASSESSMENT REPORT

3. CONTACT PERSON AND CORRESPONDENCE ADDRESS

a) Details of

i) Details of the EAP

Name of The Practitioner: **Danie Krynauw**
Tel No.: **083 412 1705 / 082 435 2108**
Fax No. : **-**
e-mail address: **info@green-box.co.za**

ii) Expertise of the EAP

(1) **The qualifications of the EAP**
(with evidence).

Masters Degree in Urban and Regional Planning (MURP)
Masters in Environmental Management (Dissertation to be completed)

(2) **Summary of the EAP's past experience**
(In carrying out the Environmental Impact Assessment Procedure)

Danie Krynauw is an environmental professional at Green-Box Consulting, a powerful consulting platform that assists Individuals, Companies, Government, Farmers and many more Sectors to comply with their environmental legal requirements. He graduated from the University of the Free State with Masters Degrees in Urban and Regional Planning, and Environmental Management. Previously, Danie worked as an environmental scientist for the Department of Environmental Affairs, Free State. He also has over 9 years' experience as an environmental assessment practitioner at a well know environmental consultancy firm based in Bloemfontein. Passionate about the environmental management field and collectively having over 17 years' experience, Danie ventured into his own environmental management business, a Company called Green-Box Consulting. Danie operates from his head office in Bloemfontein, and has a satellite office in Kimberley, Northern Cape. He has the talent to understand environmental legislative processes, Government procedures and has hands-on relationships with his clients.

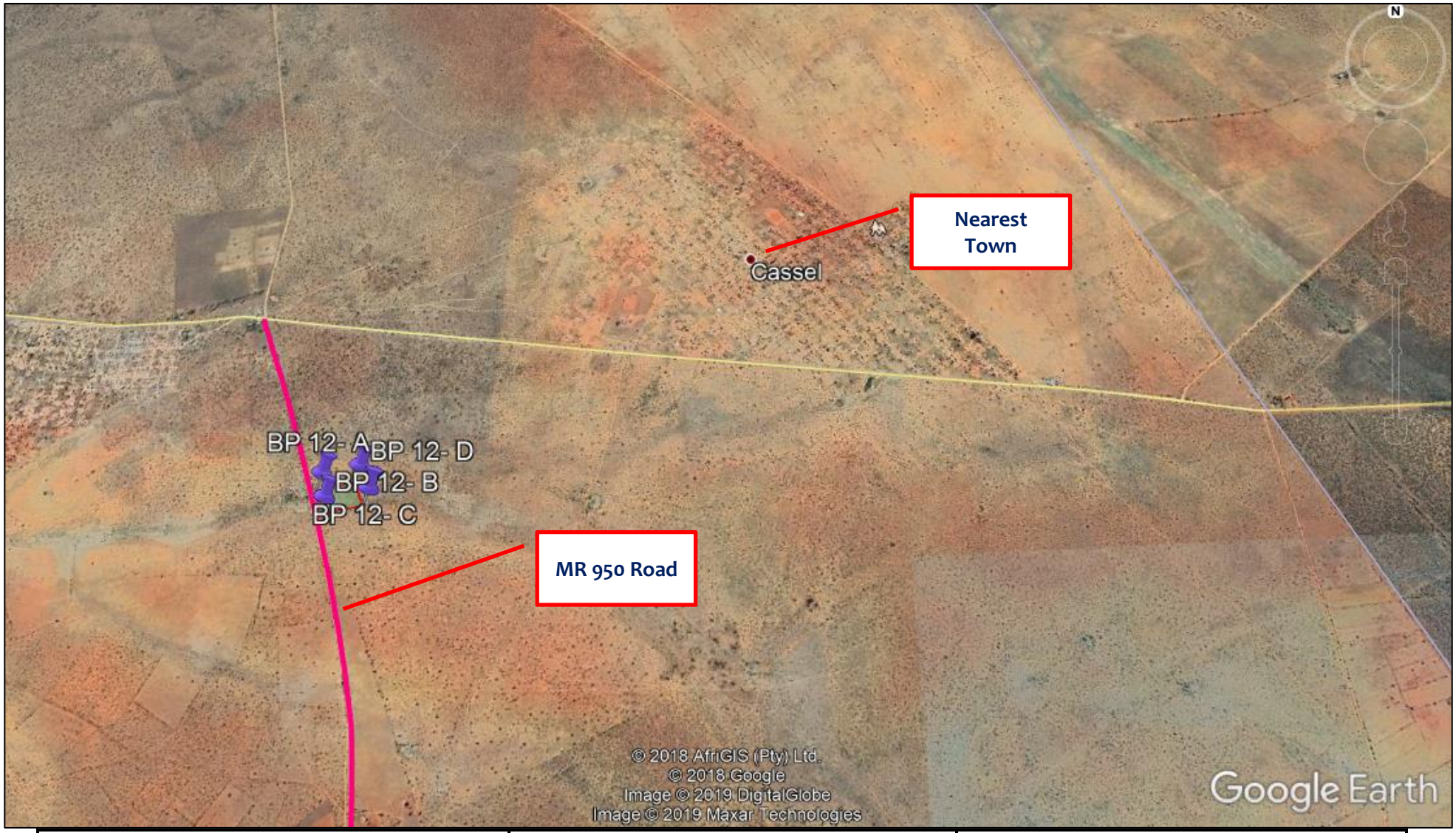
b) Location of the overall Activity.

Farm Name:	**Cassel 511**
Application area (Ha)	**4.79 hectares**
Magisterial district:	**Joe Morolong Local Municipality**
Distance and direction from nearest town	**Cassel- 3.39km from Borrow Pit in a north-eastern direction**
21 digit Surveyor General Code for each farm portion	**C08100000000051100000**

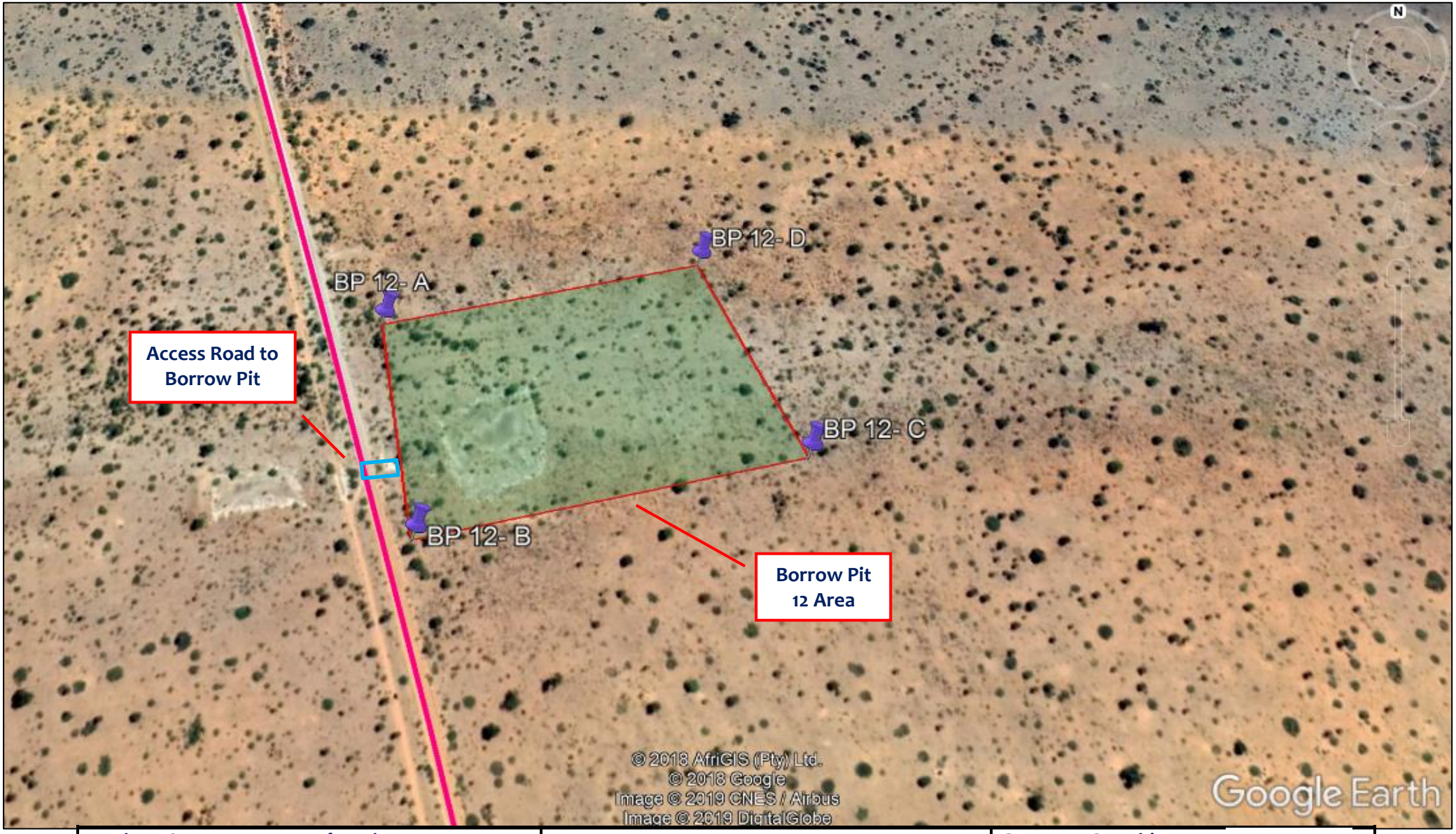
c) Locality map

(Show nearest town, scale not smaller than 1:250000).

The locality map (1:50 000 topo map) is shown in Appendix 2. See below satellite images of the borrow pit area.



Northern Cape, Department of Roads and Public Works P.O. Box 3132 Squarehill Park Kimberley, 8300	**BORROW PIT 12** **Satellite Image** (Nearest Town)	Green-Box Consulting P O Box 37738 Langenhovenpark 9330



Northern Cape, Department of Roads and Public Works P O Box 3132 Kimberley 8300	**BORROW PIT 12** **Google Earth Image** (Image accessed on 06/2019)	Green-Box Consulting P O Box 37738 Langenhovenpark 9330

d) Description of the scope of the proposed overall activity.

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site

The borrow pit diagram and dimensions are shown in Appendix 2. No permanent infrastructure will be placed on site. Only mobile and temporary structures will be used during the operational period of the borrow pit.

(i) Listed and specified activities

NAME OF ACTIVITY **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. for mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (*GNR 544, GNR 545 or GNR 546)*
Surface mining to excavate material for road building purposes from a borrow pit. (Calcrete and Chert)	**4.79 hectares**	**X**	**National Environmental Management Act; Act 107 of 1998 - Government Notice R327 – Activity Nr. 21.**

(ii) Description of the activities to be undertaken

(Describe Methodology or technology to be employed, including the type of commodity to be prospected/mined and for a linear activity, a description of the route of the activity)

The borrow pit is located east of the MR 950 road which stretches from Ditakong in the south to the Cassell turnoff in the north. The road is currently a gravel road and will therefore be upgraded to asphalt in order to assist members of the villages to travel between villages in a safer and more timeous manner than before. The current gravel road also emits high levels of dust especially during drier months, which has a safety risks for resident living in the villages, as well as people living in between the villages along the road.

The materials sourced from the borrow pit will be used in the construction process of the said road. The road stretches from Bothithong to Dithakong, and from Ditakong to the Cassel turnoff, it must be noted that several areas of the road will be re-aligned in order to lessen the bend of the road, this will be done in order to increase safety on the new road. The borrow pit is located next to (around 20-22 meters) from the current MR 950 road.

The site itself has an existing borrow pit located in the south-western border of the proposed borrow pit. The old borrow pit which is approximately 0.5 hectares has been used many years ago, however the vegetation cover within the borrow pit area has been totally transformed and has not re-established, with minimal tree cover and extremely sandy soil witnesses in this area. The areas around the previous utilised borrow pit features natural vegetation, with several smaller to medium trees and several larger shrubs, as the area is currently being used as communal grazing grounds much of the natural vegetation cover (in the form of grass cover) has been overgrazed, and as stated the area features sandy soil which inhibits vegetation growth to some extent. Except for the previously utilised borrow pit area there are minimal footpaths located within the borders of the proposed borrow pit, with no vehicle paths (jeep-track roads) witnessed. It must be noted that the access route is located next to the road (around 20-22 meters from the MR 950 road).

The mining method will entail the stripping of vegetation and removal of topsoil from the borrow area (topsoil is however sparse), using heavy construction vehicles. The topsoil and overburden will be stored in areas where it will not be disturbed during the borrow pit operation.

Areas that will be dedicated for the storage of topsoil and mined material stockpiles will be demarcated prior to the commencement of stripping. Construction vehicles will be used to excavate the material and put onto a stockpile prior to removal from site. The material will be removed with front end loaders and will be loaded onto tipper trucks to transport the material. No mineral processing water will be required, but water will be required for dust control on the roads and during excavation. Drilling and blasting are not expected, but it should be noted that in the event that hard material is encountered that hinders operations; it might be carried out as necessary to do so. No construction of infrastructure apart from the provision of adequate fencing and signage is expected at the borrow pit. Only temporary mobile equipment will be used on site. A new access route which joins the MR950 road on the east will be used in order to supply material for road construction purposes, the access road will be around 20-22 m in length as the borrow pit is located next to the MR 950 road.

Borrow Pit Corner Points	Latitude	Longitude
1	-26.984436°	23.951136°
2	-26.986053°	23.951581°
3	-26.985469°	23.954447°
4	-26.983939°	23.953608°

e) Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLIY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT. (E.g. In terms of the National Water Act a Water Use License has/ has not been applied for)
Minerals and Petroleum Resources Act 28 of 2002 as amended.	**Section 106, 17,38,39,41**	**Organs of state exempted from full mining permit application are required to have an EMP approved.**

		This is in process of being done.
National Environmental Management Act 107 of 1998 as amended.	**Section 24, 44 and 47**	**Environmental authorisation is required prior to commencement of an activity that requires a mining permit. This is in the process of being done.**

Refer to Appendix 12 for more on legislative context.

f) Need and desirability of the proposed activities.

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

Part of the vision of the Northern Cape Department of Roads and Public Works is to contribute towards the creation of a prosperous Northern Cape through the facilitation of the provision of road infrastructure. To realise this vision, the department needs to ensure road safety and an integrated transport system and networks that benefits all in the community. For them to improve and maintain road infrastructure, the department requires material for road building, which can be obtained from borrow pits. Therefore, the need for this borrow pit development has been triggered by the need for the upgrading of the road MR 952 (which includes re-alignment at several areas)- from Bothithong to Dithakong, and the upgrading of the road MR 950 from Dithakong to Cassel.

The upgrading of the MR 952 and 950 will be beneficial to residents of the villages by which the roads pass by, but also the greater northern cape population especially residents between Kuruman and Vryburg. The current road consists out of a gravel road, which has several areas of washboarding and corrugation areas present, this is due to the high traffic volumes of especially personal motor vehicles making use of the road. This type of road surface is extremely hazardous as the only way in which you can drive on the road is either extremely slow or very fast as to not jerk around on the road. Therefor the upgrading activities of the road will have a positive effect on the safety of road users making use of the road. The current gravel road surface is extremely brittle, with several areas having fine dust and sand present, this leads to dust pollution every time a vehicle travels on the gravel road surface. This is aggravated in times of low rains, with adjacent landowners next to the road and villagers suffering from huge amounts of dust and particle matter pollution. The re-alignment will also mean that the bend of the road at several areas will be lessened, increasing safety for motorists traveling on the road.

g) Motivation for the overall preferred site, activities and technology alternative.

The site is situated around 20- 22 meters east of road for which the borrow pit material will be used- the current MR 950 road, an access route will be scraped which will decrease traveling times for materials and will save allot of time as materials will be sourced locally. The site itself has an existing borrow pit located in the south-western border of the proposed borrow pit. The old borrow pit which is approximately 0.5 hectares has been used many years ago, however the vegetation cover within the borrow pit area has been totally transformed and has not re-established, with minimal tree cover and extremely sandy soil witnesses in this area. The areas around the previous utilised borrow pit features natural vegetation, with several smaller to medium trees and several larger shrubs, as the area is currently being used as communal grazing grounds much of the natural vegetation cover (in the form of grass cover) has been overgrazed, and as stated the area features sandy soil which inhibits vegetation growth to some extent.

Except for the previously utilised borrow pit area there are minimal footpaths located within the borders of the proposed borrow pit, with no vehicle paths (jeep-track roads) witnessed- as seen by the photographic evidence attached to this report.

The borrow pit will be excavated using excavators, the material will then be loaded on to trucks which will transport the materials to the road construction areas. The borrow pit area will be fenced off, with one gate which will be locked at night and over the weekends.

h) Full description of the process followed to reach the proposed preferred alternatives within the site.

NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

i) Details of the development footprint alternatives considered.

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

a) The property on which or location where it is proposed to undertake the activity:
No alternative location is considered, because there is an existing abandoned borrow pit situated within the borders of the proposed borrow pit area, therefore the vegetation cover in this area has dramatically been transformed- the borrow pit is however only 0.50 hectares in size. The rest of the area features natural vegetation, however due to overgrazing much of the natural vegetation cover has been transformed. Therefore, much of the negative environmental effects is already present on site.

b) The type of activity to be undertaken:
The type of activity will remain mining of an additional coverage in order to supply base layer material for the upgrading of the road MR 952- from Bothithong to Dithakong, and the upgrading of the road MR 950 from Dithakong to Cassel.

c) The design or layout of the activity:
Areas that will be dedicated for the storage of topsoil and mined material stockpiles will be demarcated prior to the commencement of stripping. Due to the limited scope of the activities only one layout is considered in this report.

d) The technology to be used in the activity:
No technology alternatives are considered in the report.

e) The operational aspects of the activity:
No operation alternatives are considered in the report.

f) The option of not implementing the activity:
The No-go alternative implies that no material from this borrow pit will be available for construction and repair of roads. This will mean that the road building resource base available for the mentioned road upgrading project will be reduced thereby constricting the road upgrading and construction activities. However, a need has been identified for

the material availability in order for use to improve the road surface- from gravel to asphalt and will in turn improve road safety. If this is not done, the Department's sources on road building material availability to improve roads will be limited.

ii) Details of the Public Participation Process Followed

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

The following measures were taken regarding the public participation process:

The following public participation process is proposed for the project:

-Interested and affected parties (I&APs) were identified, and all relevant information sent to these parties for comment.

- Notice board was placed at the location where the borrow pit excavations will take place. (Between the villages of Dithakong and the Cassel turnoff)

- A newspaper advertisement was placed in the Noordkaap Newspaper on the 29 May 2019. The Noordkaap Newspaper is the local newspaper distributed in the Northern Cape and North West Provinces weekly.

- Approval letter from the land owner to use the borrow pit has been signed, and is included in the BAR report.

The Interested and Affected Parties was identified as the following:

- **Joe Morolong Local Municipality;**
- **John Taolo Gaetsewe District Municiplaity;**
- **Northern Cape Department of Water and Sanitation;**
- **Northern Cape Department Roads and Public Works;**
- **Northern Cape Department Co-Operative Governance, Human Settlements and Traditional Affairs;**
- **Department of Agriculture, Forestry & Fisheries;**
- **South African Heritage Resource Agency;**
- **ESKOM Holdings SOC Ltd.**

iii) Summary of issues raised by I&Aps

(Complete the table summarising comments and issues raised, and reaction to those responses)

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
AFFECTED PARTIES					
Landowner/s	X				
Mr. Kgosi Bakang	X		To be submitted with final BAR		
Lawful occupier/s of the land					
Landowners or lawful occupiers on adjacent properties	X				
Mr. Kgosi Bakang	X		To be submitted with final BAR		
Municipal councillor	X		To be submitted with final BAR		
Municipality	X		To be submitted with final BAR		
Organs of state (Responsible for infrastructure that may be					

affected Roads Department, Eskom, Telkom, DWA e					
Department of Water and Sanitation	X		To be submitted with final BAR		
NC Heritage Resources Authority	X		To be submitted with final BAR		
Northern Cape Department Roads and Public Works;	X		To be submitted with final BAR		
Northern Cape Department Co-Operative Governance, Human Settlements and Traditional Affairs;	X		To be submitted with final BAR		
Communities					
Dept. Land Affairs					
Department of Agriculture, Forestry & Fisheries	X		To be submitted with final BAR		
Traditional Leaders					
Dept. Environmental Affairs					
Dept. of Environmental Affairs	X		To be submitted with final BAR		
Other Competent Authorities affected					
John Taolo Gaetsewe District Municiplaity	X				
OTHER AFFECTED PARTIES					
Cllr. Mxolisi			To be submitted with final BAR		
ESKOM Holdings SOC Ltd;			To be submitted with final BAR		

INTERESTED PARTIES				

iv) The Environmental attributes associated with the alternatives. (The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

(1) Baseline Environment

(a) Type of environment affected by the proposed activity.

(its current geographical, physical, biological, socio- economic, and cultural character).

The site is free from any human settlements, with the closest human settlements being that of the village of Cassel situated in a northern direction from the borrow pit site. (closest residential units being situated around 7.22 kilometres from the borrow pit site) The area as well as the entire area around the borrow pit is used as communal grazing grounds therefore several livestock has been witnessed in the area. Areas around the borrow pit has also been severely overgrazed due to the high amount of animals' present, therefore groundcover at several areas consists out of not much more than small to medium scrubs, trees and degraded grass cover. The borrow pit will also include an old much smaller borrow pit- around 0.50 hectares. The borrow will also be located around 20-22 m east of the current MR 950 road- which will be re-aligned at several areas in order to increase safety on the road.

As stated above the area is in a natural state- the proposed borrow pit however features a smaller, old and unused borrow pit which is approximately 0.50 hectares. The rest of the areas features natural vegetation, with the vegetation cove being disturbed due to overgrazing of communal animals. The area within features modified vegetation with minimal sapling trees witnessed in this area.

The natural vegetation according to Muncina & Rutherford (2006) however is described as Mafikeng Bushveld. The distribution of the vegetation type is North-West Province: West of Mafikeng and south of the Botswana border westwards to around Vergeleë, southwards to Piet Plessis and Setlagole. Altitude 1 100–1 400 m. The vegetation and landscape features of the vegetation type features of well-developed tree and shrub layers, dense stands of *Terminalia sericea*, *Acacia luederitzii* and *A. erioloba* in certain areas. Shrubs include *A. karroo*, *A. hebeclada* and *A. mellifera*, *Dichrostachys cinerea*, *Grewia flava*, *G. retinervis*, *Rhus tenuinervis* and *Ziziphus mucronata*. Grass layer is also well developed, with several areas not having any groundcover present as a result of overgrazing of communal animals.

During assessment of the site, no animals were noted, however rodents such as the short-tailed Gerbil, Desmodillus auricularis the ground-dwelling rodents, the black-tailed tree rat, Thallomys nigricauda are known to occur within the vicinity of the project site together with a variety of bird species.

(b) Description of the current land uses.

The area is currently being used for animal grazing, with a much smaller borrow pit located within the perimeters of the new proposed borrow pit. The mining activities in the old

borrow pit (sized around 0.50 hectares) has seized many years ago, therefore the entire area is lying dormant with no activities currently taking place within the perimeters of the proposed borrow pit area. The area proposed for the mining of calcrete and Chert is a completely new borrow pit (old smaller borrow pit has been dormant for many years), however the area has been modified in a number of ways as stated above. The area where the proposed access road will be situated (between the borrow pit and the MR 950 road) features no residential units and has the same vegetation cover present as the borrow pit area, it must however be noted that the borrow pit is situated next to the road, therefore the access road will be short- around 20-22 meters from the road itself.

(c) Description of specific environmental features and infrastructure on the site.

The proposed site is being used for animal grazing, the site does not have any infrastructure, and distribution of some smaller to medium shrub species and some tree species can be noted within the area. There are some storm-water structures present nearby, with no electricity and / or TELKOM lines close to the proposed borrow pit site. There are several fencing lines applicable along the MR 950 road, however most of the fencing has either been removed or is degrading, therefore the fencing does not at all have any function.

(d) Environmental and current land use map.

(Show all environmental, and current land use features)

See Annexure 2.

v) Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated).

Table 1: Potential impact of each main activity in each phase, and corresponding significance assessment.

	Activity	Impact	Duration	Intensity	Probability	Significance Rating	
1	Site Preparation	Loss of vegetation	3	3	10	60	Medium
		Habitat Destruction	3	3	10	60	Medium
		Visual scarring	3	4	8	56	Medium
		Soil erosion	3	4	6	42	Low
2	Excavations	Dust emissions	2	4	6	36	Low
		Surface disturbances	3	3	6	36	Low

	Activity	Impact	Duration	Intensity	Probability	Significance Rating	
		Drainage interruption	1	1	10	20	Low
		Slope instability	4	3	6	42	Low
		Noise	2	2	10	40	Low
		Visual Scarring	3	4	8	56	Medium
		Soil erosion	3	4	6	42	Low
3	Blasting (if done)	Fly rock	2	3	6	30	Low
		Noise and vibrations	3	4	6	42	Medium
		Dust	3	4	6	42	Medium
4	Stockpiles	Dust	2	5	8	56	Medium
		Surface disturbances	3	5	10	80	High
		Drainage disruption	2	2	10	40	Medium
5	Loading, Hauling and transportation	Dust	2	5	10	70	Medium
		Increased risk of accidents	2	4	4	16	Low
		Noise	2	2	10	55	Medium
		Soil contamination from oil/fuel leaks	3	3	6	36	Low

vi) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision).

Assessment of the significance of the potential impacts

Criteria of assigning significance to potential impacts

The significance of potential impacts is derived through a synthesis of ratings of all criteria in the following calculation:

(Duration + Intensity) x Probability = Significance

The significance of a potential impact on decision-making is indicated through significance points in the right-hand column of the table below. The significance points indicate the following:

- **Low (Significance points (SP) < 50): The impact will not have an influence on the project design;**

- **Moderate (SP between 50 and 75): It could have an influence on the environment and will require modification of the project design or operational mitigation methods;**
- **High (SP > 75): It could be a major implication on the project regardless of any mitigation.**

Table 2: Assessing Impacts for significance

Impact	Duration	Intensity	Probability	Significance points (SP) and rating
Example. Soil contamination from hazardous substances before mitigation	Permanent - 5	Very high / don't know - 5	Definite / don't know – 10	High SP > 75
	Long term - 4	High – 4	High probable – 8	Moderate SP 50 to 75
	Medium term – 3	Moderate – 3	Medium probability – 6	Low SP < 50
	Short term - 2	Low – 2	Low probability – 4	
	Immediate - 1	Minor - 1	Improbable - 2	

vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

The following standards will be upheld once the borrow pit mining has ended:

i. **The borrow pit be rehabilitated properly after material has been sourced and they should give their input in the finishing off and rehabilitation of the borrow pit.**
ii. **The borrow pit must be managed in accordance with the Environmental Management Program.**
iii. **The finishing off of the borrow pit must be safe for humans and animals.**
iv. **The landowner should be informed of who will be working on the borrow pits.**
v. **The landowner be informed of who will work on the borrow pits before this commences.**
vi. **There should be no dumping of any kind at the borrow pit.**
vii. **The borrow pit will only be used for the construction of the road by the Northern Cape Provincial Department.**

viii) The possible mitigation measures that could be applied and the level of risk.

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

MANAGING SOIL IMPACTS

These measures are targeted at managing soil erosion, soil contamination, compaction of soil and removal of topsoil

- **The area that is stripped of vegetation should be kept to an absolute minimum**
- **Contractor shall at all times carefully consider what machinery is appropriate to the task while minimising the extent of environmental damage and unnecessary movements should be prohibited.**
- **The topsoil, including the existing grass cover is to be shallowly ripped (only the depth of the topsoil) before removal. This is to ensure that organic plant material, and the natural seed base is included in the stripping process. The soil is to be stored and the soil stockpiles shall not be higher than 2 metres or stored for a period longer than one year. The slopes of soil stockpiles shall not be steeper than 1 vertical to 2.5 horizontal.**
- **Topsoil shall be stored separately from subsoil and other overburden material.**
- **No vehicles shall be allowed access onto the stockpiles after they have been placed.**
- **Stockpiles shall not be allowed to become contaminated with oil, diesel, petrol, garbage or any other material, which may inhibit the later growth of vegetation.**
- **The contractor shall apply soil conservation measures to the stockpiles to prevent erosion.**
- **Ensure regular maintenance of equipment to prevent diesel and hydraulic spillages**
- **Where possible ensure low work surface gradients so that run-off flows at a controlled rate so as to minimize channelling and soil erosion during high rainfall**
- **At the end of operations, all disturbed areas shall be re-vegetated.**

LOSS OF VEGETATION

- **No protected species must be removed without a permit. A final walkthrough must be done by an ecologist to ensure that the areas where vegetation is to be cleared do not have protected species.**
- **Clearance of vegetation should be restricted to the absolute minimum required to facilitate access and undertake borrow pit activities. Disturbance of topsoil and vegetation rootstock must be minimized as far as possible.**
- **Any declared category 1 invasive species identified should be cleared.**
- **Rehabilitation strategies following operational activities must ensure that appropriate indigenous plant species are used and should be done as per rehabilitation plan**

DUST AND VEHICLE FUMES

- **Avoid unnecessary excessive vehicle movement.**
- **Limit vehicle speeds on unsurfaced roads.**
- **Rehabilitate disturbed areas with vegetation as soon as operation is completed.**
- **Maintain equipment and vehicles in good working order to avoid excessive emissions**
- **Borrow pit working floors should be sprayed with water from time to time to reduce dust emission during operations.**
- **Use rubber curtains/other material to limit dust during screening should be considered.**
- **Spray roads, material stockpiles and screening areas with water if dust becomes problematic.**
- **No fires should be allowed on the borrow pit site.**

BLASTING

- All blasting and handling of blasting materials should be done in accordance with the Explosives Act and the Mine Health and Safety Act.
- A risk assessment has to be that takes into account the safety of the people, infrastructure and the surrounding environment. A pre and post blasting survey should be done.
- A blasting time schedule shall be distributed to all surrounding villages indicating the time and date for blasting activities. It is recommended that blasting takes place during daylight hours.
- At all times blasting shall be carried out that ground vibration, air blast and scatter are kept within such limits as to avoid damage to adjacent structures/machinery etc already placed at the works.
- Any fly rock should be cleared after blasting.

WASTE DISPOSAL

- All personnel must be instructed to dispose of waste in a proper manner in the correct designated areas.
- Suitable receptacles shall be available at all times and conveniently placed for the disposal of waste.
- No waste shall under any circumstance be disposed of in the veld. No burning of waste is permitted on site and the borrow pit area should be protected from illegal dumping of waste.
- All used oils, grease or hydraulic fluids shall be placed in appropriate impervious containers and these receptacles will be removed from the site on a regular basis for disposal at a registered or licensed disposal facility or sent for recycling/reuse with a registered facility.
- Spills should be cleaned up immediately by removing the spillage together with the polluted soil and by disposing of them at a recognised facility. In areas where the spills are some, an absorbent agent can be used, and the area treated
- Contaminated materials and residues from machinery maintenance and other sources contaminated with hazardous waste should be stored in proper containers that avoid seepage to ground.
- The reduce, reuse, recycle waste management philosophy will be used where possible.
- Only authorized registered waste disposal contractors should be hired for collection of waste for all waste streams.

SOCIAL IMPACTS

- Effective two-way public disclosure and public consultation should be implemented to allay community perceptions. There should be an opportunity provided for the resolution of grievances or complaints received and recorded from individuals in the community.
- Community should be adequately informed of activities being done at the borrow pit that are likely to affect them.
- Labour recruitment should occur in a manner that is objective, transparent, and wherever possible, provide opportunities for people from the local area.
- The activities of contractors, consultants, and company employees should be routinely reviewed to ensure good community relations are being maintained. The project proponent should use its influence as employer to encourage responsible behaviour among employees.

STABILITY OF EXCAVATIONS

- Excavations shall take place only within the approved demarcated borrow pit area and appropriate barriers should be put as necessary.

- **The borrow pit operator shall ensure that a place of work, whether temporary or permanent in or near the excavation has a structure and solidity appropriate to its use is operated, supervised and maintained, so as to withstand the environmental forces anticipated and be safe.**
- **The borrow pit operator shall ensure that material is not placed, stacked or used at the borrow pit near the edge of any excavation, where it is likely to endanger people at work and equipment or where it is likely to cause collapse of the side of the excavation.**
- **Excavations should be routinely inspected. If cracks occur in any structure they need to be investigated to ascertain if there is a risk to safety**
- **Overburden rocks and coarse material shall be placed concurrently in the excavations or stored adjacent to the excavation, if practicable, to be used as backfill material once the mineral or gravel has been excavated.**
- **An appropriate drainage provisions must be constructed as necessary to accommodate the surface water movement. If the water table is reached during excavations appropriate pumping facilities should be provided.**
- **Excavated areas should be kept in a safe and stable manner. No unstable block should be present. Reshaping of the borrow pit may need to be done to ensure that this objective is reached. The profiling should be done to match the surrounding landscape**
- **The borrow pit should be finished in such a manner that it is self-draining**
- **Topsoil should be put back on the surfaces and the areas revegetated.**

VISUAL IMPACTS

- **The excavated area must serve as a final depositing area for the placement of overburden. Rocks and coarse material removed from the excavation must be dumped into the excavation.**
- **Once excavation parts that can be filled have been refilled with overburden, rocks and coarse natural materials, the borrow pit shall be profiled with acceptable contours and erosion control measures, the topsoil previously stored shall be returned to its original depth over the area. The profiling shall be done to match the surrounding landscape as far as is reasonable possible.**
- **The area shall be fertilised if necessary, to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora.**
- **If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the there may be need for the soil to be analysed and any deleterious effects on the soil arising from the borrow pit, be corrected and the area be seeded with an indigenous vegetation seed mix that matches the surrounding flora.**

EQUIPMENT USED ON SITE

- **Only well-maintained vehicles and equipment should be operated onsite and all machinery should be serviced regularly during the borrow pit operation.**
- **The maintenance of vehicles and some equipment used for any purpose during the borrow pit operation will take place only in the maintenance workshops which are not located on the borrow pit. No vehicle may be extensively repaired in any place other than in the maintenance yard.**

- A maintenance schedule should be prepared in order to ensure that equipment is in is best form so as to no cause unnecessary pollution such as noise, emissions and makes effective use of energy.
- Equipment used in the borrow pit process must be adequately maintained so that during operations it does not spill oil, diesel, fuel, or hydraulic fluid.
- Machinery or equipment used on the borrow pit area must not constitute a pollution hazard. No equipment leaking oil should be used. Drip tray should be used to prevent pollution.

NOISE

- Construction activities required outside normal working hours must be approved by the Project Manager, and where necessary, advance warning provided to adjacent residents.
- Noise levels exceeding 85dB shall only be permitted where approved and with appropriate advanced warning to adjacent residents (minimum of 2 days) being provided.
- Noise that could cause a major disturbance should only be carried out during daylight hours and with advance warning provided as above.
- Adequate ear protection should be provided to employees in noisy areas
- No amplified music shall be allowed at the site.
- Construction vehicles and plant to be in good working order.

ix) Motivation where no alternative sites were considered.

The selected area is situated close to the road for which the material will be used namely the MR 950 road around 20-22 meters. The area also has some trees present (mostly younger trees), with smaller to medium scrubs being situated on the area which the old borrow pit is not situated, the groundcover consisting mostly of grass species has also somewhat been altered due to constant overgrazing of communal animals. There are also no infrastructure and/or dwellings present on the proposed site, with only small plots being situated north-east and north- west of the site, in the form of residential dwellings for the village of Ga-Madubu and Cassel.

x) Statement motivating the alternative development location within the overall site. (Provide a statement motivating the final site layout that is proposed)

The site is situated east to the MR 950 road, for which the material of the borrow pit will be used. The site features a much smaller abandoned borrow pit, which together with improper management of the vegetation cover has resulted in the groundcover especially grass cover being extremely degraded at areas. There is also no residential dwelling close to the borrow pit, therefore the pit will not have a safety risk for humans. The access route for the borrow pit will be from the MR 950 road, in an eastward direction towards the borrow pit, the length of the access road is however extremely short..

i) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity. (Including (i) a description of all environmental issues and risks that erer identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.)

Only one layout was considered. Information is contained in Appendix 2.

j) Assessment of each identified potentially significant impact and risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties).

NAME OF ACTIVITY **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. For mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	**POTENTIAL IMPACT** (Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	**SIGNIFICANCE** if not mitigated	**MITIGATION TYPE** (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation..	**SIGNIFICANCE** if mitigated
Site Establishment activities (fencing, signage, access formation, etc)	**Loss of vegetation**	**Visual character, Land use**	**Pre-mining**	**Medium**	**Remedy through rehabilitation, Limit footprint**	**Low**
	Habitat Destruction	**Visual character**	**Pre-mining**	**Low**	**Remedy through rehabilitation, Limit footprint**	**Low**
	Visual scarring	**Visual character**	**Pre-mining**	**Medium**	**Remedy through rehabilitation**	**Medium**
	Soil erosion	**Visual character, Land use**	**Pre-mining**	**Medium**	**Remedy through rehabilitation, Limit footprint, Control through storm water control**	**Low**
	Visual scarring	**Visual Character**	**Operational Phase**	**Low**	**Remedy through rehabilitation**	**Low**

Clearance of area for mining	Destruction of flora and habitat	Visual Character, Land use	Operational Phase	Low	Remedy through rehabilitation, Limit footprint and removal of vegetation	Low
	Loss of agricultural potential	Land use management	Operational Phase	Low	Control through soil conservation techniques Limit footprint of the borrow pit as far possible to limit loss of agricultural land	Low
	Soil erosion	Land use	Operational	Medium	Control through soil conservation techniques, Stop through appropriate storage of topsoil	Low
Excavation	Dust emissions	Air quality	Operational Phase	Medium	Control through dust control measures	Low
	Drainage disruption	Drainage	Operational Phase	Low	Control through storm water controls	Low
	Slope instability	Topography	Operational Phase	Low	Control through slope management controls	Low
	Noise	Noise	Operational Phase	Low	Control through noise control measures	Low
	Visual Scarring	Visual Character	Operational Phase	Low	Remedy through rehabilitation of already worked areas	Low
	Soil erosion	Land use	Operational Phase	Low	Remedy through the rehabilitation of already worked areas, Control through slope control, Stop through appropriate storage of topsoil	Low

	Destruction of heritage resource	Heritage issues	Operational Phase	Low	Avoidance	Low
Drilling & blasting (if done)	Noise and vibrations	Noise	Operational Phase	Medium	Control through blast control measures	Low
	Dust	Air quality	Operational Phase	Low	Control through dust control measures	Low
	Fly rock	Safety	Operational Phase	Low	Control through blast control measures	Low
Waste Disposal and Material storage	Soil contamination	Land degradation	Operational Phase	Low	Avoidance	Low
	Water pollution	Water	Operational Phase	Low	Avoidance	Low
	Increased risk of fire	Safety	Operational Phase	Low	Avoidance	Low
Material handling, hauling and transportation	Dust	Air quality	Operational Phase	Medium	Control through dust control measures	Low
	Increased risk of accidents	Safety	Operational Phase	Low	Stop through site management protocols	Low
	Noise	Noise	Operational Phase	Low	Control through noise control measures	Low
	Soil contamination from oil/fuel leaks	Land degradation	Operational Phase	Low	Stop through operational control measures e.g. drip trays and use of well serviced machinery	Low
Removal of infrastructure & equipment and re-shaping of borrow pit	Noise	Noise	Decommissioning and closure	Low	Control through noise control measures	Low
	Dust	Air quality	Decommissioning and closure	Medium	Control through dust Control measures	Low
	Soil contamination from oil/fuel	Land degradation	Decommissioning and closure	Low	Stop through operational Control measures, e.g. drip	Low

					trays and use of well serviced machinery	
	Disruption of surface drainage	Water movement	Decommissioning and closure	Low	Control through storm water controls, remedy through rehabilitation	Low
Community and labour relations management	Community conflicts and tensions	Community relations	Operational	Medium	Control through Site Management protocols	Low
	Increase risk of fire	Fire risk	Operational	Low	Control through Site Management protocols	Low
	Reduced security on area	Safety Issues	Operational	Low	Control through Site Management protocols	Low
	Improved employment	Community relations	Operational	Medium +	No mitigation required	Medium +
	Improved skills	Community relations	Operational	Medium +	No mitigation required	Medium +

The supporting impact assessment conducted by the EAP must be attached as an appendix, marked **Appendix 5**

k) Summary of specialist reports.

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form):-

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Ecology Impact Assessment	To be included in final report		
Heritage Impact Assessment	To be included in final report		

Attach copies of Specialist Reports as appendices

l) Environmental impact statement

(i) Summary of the key findings of the environmental impact assessment;

The findings of the studies undertaken within this EIA to assess both the benefits and potential negative impacts anticipated from the proposed project conclude that:

- **There are no environmental fatal flaws that should prevent the proposed borrow pit development provided that the recommended mitigation and management measures are implemented and given due consideration during the life of mine of the borrow pit.**
- **The development will have both positive and negative social impacts. It will create employment and business opportunities for locals during both the construction and but will also create health and safety risk especially during operation. The negative impacts are however low.**
- **The management of the impact's hinges on the effective and efficient operation of the borrow pit. There is need to ensure that competent personnel are employed, and adequate training and skills development provided for where it is lacking.**
- **The cumulative significance of all the negative potential impacts on the environment is considered low due to the limited scale of the development and the scarcity of development in the immediate surrounding area.**

(ii) Final Site Map

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers. Attach as **Appendix**

Attached as an Appendix

(iii)Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

No alternatives were considered. The summary of identified positive and negative risks is as follows.

Negative Impacts:

- **Visual Impacts**
- **Noise Impacts**
- **Air Quality Deterioration**
- **Disruption of surface drainage- only in times of heavy downpour**
- **Destruction of flora and loss of habitat**
- **Loss of soil and agricultural potential- minimal however**
- **Water pollution**

- Erosion
- Safety and Security Impacts
- Land Degradation

Positive impacts:

- Creation of employment opportunities
- Training and skills development opportunities.
- Contributes towards infrastructure upkeep

m) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;

Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.

The management objectives and impact management outcomes are:

- To fulfil the requirements of Minerals and Petroleum Resources Development Act and the requirements of the National Environmental Management Act and other legislative requirements.
- To promote the rational development of borrow pit in order to reduce or eliminate the associated negative environmental impacts.
- To identify proposed mitigation and management measures to manage adverse impacts and to increase benefits.
- To ensure that the applicant use resources efficiently and effectively during the life of mine in order to reduce wastage thereby reducing associated negative environmental impacts.
- To improve the environmental awareness of all personnel who will work at the borrow pit.

n) Aspects for inclusion as conditions of Authorisation.

Any aspects which must be made conditions of the Environmental Authorisation

The applicant should appoint an independent environmental control officer to inspect and audit and make recommendations for the improvement of environmental performance during the life of mine of the borrow pit.

o) Description of any assumptions, uncertainties and gaps in knowledge.

(Which relate to the assessment and mitigation measures proposed)

In undertaking this investigation and compiling the report, it has been assumed that:

- The information provided by the client, and the applicant is accurate and unbiased.
- The scope of this investigation is limited to assessing the environmental impacts associated with the borrow pit and does not include assessment of lifecycle analysis of equipment and other materials to be used at the mine.

p) Reasoned opinion as to whether the proposed activity should or should not be authorised

i) Reasons why the activity should be authorized or not.

There are no environmental fatal flaws that should prevent the proposed development of the borrow pit on the current location provided that the recommended mitigation and management measures are implemented

The cumulative significance of all the negative potential impacts on the environment is considered low due to the limited scale of the development and the scarcity of development in the immediate surrounding area.

ii) Conditions that must be included in the authorisation

- The borrow pit be rehabilitated properly after material has been sourced and they should give their input in the finishing off and rehabilitation of the borrow pit.
- The borrow pit must be managed in accordance with the Environmental Management Program.
- The finishing off of the borrow pit must be safe for humans and animals.
- People residing close to the area should be informed of who will be working on the borrow pits, as well as the farm owner on which the borrow pit is situated.
- There should be no dumping of any kind of waste at or in the borrow pit.
- The borrow pit will only be used for the construction of the road by the Northern Cape Provincial Department.
- An Environmental Control Officer should be appointed to monitor the construction phase of the project.

q) Period for which the Environmental Authorisation is required.

3 Years

r) Undertaking

Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic assessment report and the Environmental Management Programme report.

The undertaking is provided at the end.

s) Financial Provision

State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.

i) Explain how the aforesaid amount was derived.

The financial provisions were derived in order to ensure that the amount of money required for rehabilitation and remediation of environmental impacts and associated damage as well as close-out is provided for and adequately calculated. The money would cover decommissioning and final closure of the operation; and post closure management of residual and latent environmental impacts. The amount was based on an assessment of the expected operational activities that will take place, the level of disturbance damage expected, the sensitivity of the area and the amount of work that is required to bring the site back to a self-sustaining

ecosystem again. Consideration on how much it will cost to get labour, material and equipment used for the rehabilitation were also considered.

Calculation of the quantum of the financial provision required to manage and rehabilitate the environment has been worked out.

Please refer to Appendix for the Quantum Calculation.

ii) Confirm that this amount can be provided for from operating expenditure. (Confirm that the amount, is anticipated to be an operating cost and is provided for as such in the Mining work programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be).

The Department of Roads and Public Works will provide this amount in its budget for the borrow pit operation. The department is exempted from providing the works program and the financial and technical competence report, in terms of the MPRDA Government Notice No. R762 of 25 June 2004, which deals with exemptions of organs of state from certain provisions of the MPRDA.

t) Specific Information required by the competent Authority

i) Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). the EIA report must include the: -

(1) Impact on the socio-economic conditions of any directly affected person.

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as an **Appendix** .

The person directly affected is the landowner / communal chief (Mr. Kgosi Bakang). The landowner will temporarily lose some grazing land until such a time that the borrow pit is properly rehabilitated. Agreements is in place with the landowner to utilize the borrow pit area. The assessment of the socio-economic impacts is shown in Appendix 5.

(2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act. **(**Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(*i*)(vi) and (vii) of that Act, attach the investigation report as **Appendix 2.19.2** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

Heritage impact assessment has been undertaken and will be included in final document.

u) Other matters required in terms of sections 24(4)(a) and (b) of the Act.

(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as **Appendix 4)**.

As the nature and scale of the calcrete and chert extraction operation at the borrow pit is limited, no reasonable feasible alternative was therefore considered. Whilst no feasible alternatives are

assessed the assessment of the No Go alternative, i.e. not implementing the borrow pit development was done and is shown in Appendix 5.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme.

a) **Details of the EAP,** (Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required).

The details of the EAP are provided in part A.

b) **Description of the Aspects of the Activity** (Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required).

The details are covered in part A as required.

c) Composite Map

(Provide a map **(Attached as an Appendix**) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers)

The map is attached in Appendix 8.

d) **Description of Impact management objectives including management statements**

i) **Determination of closure objectives.** (ensure that the closure objectives are informed by the type of environment described)

The closure management objectives took into account the existing environment, possible environmental impacts and the expectations at closure. To ensure that the closure objectives are informed by the type of environment, the anticipated impacts and damage at closure, the sensitivity of the area and expected post closure land use were taken into account. In doing so, principles of integrated environmental management were taken into account together with the principles of sustainable development. The closure objectives are:

- **To create a post mining environment that eliminates unacceptable health hazards and ensures public safety.**
- **To leave the site in a stable, non-polluting and tidy condition with no remaining plant or infrastructure that is not required for post mining operational use.**
- **To minimise or eliminate the downstream environmental impacts on the ecosystem due to interruption of drainage once the borrow pit operations cease.**

- **To establish a stable post-mining land surface which has been rehabilitated that also supports vegetation growth, is erosion resistant and has long term sustainability.**
- **To reduce the need for long-term monitoring and maintenance by establishing effective stability of the disturbed areas.**

ii) **Volumes and rate of water use required for the operation.**

No process water will be used by the contractor, however a water cart will be supplied for workers at the borrow pit. The water will be sourced from municipal sources.

iii) **Has a water use licence has been applied for?**

A water use license has not been applied for as water will be sourced from sources that are already registered with the Department Water and Sanitation.

iv) Impacts to be mitigated in their respective phases

Measures to rehabilitate the environment affected by the undertaking of any listed activity

ACTIVITIES **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. For mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	**PHASE** (of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure).	**SIZE AND SCALE of disturbance** (volumes, tonnages and hectares or m²)	**MITIGATION MEASURES** (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity.. With regard to Rehabilitation, therefore state either: -. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Site Establishment activities (fencing, signage, access formation, etc.)	Start-up	± 0.1ha	See appendix 5	Issues of compliance with standards will be incorporated into the day to day business activities at the borrow pit. The work methods used the monitoring and measures done and the review processes will be aimed at ensuring that legal thresholds as set out in the environmental standards are complied with. This will include compliance with standards as per COLTO 1998, the standards as per Mining and Petroleum Resources Development Act regulations, Mine Health and Safety Act regulations, National Water Act regulations.	During start up, operational phase

				COLTO 1998 Refers to - Standard Specification for Road and Bridge Works for State Road Authorities by the South African Committee of Land Transport Officials.	
Clearance of area for mining	Start-up & Operational Phase	± 3.2ha	See appendix 5	The work methods used, the monitoring and measurements done, and the review processes will be aimed at ensuring that legal thresholds as set out in the environmental standards are complied with. This will include compliance with standards as per COLTO 1998, the standards as per Mining and Petroleum Resources Development Act regulations, Mine Health and Safety Act regulations, and Conservation of Agricultural Resources Act.	During start up, operational phase as necessary
Excavation of material	Operational	± 4.1ha	See appendix 5	Management of legal compliance will be incorporated into normal business activities. This means that particular responsibilities need to be clearly defined for the identification of relevant issues and delivery of compliance. This will help to ensure that adequate resources are available to support these activities. Environmental standards as set out in COLTO 1998, Mining and Petroleum Resources Development Act regulations, Mine Health and Safety Act regulations and Water Act regulations.	Operational Phase
Drilling & blasting (if done)	Operational	As needed	See appendix 5	This will be achieved by clearly outlining the environmental standards	Operational Phase (when necessary)

				to be achieved and the thresholds which are not to be exceeded in the management system used at the site. This will include compliance with standards as per COLTO 1998, Explosive Act regulations, Mine Health and Safety Act Regulations and the Hazardous Substances Act	
Waste Disposal and Material storage	Operational	Undetermined	See appendix 5	The waste management hierarchy and the proximity principle will be used in ensuring that the environmental standards as set out in COLTO 1998 and the National Environmental Management Waste Act regulation and National Water Act regulation, are complied with.	Operational Phase
Material handling, hauling and transportation	Operational	Undetermined	See appendix 5	Issues of compliance with standards will be incorporated into the day to day business activities at the borrow pit to ensure that legal thresholds as set out in the environmental standards are complied with. This will include compliance with standards as per COLTO 1998, the standards as per Mining and Petroleum Resources Development Act regulations, Mine Health and Safety Act regulations, National Water Act regulations, Mine Health and Safety Act regulations.	Operational phase
Removal of infrastructure & equipment	Decommissioning and closure	Affected areas	See appendix 5	The recommendations will incorporate factors that include the elimination or the minimization of negative impacts in the work methodologies used during decommissioning so as to comply with the standards as per COLTO	At decommissioning

				1998, Mining and Petroleum Resources Development Act regulations, Mine Health and Safety Act regulations and the National Environmental Management Act.	
Re-shaping of borrow pit	Decommissioning and closure	± 4.0ha	See appendix 5	Considerations with the elimination or at least the minimization of any future impacts from the borrow pit and the long term stability of the facility and any concerns in relation to the long term liability for the borrow pit and its aesthetics will be incorporated in order to ensure compliance with standards as set out in COLTO 1998, Mine Health and Safety Act regulations, National Environmental Management Act and National Water Act regulations.	Closure period
Community and labour relations management	Operational	N/A	See appendix 5	Will comply with standards as per COLTO 1998, Basic Conditions of Employment Act regulations, Employment equity Act, Labour Relations Act and Skills Development Act	During Operational Phase
Revegetation of disturbed areas	Closure	± 4.0ha	See appendix 5	The future impacts from the borrow pit and the long term stability of the area, any concerns in relation to the long term liability for the facility and its aesthetics will be taken into account to ensure compliance with the environmental standards as set out in COLTO 1998, the National Environmental Management Act, Conservation of Agricultural resources Act, National Environmental	During Operational Phase in sections where mining has been completed and during closure

				Management Biodiversity Act regulations.	

e) Impact Management Outcomes

(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph ();

ACTIVITY (whether listed or not listed). **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)**	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated **(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation..**	**STANDARD TO BE ACHIEVED** **(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.**
Site Establishment activities (fencing, signage, access formation, etc.)	Loss of vegetation	Visual character, land use	Start-up	Remedy through rehabilitation Limit footprint	Impact managed effectively, Rehabilitate to a self-sustaining environment.
	Habitat Destruction	Visual character, land use	Start up	Remedy through rehabilitation Limit footprint	Impact reduced
	Visual scarring	Visual character	Start up and operational	Remedy through rehabilitation	Impact managed effectively
	Soil erosion	Visual character, land use	Start up and operational	Remedy through rehabilitation, storm water control. Limit footprint, Control through storm water control	Impact avoided
Clearance of area for mining	Visual scarring	Visual Character	Operational Phase	Remedy through rehabilitation Limit footprint and removal of vegetation.	Impact managed to acceptable levels; residual impact reduced
	Destruction of flora and habitat	Visual Character, land use	Operational Phase	Remedy through rehabilitation	Impact reduced to a satisfactory level, rehabilitate to an end land use similar to that prior to the activity (depending on

					the end land use objectives)
	Loss of agricultural potential	Land use management	Operational Phase	Use soil conservation techniques Limit Footprint	Impact managed to ensure suitable soil fertility levels, Rehabilitate to an end land use similar to that prior to the activity.
	Soil erosion	Visual character, land use	Start up and operational	Remedy through rehabilitation, Storm water control	Impact avoided
Excavation	Dust emissions	Air quality	Operational Phase	Control with dust control measures	Particulates reduced to acceptable levels
	Drainage disruption	Drainage	Operational Phase	Control with Storm water controls	Good surface water run-off established
	Slope instability	Topography	Operational Phase	Control with slope management controls	Stable surfaces established
	Noise	Noise	Operational Phase	Control with Noise control measures	Noise reduced to acceptable levels
	Visual Scarring	Visual Character	Operational Phase	Rehabilitation	Impact managed effectively; residual impact reduced
	Soil erosion	Land use	Operational Phase	Rehabilitation, use slope management control	Impact levels avoided
	Destruction of heritage resource	Heritage issues	Operational Phase	Avoidance	Impact Avoided
Drilling & blasting (if done)	Noise and vibrations	Noise	Operational Phase	Control with blast control measures	Noise levels reduced to acceptable levels
	Dust	Air quality	Operational Phase	Control with dust control measures Control with blast control measures	Particulates reduced to acceptable levels
	Fly rock	Safety, Land degradation	Operational Phase	Control with blast control measures	Fly rock minimised

Waste Disposal and Material storage	Soil contamination	Land degradation	Operational Phase	Avoidance, Operational control measures	Impact Avoided
	Water pollution	Water	Operational Phase	Avoidance, Operational control measures	Impact Avoided
	Increased risk of fire	Safety	Operational Phase	Avoidance, Operational control measures	Impact avoided or managed to low levels
Material handling, hauling and transportation	Dust	Air quality	Operational Phase	Dust Control measures	Particulates reduced to acceptable levels
	Increased risk of accidents	Safety	Operational Phase	Site management protocols	Accidents avoided or reduced to low levels
	Noise	Noise	Operational Phase	Noise control measures	Noise reduced to acceptable levels
	Soil contamination from oil/fuel leaks	Land degradation	Operational Phase	Operational control measures	Impact managed to suitable soil fertility levels
Removal of infrastructure & equipment and re-shaping of borrow pit	Noise	Noise	Decommissioning and closure	Control with noise control measures	Noise levels reduced to acceptable levels
	Dust	Air quality	Decommissioning and closure	Control with dust control measures	Particulates reduced to acceptable levels
	Soil contamination from oil/fuel	Land degradation, water pollution	Decommissioning and closure	Control with operational control measures	Impact managed to suitable soil fertility levels, pollution of water avoided
	Disruption of surface drainage	Water movement	Decommissioning and closure	Control with storm water controls	Free drainage achieved
Community and labour relations management	Community conflicts and tensions	Community relations	Operational	Control using site management protocols	Reduction in complaints and incidences of conflict
	Increased risk of fire	Fire risk	Operational	Control using Site management protocols	Fires avoided and risk reduced
	Reduced security on area	Safety Issues	Operational	Control site management protocols	Improvement in security and elimination of theft incidences

	Improved employment	Community relations	Operational	Control site management protocols	Increase in number of people employed
	Improved skills	Community relations	Operational	Controls site management protocols	Improvement in skills level

f) Impact Management Actions

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (c) and (d) will be achieved).

ACTIVITY whether listed or not listed. **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** **Remedy through rehabilitation.**	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: -.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
Site Establishment activities (fencing, signage, access formation, etc.)	Loss of vegetation	Remedy through rehabilitation	Start-up	Issues of compliance with standards will be incorporated into the day to day business activities at the borrow pit. The work methods used, the monitoring and measures done, and the review processes will be aimed at ensuring that legal thresholds as set out in the environmental standards are complied with. This will include compliance with standards as per COLTO
	Habitat Destruction	Limit footprint	Start up	
	Visual scarring	Remedy through rehabilitation	Start up and operational	
	Soil erosion	Limit footprint	Start up and operational	

				1998, the standards as per Mining and Petroleum Resources Development Act regulations, Mine Health and Safety Act regulations, National Water Act regulations
Clearance of area for mining Excavation	Visual scarring	Remedy through rehabilitation	Operational Phase	The work methods used, the monitoring and measurements done, and the review processes will be aimed at ensuring that legal thresholds as set out in the environmental standards are complied with. This will include compliance with standards as per COLTO 1998, the standards as per Mining and Petroleum Resources Development Act regulations, Mine Health and Safety Act regulations, and Conservation of Agricultural Resources Act.
	Destruction of flora and habitat	Remedy through rehabilitation	Operational Phase	
	Loss of agricultural potential	Soil conservation techniques, Limit footprint of the borrow pit	Operational Phase	
	Soil erosion	Remedy through rehabilitation, Storm water control	Operational Phase	
	Dust emissions	Control with dust control measures	Operational Phase	
Drilling & blasting (if done)	Drainage disruption	Control with Storm water controls	Operational Phase	Management of legal compliance will be incorporated into normal business activities. This means that particular responsibilities need to be clearly defined for the identification of relevant issues and delivery of compliance. This will help to ensure that adequate resources are available to support these activities. Environmental standards as set out in COLTO 1998, Mining and
	Slope instability	Control with slope management controls	Operational Phase	
	Noise	Control with Noise control measures	Operational Phase	
	Visual Scarring	Rehabilitation	Operational Phase	
	Soil erosion	Rehabilitation, use slope management control	Operational Phase	
	Destruction of heritage resource	Avoidance	Operational Phase	
	Noise and vibrations	Control with blast control measures	Operational Phase	

				Petroleum Resources Development Act regulations, Mine Health and Safety Act
Waste Disposal and Material storage	Dust	Control with dust control measures Control with blast control measures	Operational Phase	This will be achieved by clearly outlining the environmental standards to be achieved and the thresholds which are not to be exceeded in the management system used at the site. This will include compliance with standards as per COLTO 1998, Explosive Act regulations, Mine Health and Safety Act Regulations and the Hazardous Substances Act
	Fly rock	Control with blast control measures	Operational Phase	
	Soil contamination	Avoidance, Operational control measures	Operational Phase	
Material handling, hauling and transportation	Water pollution	Avoidance, Operational control measures	Operational Phase	The waste management hierarchy and the proximity principle will be used in ensuring that the environmental standards as set out in COLTO 1998 and the National Environmental Management Waste Act regulation and National Water Act regulation, are complied with.
	Increased risk of fire	Avoidance, Operational control measures	Operational Phase	
	Dust	Control with dust Control measures	Operational Phase	
Removal of infrastructure & equipment and re-shaping of borrow pit	Increased risk of accidents	Site management protocols	Operational Phase	Issues of compliance with standards will be incorporated into the day to day business activities at the borrow pit to ensure that legal thresholds as set out in the environmental standards are complied with. This will include compliance with standards as per COLTO 1998, the standards as per
	Noise	Control with noise control measures	Operational Phase	
	Soil contamination from oil/fuel leaks	Control with operational control measures	Operational Phase	
	Noise	Control with noise control measures	Decommissioning and closure	

				Mining and Petroleum Resources Development Act regulations, Mine Health and Safety Act regulations, National Water Act regulations, Mine Health and Safety Act regulations.
Community and labour relations management	Dust	Control with dust control measures	Decommissioning and closure	The recommendations will incorporate factors that include the elimination or the minimization of negative impacts in the work methodologies used during decommissioning so as to comply with the standards as per COLTO 1998, Mining and Petroleum Resources Development Act regulations, Mine Health and Safety Act regulations and the National Environmental Management Act.
	Soil contamination from oil/fuel	Control with operational control measures	Decommissioning and closure	
	Disruption of surface drainage	Control with storm water controls	Decommissioning and closure	
	Community conflicts and tensions	Control using site management protocols	Operational	
Site Establishment activities (fencing, signage, access formation, etc.)	Increased risk of fire	Control using site management protocols	Operational	The future impacts from the borrow pit and the long term stability of the area, any concerns in relation to the long term liability for the facility and its aesthetics will be taken into account to ensure compliance with the environmental standards as set out in COLTO 1998, the National Environmental Management Act, Conservation of Agricultural resources Act and National Environmental
	Reduced security on area	Control site management protocols	Operational	
	Improved employment	Control site management protocols	Operational	
	Improved skills	Controls site management protocols	Operational	
	Loss of vegetation	Remedy through rehabilitation	Start-up	

				Management Biodiversity Act regulations.

i) Financial Provision

(1) Determination of the amount of Financial Provision.

(a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.

The DPR acknowledges that a borrow pit is a temporary land use which results in areas of land being temporarily disturbed. Whilst steps are taken throughout the project life cycle to reduce negative environmental impacts as they occur, the specific closure objectives are as follows:

- To create a post mining environment that eliminates unacceptable health hazards and ensures public safety.
- To leave the site in a stable, non-polluting and tidy condition with no remaining plant or infrastructure that is not required for post mining operational use.
- To minimise or eliminate the downstream environmental impacts on the ecosystem due to interruption of drainage once the borrow pit operations cease.
- To establish a stable post-mining land surface which has been rehabilitated that also supports vegetation growth, is erosion resistant and has long term sustainability.
- To reduce the need for long-term monitoring and maintenance by establishing.

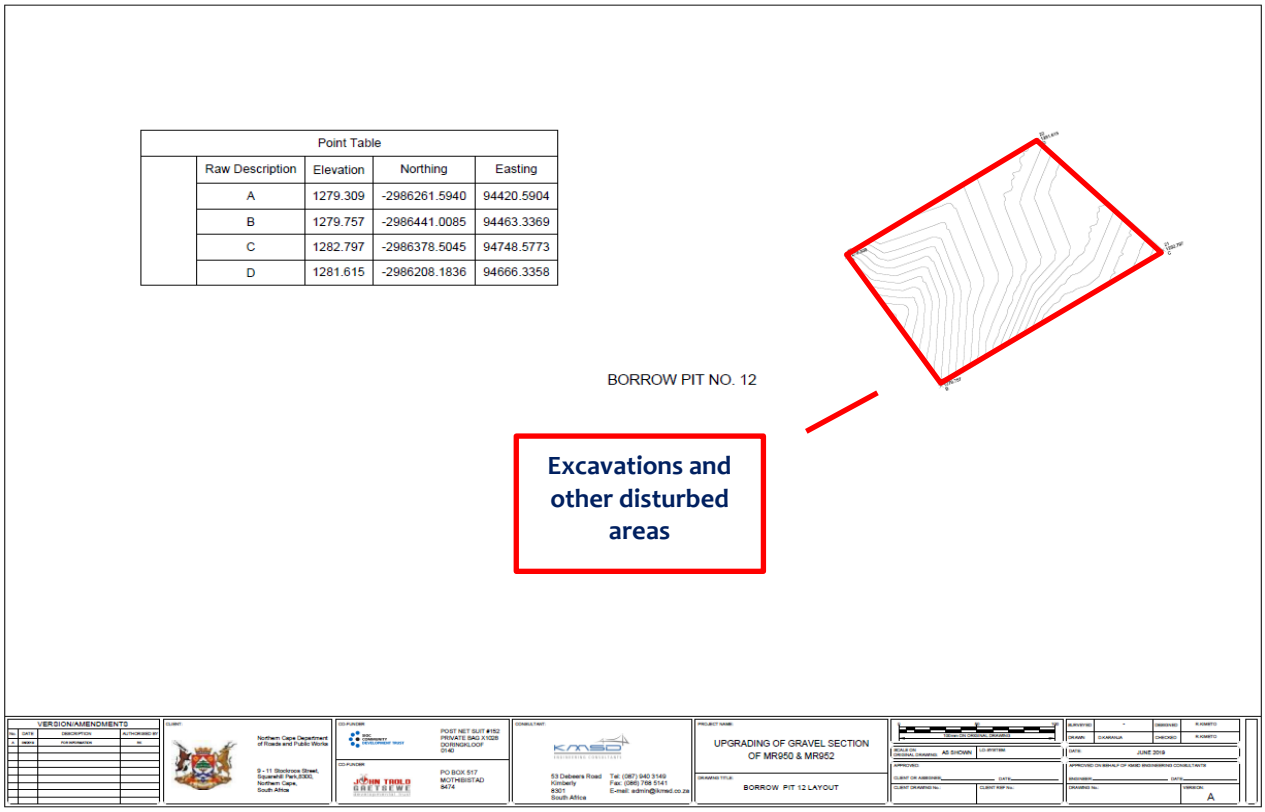
(b) Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

Objectives has been set out in regard to closing of the borrow pit, consultation between the EAP, landowners and I&AP has taken place.

(c) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

The rehabilitation plan is shown in Appendix 8.

Areas for Rehabilitation (Approximate)



(d) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

Rehabilitations to happen after borrow pit has been used by contractor for surface mining. The rehabilitation takes into consideration the closure objects, the nature of the impacted land at the end of operational activities and objectives at closure and the need to ensure that their post-closure maintenance is minimal.

(e) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

Refer to Appendix 7 for the estimated forecasted financial provisions required.

(f) Confirm that the financial provision will be provided as determined.

The applicant commits to provide the amount as determined and needed as financial provision by the Department of Mineral Resources.

Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

g) Monitoring of Impact Management Actions
h) Monitoring and reporting frequency
i) Responsible persons
j) Time period for implementing impact management actions
k) Mechanism for monitoring compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Site Establishment activities (fencing, signage, access formation, etc.)	Loss of vegetation, Habitat destruction, Visual scarring, Soil erosion	Visual checks, monitoring incidences of non-compliance, recording of key parameters See Appendix 9 for details	Appointed Contractor	At start and as and when required. Record incidences of non-compliance monthly. See Appendix 9 for details
Clearance of area for mining	Visual scarring, Destruction of flora and habitat, Loss of agricultural potential, soil erosion	Visual checks, monitoring incidences of non-compliance, recording of key parameters See Appendix 9 for details	Appointed Contractor	At start and as and when required. Record incidences of non-compliance monthly. See Appendix 9 for details
Excavation	Dust emissions, Drainage disruption, Slope instability, Visual Scarring, Soil erosion, Destruction of heritage resource	Visual checks, monitoring incidences of non-compliance, recording of key parameters See Appendix 9 for details	Appointed Contractor	During operational phase. Record measurements and incidences of non-compliance monthly. See Appendix 9 for details
Drilling & blasting (if done)	Noise and vibrations, Dust, Fly rock	Visual checks, monitoring incidences of non-compliance, recording of key parameters See Appendix 9 for details	Appointed Contractor	When drilling and blasting is done. Record key parameters when done. See Appendix 9 for details

Waste Disposal and Material storage	Soil contamination, Water pollution, Increased risk of fire	Visual checks, monitoring incidences of non-compliance, recording of key parameters See Appendix 9 for details	Appointed Contractor	During life of mine as and when required. Record key parameters and non-compliances monthly. See Appendix 9 for details
Material handling, hauling and transportation	Dust, Increased risk of accidents, Noise, Soil contamination	Visual checks, monitoring incidences of non-compliance, recording of key parameters See Appendix 9 for details	Appointed Contractor	Ongoing during life of mine and record key parameters & non-compliances monthly. See Appendix 9 for details
Removal of infrastructure & equipment and re-shaping of borrow pit	Noise, Dust, Soil contamination, Disruption of surface drainage	Visual checks, monitoring incidences of non-compliance, recording of key parameters See Appendix 9 for details	Appointed Contractor	At decommissioning and closure and when required. Maintain disposal records See Appendix 9 for details
Community and labour relations management	Community conflicts and tensions, Increase risk of fire, Reduced security on area, Improved employment rates, Improved skills	Monitoring incidences of complaints, recording of key parameters See Appendix 9 for details	Appointed Contractor	During life of mine and record complaints, incidents and labour statistics monthly. See Appendix 9 for details

l) Indicate the frequency of the submission of the performance assessment/ environmental audit report.

- The DPR shall employ an independent environmental control official to check quarterly that the contractor is carrying out all the environmental management measures and components. An audit report will be done and submitted to the DPR.
- The DPR will submit an environmental performance report annually during the operational phase of the borrow pit.

m) Environmental Awareness Plan

(1) Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.

All employees will go through an induction of general environmental issues and given specifics on their jobs. The training will include:

- Making employees aware that everyone has a right to a clean environment and that everyone has a responsibility to protect the environment.
- Explanation of the importance of complying with the EMP specifications.
- Discussion of the potential environmental impacts of operational activities and mitigation measures that must be implemented when carrying out activities.
- The importance of personal performance on dealing with environmental issued and explanations of the management structure of individuals responsible for matters pertaining to the EMP.

Communication can be done either in a written or verbal format but will be in an appropriate format for the receiving audience. Records of all training done are to be kept.

The environmental Awareness plan is shown in appendix 10.

(2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.

The applicant will endeavour to improve the competence and skills of personnel. A culture of environmental protection will be promoted.

Procedures will be put in place to effectively minimise any identified high-risk areas and to proactively control any environmental incidents if they occur.

The applicant will also continuously improve and promote a code that goes beyond minimal compliance with environmental legislation.

This is shown in Appendix 10.

n) Specific information required by the Competent Authority
(Among others, confirm that the financial provision will be reviewed annually).

The amount will be provided as part of the overall budget of the rehabilitation of the intended road and the use of the borrow pit.

2) UNDERTAKING

The EAP herewith confirms

a. the correctness of the information provided in the reports; ☒

b. the inclusion of comments and inputs from stakeholders and I&APs; ☒

c. the inclusion of inputs and recommendations from the specialist reports where relevant; ☒ and

d. that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected. parties are correctly reflected herein. ☒

Signature of the environmental assessment practitioner:

Green – Box Consulting

Name of company:

28 June 2019

Date:

-END

Page intentionally left blank

EAPs OPINION ON THE FUTURE OF BORROW PIT

It is the judged opinion of the EAP that the borrow pit should be used or considered for future use. Furthermore, the material in the borrow pit was independently tested and consists of material appropriate for the rehabilitation of the intended road.

KMSD Consulting Engineers (Pty) Ltd advises the Department of Roads and Public Works to consider the use of this borrow pit and fully rehabilitate it.

Page intentionally left blank

APPENDIXES

APPENDIX 1
EAP CURRICULUM VITAE

ONE PAGER - CURRICULUM VITAE

DANIE KRYNAUW

1. Family name: Krynauw
2. First name: Daniël
3. Date of birth: 1971/12/14
4. Nationality: South African
5. Contacts: Cell: 0824352108 / e-mail: danie@green-box.co.za
6. Education:

Institution	Degree(s) or Diploma(s) obtained
University of the Free State 2001 - 2002	Master in Environmental Management – Dissertation pending
University of the Free State 1996-1998	Masters in Urban and Regional Planning (UFS)
University of the Free State 1993-1995	BA Geography and Sociology (UFS)

7. Membership of professional bodies:
   - International Association of Impact Assessment South Africa (IAIAsa)

8. Present position: Environmental Scientist / Director – Green-Box Consulting

9. Current Responsibilities:
   - Liaising with clients in both the private and public sectors.
   - Conduct Environmental Impact Assessments and other Environmental Technical Investigations.
   - Apply and obtain waste licenses, water licenses, mining permits and environmental authorisations for clients.
   - Use different GIS datasets in order to create new information or investigate patterns for projects.
   - Conduct environmental compliance and other environmental audits.
   - Provide technical-level support for environmental remediation and mitigation projects, including remediation system design and determination of regulatory applicability for incoming projects.
   - Collaborate with other environmental scientists, planners, engineers, and other specialists, and experts in law and business etc to address environmental problems for clients.
   - Conduct Environmental training.

10. Years within the organization: 8 years (total years' environmental management experience = 18 years)

11. Other skills (e.g. computer literacy, etc.): All suits of Microsoft Office, Arc View, ReGIS, and Project Professional.

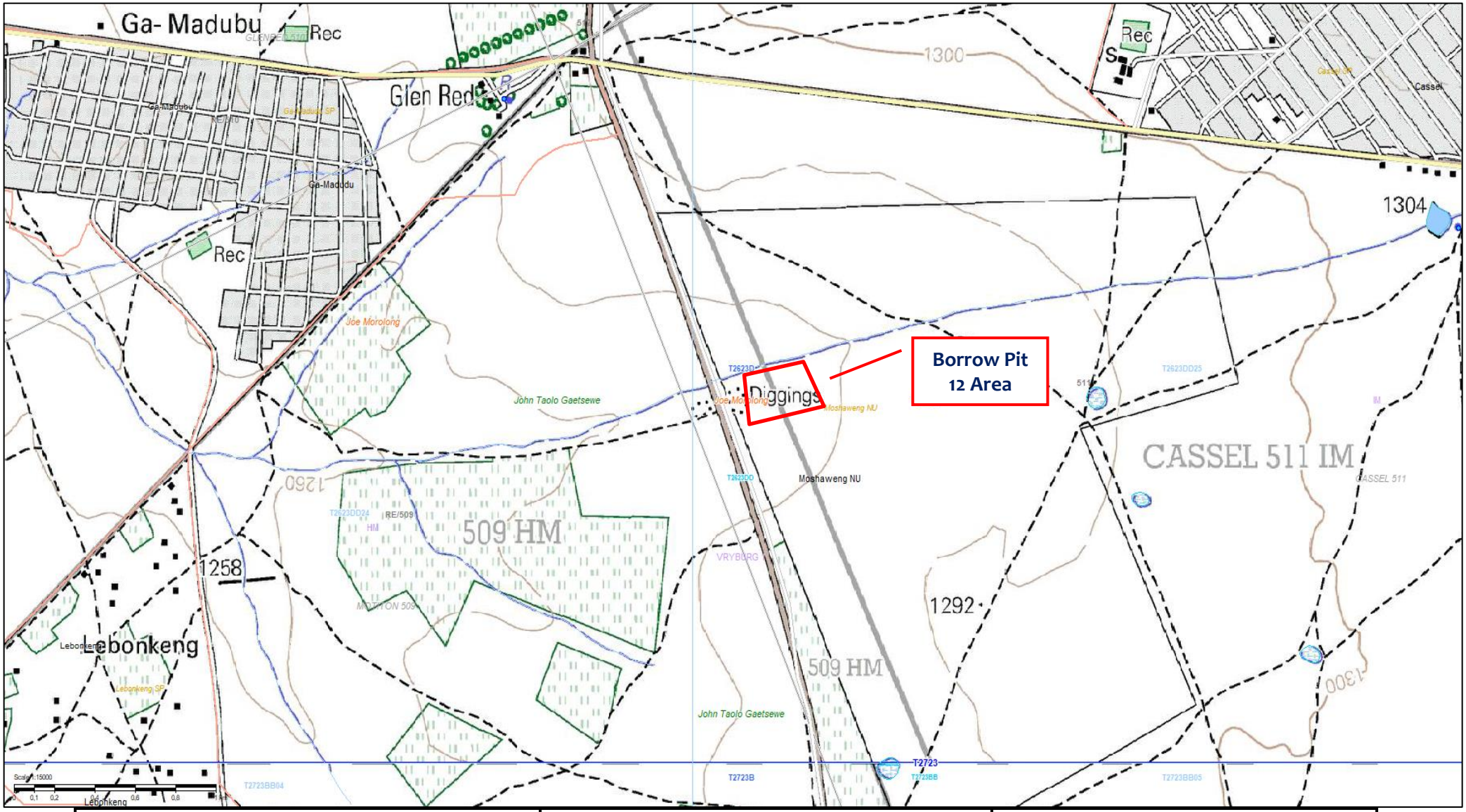
12. Professional experience:

Date	2011 - Current
Organisation	Green-Box Consulting (Environmental Consultants)
Position	Environmental Scientist (Owner and Director)

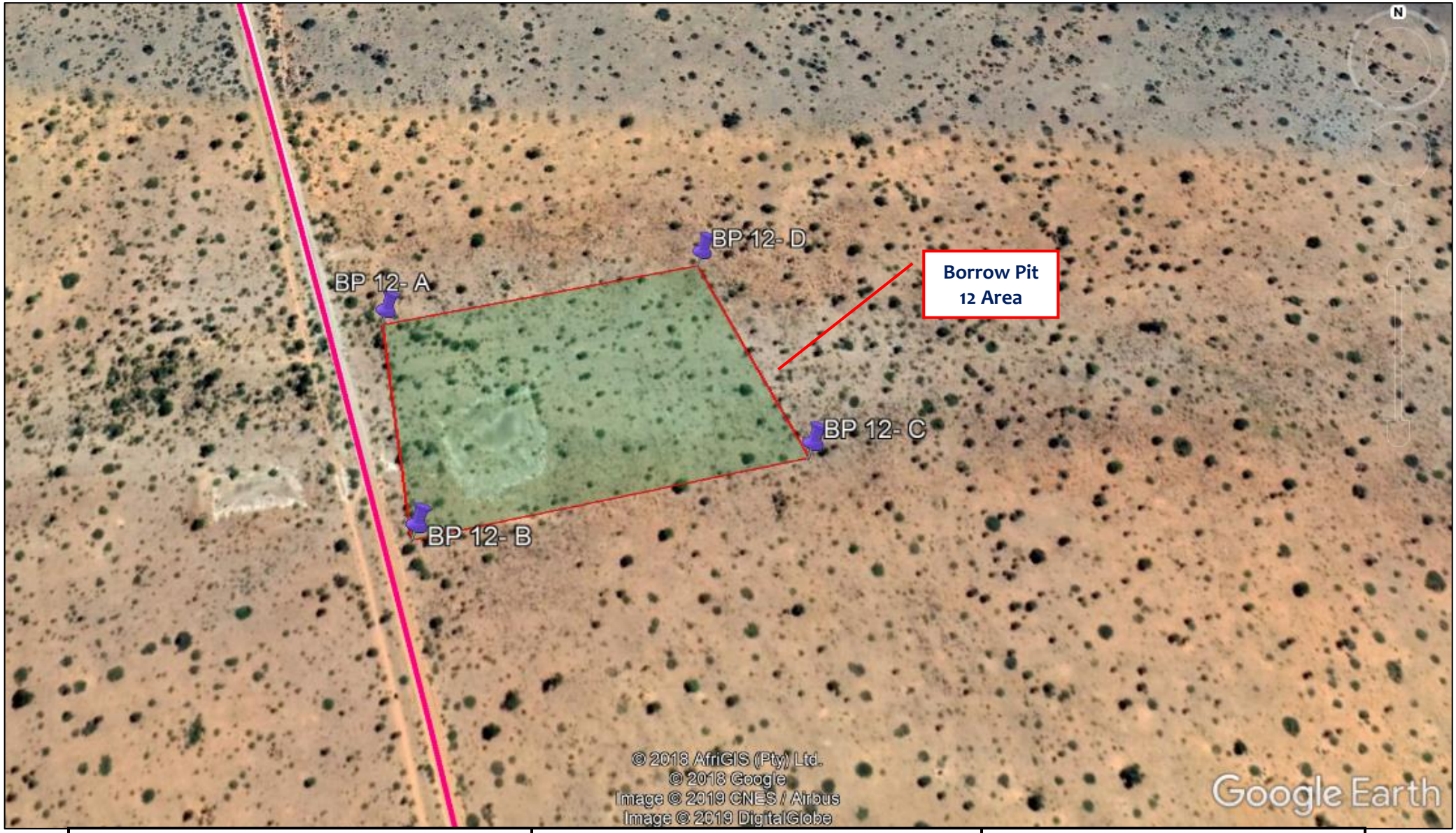
Date	2009 - 2016
Organisation	Terra Works Environmental Consultants
Position	Senior Environmental Scientist and COO

Date	2001 - 2009
Organisation	Department of Economic Development, Tourism and Environmental Affairs, Free State
Position	Principal Environmental Officer
Description of duties	Review Environmental Impact Assessments Review Environmental Management Programmes Issuing Environmental Authorisations

APPENDIX 2
LOCALITY MAP AND BORROW PIT DIAGRAM



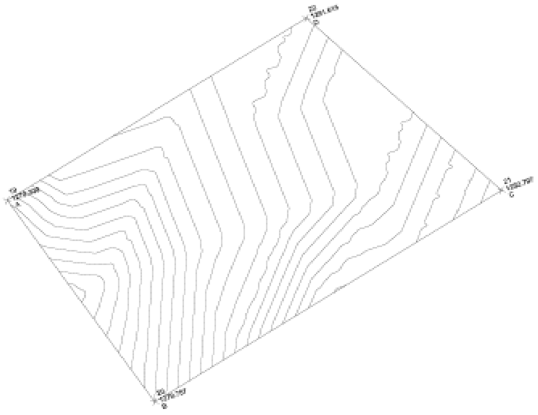
Department of Roads and Public Works- Northern Cape **P O Box 3132** **Kimberley** **8300**	**BORROW PIT 12** **Locality Map - Planet GIS Explorer** **(1: 15000)**	**Green-Box Consulting** **P O Box 37738** **Langenhovenpark** **9330**



Department of Roads and Public Works- Northern Cape P O Box 3132 Kimberley 8300	**BORROW PIT 12** **Google Earth Image** (Image accessed on 06/2019)	Green-Box Consulting P O Box 37738 Langenhovenpark 9330

Point Table				
	Raw Description	Elevation	Northing	Easting
	A	1279.309	-2986261.5940	94420.5904
	B	1279.757	-2986441.0085	94463.3369
	C	1282.797	-2986378.5045	94748.5773
	D	1281.615	-2986208.1836	94666.3358

BORROW PIT NO. 12



VERSION/AMENDMENTS

No.	DATE	DESCRIPTION	AUTHORISED BY
A		FOR INFORMATION	

CLIENT:

Northern Cape Department of Roads and Public Works

9 - 11 Stockrose Street, Squarehill Park,8300, Northern Cape, South Africa

CO-FUNDER:

POST NET SUIT #152
PRIVATE BAG X1028
DORINGKLOOF
0140

CO-FUNDER:

PO BOX 517
MOTHIBISTAD
8474

CONSULTANT:

53 Debeers Road
Kimberly
8301
South Africa

Tel: (087) 940 3149
Fax: (086) 768 5141
E-mail: admin@kmsd.co.za

PROJECT NAME:

UPGRADING OF GRAVEL SECTION OF MR950 & MR952

DRAWING TITLE:

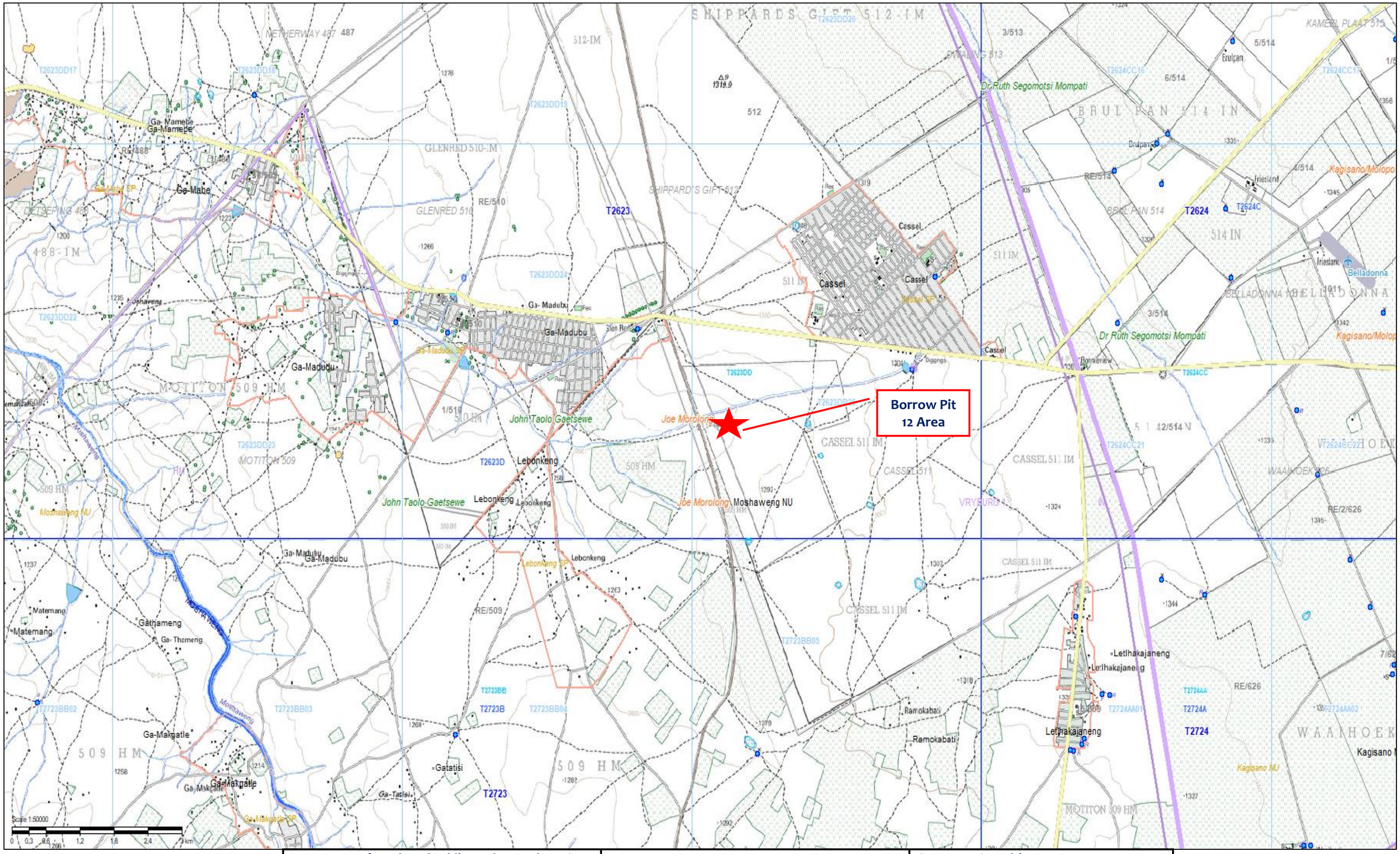
BORROW PIT 12 LAYOUT

SCALE ON ORIGINAL DRAWING: AS SHOWN

DATE: JUNE 2019

DRAWN: C.KARANJA

VERSION: A



Department of Roads and Public Works- Northern Cape **P O Box 3132** **Kimberley** **8300**	**BORROW PIT 12** **Locality Map - Planet GIS Explorer** **(1:50000)**	**Green-Box Consulting** **P O Box 37738** **Langenhovenpark** **9330**

APPENDIX 3
PUBLIC CONSULTATION DOCUMENTS

PUBLIC CONSULTATION PROCESS DOCUMENT

INTRODUCTION

This document describes the public participation processes that were carried out during the EIA process of the proposed borrow pit development.

The EIA Regulations promulgated under section 24 of the National Environmental Management Act 107 of 1998 (NEMA), sets out the minimum requirements regarding public participation by interested and affected parties (I&APs). In terms of the new EIA regulations, the public participation process is one of the first steps in an application process, not only facilitating the provision of just administrative action by an organ of state but also allowing the applicant of the environmental authorisation to take advantage of the information that I&APs may contribute concerning local knowledge, impacts and alternatives of the proposed development.

Public acceptance criteria relate to the possible adverse impact on quality of life, the impact on local land and property values, impact on biophysical environment and potential public resistance to the development of this nature. Failure to meet the public acceptance criteria may constitute a reason to decline the application for the development. Acceptance by the IAPs immediately affected by the project therefore represents a critical factor in determining the feasibility of the proposed development. It is therefore a Minimum Requirement that those IAPs who would be immediately affected by the site under consideration be included in the consultative process. The IAPs must be identified and fully informed of the proposed development and its potential implications, so that their input may be obtained. The objectives of this are to ensure that the IAP's concerns are addressed in a responsible manner. If the acceptance of the IAPs can be obtained, the feasibility of the proposed development may be confirmed. This report contain the details of the efforts taken to notify the public and key stakeholders about the project, the advertisement and site notices placed, the information provided to the IAPs, the IAPs who registered, the minutes of key stakeholder meeting held: The information is provided in the following annexures:

- **Site notices placed,**
- **Advert placed in a Newspaper,**
- **Correspondence received from IAPs,**
- **List of people contacted.**

Site Notice placed at Borrow Pit 12 Site

Plate A: Close –up Photograph of the site notice placed at Borrow Pit 12 site.

Plate B: Photograph of site noticed placed next to the road, opposite the borrow pit area.

Notice placed in the Noordkaap Newspaper- 29 May 2019

Noordkaap | 29 Mei 2019 | www.noordkaap.co.za

Geklassifiseerd

ENVIRONMENTAL IMPACT / GRAVEL MINING & WATER USE APPLICATIONS NOTIFICATION

Proposed upgrading of roads MR 952, from Bothithong to Dithakong, and MR 950 from Dithakong to Cassel, Northern Cape

Notice is given in terms of Chapter 4 of Regulations published in Government Notice No 40772, dated 07 April 2017 under the National Environmental Management Act (Act No. 107 of 1998), and the Mineral and Petroleum Resources Development Act, 2002 (as amended), & the National Water Act, Act 36 of 1998, GN 509 of 2016 that Provincial Department of Roads and Public Works is of intent to apply for approvals for the following activities:

1. Upgrading of roads MR 952 from Bothithong to Dithakong and MR 950 from Dithakong to Cassel – Environmental Authorisation application for: activity no.: 19 (The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse); no.: 21 (Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act No. 28 of 2002, including, (a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource, (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing.)
2. Mining of gravel material at 5 x new Borrow-Pits– Mining Permit application ito Section 27 of the MPRDA; and
3. Road construction crossing various drainage lines (water courses) – General Authorisation registration ito activities 21 (c) & (i) of GN R 509.

Green-Box Consulting is the Environmental Assessment Practitioner who will be managing the application process. You are invited to register as an Interested and/or Affected Party (I&AP) and/or to provide any written comments on the BA process. To obtain further information, to comment and /or to register as an I&AP, please provide your full name, full postal address, phone numbers, email address and state your area of interest and/or concern to Mr. Danie Krynauw, Green-Box Consulting, PO Box 37738, Langenhovenpark, 9330, Phone: 082 435 2108, or Email: info@green-box.co.za. You have 21 days to register as an Interested and/or Affected Party (I&AP) from the date of placement.

ENVIRONMENTAL IMPACT / GRAVEL MINING & WATER USE APPLICATIONS NOTIFICATION

Proposed upgrading of roads MR 952, from Bothithong to Dithakong, and MR 950 from Dithakong to Cassel, Northern Cape. Notice is given in terms of Chapter 4 of Regulations published in Government Notice No 40772, dated 07 April 2017 under the National Environmental Management Act (Act No. 107 of 1998), and the Mineral and Petroleum Resources Development Act, 2002 (as amended), & the National Water Act, Act 36 of 1998, GN 509 of 2016 that Provincial Department of Roads and Public Works is of intent to apply for approvals for the following activities: 1. Upgrading of roads MR 952 from Bothithong to Dithakong and MR 950 from Dithakong to Cassel – Environmental Authorisation application for: activity no.: 19 (The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse); no.: 21 (Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act No. 28 of 2002, including, (a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource, (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing.) 2. Mining of gravel material at 5 x new Borrow-Pits– Mining Permit application ito Section 27 of the MPRDA; and 3. Road construction crossing various drainage lines (water courses) – General Authorisation registration ito activities 21 (c) & (i) of GN R 509. Green-Box Consulting is the Environmental Assessment Practitioner who will be managing the application process. You are invited to register as an Interested and/or Affected Party (I&AP) and/or to provide any written comments on the BA process. To obtain further information, to comment and /or to register as an I&AP, please provide your full name, full postal address, phone numbers, email address and state your area of interest and/or concern to Mr. Danie Krynauw, Green-Box Consulting, PO Box 37738, Langenhovenpark, 9330, Phone: 082 435 2108, Email: info@green-box.co.za. You have 21 days to register as an Interested and/or Affected Party (I&AP) from the date of placement.

IN THE ESTATE OF THE LATE DESMOND PETER PAYNE
IDENTITY NUMBER: 650320 5010 08 2
PASSING: 09 MARCH 2019
FARM J11 MAGOGANG, NORTHERN CAPE
ESTATE NO: 1359/2019
MASTER'S OFFICE: KIMBERLEY
DEBTORS AND CREDITORS in the abovementioned estate are hereby requested to lodge their claims or to pay their indebtedness to the estate within a period of thirty (30) days as from date of publication hereof. ALK EXECUTORS AND FIDUCIARY SERVICES TRUST (PTY) LTD, SUITE T1, CATS CORNER BUILDING, 39 KROTON STREET, ROODEPOORT, 1715, mary@alkexec.co.za

BOEDELS: LIKWIDASIE EN DISTRIBUSIE

KENNISGEWING VIR BOEDEL WYLE ADVERTENSIES LIKWIDASIE- EN DISTRIBUSIE-REKENING
IN DIE BOEDEL VAN WYLE PHYLLIS DANIELS
IDENTITEITSNOMMER: 260517 0016 08 7
VAN: JAVID MEWS 3, JAMESON LAAN, KIMBERLEY
MEESTER SE VERW.: 430/2019
Die Gewysigde Eerste en Finale Likwidasie- en Distribusierekening in die bogemelde boedel sal ter insae lê te die kantore van die Meester van die Hooggeregshof KIMBERLEY vir 'n periode van 21 (een en twintig) dae vanaf 31 MEI 2019.
H P A VENTER, Prokureurs vir Eksekuteur, DUNCAN & ROTHMAN, Kantoor 69, Suite 1, Eerste Vloer, North Cape Mall, Jacobus Smitstraat 31, KIMBERLEY. Verw. HV/jm./DAN52/0001

Landowner agreement letter

AGREEMENT PERTAINING TO THE USE OF THE BORROW PIT

Date: 3/12/2013

Mr/Me/ B.D. PHETLHU

Postal Address: P/Bag X 130
Mothibistad
Kuruman
8460

Telephone no. 053 7771099

Cell. No. 072 737 7908

e-mail: phetlhub@yahoo.com

AGREEMENT PERTAINING TO THE USE OF THE BORROW PIT (QUARRY)

ON THE FARM BP2 on Heiso No 114 (RE/114):

IN THE DISTRICT OF John Taolo Gaetsewe:

1. I Kgosi Bakang D. Phetlhu,

the traditional leader of the property

.....,

hereby certify that I agree that the borrow pit/s (quarry/s) on the property (see attached map) can be used for the excavation of road building material subject to the following conditions:

1.1 The borrow pit (quarry) and access road (if applicable) will be satisfactorily rehabilitated in terms of the Environmental Management Plan.

1.2 All activities shall be kept within the designated borrow pit (quarry) area..

1.3 Chemical toilets shall be provided to prevent pollution of the environment, including ground and surface water.

1.4 The borrow pit area and haul road shall be fenced off and gates provided in order to ensure the safety of the borrow pit and to ensure that no livestock enter the borrow pit.

1.5 Adequate access control will be exercised during the period of excavation of road building material.

1.6 All site personnel shall be taught regarding the requirements for dealing with potential emergencies, including fires, accidental leaks and spillage of pollutants.

1.7 All precautions shall be taken to prevent any waste/fires from spreading on or from the site.

1.8 The material obtained from the borrow pit (quarry) will only be used for the rehabilitation and/or construction of provincial roads.

1.9 A copy of the Environmental Management Plan compiled by an Environmental Managing Consultant regarding the management, operation and rehabilitation of the borrow pit will be made available to me.

1.10 I also request that the following conditions be addressed:

See attached minutes

Signed on 03-12-2013 2013 at Camdeboo Village

Yours faithful

TRADITIONAL LEADER

WITNESSES: (1)

Date: 03-12-2013

(2)

AGREEMENT PERTAINING TO THE USE OF THE BORROW PIT

Date: 3/12/2013

Mr/Me/ B.D. PHETLHU

Postal Address: P/Bag X 130
Mathibistad
Kuruman
8474

Telephone no. 053 773 1099

Cell. No. 082 731 9908

e-mail: phetlhub@yahoo.com

AGREEMENT PERTAINING TO THE USE OF THE BORROW PIT (QUARRY)

ON THE FARM BP 546 on Petersham No. 107 (5/107)

IN THE DISTRICT OF John Taolo Gaetsewe

1. I Kgosi B.D. Phetlhu,

the traditional leader of the property

.....,

hereby certify that I agree that the borrow pit/s (quarry/s) on the property (see attached map) can be used for the excavation of road building material subject to the following conditions:

1.1 The borrow pit (quarry) and access road (if applicable) will be satisfactorily rehabilitated in terms of the Environmental Management Plan.

1.2 All activities shall be kept within the designated borrow pit (quarry) area..

1.3 Chemical toilets shall be provided to prevent pollution of the environment, including ground and surface water.

1.4 The borrow pit area and haul road shall be fenced off and gates provided in order to ensure the safety of the borrow pit and to ensure that no livestock enter the borrow pit.

1.5 Adequate access control will be exercised during the period of excavation of road building material.

1.6 All site personnel shall be taught regarding the requirements for dealing with potential emergencies, including fires, accidental leaks and spillage of pollutants.

1.7 All precautions shall be taken to prevent any waste/fires from spreading on or from the site.

1.8 The material obtained from the borrow pit (quarry) will only be used for the rehabilitation and/or construction of provincial roads.

1.9 A copy of the Environmental Management Plan compiled by an Environmental Managing Consultant regarding the management, operation and rehabilitation of the borrow pit will be made available to me.

1.10 I also request that the following conditions be addressed:

See attached minutes

Signed on 03-12-2013 2013 at Camden Village

Yours faithful

TRADITIONAL LEADER

WITNESSES: (1)

Date: 03-12-2013

(2)

AGREEMENT PERTAINING TO THE USE OF THE BORROW PIT

Date: 3/12/2013

Mr/Me/ BD Phetlhu

Postal Address: P/Bag X 130
Mothibistad
Kuruman
8474

Telephone no. 053 7731099

Cell. No. 072 731 9908

e-mail: phetlhuba@yahoo.com.

AGREEMENT PERTAINING TO THE USE OF THE BORROW PIT (QUARRY)

ON THE FARM BP3#4 on Depathaleng No. 108 (RE/108 & 1/108)

IN THE DISTRICT OF John Taolo Gaetsewe:

1. I Kgosi Balcang D. Phetlhu,

the traditional leader of the property

.....,

hereby certify that I agree that the borrow pit/s (quarry/s) on the property (see attached map) can be used for the excavation of road building material subject to the following conditions:

1.1 The borrow pit (quarry) and access road (if applicable) will be satisfactorily rehabilitated in terms of the Environmental Management Plan.

1.2 All activities shall be kept within the designated borrow pit (quarry) area..

1.3 Chemical toilets shall be provided to prevent pollution of the environment, including ground and surface water.

1.4 The borrow pit area and haul road shall be fenced off and gates provided in order to ensure the safety of the borrow pit and to ensure that no livestock enter the borrow pit.

1.5 Adequate access control will be exercised during the period of excavation of road building material.

1.6 All site personnel shall be taught regarding the requirements for dealing with potential emergencies, including fires, accidental leaks and spillage of pollutants.

1.7 All precautions shall be taken to prevent any waste/fires from spreading on or from the site.

1.8 The material obtained from the borrow pit (quarry) will only be used for the rehabilitation and/or construction of provincial roads.

1.9 A copy of the Environmental Management Plan compiled by an Environmental Managing Consultant regarding the management, operation and rehabilitation of the borrow pit will be made available to me.

1.10 I also request that the following conditions be addressed:

See attached minutes

Signed on 03-12-2013 2013 at Camden Village.

Yours faithful

TRADITIONAL LEADER

WITNESSES: (1)

Date: 03-12-2013

(2)

List of identified I&APs

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
John Taolo Gaetsewe District Municipality	Mr. T. Matlhare	053-712 8731	-	matlhareth@taologaetsewe.gov.za	PO Box 1480 Kuruman 8460
Joe Morolong Local Municipality	Mrs. Lerato Khunou	053-7739300	-	municipalmanager@joemorolong.gov.za	Private Bag X117 Mothibistad 8474
Northern Cape Department Roads and Public Works	Ms. Crystal Robertson	053-839 2183	-	crobertson@ncpg.gov.za	PO Box 3132 Kimberley 8300
Northern Cape Department of Water and Sanitation	Ms. Lerato Mokhoantle	053-830 8800	-	mokhoantlel@dws.gov.za	Private Bag X6101 Kimberley 8300
Northern Cape Department Co-Operative Governance, Human Settlements and Traditional Affairs	Ms Lerato Khunou (Communications Officer)	053-830 9400	-	-	Private Bag X5005 Kimberley 8300
Department of Agriculture, Forestry & Fisheries	Mr. Dimakatso Viljoen Mothibi	053-839 7806	-	cfortune@agri.ncape.gov.za	-
South African Heritage Resource Agency	To be submitted via the online system	-	-	To be submitted via the online system	-
ESKOM Holdings SOC Ltd	Mr. Jacob Madumo (Region 2 RM)	053-830 5911	-	MadumoJL@eskom.co.za	64 Memorial Road Monument Heights Kimberley 8300

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
Mr. Kgosi Bakang	Landowner / communal chief for the area	Tel: 072 7319 908 / 083 7731 099 Email: phethub@yahoo.com
Cllr. Mxolisi	Ward Councillor for the area- Ward 12	Tel: 076 072 5430 D320 Cardigton Road Churchill Village Kuruman 84690

APPENDIX 4
ON SITE SURVEY REPORT

Site Photographs

Plate 01: Total modification of vegetation cover due to previous mining activities on the area, with hard rock witnessed on the western border of the proposed borrow pit.

Plate 02: Previously utilized borrow pit situated on the south-eastern side of the new planned borrow pit.

NORTH

WEST EAST

SOUTH

APPENDIX 5
IMPACT AND RISK ASSESSMENT REPORT

IMPACTS AND RISKS REPORT

Introduction

This report describes the environmental impacts and risks identified during the environmental impact assessment carried out for the borrow pit.

Environmental Impact Assessment is a structured approach for obtaining and evaluating environmental information prior to its use in decision-making in the development process. This information consists, basically, of predictions of how the environment is expected to change if certain alternative actions are implemented and advice on how best to manage environmental changes if one alternative is selected and implemented. NEMA through the EIA regulations requires that listed activities that have or are likely to have a detrimental effect on the environment should be authorised and a license applied for before commencement. An EIA must be done as stipulated in the EIA regulations made under section 24(5) of NEMA. The EIA process used for this project refers to the process dictated by the 2014 EIA regulations which involves the identification and assessment of direct, indirect and cumulative environmental impacts of a proposed project. In addition to this the specific requirements for environmental assessments as stipulated in the Minerals and Petroleum Resources Development regulations were also taken into account to ensure that all aspects of the impacts and risks were taken into account.

The report contains the following appendixes to comply with the requirements of the Basic Assessment Report and Environmental Management Plan:

APPENDIX 5.1: Nature of the Impacts and Risks Identified.

APPENDIX 5.2: Methodology Used in Assessing the Impacts and Consequences.

Appendix 5.3: Assessment of the Impacts and Risks before Mitigation.

Appendix 5.4: Possible Mitigation Measures that could be applied and the level of risk.

Appendix 5.5: Assessment of the Impacts and Risks after Mitigation.

Appendix 5.6: Assessment of the No-Go Alternative.

APPENDIX 5.1: IMPACTS AND RISK IDENTIFIED INCLUDING THEIR NATURE, SIGNIFICANCE, CONSEQUENSES, EXTENT, PROBABILITY AND REVERSIBILITY

1) **DESCRIPTION OF THE NATURE OF POTENTIAL ENVIRONMENTAL IMPACTS AND RISKS**

a) Destruction of Flora and Habitat Loss

The borrow pit establishment will result in net vegetation loss during the establishment and the operational phases. Net vegetation loss will result in secondary impacts on fauna due to habitat loss. Direct loss or damage to habitat leads to reduced foraging/food resources, disturbance and displacement of fauna. If invasive weeds find themselves in the area as a result of being accidentally carried into the area, for example along tyres of vehicles, there might be a weed invasion/proliferation of opportunist species. This will threaten indigenous vegetation species. Whilst assessment noted that the site does not have endangered or protected plant species, the removal of vegetation needs to be carefully managed to limit the impacts.

b) Air Quality Deterioration

Stripping of soil and vegetation and excavating for gravel can result in dust emissions. Dust can cause adverse environmental impacts such as soiling of property or surfaces, visual impacts and personal discomfort (for example, gritty eyes) and can also cause considerable annoyance to people and respiratory problems for sensitive people. It can be a very contentious issue, particularly for heavy dusty activities. Wind whipping can result in dust emission from stockpiles and bare surfaces. The mobilisation of vehicles and equipment on site can result in excessive vehicular emissions such as smoke if they are not properly maintained. Dust pollution can also be very problematic due to the concentration of heavy machinery and vehicle on the gravel access roads in the area during the operational phase.

c) Visual Impact

Disturbance of the borrow pit area and excavated areas can cause visual scarring of the environment if not properly handled. Before rehabilitation, during operational phase, the borrow pit surfaces with bare patches may contrast with the surrounding area that has vegetation, making the site unpleasant.

d) Land and Soil Contamination and Erosion Impacts

Soil surface erosion, loss of topsoil and deterioration of soil quality and productivity may occur due to the removal of stabilising vegetation from certain areas in order to facilitate construction. Soils may also be compacted by heavy vehicles and construction equipment. Once disturbed, soils become more susceptible to erosion. Also associated with land pollution is the disposal of waste. Careless unregulated waste management practices during operation of the borrow pit will exacerbate this problem. Oil and fuel leakages from the vehicle and material stored can cause soil contamination by hazardous substances if they occur. Improper disposal of food cartons and other domestic forms of mining garbage could lead to littering of the site and pollution.

e) Water Conservation and Water Pollution

The borrow pit operation will require use of water mainly for dust suppression. Water is a scarce resource and needs to be conserved. The impact of using water resources for dust suppression should be weighted up against the impact of dust. Poor waste management practices at the borrow pit site areas may lead to the contamination of water. Sewage and sanitary effluent have the potential to adversely affect the quality of water if not properly handled. Fuel leakage and

chemical spills can also cause problems to water resources. These may be washed during rains and end up polluting water bodies.

f) Disruption of Surface Drainage

Failure to incorporate drainage control systems on site and from excavated area can lead to interruption of natural drainage. Natural movement of surface water might be changed. The borrow pit might form a pool(s), depriving areas that normally get surface water, of the resource. Ecosystem functions that depend on natural water surface drainage of the area will be negatively affected. Drowning of animals may occur in the formed pools.

g) Slope Instability

Unstable slopes or slope failure of excavated surfaces may result in safety problems if the excavation is not managed.

h) Erosion

Removal of vegetation cover and the disturbance of soils can lead to soil erosion during rainy periods where soil is loose.

i) Noise and Vibration

The proposed borrow pit development is anticipated to cause increased noise levels in the area during the operational phase, due to the movement of construction vehicles and machinery. If drilling and blasting is done this can be a major source of noise. Noise and vibration generated during operational phase has the potential to cause annoyance and disturbance effects on noise sensitive receptors, ear damage to workers and cause damage to structures as a result of vibration if operations are not handled properly. While there are not houses nearby noise will still require to be properly managed to reduce its impact.

j) Increased Risk of Fire

The presence of construction workers and borrow pit operational related activities poses an increased risk of veld fires. The potential risk of veld fires is heightened during windy conditions in the area. Fire may result in the loss of grazing vegetation and would therefore impact negatively on the affected community's livelihoods. Changes to the fire regime may impact on ecosystem integrity and biodiversity in the long term.

k) Increased Water Consumption

Although no mineral processing will take place, the borrow pit operation will require water mainly for dust suppression. This has the effect of adding to the current water consumption in the area.

l) Safety and Security Risks

Conduct of quarry workers is also important in considering public safety. Trespassing and illegal access onto private land may compromise the safety of local communities. The presence of workers also increases the potential risk of stock theft and poaching. The movement of construction workers on and off the site also poses a potential threat to farm/plots/communal infrastructure, such as fences and gates, which may be damaged. It can also overload community infrastructure/facilities. Stock and game losses may also result from gates being left open and/or fences being damaged. The applicant and the appointed contractor will need to have the necessary

management and control procedures in place for this. Excessive dust generated on the un-surfaced gravel access road due to the high concentration of vehicles at operational phase may affect visibility and create dangerous road conditions. As the borrow pit development is taking place in a farming area, collisions with livestock are likely to be present as a hazard.

m) Creation of Employment Opportunities and Skills Development

The development of the borrow pit is expected to create employment opportunities during construction of roads in the area. Some will be low skilled positions (i.e. labourers and security staff etc.) and semi-skilled workers (i.e. drivers, equipment operators etc.) and some skilled personnel (i.e. engineers, land surveyors, project managers etc.) Although the development of the borrow pit is a small operation and does not guarantee the generation of significant employment opportunities there is need to maximise the employment opportunities for the locals.

n) Skills Development Impacts

In terms of training, the contractors are likely to provide on-site training and skills development opportunities. However, the majority of the training benefits are likely to accrue to personnel employed by the relevant contractor the Department of Roads and Public Works, Northern Cape will assign to develop the borrow pit. The training should provide for meaningful skills development for members from the local community.

APPENDIX 5.2: METHODOLOGY USED IN DETERMINING THE NATURE, SIGNIFICANCE, CONSEQUENCES, EXTENT, DURATION AND PROBABILITY OF THE POTENTIAL IMPACTS

The borrow pit development will result in a number of environmental impacts and risks so it is important to determine the critical ones so that effort can be concentrated in managing them. The following criterion was used to determine the significance of the impacts. The criterion takes into account the nature of the impact, the duration, the extent, the magnitude and the likelihood of occurrence to determine the significance of the potential impact.

The following ratings will be used.

The extent indicates whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score of between 1 and 5 is assigned as appropriate (with a score of 1 being low and a score of 5 being high). The scores are as follows:

- 1 - Local immediate area
- 2 - Local immediate area and surroundings
- 3 - Regional
- 4 - National
- 5 - International

The duration was assigned a score of 1 to 5 where:

- 1 - The lifetime of the impact will be of a very short duration.
- 2 - The lifetime of the impact will be of a short duration.

- **3 - Assigned to medium-term (5–15 years)**
- **4 - Assigned to long term (> 15 years)**
- **5 - Permanent.**

The magnitude, quantified on a scale from 0-10, where a score is assigned:

- **0 - is small and will have no effect on the environment**
- **2 - is minor and will not result in an impact on processes**
- **4 - is low and will cause a slight impact on processes**
- **6 - is moderate and will result in processes continuing but in a modified way**
- **8 - is high (processes are altered to the extent that they temporarily cease)**
- **10 - is very high and results in complete destruction of patterns and permanent cessation of processes**

The probability of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, score of 1–5 where:

- **1 - is very improbable (probably will not happen)**
- **2 - is improbable (some possibility, but low likelihood)**
- **3 - is probable (distinct possibility)**
- **4 - is highly probable (most likely)**
- **5 - is definite (impact will occur regardless of any prevention measures)**

The significance, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high. The significance is determined by combining the criteria in the following formula:

S = (E+D+M) P; where S = Significance weighting

E = Extent, D = Duration, M = Magnitude, P = Probability

The status of the impact describes whether the impact will have positive, negative or neutral ramifications of the environment.

The significance weightings for each potential impact are as follows:

Value	Significance
<30 points	Low (i.e. where this impact would not have a direct influence on the decision to develop in the area)
30-60 points	Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated)
>60 points	High (i.e. where the impact must have an influence on the decision process to develop in the area)

APPENDIX 5.3: THE ASSESSMENT OF IMPACTS BEFORE MITIGATION OF THE IMPACTS

	Activity	Impact	Positive /Negative	Duration	Magnitude	Extent	Probability	Significance Rating Before Mitigation		Is Impact Reversible? Yes/No	Irreplaceable Loss of Resources? Yes/No
	START-UP ACTIVITIES										
1	Site establishment activities, vegetation stripping	Loss of vegetation	Neg	2	3	3	5	40	Medium	Reversible	No
		Habitat destruction	Neg	3	4	3	4	40	Medium	Reversible	No
		Visual scarring	Neg	2	4	2	4	32	Medium	Reversible	No
		Air quality deterioration	Neg	2	2	2	4	24	Medium	Reversible	No
		Soil erosion	Neg	2	2	2	4	24	Low	Reversible	No
		Potential loss of agricultural potential	Neg	2	8	2	2	24	Low	Reversible	No
		Impact of use of water during all operations	Neg	2	2	2	3	28	Low	Reversible	No
		Safety and security	Neg	2	2	2	1	6	Low	Reversible	No
2	Soil stripping and stockpiling	Dust	Neg	2	4	2	4	32	Medium	Reversible	No
		Disruption of drainage	Neg	3	2	2	3	21	Low	Reversible	No
	DURING OPERATIONAL PHASE										
3	Clearance of area for mining	Visual impact	Neg	2	5	2	5	45	Medium	Reversible	No
		Destruction of flora and habitat	Neg	2	3	2	5	35	Low	Reversible	No
		Loss of agricultural potential	Neg	2	6	2	2	20	Low	Reversible	No
4	Gravel excavation	Dust emissions	Neg	4	4	3	5	40	Medium	Reversible	No
		Drainage disruption	Neg	1	2	2	2	26	Low	Reversible	No
		Slope instability	Neg	2	4	1	3	21	Low	Reversible	No

	Activity	Impact	Positive /Negative	Duration	Magnitude	Extent	Probability	Significance Rating Before Mitigation		Is Impact Reversible? Yes/No	Irreplaceable Loss of Resources? Yes/No
		Noise	Neg	1	4	1	4	24	Low	Reversible	No
		Visual Scarring	Neg	2	2	2	5	30	Medium	Reversible	No
		Soil erosion	Neg	2	2	2	4	24	Low	Reversible	No
		Altered topography	Neg	2	4	2	4	32	Medium	Irreversible	No
5	Drilling & blasting (if done)	Noise and vibrations	Neg	1	4	1	4	24	Low	Reversible	No
		Dust	Neg	1	4	1	5	30	Medium	Reversible	No
6	Stockpiles	Dust	Neg	2	4	1	3	21	Low	Reversible	No
		Surface disturbances	Neg	2	2	1	3	15	Low	Reversible	No
		Drainage disruption	Neg	2	2	1	3	15	Low	Reversible	No
7	Material handling, hauling and transportation	Dust	Neg	2	2	2	4	24	Low	Reversible	No
		Increased risk of accidents	Neg	2	2	1	2	10	Low	Reversible	No
		Noise	Neg	2	2	1	3	15	Low	Reversible	No
		Soil contamination from oil/fuel leaks	Neg	2	2	1	3	15	Low	Reversible	No
8	Waste Disposal and Material storage	Soil contamination	Neg	2	2	1	3	15	Low	Reversible	No
		Water pollution	Neg	1	2	2	3	15	Low	Reversible	No
		Increased risk of fire	Neg	2	2	1	3	15	Low	Reversible	No
	DURING CLOSURE AND POST CLOSURE										
9	Decommissioning of site and shaping of borrow pit	Noise	Neg	1	2	1	3	12	Low	Reversible	No
		Dust	Neg	1	2	1	3	12	Low	Reversible	No
		Soil contamination from oil/fuel	Neg	1	2	1	3	12	Low	Reversible	No
		Disruption of surface drainage	Neg	1	2	2	3	15	Low	Reversible	No

	Activity	Impact	Positive /Negative	Duration	Magnitude	Extent	Probability	Significance Rating Before Mitigation		Is Impact Reversible? Yes/No	Irreplaceable Loss of Resources? Yes/No
	SOCIO ECONOMIC IMPACTS										
10	Negative socio-economic impacts	Community conflicts and tensions	Neg	2	2	2	3	18	Low	N/A	N/A
		Increase risk of fire	Neg	2	2	1	2	10	Low	N/A	N/A
		Reduced security in area	Neg	2	2	1	2	10	Low	N/A	N/A
11	Positive socio-economic impacts	Employment opportunities	Pos	2	2	1	2	10	Low	N/A	N/A
		Training and Skills Development	Pos	2	2	1	2	10	Low	N/A	N/A
	HERITAGE RESOURCES IMPACTS										
11	Heritage impacts	Potential impacts associated with site of a cultural or archaeological importance	Neg	5	2	1	1	8	Low	Irreversible	Irreplaceable if it occurs
	CUMULATIVE IMPACTS										
12		Increased loss of vegetation	Neg	2	4	2	4	32	Low	Reversible	No

APPENDIX 5.4: POSSIBLE MITIGATION MEASURES THAT COULD BE APPLIED AND THE LEVEL OF RISK

1. INTRODUCTION

These technical and management processes in this section have been developed to enable the applicant to mitigate negative environmental impacts and to provide a proactive approach to manage identified environmental risks. It provides systematic and explicit mitigation and monitoring measures for the proposed borrow pit to ensure implementation during the planning, construction, operational and decommissioning phase of the project. It also mandates the Department to internalise the environmental impacts that would otherwise be a social cost.

2. PERMITS AND PERMISSIONS

All pertinent permits, approvals and agreements are to be obtained before activities commence on site and the conditions are to be strictly adhered to.

3. GENERAL SITE ESTABLISHMENT

Objective: To ensure proper control of the mining area

Management measures

- **Access at the borrow pit shall be controlled and adequate precautions taken to prevent unauthorised entry to the borrow pit. A fence or other barrier should be erected to restrict access.**
- **The area must be clearly demarcated along its boundaries.**
- **Permanent beacons must be firmly erected and maintained in their correct position throughout the life of the operation.**
- **Resultant operations shall only take place within this demarcated area.**
- **Borrow pit boundaries shall be signposted and laid out so as to be clearly visible and identifiable.**
- **Entry to the borrow pit area shall be controlled and unauthorised entry prohibited.**
- **Adequate precautions shall be taken to protect persons present at, or in the vicinity of, the borrow pit from risks that may arise from borrow pit operations.**

Time Schedule for Implementation: At start up and throughout life of mine.

4. MINING AREA LAYOUT PLAN

Objective: To ensure proper control of the mining area

Management measures

- **A copy of the layout plan of the borrow pit must be available at the mining site for scrutiny when required.**
- **The plan should be updated on a regular basis with regards to the actual progress of establishment of surface infrastructure, mining operations and rehabilitation.**
- **The final layout plan must be submitted to DMR at the closure of the borrow pit or when operations have ceased.**
- **Beacons as indicated on the layout plan or as prescribed by the DMR must be firmly erected and maintained in their correct positions throughout the life of the operations.**

Time Schedule for Implementation: At start up and throughout life of mine.

5. ESTABLISHMENT OF SITE OFFICE / CAMP

- **The planning and design for the Construction Camp must ensure that there is a minimum impact on the environment. Where possible existing infrastructure and disturbed areas must be used.**
- **No construction camps will be allowed in sensitive areas such as wetlands and offices and camp sites shall be established, as far as is practicable, outside the flood plain, above the 1 in 50 flood level mark within the boundaries of the road area.**
- **The area chosen for these purposes shall be the minimum reasonably required and which will involve the least disturbance to vegetation.**
- **No trees or shrubs will be felled or damaged for the purpose of obtaining firewood. Fires will only be allowed in facilities or equipment specially constructed for this purpose and only in areas demarcated for that purpose. If required by applicable legislation, a firebreak shall be cleared around the perimeter of the camp and office sites.**
- **Adequate firefighting equipment must be available at all areas that might pose a fire risk.**
- **Lighting and noise disturbance or any other form of disturbance that may have an effect on the landowner/tenant/persons lawfully living in the vicinity shall be kept to a minimum.**
- **Chemical toilet facilities or other approved toilet facilities should be sited in such a way that they do not cause water or other pollution. The use of existing facilities must take place in consultation with the owners of the facilities.**
- **In cases where facilities are linked to existing sewerage structures, all necessary regulatory requirements concerning construction and maintenance should be adhered to.**
- **Only domestic type wash water shall be allowed to enter a French drain and any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and treated prior to discharge or removed from the site for appropriate disposal at a recognised facility.**

- **Adequate waste receptacles should be made available for waste collection on site prior to removal for disposal at an authorised waste disposal facility.**
- **Adequate storage facilities should be available for materials. The nature of the storage facilities should be as per the recommendations of the manufacturer. The storage areas shall be securely secured and appropriately marked to indicate the goods in the storage.**
- **Provisions shall be made for the storage of hazardous substances and stocks. Diesel and oil, etc. shall be stored in areas with impervious flooring such as concrete and will be bunded with a total capacity to obtain 110% of the volume stored. Drip pans, a thin concrete slab or other impervious surfaces shall be installed in such storage areas with a view to prevent soil and water pollution.**

Time Schedule for Implementation: At start up and throughout life of mine.

6. ACCESS ROADS ON THE SITE

- **The access road to the area and the campsite/site office must be established in consultation with the landowner/tenant and existing roads shall be used as far as practicable.**
- **Should a portion of the access road be newly constructed, the route shall be selected that a minimum number of bushes or trees are felled, and existing fence lines shall be followed as far as possible. Adequate drainage and erosion protection shall be provided where necessary.**
- **The erection of gates in fence lines and the open or closed status of gates in new and existing positions shall be clarified in consultation with the landowner/tenant and maintained throughout the operational period.**
- **No other routes will be used by vehicles or personnel for the purpose of gaining access to the site except designated areas only.**
- **In the case of dual or multiple uses of access roads by other users, arrangements for multiple responsibilities must be made with the other users. If not, the maintenance of access roads will be the responsibility of the appointed contractor/borrow pit operator.**
- **Traffic controls/signage should be installed as appropriate, particularly in advance of temporary route changes or deviations and alternatives should be provided as necessary to maintain required access.**
- **Movement of heavy earth moving machinery should be restricted to certain access roads.**
- **Access roads shall be adequately maintained so as to minimise dust, erosion or undue surface damage. Spraying with water or use of dust suppressants shall be done as is necessary.**

Time Schedule for Implementation: At start up and throughout life of mine.

7. MANAGING SOCIAL IMPACT RELATED ISSUES

- **Effective two-way public disclosure and public consultation should be implemented to allay community perceptions. There should be an opportunity provided for the resolution of grievances or complaints received and recorded from individuals in the community.**
- **Community should be adequately informed in advance of activities being done at the borrow pit that are likely to affect them.**
- **Labour recruitment should occur in a manner that is objective, transparent, and wherever possible, provide opportunities for people from the local area.**
- **The activities of contractors, consultants, and company employees should be routinely reviewed to ensure good community relations are being maintained. The project proponent should use its influence as employer to encourage responsible behaviour among employees.**
- **The landowner should be fully compensated prior to usage of his land for mining and he should be notified when operations commence and who will work on the site.**
- **An agreement should be made with the landowner that he is satisfied with the level of rehabilitation on completion of the mining.**

8. SPECIFIC MITIGATION MEASURES FOR ENVIRONMENTAL IMPACTS AND RISKS

8.1 MANAGING SOIL IMPACTS

These measures are targeted at managing soil erosion, soil contamination, compaction of soil and removal of topsoil.

- **The area that is stripped of vegetation should be kept to an absolute minimum.**
- **The contractor shall at all times carefully consider what machinery is appropriate to the task while minimising the extent of environmental damage and unnecessary movements should be prohibited.**
- **The topsoil, including the existing grass cover is to be shallowly ripped (only the depth of the topsoil) before removal. This is to ensure that organic plant material, and the natural seed base is included in the stripping process. The soil is to be stored and the soil stockpiles shall not be higher than 2m or stored for a period longer than one year. The slopes of soil stockpiles shall not be steeper than 1 vertical to 2.5 horizontal.**
- **Topsoil shall be stored separately from subsoil and other overburden material.**
- **No vehicles shall be allowed access onto the stockpiles after they have been placed.**
- **Stockpiles shall not be allowed to become contaminated with oil, diesel, petrol, garbage or any other material, which may inhibit the later growth of vegetation.**
- **The contractor shall apply soil conservation measures to the stockpiles to prevent erosion.**
- **Ensure regular maintenance of equipment to prevent diesel and hydraulic spillages.**
- **Where possible ensure low work surface gradients so that run-off flows at a controlled rate so as to minimize channelling and soil erosion during high rainfall.**
- **At the end of operations, all disturbed areas shall be re-vegetated.**

TIMING: At Start up and throughout the operational phase of the borrow pit

8.2 LOSS OF VEGETATION AND HABITAT DESTRUCTION

- **Clearance of vegetation should be restricted to the absolute minimum required to facilitate access and undertake borrow pit activities. Disturbance of topsoil and vegetation rootstock must be minimized as far as possible.**
- **Trees larger than 2m should not be removed unless it is absolutely necessary and cannot be avoided.**
- **No protected species must be removed without a permit. A final walk-through must be done by an ecologist to ensure that the areas where vegetation is to be cleared do not have protected species.**
- **Any alien species identified should be cleared.**
- **Burning of any waste material is not permitted under any circumstances.**
- **Rehabilitation strategies following operational activities must ensure that appropriate indigenous plant species are used and should be done as per rehabilitation plan.**

TIMING: At Start up and throughout the operational phase of the borrow pit

8.3 DUST AND VEHICLE FUMES

- **Avoid unnecessary excessive vehicle movement.**
- **Limit vehicle speeds on unsurfaced roads.**
- **Rehabilitate disturbed areas with vegetation as soon as operation is completed.**
- **Maintain equipment and vehicles in good working order to avoid excessive emissions.**
- **Borrow pit working floors should be sprayed with water from time to time to reduce dust emission during operations.**
- **The use of rubber curtains/other material to limit dust during screening should be considered.**
- **Spray roads, material stockpiles and screening areas with water if dust becomes problematic.**
- **No fires should be allowed on the borrow pit site.**

TIMING: Throughout life of mine

8.4 BLASTING IMPACTS

- **All blasting and handling of blasting materials should be done in accordance with the Explosives Act and the Mine Health and Safety Act.**
- **A risk assessment has to be undertaken that takes into account the safety of the people, infrastructure and the surrounding environment. A pre and post blasting survey should be done.**
- **A blasting time schedule shall be distributed to all surrounding villages indicating the time and date for blasting activities. It is recommended that blasting takes place between 1200hrs and 1500hrs.**

- **At all times blasting shall be carried out in such way that ground vibration, air blast and scatter are kept within such limits as to avoid damage to adjacent structures/machinery etc. already placed at the works. Any fly rock should be cleared after blasting.**

TIMING: As and when blasting occurs

8.5 WASTE DISPOSAL

- **All personnel must be instructed to dispose of waste in a proper manner.**
- **Suitable receptacles shall be available at all times and conveniently placed for the disposal of waste.**
- **No waste shall under any circumstance be disposed of in the veldt. No burning of waste is permitted on site and the borrow pit area should be protected from illegal dumping of waste.**
- **All used oils, grease or hydraulic fluids shall be placed in appropriate impervious containers and these receptacles will be removed from the site on a regular basis for disposal at a registered or licensed disposal facility or sent for recycling/reuse with a registered facility.**
- **Spills should be cleaned up immediately by removing the spillage together with the polluted soil and by disposing thereof at a recognised facility. In areas where the spills are small, a tested absorbent agent can be used, and the area treated accordingly.**
- **Contaminated materials and residues from machinery maintenance and other sources contaminated with hazardous waste should be stored in proper containers that avoid seepage to the ground.**
- **The 'reduce, reuse, recycle' waste management philosophy will be used where possible.**
- **Only authorized registered waste disposal contractors should be hired for collection of waste for all waste streams**

TIMING: At Start – up and throughout the operational phase of the borrow pit

8.6 STABILITY OF EXCAVATIONS

- **Excavations shall take place only within the approved demarcated borrow pit area and appropriate barriers should be put as necessary.**
- **The appointed contractor/borrow pit operator shall ensure that a place of work, whether temporary or permanent in or near the excavation has a structure and solidity appropriate to its use and is operated, supervised and maintained, so as to withstand the environmental forces anticipated and be safe.**
- **The appointed contractor/borrow pit operator shall ensure that material is not placed, stacked or used at the borrow pit near the edge of any excavation, where it is likely to endanger people at work and equipment or where it is likely to cause collapse of the side of the excavation.**
- **Excavations should be routinely inspected. If cracks occur in any structure they need to be investigated to ascertain if there is a risk to safety.**

- **Overburden rocks and coarse material shall be placed concurrently in the excavations or stored adjacent to the excavation, if practicable, to be used as backfill material once the mineral or gravel has been excavated.**
- **Appropriate drainage provisions must be constructed as necessary to accommodate the surface water movement. If the water table is reached during excavations, appropriate pumping facilities should be provided.**
- **Excavated areas should be kept in a safe and stable manner. No unstable block should be present. Reshaping of the borrow pit may need to be done to ensure that this objective is reached. The profiling should be done to match the surrounding landscape.**
- **The borrow pit should be finished in such a manner that it is self-draining as far as is possible.**
- **Topsoil should be put back on the surfaces and the areas re-vegetated.**

TIMING: During operational phase, closure and post closure of the borrow pit

8.7 VISUAL IMPACTS

- **The excavated area must serve as a final depositing area for the placement of overburden. Rocks and coarse material removed from the excavation must be backfilled into the excavation.**
- **Once excavation parts that can be filled have been refilled with overburden, rocks and coarse natural materials, the borrow pit shall be profiled with acceptable contours and erosion control measures, the topsoil previously stored shall be returned to its original depth over the area. The profiling shall be done to match the surrounding landscape as far as is reasonable possible.**
- **The area shall be fertilised if necessary, to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora.**
- **If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, then there may be need for the soil to be analysed and any deleterious effects on the soil arising from the borrow pit, be corrected and the area be re-seeded with a suitable vegetation seed mix**

TIMING: At Start up and throughout the whole life of the borrow pit

8.8 EQUIPMENT USED ON SITE

- **Only well-maintained vehicles and equipment should be operated on site and all machinery should be serviced regularly during the borrow pit operation to limit environmental impacts as a result of spillage, emissions and noise.**
- **The maintenance of vehicles and some equipment used for any purpose during the borrow pit operation will take place only in the maintenance workshops which are not located on the borrow pit. No vehicle may be extensively repaired in any place other than in the maintenance yard.**

- **A maintenance schedule should be prepared in order to ensure that equipment is in its best form**
- **Machinery or equipment used on the borrow pit area must not constitute a pollution hazard. No equipment leaking oil, fuels etc should be used. Drip tray should be used to prevent pollution**

TIMING: At Start up and throughout the operational phase of the borrow pit

8.9 NOISE

- **Construction activities required outside normal working hours must be approved by the Project Manager, and where necessary, advance warning provided to adjacent residents.**
- **Noise levels exceeding 85dB shall only be permitted where approved and with appropriate advanced warning to adjacent residents (minimum of 2 days) being provided.**
- **Noise that could cause a major disturbance should only be carried out during daylight hours and with advance warning provided as above.**
- **Adequate ear protection should be provided to employees in noisy areas.**
- **No amplified music shall be allowed at the site.**
- **Construction vehicles and plant to be in good working order.**

TIMING: At Start up and throughout the operational phase of the borrow pit

8.10 SAFETY AND SECURITY RISKS

- **The borrow pit should be fenced of and adequate beacons put in place. Entry to the borrow pit area shall be controlled and unauthorised entry prohibited.**
- **Adequate precautions shall be taken to protect persons present at, or in the vicinity of, the borrow pit from risks that may arise from borrow pit operations.**
- **Adequate signage should be put in place regarding safety and to warn the public it is a mine.**
- **The appointed contractor/borrow pit operator should be held liable for damage to farm/community infrastructure that can be linked to construction workers.**
- **The appointed contractor/borrow pit operator should have a code of conduct governing activities of workers during the work at the borrow pit and ensure that all workers are informed of the conditions, specifically trespassing on adjacent farms/plots.**
- **Workers are only to use designated access roads for movement of material from or to site.**
- **Safety rules, such as the implementation of speed limits in particularly, restriction of heavy vehicle movements to specific access roads should be in place.**
- **There should be procedures for managing and storing waste on site that may pose a threat to livestock if ingested e.g. plastics.**
- **There should be mechanism to inform police of theft that occur on site.**

TIMING: At Start up and throughout the operational phase of the borrow pit

8.11 ALTERED TOPOGRAPHY IMPACTS

- **Mining techniques used should try to avoid the creation of steep slopes.**
- **On completion of mining, the borrow pit is to be profiled and profiling shall be done to match the surrounding landscape as far as is reasonable possible.**
- **Slopes on finishing off the borrow pit should not exceed 3:1 to ensure slope stability and the easy re-establishment of vegetation. Gentler slopes are preferred.**
- **Appropriate drainage provisions must be constructed as necessary to accommodate the free surface water movement.**
- **On completion all slopes and disturbed areas are to be re-top soiled and re-vegetated in order to prevent erosion, improve aesthetics and regenerate the biodiversity of the site.**

TIMING: During the operational and closing phase

8.12 DEALING WITH EMERGENCIES

- **The appointed contractor/borrow pit operator should identify all situations that can lead to emergency situations and provide response strategies. The situations should include fire and major chemical spill.**
- **Contact details of all departments/service providers to be contacted in case of an emergency shall be made available to employees.**
- **Equipment for dealing with emergencies such as spill kits, firefighting equipment, first aid boxes etc. shall be made available and personnel properly trained in its use.**
- **All the emergency equipment should be serviced, repaired and maintained as per supplier's specification or as per engineering specification to ensure that the equipment is in order. Service certificates should be kept on site and be available on inspection.**
- **All staff on site should be trained on how to handle emergency situations and emergency drills/ rehearsals should be conducted periodically to ensure that staff is prepared. The training shall be recorded.**

TIMING: During the operational phase and whenever an emergency occurs during the operational and closing phase.

APPENDIX 5.5 ASSESSMENT OF IMPACTS AFTER MITIGATION MEASURES

	Activity	Impact	Positive /Negative	Duration	Magnitude	Extent	Probability	Significance Rating after mitigation	
	START-UP ACTIVITIES								
1	Site establishment activities, vegetation stripping	Loss of vegetation	Neg	2	4	2	3	24	Low
		Habitat destruction	Neg	2	4	2	3	24	Low
		Visual scarring	Neg	2	3	2	3	21	Low
		Air quality deterioration	Neg	2	2	2	3	18	Low
		Soil erosion	Neg	2	3	2	3	24	Low
		Potential loss of agricultural potential	Neg	1	6	2	2	18	Low
		Safety and security	Neg	2	2	1	1	5	Low
2	Soil stripping and stockpiling	Dust	Neg	3	4	2	2	18	Low
		Disruption of drainage	Neg	3	2	1	2	12	Low
	DURING OPERATIONAL PHASE								
3	Clearance of area for mining	Visual impact	Neg	3	3	1	3	21	Low
		Destruction of flora and habitat	Neg	2	4	1	3	21	Low
		Loss of agricultural potential	Neg	2	6	2	2	20	Low
4	Gravel excavation	Dust emissions	Neg	1	4	2	2	14	Low
		Drainage disruption	Neg	3	2	1	4	24	Low
		Slope instability	Neg	2	3	1	1	6	Low
		Noise	Neg	1	2	1	3	12	Low
		Visual Scarring	Neg	2	3	2	3	21	Low
		Altered topography	Neg	2	3	2	3	21	
		Soil erosion	Neg	2	1	2	3	15	Low
5	Drilling & blasting (if done)	Noise and vibrations	Neg	1	4	1	1	6	Low
		Air quality deterioration	Neg	1	3	1	1	5	Low
6	Stockpiles	Dust	Neg	1	2	2	2	10	Low
		Surface disturbances	Neg	1	2	1	2	8	Low
		Drainage disruption	Neg	1	2	2	2	20	Low
7	Material handling, hauling and transportation	Dust	Neg	2	2	1	3	15	Low
		Increased risk of accidents	Neg	1	2	1	3	12	Low
		Noise	Neg	1	2	1	3	12	Low
		Soil contamination from oil/fuel leaks	Neg	1	2	1	3	12	Low
8	Waste Disposal and Material storage	Soil contamination	Neg	1	2	2	3	15	Low
		Water pollution	Neg	1	2	1	3	12	Low
		Increased risk of fire	Neg	1	2	1	3	12	Low

	Activity	Impact	Positive /Negative	Duration	Magnitude	Extent	Probability	Significance Rating after mitigation	
	DURING CLOSURE AND POST CLOSURE								
9	Decommissioning of site and shaping of borrow pit	Noise	Neg	1	2	1	2	8	Low
		Air quality deterioration (dust)	Neg	1	3	2	2	12	Low
		Soil contamination from oil/fuel	Neg	1	2	1	2	8	Low
		Disruption of surface drainage	Neg	1	2	1	2	8	Low
	SOCIO ECONOMIC IMPACTS								
10	Negative socio-economic impacts	Community conflicts and tensions	Neg	1	3	2	2	12	Low
		Increased risk of fire	Neg	1	2	1	2	8	Low
		Reduced security in area	Neg	1	2	2	2	10	Low
11	Positive socio-economic impacts	Employment opportunities	Pos	2	2	2	3	18	Low
		Training and Skills Development	Pos	2	2	2	3	18	Low
	HERITAGE RESOURCES IMPACTS								
11	Heritage impacts	Potential impacts associated with site of a cultural or archaeological importance	Neg	5	1	1	1	7	Low
	CUMULATIVE IMPACTS								
12		Increased loss of vegetation	Neg	2	4	2	2	16	Low

APPENDIX 5.6: ASSESSMENT OF NO-GO ALTERNATIVE

The no-go alternative means that no further mining activities will take place on the site.

Activity	Impact	Positive /Negative	Duration	Magnitude	Extent	Probability	Significance Rating	
NO GO ALTERNATIVE								
Leaving area as is	Possible Land degradation	Neg	2	4	2	3	24	Low
	Potential for soil erosion	Neg	2	2	2	3	18	Low

(d) Borrow materials obtainable in the road prism or within the road reserve boundaries

Where suitable sources of materials are available in existing cuttings and side drains, or anywhere else in the road prism or within the road reserve boundaries, such materials may be used for the construction of fills, pavement layers and shoulders, if so ordered by the engineer.

3104 OPENING AND WORKING BORROW PITS AND HAUL ROADS

(a) Removing topsoil

Prior to opening a borrow pit, the contractor shall ascertain from the engineer whether the removal of topsoil is required and shall then remove and stockpile such topsoil as instructed by the engineer.

This work shall be carried out, measured and paid for in accordance with the provisions of section 5800.

(b) Clearing and grubbing

Clearing and grubbing of borrow areas will be measured for payment in accordance with the provisions of section 1700 before excavation is commenced, but only in the following cases, unless otherwise directed by the engineer:

(i) In borrow areas located in plantations.

(ii) In borrow areas where large trees with trunks exceeding 1 m in circumference as defined in section 1700 are found.

(iii) In borrow areas without any excess overburden but where the removal of grass, shrubs and roots is required.

Unless the clearing and grubbing of a borrow area have been prescribed by the engineer in writing, no payment will be made for clearing and grubbing such borrow area.

(c) Excess overburden

The contractor shall advise the engineer in good time, before any excavation at such borrow area is commenced, of his intention of starting to use a borrow area in order that a survey of the site can be made for the purpose of computing the quantity of excess overburden, if any, to be removed.

No removal of overburden or other quarrying operations shall be proceeded with until agreement has been reached between the engineer and the contractor in regard to the quantity of such overburden.

Unless, under exceptional circumstances, the clearing and grubbing of the borrow area is required to be done first, the excess overburden shall be measured only after this work has been completed.

As instructed by the engineer, excess overburden shall be moved to the outer limits of the proposed borrow area, and, if this area is enlarged later on, the excess overburden shall be moved further to the new outer limits, or, where possible at that stage, replaced into the borrow pits as described in clause 3105.

Excess overburden will also be measured for payment where the borrow material shall be stone or sand used for stone pitching, concrete work, crushed-stone subbase and base, permeable material in subsurface drainage systems, and asphalt pavements and seals.

(d) Excavating borrow material

Borrow material shall be excavated within the limits of depth and area shown on the borrow-pit plans or directed by the engineer, and in a manner that will not prejudice the use of the material for the intended purpose.

Where any borrow pit contains different types of materials in separate layers which require to be mixed to produce a suitable product, the materials shall be excavated over the full depth of the approved working face in one operation without the different types of materials being separated.

The contractor shall take all reasonable precautionary measures so as to avoid contamination of the suitable borrow material by the inclusion of clayey or otherwise unsuitable material from the floor of the borrow pit, the overburden, any unsuitable layers, or areas beyond the approved limits of the borrow area. During loading, any hard oversize material which will not break down during processing on the road shall be excluded as far as is practicable.

During borrow operations, and especially when excavating material near the floor and outer boundaries of the borrow areas, the contractor shall plan his operations so as to reduce, in so far as is possible, the amount of earth moving work that will be necessary for finishing-off the borrow pits. Indiscriminate excavation without due regard being given to the desired final shape of the borrow pit will not be permitted.

The material in borrow pits shall be blasted or ripped and excavated in a manner that will ensure the effective breaking-down of the material in the borrow pit before it is loaded.

(e) Control at borrow pit

The contractor shall be responsible for controlling his operations at every borrow pit where material is being excavated to ensure compliance with all the requirements of subclause 3104(d).

He shall conduct sufficient tests on the material being excavated from the borrow pit to satisfy himself that the quality of the material will comply with the specified requirements for the particular layer for which it will be used.

If there is any doubt concerning the quality of the borrow material being excavated at any time, the contractor shall notify the engineer immediately, and in any case before such material is brought onto the road. The results of all the tests which are conducted by the contractor shall be submitted to the engineer on request. The engineer will, after further testing or inspection if necessary, instruct the contractor regarding the use of the material in the borrow area, or he may order the borrow pit to be finished off and

abandoned.

(f) Protecting borrow pits

Borrow pits shall be continuously protected against the ingress of surface water, and the contractor shall construct such temporary banks as may be required for diverting surface water, and, in so far as is possible, his operations shall be planned in such a way that the borrow pit will be self-draining. Where this is unfeasible, borrow pits shall be dewatered by pumping. The contractor shall be solely responsible for keeping borrow areas dry and ensuring that borrow material is sufficiently dry when required for use.

(g) Unproclaimed private access roads

Where materials from a borrow pit are hauled on unproclaimed private access roads, such roads shall be maintained properly to the satisfaction of the engineer and the owner during borrow operations at the borrow pit. No additional payment will be made for this work, and full compensation for maintaining unproclaimed private access roads used as haul roads will be regarded as being included in the rates tendered and paid for the various items of work where the materials are used.

3105 FINISHING-OFF BORROW AREAS AND HAUL ROADS

(a) Borrow areas

On completion of his operations in a borrow area, the contractor shall reinstate the entire area so as to blend it with the surrounding area and to permit the re-establishment of vegetation. For this purpose the borrow area shall be shaped to even contours without any slopes being steeper than 1 in 3, except where the engineer so permits in specified cases. All material in and around the borrow area, whether spoil from road-building operations, excess stockpiled material, oversize material left in the borrow pit, material resulting from clearing and grubbing operations or excess overburden, shall be used or disposed of as directed by the engineer. Material incapable of supporting vegetation shall be buried and used for shaping the borrow area and shall subsequently be covered with soft material. All available soft material shall be spread evenly to the prescribed thickness, and where sufficient material is not available for so covering the entire area, the remaining portions shall be scarified along the contours so as to avoid undue erosion.

The shaping and finishing-off of the borrow pit shall be done in such a manner that the borrow pit will be properly drained wherever practicable, and, where required, the contractor shall place earth banks to divert surface water from the borrow area.

If so directed, the borrow area shall be fenced off and provided with gates as specified in section 5500, and topsoiled and/or hydroseeded as specified in section 5800.

The finishing-off of the borrow areas shall also comply with all legal provisions, which require, inter alia, that rehabilitation shall be approved. (See also Act 50 of 1991.)

The finishing-off of any borrow pit shall be to the entire satisfaction of the engineer, and the contractor shall furnish the engineer with a signed certificate from the landowner stating that he is fully satisfied with the finishing-off of any borrow area. The contractor's attention is drawn to the provisions of clause 1214 in this respect.

(b) Haul roads

All haul roads shall be obliterated and their surfaces scarified, earth banks shall be constructed to prevent erosion, and all damaged fences and other structures shall be reinstated, unless otherwise specified.

Where materials from a borrow pit are hauled on unproclaimed private access roads, such roads shall be restored to their original condition to the satisfaction of the engineer and the owner when borrow operations at the borrow pit are completed, unless otherwise specified. No additional payment will be made for this work, and full compensation for restoring unproclaimed private access roads used as haul roads will be regarded as being included in the rates tendered and paid for the various items of work where the materials are used.

The restoration of proclaimed roads shall be done in accordance with the instructions of the engineer and payment will be made in accordance with applicable unit rates.

3106 DISPOSAL OF BORROW MATERIAL

The contractor shall not have the right to use material obtained from borrow pits for any purpose other than for the execution of this contract. He shall not dispose of any borrow material whether processed or not either by sale or donation to any person without the written authorization of the employer.

3107 CLASSIFICATION OF BORROW PITS FOR GRAVEL MATERIALS FOR PAVEMENT LAYERS

Borrow pits for the exploitation of gravel materials shall be classified in accordance with the same classification as that described in clause 3303 for mass earthworks. Borrow pits for exploiting stone for pitching or crushing, and borrow pits for sand shall not be classified for purposes of payment.

The engineer shall have the right to decide which borrow pit shall be operated by the contractor at any particular stage of the work and to approve new borrow pits during the construction period.

3108 MEASUREMENT AND PAYMENT

Item	Unit
31.01 Excess overburden	cubic metre (m^3)

The unit of measurement shall be the cubic metre of excess overburden measured in place before stripping. Such measurement shall be based on the depth of overburden as measured in the trial pits.

APPENDIX 6
FINANCIAL PROVISIONS QUANTUM CALCULATION

CALCULATION OF THE QUANTUM

Applicant: Department of Roads and Public Works- Northern cape

Location: Borrow Pit 12
Date: Jun-19

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	10,87	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	151,42	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	223,14	1	1	0
3	Rehabilitation of access roads	m2		27,1	1	1	0
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	262,98	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	143,45	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	302,83	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0	158747,27	1	1	0
7	Sealing of shafts adits and inclines	m3	0	81,29	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0,4	105831,51	1	1	42332,604
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	131811,24	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	382842,31	1	1	0
9	Rehabilitation of subsided areas	ha	0	88617,95	1	1	0
10	General surface rehabilitation	ha	1,6	83836,41	1	1	134138,256
11	River diversions	ha	0	83836,41	1	1	0
12	Fencing	m		95,63	1	1	0
13	Water management	ha	0	31876,96	1	1	0
14	2 to 3 years of maintenance and aftercare	ha		11156,92	1	1	0
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum				1	0
					Sub Total 1		176470,86

1	Preliminary and General	21176,5032	weighting factor 2 1	21176,5032
2	Contingencies	17647,086		17647,086
			Subtotal 2	215294,45
			VAT (15%)	32294,17
			Grand Total	**247589**

APPENDIX 7
REHABILITATION AND CLOSURE PLAN

REHABILITATION AND CLOSURE PLAN

1. INTRODUCTION

Quarrying operations is finite economic activities, which is usually relatively short term. The long term environmental and social performance of a site is noticeable once mine closure and mine site operations have ceased, however the environmental, social and economic impacts are determined by the processes and procedures which occur during both the mining and mine closure phase.

The appointed contractor/borrow pit operator must perform progressive rehabilitation as material extraction is done. Progressive rehabilitation means rehabilitation done sequentially within a reasonable time after extraction of borrow pit resources is complete. As one area of their pit or borrow pit is being extracted, rehabilitation must be completed in the areas where the borrow pit reserves have been stopped or exhausted. Progressive rehabilitation is beneficial in many ways as it reduces the open areas within a borrow pit, reduces soil erosion potential and reduces double-handling of soils and spoil material.

2. REGULATORY REQUIREMENTS AND SPECIAL CONDITIONS

The following regulatory requirements and conditions were documented for closure in the environmental management plan:

- Mineral and Petroleum Resources Development Act (Act 28 of 2002) and Regulations 57: Application for Closure Certificate.
- Mine Safety and Health Act, 1996 (Act 29 of 1996)
- The National Water Act, 1998 (Act 36 of 1998)
- The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983).
- National Environmental Management Act (Act 107 of 1998)

The summary of the regulatory requirements pertaining to closure mentioned in the Environmental Management plan are:

a) All waste to be disposed of at authorised disposal sites.
b) No ponding of water will be allowed to limit drainage disruption and the risk of groundwater pollution.
c) The borrowed areas are to be landscaped to a profile in line with the surroundings.
d) On completion of the mining process all topsoil should be spread back on disturbed surfaces to enable vegetation to grow again.

3. KEY OBJECTIVES OF CLOSURE

The closure management objectives take into account the existing environment, environmental impacts and the expectations at closure. To ensure that the closure objectives are informed by the type of environment, the anticipated impacts and damage at closure, the sensitivity of the area and expected post closure land use were taken into account. In doing so, principles of integrated environmental management were taken into account together with the principles of sustainable development. The closure objectives are:

- To create a post mining environment that eliminates unacceptable health hazards and ensures public safety.
- To leave the site in a stable, non-polluting and tidy condition with no remaining plant or infrastructure that is not required for post mining operational use.
- To minimise or eliminate the downstream environmental impacts on the ecosystem due to interruption of drainage once the borrow pit operations cease.
- To establish a stable post-mining land surface which has been rehabilitated.

4. MECHANISMS FOR MONITORING COMPLIANCE

Effective monitoring, review and evaluation provide information on emerging issues, improve performance and ensure accountability of the closure activities.

4.1. MONITORING

Successful monitoring delivers timely and relevant information that allows tracking of progress towards outcomes and allows adjustments to implementation arrangements as necessary. The day-to-day monitoring and verification that the EMP and Closure and Rehabilitation Plan are being adhered to shall be undertaken by the Contactor or borrow pit operator appointed by the Department Police, Roads and Transport.

4.2. REVIEWING AND AUDITING

An independent Environmental Control Official shall visit the site quarterly during the closure and rehabilitation process to ensure that the provision of closure and rehabilitations are being met. A report on non-conformances observed will be made and submitted to the Department of Police, Roads and Transport. Reviews of the closure plan and financial provisions will be made yearly to ensure that the plan is relevant and adequate.

5. LAND END –USE PLAN

Quarrying is a temporary land use which has to be followed by other land uses. The borrow pit is located on farmland currently used primarily for grazing. At the end of the closure after vegetation has been re-established, the area will revert back to an open area grazing land.

6. TIME FOR IMPLEMENTING THE CLOSURE PLAN

The closure and rehabilitation activities are to be implemented immediately at the cessation of the extraction of road building material from the borrow pit.

7. ENVIRONMENTAL RISK REPORT.

A risk assessment will be taken at the end of the mining period. The purpose of this risk assessment is to identify to identify the risks present at the closure of the borrow pit, to evaluate them and have management measures in place so as to eliminate the risk or reduce the risks to levels that are in line with legal requirements, acceptable to the community and have long term sustainability

8. FINAL ENVIRONMENTAL PERFORMANCE ASSESSMENT

A final environmental performance assessment is to be done at the end of the mining of the borrow pit. The scope of the performance assessment is to identify any deviation from the Environmental Management Plan measures and any outstanding issues regarding the final rehabilitation of the mined site

9. REHABILITATION MEASURES

9.1. PROGRESSIVE REHABILITATION

Mining is to be done in sections to allow progressive rehabilitation during mining to take place. If during mining of the borrow pit it is deemed that the mined section will no longer be mined again, then the area can be rehabilitated as after cessation of the mining of the section. The area is to be properly profiled and the slopes smoothened. This is done in order to improve the visual impact of the area and to simplify the management of storm water runoff and improve slope safety. Top soil is to be put back on the disturbed surfaces to enable the re-vegetation process to take place.

9.2. REHABILITATION OF ACCESS ROADS

- Whenever the borrow pit is suspended, cancelled or abandoned any access road or portions thereof, constructed by the holder of the permit and which will no longer be required by the landowner/tenant, shall be removed and/or rehabilitated to the satisfaction of the owner.
- Any gate or fence erected by the appointed contractor/borrow pit operator which is not required by the landowner/tenant, shall be removed and the situation restored to the pre-borrow pit situation.
- Roads shall be ripped or ploughed, and if necessary, appropriately fertilised (based on a soil analysis) to ensure the regrowth of vegetation. Imported road construction materials which may hamper regrowth of vegetation must be removed and disposed of in an approved manner prior to rehabilitation.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the soil must be analysed and any deleterious effects on the soil arising from the borrow pit, be corrected and the area be seeded with a seed mix which is similar with the vegetation of the area.

9.3. OFFICES, STORAGES AREA AND PLANT STRUCTURES

- On completion of operations, all buildings, structures or objects on the camp/office site shall be demolished and removed.
- Where office/camp sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
- On completion of borrow pit operations, the above areas shall be cleared of any contaminated soil, which must be disposed of through a licensed disposal facility or operator.
- All infrastructure, equipment, plant, temporary housing and other items used during the borrow pit period will be removed from the site
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the borrow pit area and disposed of at a registered waste disposal facility. It will not be permitted to be buried or burned on the site
- Photographs of the camp and office sites, before and during the borrow pit and after rehabilitation, shall be taken at selected fixed points and kept on record.

- **The surface shall then be ripped or ploughed and the topsoil previously stored shall be spread evenly to its original depth over the whole area. The area shall then be fertilised if necessary (based on a soil analysis).**
- **The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.**
- **If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, there might be need for the soil be analysed and any deleterious effects on the soil arising from the borrow pit operation be corrected and the area be re-seeded with a suitable vegetation seed mix.**

9.4. REHABILITATION OF EXCAVATION AREAS

- **Excavated areas should be kept in a safe and stable manner. No unstable block should be present. Reshaping of the borrow pit may need to be done to ensure that this objective is reached.**
- **Preventative measures may be necessary during closure to construct adequate drainage structures including ditches and other structures to facilitate the movement of surface water and prevent damming. An assessment will need to be done when mining has ceased to determine if there is need for such measures. The objective of these measures is to avoid water build-up that affects the physical stability of the slopes and also interferes with the drainage of the whole area.**
- **The excavated area must serve as a final depositing area for the placement of overburden and un-used material.**
- **Rocks and coarse material removed from the excavation must be dumped into the excavation simultaneously, as described in previous paragraph. Waste will not be permitted to be deposited in the excavations.**
- **Once excavation parts that can be filled have been refilled with overburden, rocks and coarse natural materials and profiled with acceptable contours and erosion control measures, the topsoil previously stored shall be returned to its original depth over the area.**
- **The area shall be fertilised if necessary, to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora.**
- **If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, there may be need for the soil to be analysed and any deleterious effects on the soil arising from the borrow pit, be corrected and the area be seeded with a vegetation seed mix to his or her specification.**

The final rehabilitation takes into account that the borrow pit is located in a semi-arid region. The environment affected by the operations shall be rehabilitated, as far as is practicable, to its natural state or to a predetermined and agreed to standard or land use which conforms with the concept of sustainable development. The affected environment shall be maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof. The rehabilitation activities shall require the re-planting of vegetation in some areas cleared for the borrow pit activities. This will promote soil stability, improve the visual environment and provide faunal habitat into the operation stage.

10. MANAGING IMPACTS ARISING FROM UNDERTAKING CLOSURE ACTIVITIES

The undertaking of the closure and rehabilitation activities is not expected to generate additional impacts that are different from the ones generated during the operational stage of the borrow pit. The impact mitigation and management measures that are provided in the environmental management plan are deemed adequate to manage the impacts arising from the closure process itself. However, in the event that are additional new issues are noted, appropriate mitigation will be put in place to manage the impacts.

11. LONG TERM MANAGEMENT AND MAINTENANCE AFTER CLOSURE

No long-term monitoring and maintenance is expected. There is no risk of acid mine drainage.

12. PUBLIC PARTICIPATION PROCESS FOR CLOSURE PLAN

The public participation process for the closure plan was done as part of the basic assessment process and the details are provided for in Appendix 3.

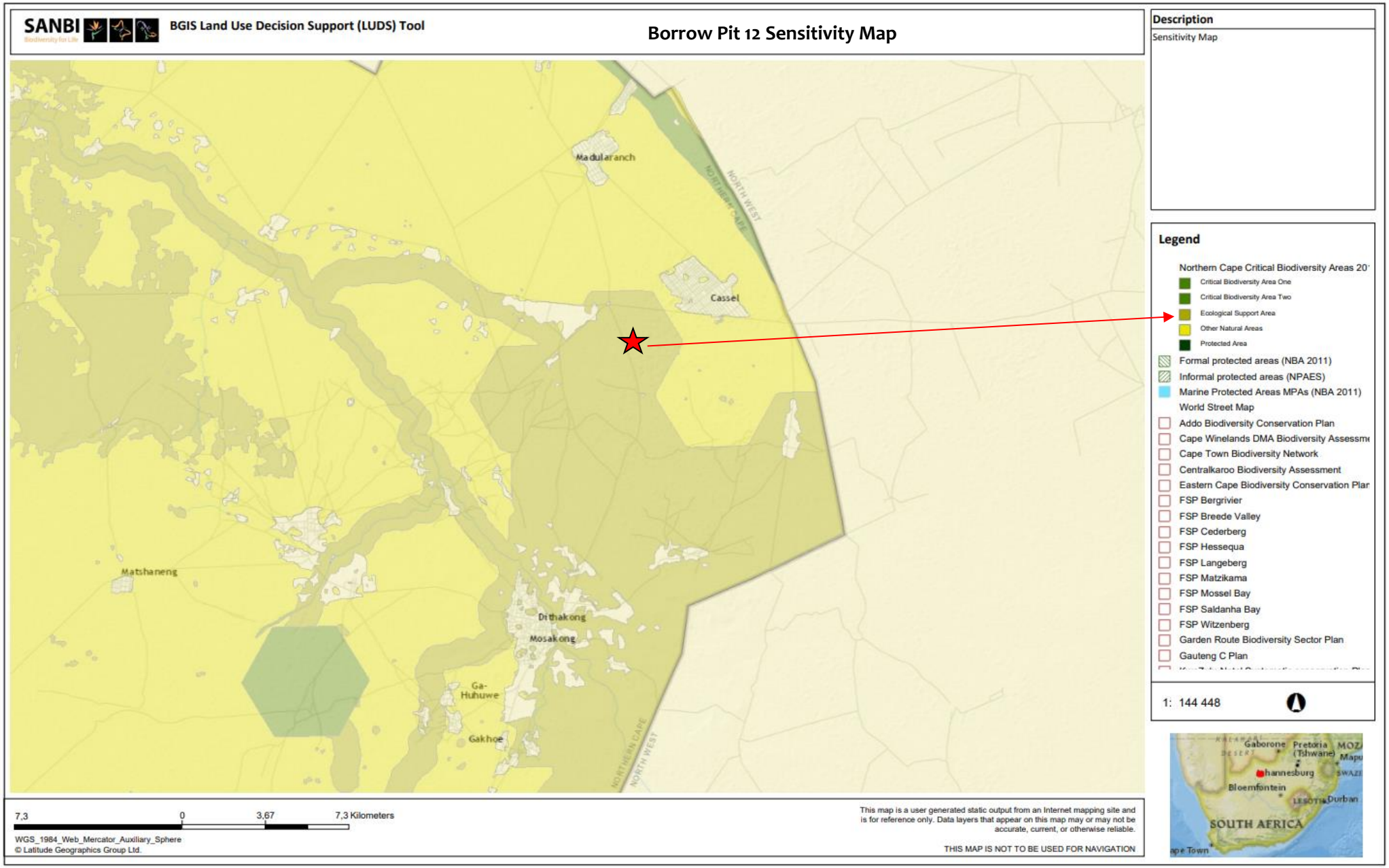
13. FINANCIAL PROVISIONS FOR CLOSURE

The rehabilitation costs and closure cost were estimated based on the activities required for implementing the protective and rehabilitated measures including maintenance and monitoring of the closure program. Financial provision to cover costs of closure will be budgeted for and set aside when this borrow pit is to be used. The expected amount of money required for closure and rehabilitation is shown in Appendix 7 in the Quantum Calculation for Financial Provisions. The Department of Police, Roads and Transport will strive to ensure that the amount is available as part of the budget for the development of the borrow pit.

14. CONCLUSION

The closure plan serves to provide details of the closure activities to be undertaken based on the anticipated mode of operation of the borrow pit. It is expected that adequate implementation of the closure activities will minimise the negative impacts of the borrow pit on the environment and enable a self-sustaining ecosystem to be re-established. If during the operation any unanticipated aspects occur, these should be assessed immediately, and adequate mitigation measure implemented to minimise their effect at and after closure.

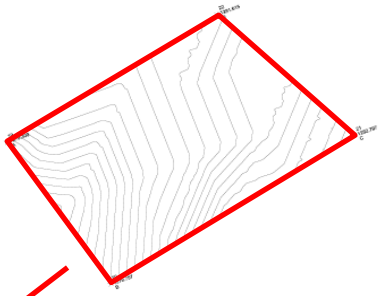
Sensitivity Map



Rehabilitation Layout Plan

Areas for Rehabilitation (Approximate)

Point Table				
	Raw Description	Elevation	Northing	Easting
	A	1279.309	-2986261.5940	94420.5904
	B	1279.757	-2986441.0085	94463.3369
	C	1282.797	-2986378.5045	94748.5773
	D	1281.615	-2986208.1836	94666.3358



BORROW PIT NO. 12

Excavations and other disturbed areas

VERSION/AMENDMENTS

Northern Cape Department of Roads and Public Works

9 - 11 Blackmore Street, Squarehill Park,8300, Northern Cape, South Africa

POST NET SUIT #152 PRIVATE BAG X1028 DORINGKLOOF 0140

PO BOX 517 MOTHIBISTAD 8474

53 Debeers Road Kimberly 8301 South Africa

Tel: (087) 940 3149 Fax: (086) 768 5141 E-mail: admin@kmsd.co.za

UPGRADING OF GRAVEL SECTION OF MR950 & MR952

BORROW PIT 12 LAYOUT

AS SHOWN

JUNE 2019

A

APPENDIX 8
ENVIRONMENTAL MONITORING PLAN

ENVIRONMENTAL MONITORING PLAN

INTRODUCTION

A number of potential environmental impacts, mitigation measures and environmental management controls are laid out in this document. The effective implementation and monitoring of the EMP requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during the project life cycle. The key roles for the successful implementation of the mitigation of the project are the Applicant, the appointed contractor or operator of the borrow pit and the independent environmental control officer.

The Applicant – Department of Roads and Public Works, Northern Cape
It is the responsibility of the project applicant to ensure that the mitigation on all work is compliant with the requirements of the EMP. The applicant shall ensure that competent people are employed on the project by its construction contractor. Where necessary a skills development program will be instituted to ensure that the required levels of competency are attained. The applicant should ensure that the selected contractor is able to adequately deal with the environmental challenges in this project.

The Appointed Contractor/Operator
The Contractor refers to the team/company appointed by the Applicant to undertake the borrow pit developmental activities for the borrow pit. The Contractor shall have the following responsibilities:

- **To implement all provisions of the EMP and ensure that the appropriate levels of measuring and monitoring is done.**
- **To ensure that all staff and sub-contractors are familiar with the EMP and that duties and responsibilities of employees working on site include environmental responsibilities pertaining to the nature of their work.**
- **To make personnel aware of environmental issues and to ensure they show adequate consideration of the environmental aspects of the project.**
- **To report any incidents of non-compliance with the EMP to the ECO and the applicant.**

The Independent Environmental Control Officer (ECO)
In order to ensure compliance with the environmental management plan and ensure that adequate monitoring and auditing is done of the mining activities, the applicant shall appoint an independent environmental Control Officer (ECO) to monitor the implementation of the recommendations made. The ECO must undertake monthly audits in respect of compliance with the EMP and report to the applicant and the appointed contractor/borrow pit operator if areas of non-conformance are identified. The ECO shall also inform the applicant and its contractors of any identified opportunities for improving environmental performance.

MONITORING MATRIX
The expected monitoring requirements are shown in the Table provided.

	ISSUE	MONITORING METHODOLOGY	MONITORING FREQUENCY	RESPONSIBILITY
A	Social Issues			
	Community Complaints	Recording No. Of complaints received	Monthly record of incidents	Contractor
	Fair Labour Recruitment	Recording Local Vs Migrant labour	Monthly key labour statistics	Contractor
B	General Site Issues			
	Location of parking, offices etc.	Visual check of site suitability	At start up	Contractor
	Vegetation Clearance	Areas cleared	At start up, Ongoing during life of Mine (LOM)	Contractor
	Surface or gully erosion on site	Visual check of surfaces	Ongoing during LOM. Record NCs Monthly	Contractor
	Adequacy of fencing and beacons	Visual check of integrity of fencing	Ongoing during LOM. Record NCs Monthly	Contractor
	Suitability of storage areas for waste	Check no. of receptacles and bunding	Ongoing during LOM, Record NCs Monthly	Contractor
	Fire Breaks	Visual check	Ongoing during LOM, Record NCs Monthly	Contractor
	Proper functioning of sanitation facilities	Check that there is no overflows & effluent spillages	Ongoing during LOM, Record NCs Monthly	Contractor
	Control of Fires/Prevention of burning	Monitor incidences of non-compliance Check that firefighting equipment is serviced	Ongoing during LOM, Record NCs Monthly	Contractor
	Overall appearance of site/housekeeping	Visual check of litter and order	Ongoing during LOM, Record NCs Monthly	Contractor
C	Worker conduct			
	General environmental awareness training	Record people and issues trained	At recruitment and start-up, then as necessary Keep training records	Contractor
	Prohibition of hunting and gathering	Monitor incidences of non-compliance	Ongoing during LOM, Record NCs Monthly	Contractor
	Limit access to operational borrow pit areas only	Monitor incidences of non-compliance	Ongoing during LOM, Record NCs Monthly	Contractor
D	Equipment Maintenance			

	ISSUE	MONITORING METHODOLOGY	MONITORING FREQUENCY	RESPONSIBILITY
	Adequate Maintenance of Vehicles	Check compliance with schedule	Ongoing during LOM, Keep monthly maintenance records	Contractor
	Oil Leaks and spills clean-up	Monitor incidences of non-compliance	Ongoing during LOM, Record NCs Monthly	Contractor
	Excessive vehicular emissions control	Monitor incidences of non-compliance	Ongoing during LOM, Record NCs Monthly	Contractor
E	Material Storage			Contractor
	Suitability of storage facilities	Record material usage Check receptacles and bunding integrity	Ongoing during LOM, Keep monthly usage records	Contractor
F	Waste Management			
	Efficiency of collection of waste streams	Record waste disposed	Ongoing during LOM, Record Monthly disposal	Contractor
	Adequacy of storage receptacles	Visual checks	Ongoing during LOM, Record NCs Monthly	Contractor
	Containment of liquid waste	Visual checks of leakages & bunding	Ongoing during LOM, Record NCs Monthly	Contractor
	General Cleanliness of area	Visual checks of no littering	Ongoing during LOM, Record NCs Monthly	Contractor
	Containment of contaminated waste	Visual check of bunding & receptacles	Ongoing during LOM, Record NCs Monthly	Contractor
G	Excavations, Exposed Surfaces, screening			
	Stability of slopes	Visual checks of cracks and failure signs	Ongoing during LOM, Record NCs Monthly	Contractor
	Safety signs and demarcations	Visual checks of integrity	Ongoing during LOM, Record NCs Monthly	Contractor
	Adequacy of site drainage	Check that storm water is moving freely	Ongoing during LOM, Record NCs Monthly	Contractor
	Dust Suppression on dust generating area	Check adequacy of water spraying	Ongoing during LOM, Record NCs Monthly	Contractor
	Surface erosion on site	Visual check of surfaces	Ongoing during LOM, Record NCs Monthly	Contractor
H	Water			
	Cleaning up of contaminated soils	Report incidences of non-conformances	Ongoing during LOM, Record NCs Monthly	Contractor
	Water Consumption at site	Report amount of water used	Ongoing during LOM, Record NCs Monthly	Contractor
I	Drilling and Blasting			
	Dust Suppression	Visual check before & after blasting Record key parameters	Ongoing during LOM, Record NCs Monthly	Contractor

	ISSUE	MONITORING METHODOLOGY	MONITORING FREQUENCY	RESPONSIBILITY
	Warning of workers and public	Check signs and documents before blasting.	Ongoing during LOM, Record NCs Monthly	Contractor
J	Final Rehabilitation			
	Removal of infrastructure	Visual check of removal, Keep removal records	At decommissioning, Record of Disposal	Contractor
	Rehabilitation of access roads	Visual check	At decommissioning, Record NCs Monthly	Contractor
	Removal of contaminated soils	Record disposal record	At decommissioning, Monthly disposal record	Contractor
	Reshaping of borrow pit and stabilisation	Visual check	At decommissioning	Contractor
	Establishment of adequate drainage structure	Visual check of non-pooling	At decommissioning, Record NCs Monthly	Contractor
	Replanting with indigenous local species	Record areas planted	At decommissioning, Keep record of action done	Contractor
	Checking the re-vegetation efforts	Visual check	Quarterly thereafter	Contractor

APPENDIX 9
ENVIRONMENTAL AWARENESS PLAN

ENVIRONMENTAL AWARENESS AND TRAINING PLAN

1. Introduction

The successful implementation of the EMP is hinged on adequate environmental awareness training of employees. The workforce needs to understand their role in the achievement of the objectives specified in the EMP. All operational staff should be provided with environmental awareness training and employees who require specialised training in line with the nature of their job should be provided with such training.

2. What the training and awareness should cover.

Mining employees and subcontractors are required to attend a site induction addressing environmental issues prior to commencing duties. Environmental issues covered include:

- **Making employees aware that everyone has a right to a clean environment and that everyone has a responsibility to protect the environment.**
- **Explanation of the importance of complying with the EMP.**
- **Discussion of the potential environmental impacts of mining activities and mitigation measures that must be implemented when carrying out 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 specifics of the EMP and its specification.**

It is recommended that a short induction lecture on environmental awareness be done to all contractors and casual workers covering topic such as:

- **Waste management**
- **Artifacts**
- **Storage of hazardous materials**
- **Fires**
- **Importance of good house keeping**
- **Noise**
- **Importance of water conservation**
- **Dust management**
- **And emphasize importance of minimizing vegetation removal**

The training should include showing on the construction area, areas where vegetation clearance is not to be done, showing the personnel No Go areas, locations for stockpiles and access roads to be used.

Training can be done either in a written or verbal format but will be in an appropriate format for the receiving audience. A record of people who have been trained and the training done shall be kept.

3. **Training on Emergencies.**

All personnel should be trained on how emergencies on site will be handled.

- **The appointed contractor/borrow pit operator should identify all situations that can lead to emergency situations and provide response strategies. The situations should include fire and major chemical spill.**
- **Contact details of all departments/service providers to be contacted in case of an emergency shall be made available to employees.**
- **Equipment for dealing with emergencies such as spill kits, firefighting equipment, first aid boxes etc. shall be made available and personnel properly trained in its use.**
- **All staff on site should be trained on how to handle emergency situations and emergency drills/ rehearsals should be conducted periodically to ensure that staff is prepared.**


GREEN-BOX
CONSULTING
INTEGRATED ENVIRONMENTAL MANAGEMENT