PROPOSED MINING OF AGGREGATE ON A PORTION OF PORTION 8 OF THE REMAINING EXTENT OF THE FARM DRIEFONTEINEN 243, REGISTRATION DIVISION OF MOSSEL BAY, WESTERN CAPE

DRAFT BASIC ASSESSMENT REPORT

APRIL 2019

REFERENCE NUMBER: WC 30/5/1/3/2/10206 MP

PREPARED FOR:

Haw and Inglis Civil Engineering (Pty) Ltd

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EXECUTIVE SUMMARY

Haw and Inglis Civil Engineering (Pty) Ltd intends to apply for a mining permit to mine 5 ha of on a portion of portion 8 of the remaining extent of the farm Driefonteinen 243 which falls in the Mossel Bay Local Municipality in the Registration Division of Mossel Bay RD, Western Cape Province.

The area earmarked for the proposed mining falls on a section of the farm that was previously used as an existing quarry and the intention of this application is to increase the existing quarry. The mining methods will make use of blasting means of explosives in order to loosen the hard rock. The material is then loaded and hauled out of the excavation to the mobile crushing and screening plants. The aggregate will be screened to various sized stockpiled. The aggregate will be stockpiled and transported to clients via trucks and trailers. All activities will be contained within the boundaries of the site. Blasting will only occur once every six (6) to eight (8) weeks.

The proposed mining area is approximately 5 ha in extent and the applicant, Haw and Inglis Civil Engineering (Pty) Ltd, intents to win material from the area for at least 2 years with a possible extension of another 3 years. The aggregate to be removed from the quarry will be used local construction and building projects in the vicinity. The proposed quarry will therefore contribute to the upgrading / maintenance of road infrastructure and building contracts in and around the Mossel Bay area.

The proposed project triggers listed activities in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and the Environmental Impact Assessment Regulations 2014 (as amended 2017) and therefore requires an environmental impact assessment (basic assessment process) that assess project specific environmental impacts and alternatives, consider public input, and propose mitigation measures, to ultimately culminate in an environmental management programme that informs the competent authority (Department of Mineral Resources) when considering the environmental authorisation. This report, the Draft Basic Assessment Report, forms part of the departmental requirements, and presents the first report of the EIA process.

Should the MP be granted and the mining of quartzite (aggregate) be allowed, the Driefonteinen Quarry project will comprise of activities that can be divided into 3 key phases namely the:

(1) *Site establishment/construction phase* which will involve the demarcation of the permitted mining area and required buffer no-go zones pertaining to areas of significant importance identified during the environmental impact assessment.

(2) *Operational phase* that is presently expected to entail the mining of aggregate from the approved footprint area via conventional open cast mining methods.

The mining method will make use of blasting in order to loosen the hard rock; upon which the loosened material will be transported to the crushing and screening processing plant where it will be screened to various sized stockpiles, before it is sold and transported from site to clients.

(3) *Decommissioning phase* which entails the rehabilitation of the affected environment prior to the submission of a closure application to the Department of Mineral Resources (DMR). The permit holder will further be responsible for the seeding of all rehabilitated areas. Once the full mining area is rehabilitated, the mining permit holder will be required to submit a closure application to the DMR in accordance with section 43(4) of the MPRDA, 2002. The Closure Application will be submitted in terms of Regulation 62 of the MPRDA, 2002, and Government Notice 940 of NEMA, 1998 (as amended).

Preferred Site

The Applicant, Haw and Inglis Civil Engineering (Pty) Ltd applied for a mining permit, 5ha, on a portion of portion 8 of the remaining extent of the farm Driefonteinen 243 which falls in the Mossel Bay Local Municipality in the Registration Division of Mossel Bay RD, Western Cape Province. The area earmarked for the proposed mining falls on a section of the farm that was previously used as an existing quarry and the intention of this application is to increase the existing quarry.

No-go Alternative

The no-go alternative entails no change to the status quo and is therefore a real alternative that needs to be considered. The aggregate to be stockpiled at the site will be used for road and construction industries, if however, the no-go alternative is implemented the applicant will not be able to utilize the mineral present in the area.

This could have major impacts on aspects such as transporting of material to construction sites from far off mining areas, cost effectiveness of material, impact on roads and road users due to long distance hauling of gravel and loss of income to the Mossel Bay business area due to the multiplier effect.

Public Participation Process

During the initial public participation process the stakeholders and I&AP's were informed of the project by means of background information documents that were sent directly to the contact persons. An advertisement that was placed in Mossel Bay Advertiser on the 29th of March 2019 on-site notices that were placed at conspicuous places. A 30-days commenting period was allowed which run from 29th March 2019 to 2nd May 2019. In accordance with the timeframes stipulated in the EIA Regulations, 2014 (as amended by GNR 326 effective 7 April 2017) the Draft Basic Assessment Report was compiled and will be distributed for comment and perusal to the I&AP's and stakeholders listed above. A 30-day commenting period, ending 10th of June 2019, will be allowed for perusal of the documentation and submission of comments. The comments received on the DBAR will be incorporated into the Final Basic Assessment Report (FBAR) to be submitted for decision making to DMR.

Basic Assessment Report

The basic assessment report identifies the potential positive and negative impacts that the proposed activity will have on the environment and the community as well as the aspects that may impact on the socio-economic conditions of directly affected persons, and proposes possible mitigation measure that could be applied to modify / remedy / control / stop the identified impacts.

The key finding of the environmental impact assessment entail the following:

Mining and Biodiversity Conservation Areas:

- The environmental impact assessment identified a Critical Biodiversity Area (CBA) that extend throughout the property of the proposed mining area. This area is also highlighted in terms of the Mining and Biodiversity Guideline as an area of high biodiversity importance with a corresponding rating of high risk for mining.
- However, the area that the proposed mining area will be located area extent to an area that was previously used for the mining of aggregate, and can be classified as an disturbed area.
- In order to preserve the CBA and prevent mining having a negative impact on the biodiversity sensitive area, it is proposed that a 20 m no-go buffer be set from the border of the CBA line in which no mining may take place.

Other Site Specific Environmental Aspects:

- Driefonteinen Quarry will be cut into the hill. Due to the nature of the activity, the topography of the hill will be altered in that a depression will be created with stepped side walls as mining progress. The rehabilitation option (upon closure) is to render the quarry safe and leave it as a minor landscape feature.
- The viewshed analysis showed that the proposed visual impact will be high towards the due to the elevation of the earmarked area compared to the surrounding area. It is therefore anticipated that the proposed mine will be highly visible within the short to medium distance zone; however, as the distance between the proposed development and the observer increases the visual impact will decrease.
- As the prevalent wind direction is in an south – south- eastern direction the hill will screen dust generated at Driefonteinen quarry from the operations/residents on the opposite side. Should the Applicant implement the mitigation measures proposed in this document and the EMPR the impact on the air quality of the surrounding environment is deemed to be of low-medium significance.
- Although the proposed activity will have a cumulative impact on the ambient noise levels, the development will not take place in a pristine environment, and the impact is therefore deemed compatible with the current operations and of low significance.
- There are no rivers, streams or wetlands within close proximity of the mining area. Haw and Inglis is currently in process of applying for a Water Use Authorisation for the drilling of a borehole on site for water abstraction to be used on the quarry.

- The fauna at the site will not be impacted on by the proposed mining activity as they will be able to move away or through the site, without being harmed.
- No sites of archaeological or cultural importance were identified during the site inspection.

During the environmental impact assessment process the feasibility of the proposed site was assessed to identify fatal flaws that are deemed as severe as to prevent the activity continuing, or warrant a site or project alternative. The outcome of the assessment showed that should the mitigation measures and monitoring programmes proposed in this document be implemented, no fatal flaws could be identified that prevents the activity continuing.

Environmental Management Programme (EMPR)

The EMPR provides a description of the impact management outcomes and closure objectives. It presents the impacts to be mitigated in their respective phases as well as stipulates the mitigation measures to be applied on site.

The financial provision amount that will be necessary for the rehabilitation of damages caused by the operation, both sudden closures during the normal operation of the project and at final, planned closure gives a sum total of R 1 380 769,52.

ABBREVIATIONS

ASTM	American Standard Test Method
BID	Background Information Document
DBAR	Draft Basic Assessment Report
DEAT	Department of Environment, Agriculture and Tourism
DEAP	Department of Environmental Affairs and Development Planning
DMR	Department of Mineral and Resources
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
ECO	Environmental Control Officer
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
FBAR	Final Basic Assessment Report
GN	Government Notice
GNR	Government Notice Regulation
HIA	Heritage Impact Assessment
H&I	Haw and Inglis Civil Engineering (Pty) Ltd
I&AP's	Interested and Affected Parties
LED	Local Economic Development
NEMA	National Environmental Management Act, 1998
NHRA	National Heritage Resources Act, 1999
MPRDA	Minerals and Petroleum Resources Development Act, 2002
MHSA	Mine Health and Safety Act, 1996
PPP	Public Participation Process
PPE	Personal Protective equipment
Ptn	Portion
PSM	Project Site Manager
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SHE	Safety, Health and Environment
SLP	Social and Labour Plan
WC	Western Cape
WMA	Water Management Area

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mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATION IN TERMS OF THE NATIONAL ENVIRONMENTAL 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: *Haw and Inglis Civil Engineering (Pty) Ltd Limited*

TEL NO: *021 976 1110*
FAX NO: *021 976 8802*
POSTAL ADDRESS: *Private Bag X3, Durbanville, 7551*
PHYSICAL ADDRESS: *Hillcrest Estate, Racecourse Road, Durbanville, 7551*

FILE REFERENCE NUMBER SAMRAD: ***WC 30/5/1/3/2/10206 MP***

1. IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 29 of 2002) as amended), the Minister must grant a Mining 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 can 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 these aspects to determine:

  (I) the nature, signification, 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 ASSESSMENT AND BASIC ASSESSMENT REPORT

1. Contact Person and correspondence address

a) Details of: Greenmined Environmental

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) the proponent must appoint an independent Environmental Assessment Practitioner (EAP) to undertake the environmental impact assessment (EIA) of any activities regulated in terms of the aforementioned Act. Haw and Inglis Civil Engineering (Pty) Ltd appointed Greenmined Environmental to undertake the study needed. Greenmined Environmental has no vested interest in Haw and Inglis Civil Engineering (Pty) Ltd or the proposed project and declares its independence as required by the Environmental Impact Assessment Regulations, 2014 (as amended April 2017) (EIA Regulations).

i) Details of the EAP

Name of the Practitioner:	Greenmined Environmental
	Yolandie Coetzee
Tel No.:	011 966 4390 / 082 734 5113
Fax No.:	086 546 0579
E-mail address:	yolandie.c@greenmined.co.za

ii) Expertise of the EAP.

(1) The qualifications of the EAP

(With evidence).

Mrs. Yolandie Coetzee has a B.Sc. Degree in Microbiology and Biochemistry and an Honours Degree in Envivornmental Sciencies. Please find full CV attached in Appendix J.

(1) Summary of the EAP's past experience.

(In carrying out the Environmental Impact Assessment Procedure)

Yolandie Coetzee is an Environmental Consultant with 9 years' experience in the environmental sector. She specialized the last 5 years in the rehabilitation of mines where she conducted the conceptual rehabilitation and management designs and the closure plans and programs. She has also been involved in a number of other environmental projects including railway sidings, filling stations, abattoir's, logistics hub and mining sites where she compiled environmental management plans, environmental impact assessments, environmental audits, due diligences, IWULA's/IWWMP's and alien invasive encroachment programs.

She studied at the University of Potchefstroom where she has successfully completed her undergraduate degree in microbiology and biochemistry and her Honors degree in environmental sciences. See a list of past project attached as Appendix J.

b) 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 aforesaid main and listed activities, and infrastructure to be placed on site

Haw and Inglis Civil Engineering (Pty) Ltd intends to apply for a mining permit to mine 5 ha of on a portion of portion 8 of the remaining extent of the farm Driefonteinen 243 which falls in the Mossel Bay Local Municipality in the Registration Division of Mossel Bay RD, Western Cape Province.

The area earmarked for the proposed mining falls on a section of the farm that was previously used as an existing quarry and the intention of this application is to increase the existing quarry. The mining methods will make use of blasting means of explosives in order to loosen the hard rock. The material is then loaded and hauled out of the excavation to the mobile crushing and screening plants. The aggregate will be screened to various sized stockpiled. The aggregate will be stockpiled and transported to clients via trucks and trailers. All activities will be contained within the boundaries of the site. Blasting will only occur once every six (6) to eight (8) weeks.

The proposed mining area is approximately 5 ha in extent and the applicant, Haw and Inglis Civil Engineering (Pty) Ltd, intents to win material from the area for at least 2 years with a possible extension of another 3 years. The aggregate to be removed from the quarry will be used local construction and building projects in the vicinity. The proposed quarry will therefore contribute to the upgrading / maintenance of road infrastructure and building contracts in and around the Mossel Bay area.

The mining activities will consist out of the following:

- Stripping and stockpiling of topsoil;
- Blasting;
- Excavating;
- Crushing;
- Stockpiling and transporting;
- Sloping and landscaping upon closure of the site; and
- Replacing the topsoil and vegetation the disturbed area.

The mining site will contain the following:

- Drilling equipment;

- Excavating equipment;
- Earth moving equipment;
- Static crushing and screening plants.
- Access Roads;
- Site Office (6m Containers);
- Security Gate;
- Site vehicles;
- Parking area for visitors and site vehicles;
- Vehicle service area;
- Wash bay;
- Workshop (6m Containers);
- Salvage Yard;
- Bunded diesel (20 000l tank) and oil storage facilities;
- Generator on bunded area;
- Ablution Facilities (6m Container with Septic Tank);
- Weigh Bridge; and
- Demarcated general and hazardous waste area.

An Eskom connection will be used to power the infrastructure on site. All diesel storage will be below the threshold as mentioned in the EIA regulations of the National Environmental Management Act, 1998 (Act No 107 of 1998) as amended 2017.

The proposed mining area will be reached via the existing access road to the quarry, making use of the existing internal/haul roads to access the material within the mining area. Trucks delivering the materials to the destinations will take the N2 national route. Marker info according to the SANRAL roads system N2-6 67.2E.

Any water required for the implementation of the project will be drawn from a borehole to be established on site, a water use authorization application will be made for this.

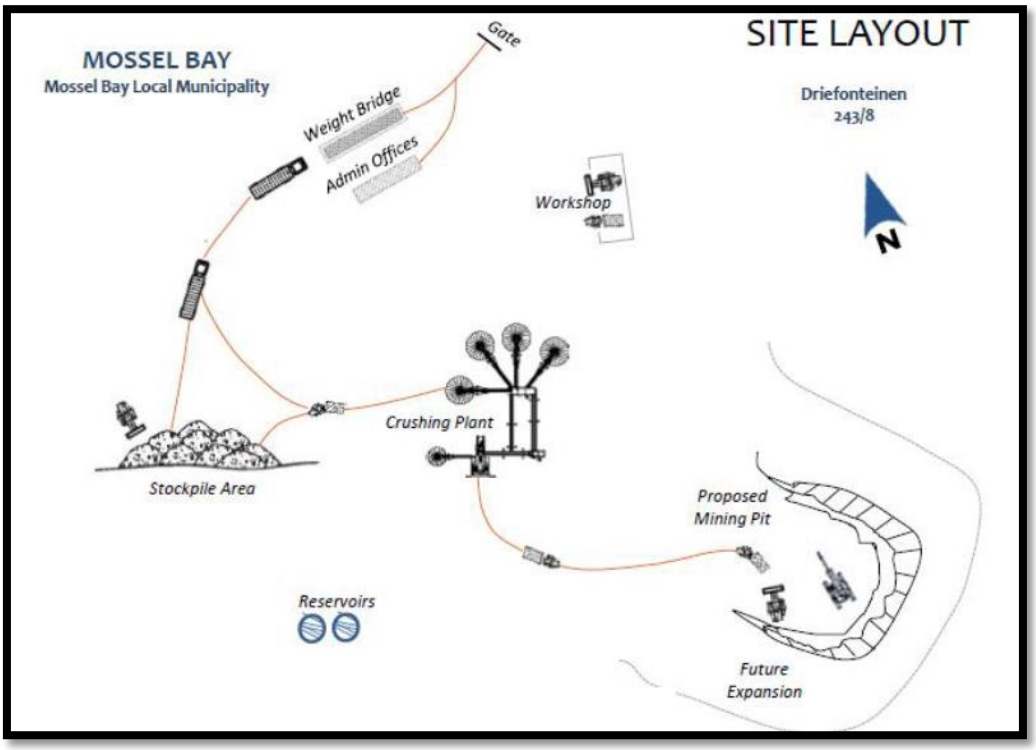

Figure 1: Site Layout Plan of the proposed Quarry.

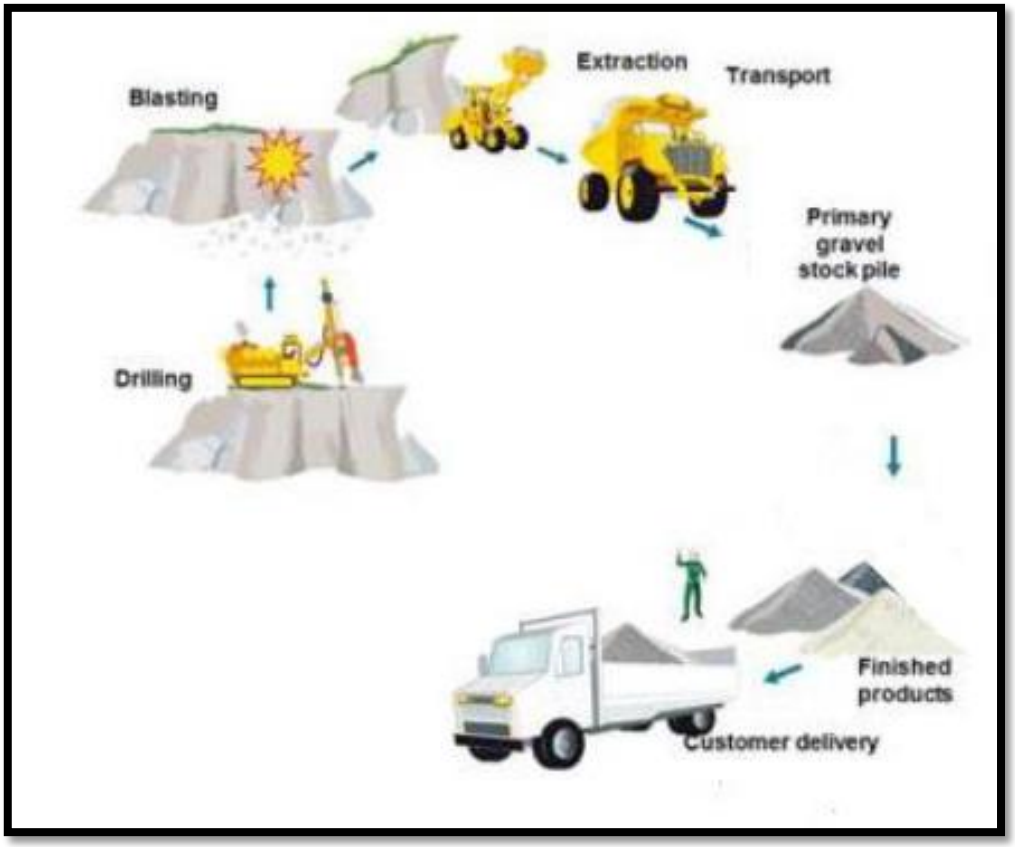

Figure 2: Operation Plan of the proposed Quarry.

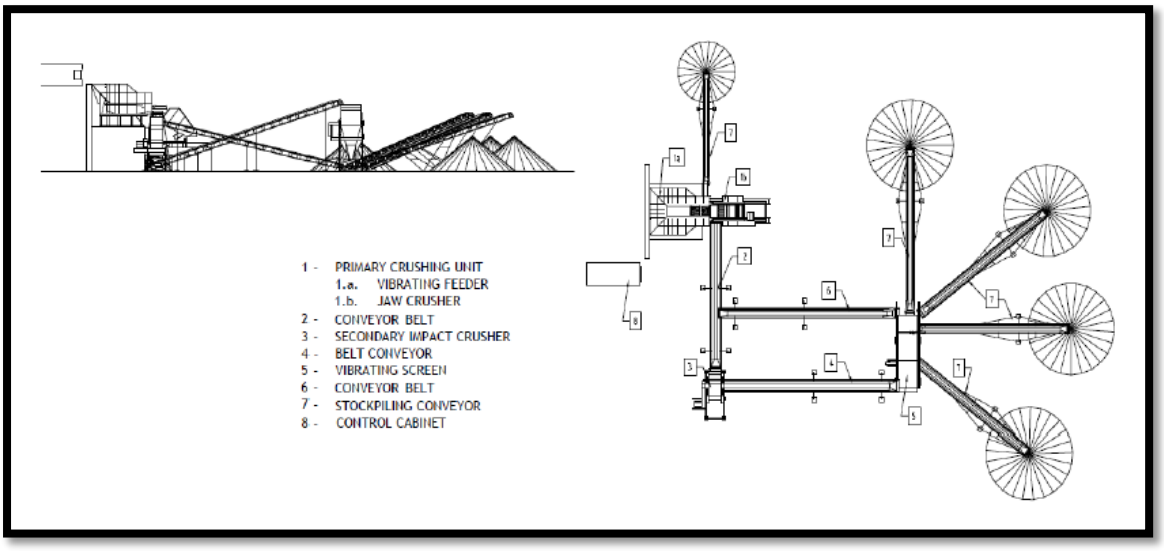

Figure 3: Crushing and Screening Plant of the proposed Quarry.

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)***
Demarcation of site with visible beacons.	5 ha	N/A	Not listed
Stripping and stockpiling of topsoil.	5 ha	**X**	GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 27, 28
Drilling and blasting.	±2 ha	**X**	GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 21, 28
Excavation, loading and hauling to the processing area.	±2 ha	**X**	GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 21, 28
Crushing and Screening	±1 ha	**X**	GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 21, 28
Stockpiling and transportation of material from site	±2 ha	**X**	GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 21, 28
Sloping and landscaping upon closure of the mining area.	5 ha	**X**	GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 22
Replacing the topsoil and vegetating the disturbed area.	5 ha	**X**	GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 22

ii) Description of the activities to be undertaken

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

As mentioned earlier, the Applicant applied for Environmental Authorisation to expand the existing aggregate quarry located on located on the farm Driefonteinen 243, Portion 8 (Remaining Extent), which falls in the Mossel Bay Local Municipality. The mining methods will make use of blasting means of explosives in order to loosen the hard rock, primary crushing is conducted in the pit, and the material is then loaded and hauled out of the excavation to the mobile crushing and screening plants.

Table 1 lists the GPS Co-ordinates of the proposed mining area as shown on the Regulation 2.2 Mine Plans as attached as Appendix A.

Table 1: GPS Co-ordinates of the proposed mining footprint.

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	34°10'50.765	21°53'40.823	-34.180768º	21.894673º
B	34°10'56.143	21°53'40.351	-34.182262º	21.894542º
C	34°10'55.456	21°53'28.705	-34.182071º	21.891307º

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
D	34°10'50.113	21°53'29.044	-34.180587º	21.891401º
A	34°10'50.765	21°53'40.823	-34.180768º	21.894673º

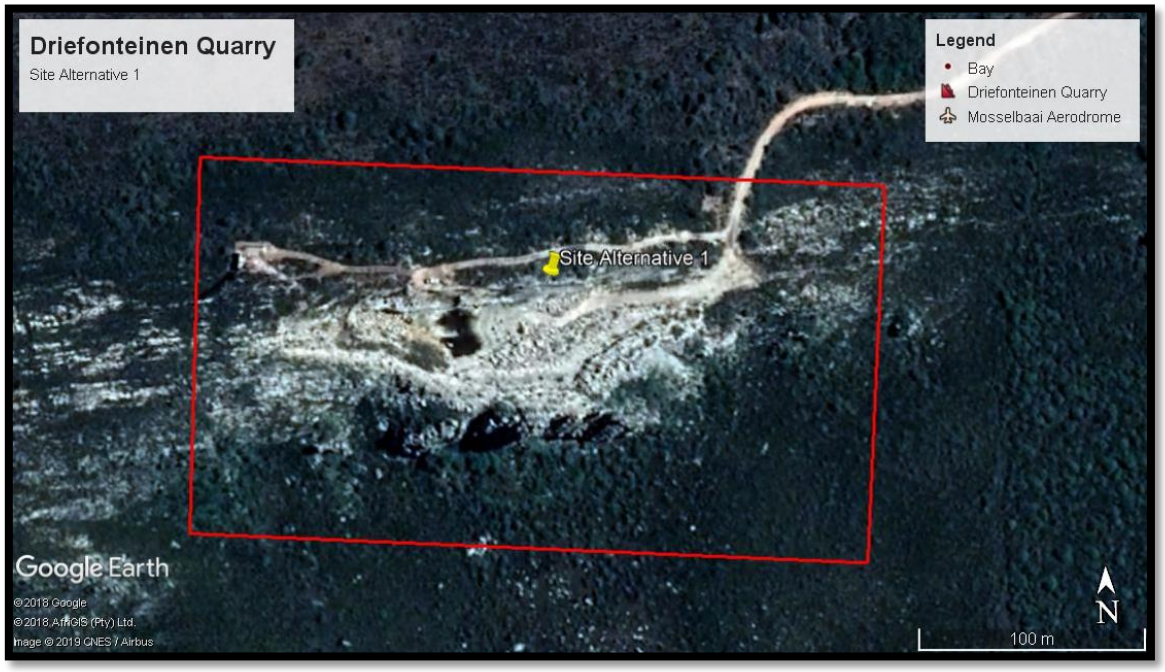

Figure 4: Site Alternative

2. Alternative Site Description

The following alternative site was assessed for the proposed mining but found not environmentally and practically suitable. The earmarked area is a greenfield site that will have to be disturbed for the quarry to be established. The alternative site, considered during the planning phase, entails a rehabilitated quarry. Although the quarry has been in existence from 1977 the disturbance to the footprint area was rehabilitated. This alternative site was not deemed to be the preferred option as an already rehabilitated area will have to be disturbed, and the quality of the mineral available at the quarry does not comply with the material standards required by H&I. The product available at this pit, is also not the product that H&I is after for the road construction industry.

Table 2: GPS Co-ordinates of the proposed mining footprint.

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
E	34°10'46.38"S	21°53'57.97"E	-34.179549°	21.899435°
F	34°10'51.49"S	21°53'58.39"E	-34.180970°	21.899552°
G	34°10'50.54"S	21°54'10.85"E	-34.180705°	21.903014°
H	34°10'45.51"S	21°54'10.59"E	-34.179309°	21.902942°
E	34°10'46.38"S	21°53'57.97"E	-34.179549°	21.899435°

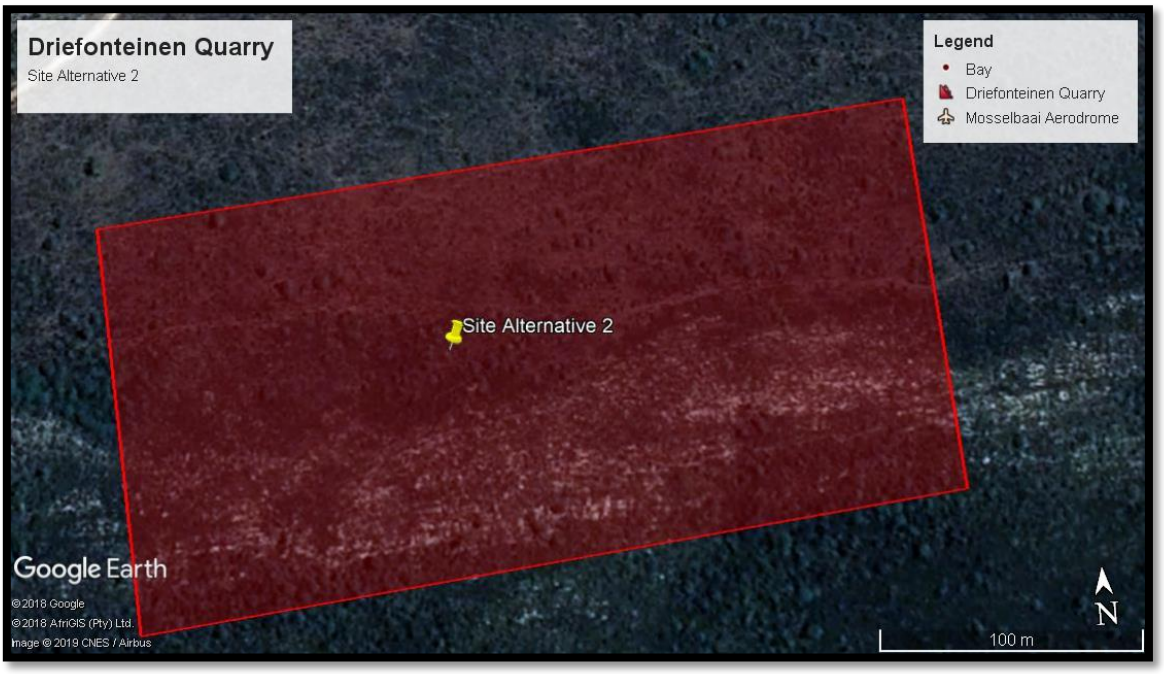

Figure 5: Satellite view showing the location of the MP application area (red polygon).

An application for a mining permit in terms of Section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) [MPRDA] was submitted to the Department of Mineral Resources (DMR).

The proposed project triggers the following listed activities in terms of the National Environmental Management Act, 1998 (Act No.107 of 1998) [NEMA] and the Environmental Impact Assessment (EIA) Regulations (as amended by GNR 326 effective 7 April 2017), and therefore requires a basic assessment process to obtain environmental authorisation:

- <u>GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 21:</u>

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, 2002 (Act No. 28 of 2002), including —

(a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource [,]; or [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)]

(b) The primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing;

But excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies.

- GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 22:

The decommissioning of any activity requiring –

(i) A closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002); or

(ii) a Mining right, mining right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years excluding where the competent authority has in writing agreed that such reduction in throughput does not constitute closure;

But excluding the decommissioning of an activity relating to the secondary processing of a –

(a) Mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource; or

(b) Petroleum resource, including the refining of gas, beneficiation, oil or petroleum products; in which case activity 31 in this Notice applies.

- GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2014 Activity 27:

The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.

- GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2014 Activity 28:

Commercial and industrial developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.

Other legislation triggered by the proposed project includes:

- An application for a Mining Permit in terms of Section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) has been submitted to the Department of Mineral Resource.

Should the Mining Permit (MP) be issues, and the mining of aggregate is allowed, the proposed project will comprise of activities that cab be divided into 3 key phases (discussed in more details below) namely the:

a) Site Establishment / Construction phase:

Site establishment will involve the demarcation of the permitted mining area and required buffer no-go areas pertaining to areas of importance identified during the environmental impact assessment. Site establishment will also necessitate the clearing of vegetation, the stripping and stockpiling of topsoil, and the introduction of mining machinery.

During the site establishment phase the applicant must fence the footprint area and clear the topsoil from the applied area, it should be noted that there is very little topsoil on site.

Upon stripping, the topsoil will be stockpiled along the boundaries of the mining area to be used during the rehabilitation phase. Topsoil stripping will be restricted to the areas to be used for aggregate stockpiling and mining. The complete A-horizon (topsoil – the top 100 – 200 mm of soil which is generally darker coloured due to high organic matter content) will be removed. If it is unclear where the topsoil layer ends the top 300 mm of soil has to be stripped. The topsoil will be stockpiled in the form of a berm alongside the boundary of the mining area where it will not be driven over, contaminated, flooded or moved during the operational phase. The topsoil berm will measure a maximum of 1.5 m high and should be planted with indigenous grass species if vegetation does not naturally establish within 6 months of stockpiling to prevent soil erosion and to discourage growth of weeds. The roots of the grass will also improve the viability of the soil for rehabilitation purposes.

The mining activities will consist out of the following:

- Demarcation of the Mining Boundaries;
  Pursuant to receipt of an Environmental Authorisation (EA) and Mining Permit (MP), and prior to site establishment, the boundaries of the mining area has to be demarcated.

- Clearing of Vegetation;
  The vegetation type of the earmarked footprint is classified as North Langeberg Sandstone Fynbos and the Albertina Sand Fynbos .The vegetation cover of the mining footprint is in a natural to near natural state, and therefore the proposed activity will require the removal of indigenous vegetation during the site establishment- and operational phases to access the mineral.

  In the circumstance, upon receipt of the EA and prior to site establishment, a qualified botanist will conduct a plant identification walkthrough with site management to identify the plants in need of a destruction/removal permit. Bush clearance will only commence upon receipt of the destruction/removal plant permit. The environmental control officer (ECO) will assess the compliance of the permit holder with the conditions of the plant permit.

- Stripping and stockpiling of topsoil;
  It is proposed that topsoil removal will be restricted to the exact footprint of areas required during the operational phase of the activity. The topsoil will be stockpiled at a designated signposted area within the mining boundary, or at Driefonteinen Quarry (upon mutual agreement between Haw and Inglis and the landowner), to be replaced during the rehabilitation of the area. It will be part of the obligations of site management to prevent the mixing of topsoil heaps with overburden/other soil heaps. The complete A-horizon (the top 100 – 200 mm of soil which is generally darker coloured due to high organic matter content) will be removed. If it is unclear where the topsoil layer ends the top 300 mm of soil will be stripped. The topsoil berm will measure a maximum of 1.5 m in height in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen.

- Blasting;
- Excavating;

- Crushing;
- Stockpiling and transporting;
- Sloping and landscaping upon closure of the site; and
- Replacing the topsoil and vegetation the disturbed area.

The mining site will contain the following:

- Drilling equipment;
- Excavating equipment;
- Earth moving equipment;
- Static crushing and screening plants.
- Access Roads;
- Site Office (6m Containers – 120m^2);
- Security Gate;
- Site vehicles;
- Parking area for visitors and site vehicles;
- Vehicle service area (48m^2);
- Wash bay (24m^2);
- Workshop (6m Containers – 24m^2);
- Salvage Yard (100m^2);
- Bunded diesel (20 000l tank) and oil storage facilities (136m^2);
- Generator on bunded area;
- Ablution Facilities (6m Container with Septic Tank);
- Weigh Bridge (18m^2); and
- Demarcated general and hazardous waste area (50m^2).

Operational phase:

The proposed mining site will be an extension of the existing quarry pit previously distributed by aggregate mining activities. The mining methods will make use of blasting means of explosives in order to loosen the hard rock, the material is then loaded and hauled out of the excavation, where primary crushing is conducted in the pit, to the mobile crushing and screening plants. The aggregate will be stockpiled and transported to clients via trucks and trailers. All activities will be contained within the boundaries of the site. Blasting will only occur once every six (6) to eight (8) weeks. The noise caused by blasting will be instantaneous and of short duration. As there are no residents within close proximity to the proposed mining area, the blasting at the site will not have an adverse effect on surrounding landowners. The applicant must ensure that all surrounding residents as well as permit holders are informed of each blasting event.

The proposed mining area is approximately 5 ha in extent and the applicant, Haw and Inglis Civil Engineering (Pty) Ltd, intents to win material from the area for at least 2 years with a possible extension of another 3 years. The aggregate to be removed from the quarry will be used for road construction and various other projects in the vicinity. The proposed quarry will therefore contribute to upgrading/maintenance of road infrastructure in the Eden N2 Upgrade from Swellendam to Plettenberg Bay.

The stockpiling process includes mechanical loading and transportation of the sought aggregate. As mentioned previously the aggregate will be loaded with a front end loader onto trucks upon which it will be weighed and transported to the client. The product stockpiling activities will consist of the following:

- Loading of aggregate;
- Weighing of aggregate; and
- Transportation of aggregate.

A chemical toilet (flushable) will be established on site to be used by the employees. The existing farm and provincial roads currently used to gain access to the property will be used to transport the aggregate from the mining site to the client. Haul trucks will travel along the existing farm road up to the provincial/public road. Turning onto the N2, they will travel along the existing N2 road, as illustrated below.

The water needed for the proposed activity will stem from the need for dust suppression within the excavation and along the hail roads as well as for the processing of the mineral on the plant equipment. Water will be abstracted from a borehole to be located on site, which will be drilled. A water truck will be used to spray access roads to alleviate dust generation. It is proposed that the mining activities will require to a maximum of 2000 – 4000L of water per day.

A borehole located on site for the abstraction of groundwater for the use on site for dust suppression and plant equipment (processing) will be drilled for the proposed activity. This water use will be licensed with DWS in accordance with NWA (Act No. 104 of 1998), Section 21 activities.

Due to the nature of the project and the fact that no infrastructure will be established on site, very little if any general waste will be generated as a direct result of the mining activities. Any waste generated during the operational phase, will be contained in a sealable refuse bin to be taken to the local landfill site at Mossel Bay.

Due to the nature of the project very little generation of hazardous waste is expected. Hazardous waste will mainly be the result of accidental spillages or breakdowns. Such contaminated areas will be cleaned up immediately (within two hours of the occurrence) and contaminated soil will be contained in designated hazardous waste containers to be removed daily to the hazardous waste storage area and to be removed by a registered hazardous waste handling contractor.

Figure 6: Satellite view indicating the access road to the mining site

Decommissioning phase:

The closure objectives for the mining area is to be made safe, and the remainder of the site to be returned to agricultural use (grazing). The perimeter of the site will be subject to top-dressed with topsoil and vegetated with an appropriate grass mix if vegetation does not naturally establish in the area within six months of the replacement of the topsoil.

Control of weeds and alien invasive plant species is an important aspect after topsoil replacement and seeding (if applicable) has been done in an area.

Site management will implement an alien invasive plant management plan during the 12 months' aftercare period to address germination of problem plants in the area.

The decommissioning activities will consist of the following:

- Reshaping during rehabilitation;
- Replacing of topsoil; and
- Implementation of an alien invader plant management plan.

Decommissioning phase entails the rehabilitation of the affected environment prior to the submission of a closure application to the Department of Mineral Resources (DMR). The permit holder will further be responsible for the seeding of all rehabilitated areas. Once the full mining area is rehabilitated, the mining permit holder will be required to submit a closure application to the DMR in accordance with Section 43(4) of the MPRDA, 2002. The Closure Application will be submitted in terms of Regulation 62 of the MPRDA, 2002, and government Notice 940 of NEMA, 1998.

The Applicant will comply with the minimum closure objectives as prescribed by the DMR and detailed below:

- Rehabilitation of the excavated area:

  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.

  No waste may be permitted to be deposited in the excavations.

  Once overburden, rocks and coarse natural materials has been added to the excavation and it was profiled with acceptable contours and erosion control measures, the topsoil previously stored must be returned to its original depth over the area.

  The area must be fertilized 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, should natural vegetation not re-establish within 6 months from closure of the site.

  If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from

the mining operation be corrected and the area be seeded with a vegetation seed mix to his or her specification.

- Final rehabilitation:

Rehabilitation of the surface area shall entail landscaping, levelling, top dressing, land preparation, seeding (if required) and maintenance, and invasive plant species clearing.

All mining equipment, and other items used during the mining period must be removed from the site (section 44 of the MPRDA).

Waste material of any description, including receptacles, scrap, rubble and tyres, must be removed entirely from the mining area and disposed of at a recognized landfill facility. It will not be permitted to be buried or burned on the site.

The management of invasive plant species must be done in a sporadic manner during the life of the mining activities. Species regarded as Category 1a and 1b invasive species in terms of NEM: BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto) will be eradicated from the site.

Final rehabilitation shall be completed within a period specified by the Regional Manager.

Once the mining area was rehabilitated the permit holder is required to submit a closure application to the Department of Mineral Resources in accordance with section 43(4) of the MPRDA, 2002 that states: *"An application for a closure certificate must be made to the Regional Manager in whose region the land in question is situated within 180 days of the occurrence of the lapsing, abandonment, cancellation, cessation, relinquishment or completion contemplated in subsection (3) and must be accompanied by the prescribed environmental risk report".* The Closure Application will be submitted in terms of Regulation 62 of the MPRDA, 2002, and Government Notice 940 of NEMA, 1998.

c) Location of the overall Activity.

Farm Name:	Driefonteinen 243, Portion 8 (Remaining Extent)
Application area (Ha)	5ha
Magisterial district:	Registration Division of Mossel Bay RD
Distance and direction from the nearest town	±22.47km west of Mossel Bay. Using the N2, head west for approximately 22.47km. The entrance to the proposed mining area is found on the left of the road. The quarry will be an extension to the existing quarry
21 digit Surveyor General Code for each farm portion	C05100000000024300008

d) Locality map

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

The requested map is attached as Appendix B.

Figure 7: Satellite view of the proposed mining permit area (red polygon) of Driefonteinen Quarry (image obtained from Google Earth).

e) Policy and Legislative Context

Table 3: 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 COMPLY 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)
Mineral and Petroleum Resources Development Act, 2002, (Act No. 28 of 2002) Section 27	Part A (d) Description of the scope of the proposed overall activity. Application for a Mining Permit Ref No: WC 30/5/1/3/2/10206MP	Mineral and Petroleum Resources Development Act, 2002, (Act No. 28 of 2002) - Section 27 – Application for a mining permit submitted to DMR-WC.
National Environmental Management Act, 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2017 • GNR 327 LN 1 of 2017 Activity 21 • GNR 327 LN 1 of 2017 Activity 22 • GNR 327 LN 1 of 2017 Activity 27 • GNR 327 LN 1 of 2017 Activity 28	Application for environmental authorisation Ref No: WC 30/5/1/3/2/10206 MP	Application for environmental authorisation submitted to DMR-WC.
National Environmental Management Act: Biodiversity Act, 2004 (Act No. 10 of 2004) read together with applicable amendments and regulations thereto.	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity - *Biological Environment* Part A (1) (h) (viii) The possible mitigation measures that could be applied on the level of risk – *Management of invader plant species*.	The mitigation measures proposed for the site includes specifications of the NEM: BA, 2004.
Mine Health and Safety Act, 1996 (Act No. 29 of 1996)	The mitigation measures proposed for the site includes specifications of the MHSA. Part A (iv) (1) (viii) The possible mitigation measures that could be applied on the level of risk – *Management of Health and Safety Aspects.*	The operational phase of the site will trigger the MHSA. The mitigation measures proposed for the site includes specifications of the MHSA, 1996
National Heritage Resources Act No. 25 of 1999	Cultural and Heritage Environment. Part A(iv)(1)(a) Type of environment affected by the proposed activity – *Human Environment*	No aspects of the project could be identified that triggers the NHRA. A Notice of Intent to Develop in terms of Section 38(8) of the NHRA, 1999 will be submitted to SAHRA to determine the action required for the proposed project. SAHRA requested that a HIA and Paleontological Study be conducted. The mitigation measures proposed for the site includes specifications of the NHRA, 1999.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	Part A (iv) (1) (a) Type of environment affected by the proposed activity: *Physical Environment – Geology and Soil.* Part A (iv) (1) (viii) The possible mitigation measures that could be applied on the level of risk – *Management of weeds- or invader plants*.	The mitigation measures proposed for the site includes specifications of the CARA, 1983.
Western Cape Biosphere Reserves Act, Act 6 of 2011 Cape Nature and Environmental Conservation Ordinance 9 of 1974	Biophysical Environment	Protected trees and plants in the area have been identified. Relevant acts are complied with and the necessary permits and licences obtained. The mitigation measures proposed for the site includes the specifications as per the Act.
National Environmental Management: Air Quality Control Act, 39 (Act No 39 of 2004) read together with applicable amendments and regulations thereto specifically the National Dust Control Regulations, GN No R827	Part A (1) (h) (iv) (1) (a) Type of environment affected by the proposed activity – *Air and Noise Quality.* Part A (1) (h) (viii) The possible mitigation measures that could be applied on the level of risk – *Dust Handling*.	The mitigation measures proposed for the site take into account the NEM: AQA, 2004 and the National Dust Control Regulations.
National Water Act, 36 (Act No 36 of 1998) read together with applicable amendments and regulations thereto.	Part A (iv) (1) (a) Type of environment affected by the proposed activity – *Aquatic Features.*	No mining will be conducted within 100m from a watercourse.
National Environmental Management: Waste Act, 59 (Act No 59 of 2008) read together with applicable amendments and regulations thereto. NEM:WA, 2008: National norms and standards for the storage of waste (GN 926)	Part A(ii) Description of the activities to be undertaken: *Operational phase – Waste Handling*	The mitigation measures proposed for the site take into account the NEM: WA.
Land Use Planning Ordinance (Ordinance 15 of 1985)	Land use zoning requirements	Land Use Planning Ordinance (Ordinance 15 of 1985)
Mossel Bay Municipality Spatial Development Framework / Land Development Plan Western Cape Land Use Planning Act, 2015 Garden Route (Eden) Municipality, Spatial Planning and Land Use Management Act, 16 of 2013 Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013), the Western Cape Land Use Planning Act, 2014 (Act 3 of 2014) and the By-laws on Municipal Land Use Planning,	Description of the current land uses	Land Rezoning will be conducted once the mining permit application has been converted to a mining right application.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
Mossel Bay Local Municipality Integrated Development Plan		
Spatial Planning and Land Use Management Act, Act 16		
Public Participation Guideline in terms of the NEMA EIA Regulations	Part A(ii) Details of the Public Participation Process Followed	Public Participation Guideline in terms of the NEMA EIA Regulations

f) Need and desirability of the proposed activities.

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

The increase in building, construction and road maintenance projects in the vicinity of the property triggered the need of the applicant to trade with the available aggregate. The proposed mining will also contribute to the diversification of activities on the property, extending it from agriculture to include small scale mining. H&I will enter into an agreement with the local building contractors and road contractors for supplying aggregate material for the construction in the Garden Route area between Swellendam and Plettenberg Bay, and the general roads maintenance in the area by the Municipality, Provincial Government and Sanral.

The quarry itself will provide various short term jobs during the construction, operation and decommissioning phases. H&I would also provide jobs and skills to local people. The quarry will also be fully rehabilitated post mining and therefor revert to grazable land.

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

The proposed site earmarked for the mining of the loose aggregate will entail an area previously used for mining. The proposed site was identified as the preferred alternative due to the following reasons:

- The mining site offers the mineral sought after;
- The proposed sites were previously used for mining activities, thus minimal environmental damage will occur;
- The mining area can be reached by an existing farm access road that connects to N2. No new road infrastructure need to be constructed;
- Due to the small size of the activity and the remote location of the mining area the potential impacts on the surrounding environment, associated with mining is deemed to be of low significance; and
- No residual waste as a result of the mining activity will be produced that needs to be treated on site. Any general waste that may be produced on-site will be contained in sealed refuse bins to be transported to the local municipal landfill site. The amount of hazardous waste to be produced at the site will be minimal and will mainly be as a result of accidental leakage. Contaminated soil (contained in sealed bins) will be collected from site by a hazardous waste handling Removal Company to be disposed of at a registered hazardous waste handling site.

During the environmental impact assessment process the feasibility of the proposed site alternative was assessed to identify fatal flaws that are deemed as severe as to prevent the activity continuing, or warrant a site or project alternative. The outcome of the assessment showed that should the mitigation measures and monitoring programmes proposed in this document be implemented, no fatal flaws could be identified that prevents the activity continuing. In light of the above, the mining proposal was updated to incorporate the project related mitigation measures and monitoring programmes identified during the assessment process. The preferred development footprint was subsequently finalized and is depicted on the attached site activities plan (Appendix C).

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.

The applicant identified two (2) alternative sites for the proposed mining activity namely:

1. **Site Alternative 1 (S1) (Preferred Alternative):** The Applicant, Haw and Inglis Civil Engineering (Pty) Ltd applied for a mining permit, 5ha, on a portion of portion 8 of the remaining extent of the farm Driefonteinen 243 which falls in the Mossel Bay Local Municipality in the Registration Division of Mossel Bay RD, Western Cape Province. The area earmarked for the proposed mining falls on a section of the farm that was previously used as an existing quarry and the intention of this application is to increase the existing quarry. The GPS coordinates of the proposed mining area are as follow:

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	34°10'50.765	21°53'40.823	-34.180768º	21.894673º
B	34°10'56.143	21°53'40.351	-34.182262º	21.894542º
C	34°10'55.456	21°53'28.705	-34.182071º	21.891307º
D	34°10'50.113	21°53'29.044	-34.180587º	21.891401º
A	34°10'50.765	21°53'40.823	-34.180768º	21.894673º

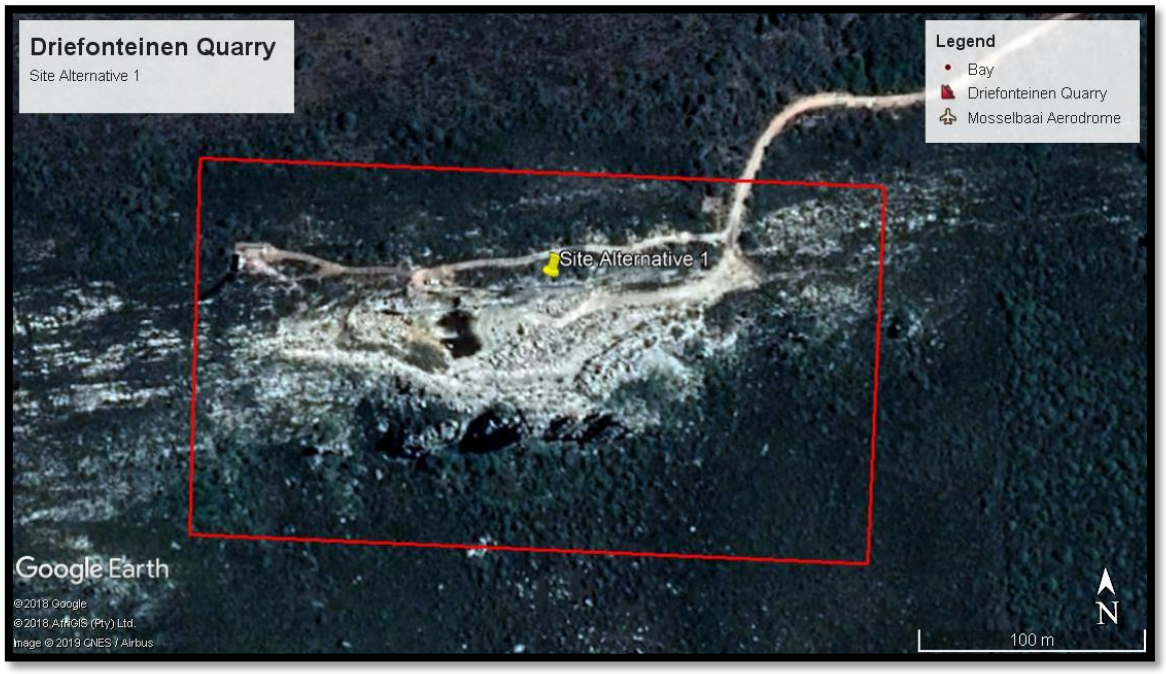

Figure 8: Haw and Inglis Civil Engineering (Pty) Ltd – Option 1 (Preferred Option)

Site Alternative 1 was identified during the assessment phase of the environmental impact assessment, by the applicant and project team, and was therefore selected as the **preferred alternative** due to the following:

- The mining site offers the mineral sought after;
- The proposed footprint area was previously used for mining therefore very little indigenous vegetation needs to be disturbed in order to establish the mining area;
- The mining site is more than 22.47 km away for the town of Mossel Bay, and will not affect the community with regards to dust and noise;
- The mining area can be reached by an existing farm access road and existing mine road that connects to N2. No new road infrastructure need to be constructed;
- Due to the small size of the activity and the remote location of the mining area the potential impacts on the surrounding environment, associated with mining is deemed to be of low significance; and
- No residual waste as a result of the mining activity will be produced that needs to be treated on site. Any general waste that may be produced on-site will be contained in sealed refuse bins to be transported to the local municipal landfill site. The amount of hazardous waste to be produced at the site will be minimal and will mainly be as a result of accidental leakage. Contaminated soil will be removed to the depth of the spillage and contained in sealed bins until removed from site by a hazardous waste handling contractor to be disposed of at a registered hazardous waste handling site.

2. Alternative Site Description

The following alternative site was assessed for the proposed mining but found not environmentally and practically suitable. The earmarked area is a greenfield site that will have to be disturbed for the quarry to be established. The alternative site, considered during the planning phase, entails a rehabilitated quarry. Although the quarry has been in existence from 1977 the disturbance to the footprint area was rehabilitated.

This alternative site was not deemed to be the preferred option as an already rehabilitated area will have to be disturbed, and the quality of the mineral available at the quarry does not comply with the material standards required by H&I. The product available at this pit, is also not the product that H&I is after for the road construction industry.

Table 4: GPS Co-ordinates of the proposed mining footprint.

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
E	34°10'46.38"S	21°53'57.97"E	-34.179549°	21.899435°
F	34°10'51.49"S	21°53'58.39"E	-34.180970°	21.899552°
G	34°10'50.54"S	21°54'10.85"E	-34.180705°	21.903014°
H	34°10'45.51"S	21°54'10.59"E	-34.179309°	21.902942°
E	34°10'46.38"S	21°53'57.97"E	-34.179549°	21.899435°

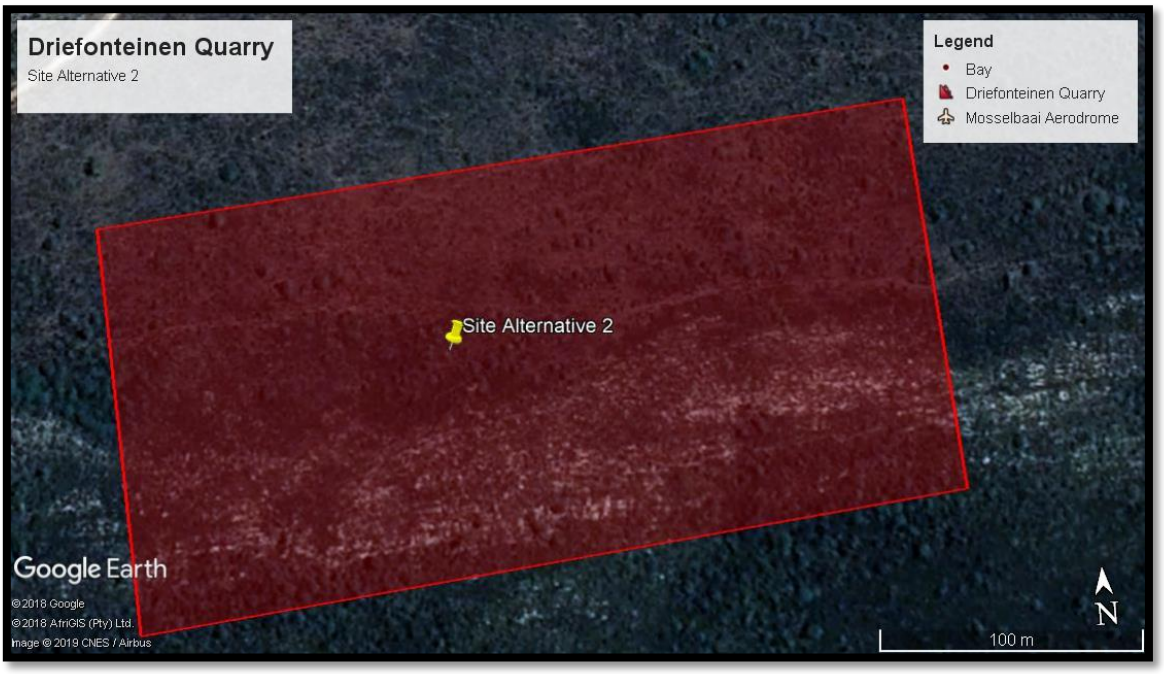

Figure 9: Satellite view showing the location of the MP application area (red polygon).

3. No-go Alternative:

The no-go alternative entails no change to the status quo and is therefore a real alternative that needs to be considered. The aggregate to be stockpiled at the site will be used for road and construction industries, if however, the no-go alternative is implemented the applicant will not be able to utilize the mineral present in the area.

This could have major impacts on aspects such as transporting of material to construction sites from far off mining areas, cost effectiveness of material, impact on roads and road users due to long distance hauling of gravel and loss of income to the Mossel Bay business area due to the multiplier effect.

The no-go alternative was not deemed to be the preferred alternative as:

- The applicant will not be able to supply in the demand of road or construction contractors,
- The application, if approved, would allow the applicant to utilize the available aggregates as well as provide employment opportunities to local employees. Should the no-go alternative be followed these opportunities will be lost to the applicant, potential employees and clients,
- The applicant will not be able to diversify the income of the property.

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 stakeholders and I&AP's were informed of the project by means of I&AP comment / notification letters that were either delivered by hand or sent directly to the contact persons. A 30 days commenting period were allowed which extended from the 29th March 2019 to 2nd May 2019. The following I&AP's and stakeholders were contacted to obtain their comments:

Table 5: I&AP and Stakeholders Contact List

SURROUNDING LANDOWNERS & INTERESTED AND AFFECTED PARTIES	STAKEHOLDERS
Landowner: • Mr. Kokkie Muller **Surrounding landowners & lawful occupiers:** • Bennie Pienaar • Lukas Muller • Emile van Rensburg • Johan van Rensburg • Maria C Muller • Wild X Adventures (Marisa Borrette) • Indula Game Reserve (Gerhard van Rooyen) • De Heus Voere / Feeds (Tersius Jones) • Willie Smit • Gilbert Muller	• Garden Route District Municipality • Mr. M Stratu (Garden Route District Municipality) • Adv. T Giliomee (Mossel Bay Local Municipality) • Barnie Groenewald (Mossel Bay Local Municipality, Ward 7) • Mr Mxolisia Dlamuka (Heritage Western Cape) • Benjamin Walton (Cape Nature – George) • Jacqui Gooch (Department of Transport and Public Works) • Mr. Pierre Nel (SANPARKS) • Nicole Abrahams (Sanral Western Cape) • Lutendo (Department Of Agriculture, Forestry And Fisheries • Fabion Smith (Breede Gouritz Catchment Management Agency • Marinda Van As (Gouritz Cluster Biosphere Reserve • Me Adri LaMeyer (Department Of Environmental Affairs, Development Planning Western Cape) • Dr. Ina Little (Endangered Wildlife Trust) • Mr. Con Meyer (West Coast Society) • Mr Solly Fourie (Department of Economic Development and Tourism) • Brandon Layman (Department of Agriculture) • Me Juanita Fortuin (Department of Rural Development And Land Reform) • Ms Fatima Williams (Department of Rural Development and Land Reform) • Alana Dufell-Canham (Cape Nature) • Johnathan Visagie (Telkom) • Dian Niacker (Petro SA) • Abongile Mgqada (Vodacom) • Danie Swanepoel (DEADP) • Mr R Khan (Department of Water and Sanitation) • Mrs. Adri La Meyer, and Danie Swanepoel (Department Environmental Affairs and Development Planning) • CM Pauw (Stellenbosch University)
I&AP'S AND STAKEHOLDERS THAT REGISTERED DURING THE INITIAL NOTIFICATION PERIOD	
• Stellenbosch University • Department of Environmental Affairs and Developmental Planning • Paul Slabbert • Heritage Western Cape	

On-site notices were placed on the 27th of March 2019 at the site entrance on the N2 and in town at the Mossel Bay Local Municipality as well as the Garden Route District Municipality offices in Mossel Bay. The project was also advertised in the Mossel Bay Advertiser on the 29th of March 2019. The advertisement, on site notices and background information document (BID) invited the recipients to register / comment on the project before the 2nd of May 2019.

In compliance with the timeframes stipulated in the EIA Regulations of December 2014 (amended by GNR 326 effective 7 April 2017) the Draft Basic Assessment Report (DBAR) was compiled and will be distributed for comment and perusal to the I&AP's and stakeholders listed above. A 30-day commenting period, ending 10th June 2019 will be allowed for perusal of the documentation and submission of comments. The comments received on the DBAR will be incorporated into the Final Basic Assessment Report (FBAR) to be submitted for decision making to DMR. See attached as Appendix G proof that the stakeholders and I&AP's were contacted.

iii) Summary of issues raised by I&AP's

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

Table 6: Summary of comments received.

Interested and Affected Parties List the name 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				
Mr. Cornelius (Kokkie) Muller Elandsrug Boerdery BK	09/04/2019	No objections received. Please refer to Appendix G for the landowner agreement and comments letter.	No objections	N/A
Lawful occupier/s of the land				
N/A	N/A	No comments received. Please refer to Appendix G for the landowner agreement and comments letter.	N/A	N/A
Landowners or lawful occupiers on adjacent properties				
Bennie Pienaar	N/A	No comments received. Please refer to Appendix G for PPP that was conducted.	N/A	N/A
Lukas Muller	N/A		N/A	N/A
Emile van Rensburg	N/A		N/A	N/A
Johan van Rensburg	N/A		N/A	N/A
Maria C Muller	N/A		N/A	N/A
Wild X Adventures (Marisa Borrette)	N/A		N/A	N/A

Indula Game Reserve (Gerhard van Rooyen)	3 May 2019	Objection. Period of mining exceeding 2 years with an possible 3 year extension. 1. Noise levels generated from the mentioned mining activities despite actions listed. 2. Is there any advantage for the community and surrounding land ownerrss from this project for example upgrade of provincial road for 4km on Copper From N2. "More Yolandie, In opvolg van ons telefonies gesprek vind asb aangeheg die dokument versoek. Ek heg ook korrespondensie aan met verwysing na verskeie eposte ter inligting, insake die Cooper Provinsiale Pad wat n groot probleem is. Graag wil ek versoek rig vir die gunstige oorweging om die oppervlak te teer van die **P0341 Provinsiale grondpad vir n afstand van 4km vanaf die N2 hoofweg (Herbertsdale/ Cooper)** afrit. Ons sit met geweldige problem as gevolg van stof wat veroorsaak word deur die swaarvoertuie en melk lorries veral wat daagliks die grondpad gebruik. Verder is dit n baie swak pad op veral drie punte op die 4km afstand wat onbegaanbaar is sodra dit gereen het, is die pad eenvoudig te glad om skuinstes uit te ry en ook om op te ry. Hier het al verskeie ongelukke plaas gevind en is hier verskeie kere deur my wildsheinig gery waar n skerp draai is en menige bestuurders hulle misgis met hul	Thank you for your valued comments. Noise and Dust (Air Quality) management and mitigation measures will be adhered to strictly during the mining process. The mining permit does not entail an Social and Labour plan, but discussions will be held with Haw and Inglis to discuss the possible upgrade of the provincial road.	Please refer to Part A, 1., h), iv) (1) (a) for the Noise and Dust impacts and management measures are discussed in Part B.

		spoed en afdraande gepaard gaande met die skerp draai. Verder beplan ons ook n ontwikkeling op Indalu en sal dit ons vreeslik baie help om die stof van die infrastruktuur byvoorbeeld die restaurant af weg te hou asook ons hoof woning en sal beslis ons konstante sinus en algemene gesondheid tot voordeel wees indien die pad geteer kan word vir die gemeenskap uit die projekte vir die myn van die grys. Verneem graag van julle en Haw and Inglis Engineering.		

Interested and Affected Parties List the name 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.**
De Heus Voere / Feeds (Tersius Jones) Charmaine Cupido (Receptionist)	17/04/2019	No objections received. Please refer to Appendix G for the PPP that was conducted.	No objections	N/A
Willie Smit	N/A	N/A	N/A	N/A
Gilbert Muller	N/A	N/A	N/A	N/A
Municipal councillor				
Barnie Groenewald (Mossel Bay Local Municipality, Ward 7)	X	No comments received. Please refer to Appendix G for PPP that was conducted.	N/A	N/A
Municipality				
Garden Route District Municipality	X	No comments received. Please refer to Appendix G for PPP that was conducted.	N/A	N/A
Mr. M Stratu (Garden Route District Municipality)	X		N/A	N/A
Adv. T Giliomee (Mossel Bay Local Municipality)				
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWS				
Jacqui Gooch (Department of Transport and Public Works)	N/A	No comments received. Please refer to Appendix G for PPP that was conducted.	N/A	N/A
Lutendo (Department Of Agriculture, Forestry And Fisheries	N/A		N/A	N/A
Mr Solly Fourie (Department of Economic Development and Tourism)	N/A		N/A	N/A

Interested and Affected Parties List the name 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.
Brandon Layman (Department of Agriculture)	N/A	No comments received. Please refer to Appendix G for PPP that was conducted.	N/A	N/A
Me Juanita Fortuin (Department Of Rural Development And Land Reform	N/A		N/A	N/A
Ms Fatima Williams (Department of Rural Development and Land Reform)	30 April 2019	I have checked on the system for the property in question, i.e 5 ha on Portion 8 (Remaining Extent) of the farm Driefonteinen, Registration Division of Mossel Bay RD, Mossel Bay, Western Cape, and wish to advise that there are no recorded claims lodged on it. Rudi you can go ahead and draft the letter.	Noted and receive. We await your letter regarding no land claims on Portion 8 (RE) of the farm Driefonteinen, Registration Division of Mossel Bay RD, Western Cape.	N/A
Danie Swanepoel (DEADP)	N/A		N/A	N/A
Mr R Khan (Department of Water and Sanitation)	N/A		N/A	N/A
Marianne Claasen (Department of Water and Sanitation)	02/04/2019	I have forwarded your e-mail to Mr Jannie van Staden at the Breede Gourits Catchment Management Agency (BGCMA) who will further liaise with you on your e-mail.	Thank you for your email. I did contact Mr Fabion Smit at Breede-Gouritz Catchment Management Agency. Will included Mr Jannie van Staden in further correspondence.	N/A
Communities				
N/A	N/A	N/A	N/A	N/A
Dept. Land Affairs				

Interested and Affected Parties List the name 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.**
Me Juanita Fortuin (Department of rural development and land reform	X	No comments received. Please refer to Appendix G for PPP that was conducted.	N/A	N/A
Traditional Leaders				
N/A	N/A	N/A	N/A	N/A
Dept. Environmental Affairs				
Mrs. Adri La Meyer, and Danie Swanepoel (Department Environmental Affairs and Development Planning)	29/03/2019	I hereby acknowledge receipt of your e-mail. Could you please provide me with 3 x CDs of the Draft BAR when it is available for comment? Kindly also provide the George office with one hard copy and one CD of the Report. Please mark the report for the George office for the attention of: **Danie Swanepoel** Directorate: Development Management (Region 3) Department Environmental Affairs and Development Planning 93 York Street, 4th Floor York Park Building, George, 6530 OR Private Bag X6509, George, 6530 I will again collate the Department's comments (from both the George and Cape Town offices) on the Draft BAR.	Will do once DBAR is ready to be published.	
Other Competent Authorities affected				
Mr Mxolisia Dlamuka (Heritage Western Cape)	X	No comments received. Please refer to Appendix G for PPP that was conducted.	N/A	N/A

Interested and Affected Parties List the name 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.**
Benjamin Walton and Colin Fordham (Cape Nature – George)	N/A		N/A	N/A
Alana Duffell-Canham (Cape Nature- Western Cape)	10/04/2019	The paper copy of the BID received today for the above application has reference. Please note that this application is located within my colleague Colin Fordham's area who is based in our George office. I have copied him in and his details are in the attached letter. Please ensure that the BID reaches him for comment. A digital version is probably best as I see comment is due on the 2nd of May already. Please also provide a better quality map and a shapefile of the site to him. Please also note that the BID does not supply the farm number only the portion.	We did send a copy, as well an email copy to the George office, to Benjamin Walton and Colin Fordham. I have attached the mail that was send to Benjamin and Collin. The quarry will be located on Portion 8 (Remaining Extent) of the farm Driefonteinen, Registration Division of Mossel Bay RD, Mossel Bay, Western Cape. As per the BID. Please also find attached the KML file for the proposed quarry.	
Mr. Pierre Nel (SANPARKS)	N/A	No comments received. Please refer to Appendix G for PPP that was conducted.	N/A	N/A

Interested and Affected Parties List the name 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.**
Nicole Abrahams (SANRAL Wester Cape)	16/04/2019	The above listed project bears reference. I would hereby wish to register as an I&AP for this particular project. The South African National Roads Agency SOC Limited (SANRAL) has received background information and a site layout plan for this project and based on the proximity of the proposed development in relation to the National Road N2, it appears that SANRAL could be impacted by this development. Could you please confirm the nearest blue km marker board on N2 is 196.1 If services need to be constructed over or under the national road, (in this case the N2) or within 60m measured from the road reserve fence, the service owner must apply for a written permission from SANRAL, before any work may be carried out. Attached please find an application form for the proposed encroachment. Do not hesitate to contact the sender should you have any further queries. I trust that you will find the above in order.	Thank you for registering as an I&AP for the Haw and Inglis Driefonteinen Quarry application. The quarry footprint area will be located approximately 270m from the N2. No services or construction will be over or under the national road or within the 60m reserve fence. If this needs to be done, application would be made for the mentioned encroachment. Please find attached the road marker info. There is 2, the one is located at the entrance to the farm (N2-6 68.4E), and the other is located at the entrance to the quarry (N2-6 67.2E).	Part A, 1, d).

Interested and Affected Parties List the name 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.**
Fabion Smith (Breede Gouritz Catchment Management Agency	N/A	No comments received. Please refer to Appendix G for PPP that was conducted.	N/A	N/A
Marinda Van As (Gouritz Cluster Biosphere Reserve	N/A		N/A	N/A
Dr. Ina Little (Endangered wildlife trust)	N/A		N/A	N/A
Mr. Con Meyer (West Coast Society)	N/A		N/A	N/A
Alana Dufell-Canham (Cape Nature)	N/A		N/A	N/A
Wassefa Dhansay Assistant Director: Professional Services Heritage Western Cape	02/04/2019	Please note the proposal will trigger the provisions of Section 38 of the National Heritage Resources Act. A formal notification of Intent to Develop (NID) will be required in order for HWC to provide a formal comment in terms of the NHRA. Please see the attached application form for the submission of the NID.	HIA application will be made by Heritage Consultant.	N/A
OTHER AFFECTED PARTIES				
CM Pauw	29/03/2019	Baie dankie Marlene. Ons het nie op hierdie stadium enige kommentaar nie. Hou ons asseblief op hoogte van sake	Baie dankie vir die epos. Ons stuur alle verdere dokumentasie rakende die projek aan.	N/A
Johnathan Visagie (Telkom)	N/A	No comments received. Please refer to Appendix G for PPP that was conducted.	N/A	N/A
Dian Niacker (Petro SA)	N/A		N/A	N/A

Interested and Affected Parties List the name 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.
Abongile Mgqada (Vodacom)		No comments received. Please refer to Appendix G for PPP that was conducted.		
INTERESTED PARTIES				
Paul Slabbert	01/04/2019 15/04/2019	Please register us as I&AP's. Please send us a locality plan for the farm. Also clarify does the applicant intent to distribute material in the open market or is it intended for a dedicated construction contract? Please send me the Google earth placemark for the site. Where can the I&AP's get hold of the EIA?	We have registered you as I&AP's. Please also find attached the Locality Plan for the Driefonteinen Quarry. As well as the Google earth placemark for the site. The intention of H&I will be for the construction of the N2. This will not be a commercial quarry. Please let me know if more clarification is needed. We will send you the notification when the DBAR is available for review. The documents will be added on our Greenmined website once available.	N/A

iv) The Environmental attributes associated with the alternatives.

(The environmental attributes 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)

i. Climate

According to SA Explorer, Mossel Bay normally received about 333mm of rain per year, with rainfall occurring throughout the year. The figure below (Figure 10) shows the average rainfall values for Mossel Bay per month. It receives the lowest rainfall (21mm) in July and the highest (36mm) in October. The monthly distribution of the average daily maximum temperatures (Figure 11) shows that the average midday temperatures for Mossel Bay range from 18.4C in July to 26C in January. The region is the coldest during July when the mercury drops to 7.6C on average during the night. Refer to Figure 12 below for an indication of the monthly variation of average minimum daily temperatures, frost occurs between 3-20 days per year (Explorer, 2019).

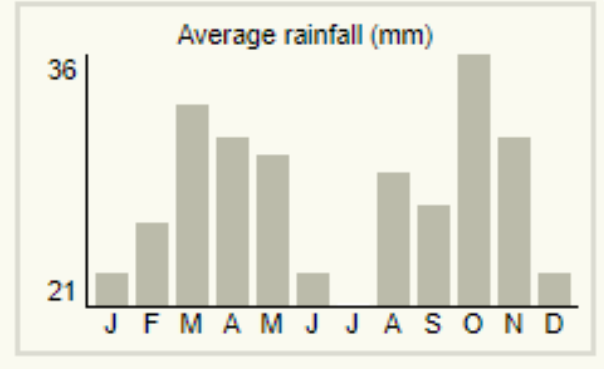

Figure 10:Average rainfall for Mossel Bay

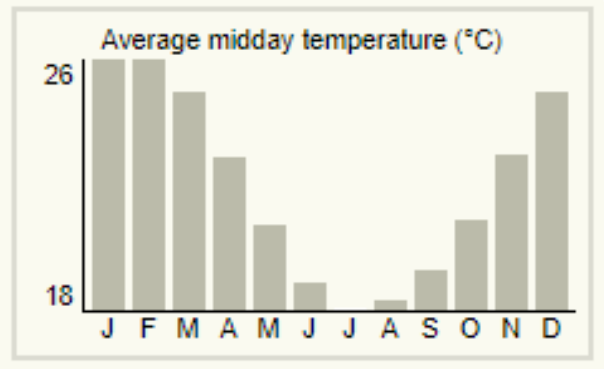

Figure 11:Average midday temperature

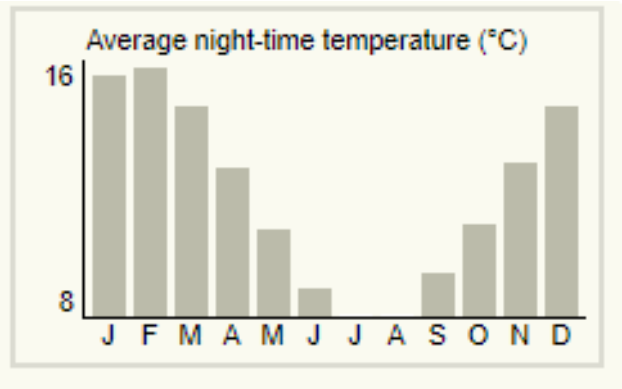

Figure 12: Average night-time temperature

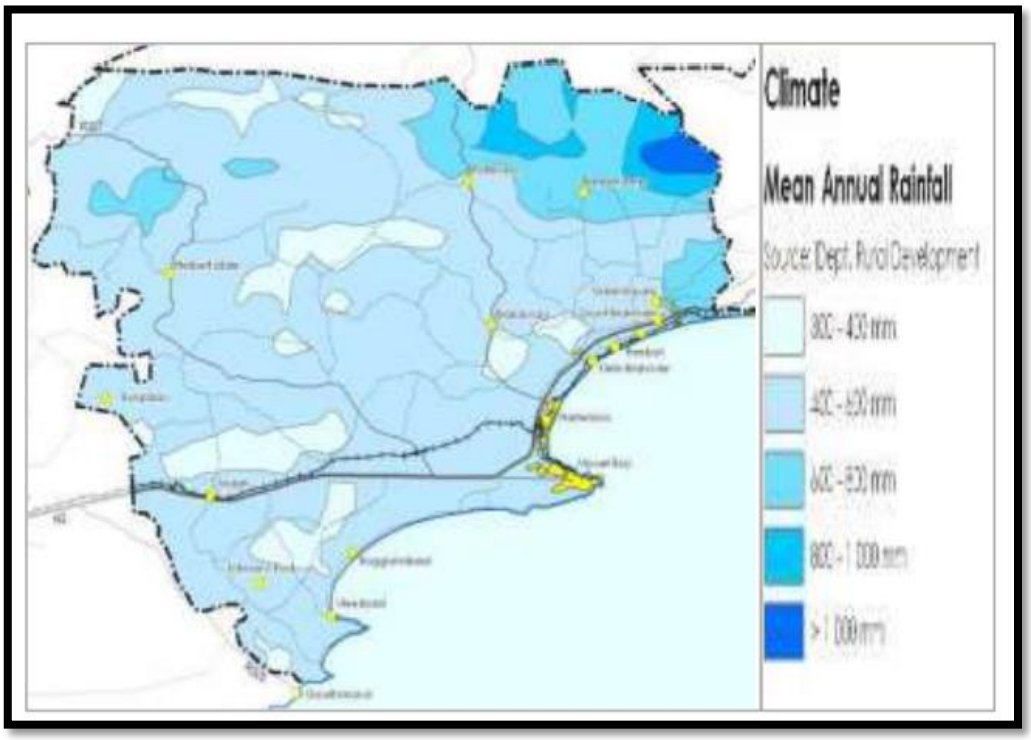

Figure 13: Climate rainfall (Municipality, 2019)

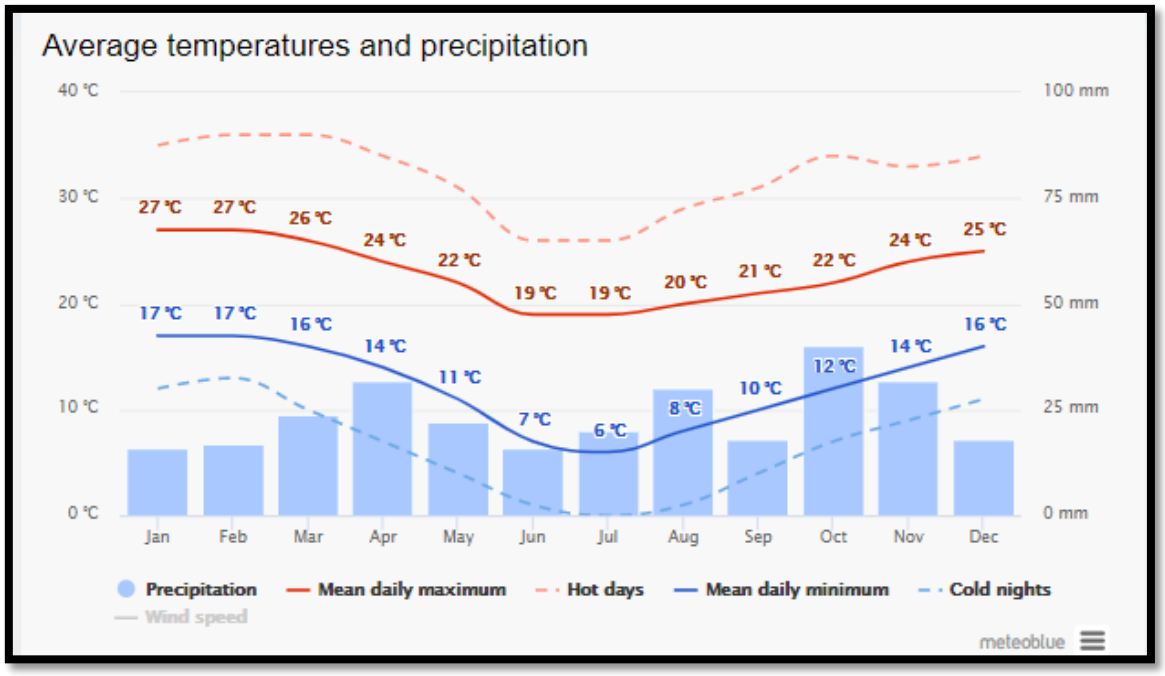

Figure 14: Average rainfall and Temperature for Mossel Bay

Figure 16 shows the monthly number of sunny, partly cloudy, overcast and precipitation days. Days with less than 20% cloud cover are considered as sunny, with 20-80% cloud cover as partly cloudy and with more than 80% as overcast. As indicated in the figure below, sunny days are in June-July during winter, with overcast and precipitation days occurring in the summer season, mostly in October (Meteoblue, Meteoblue, 2018).

Mossel Bay, interestingly, falls into a different climatic zone than the other coastal Garden Route municipalities of George, Knysna and Bitou. They have a temperate climate with perennial rainfall and warm summer, whereas Mossel Bay has an arid, steppe and colder climate (see Figure 9).

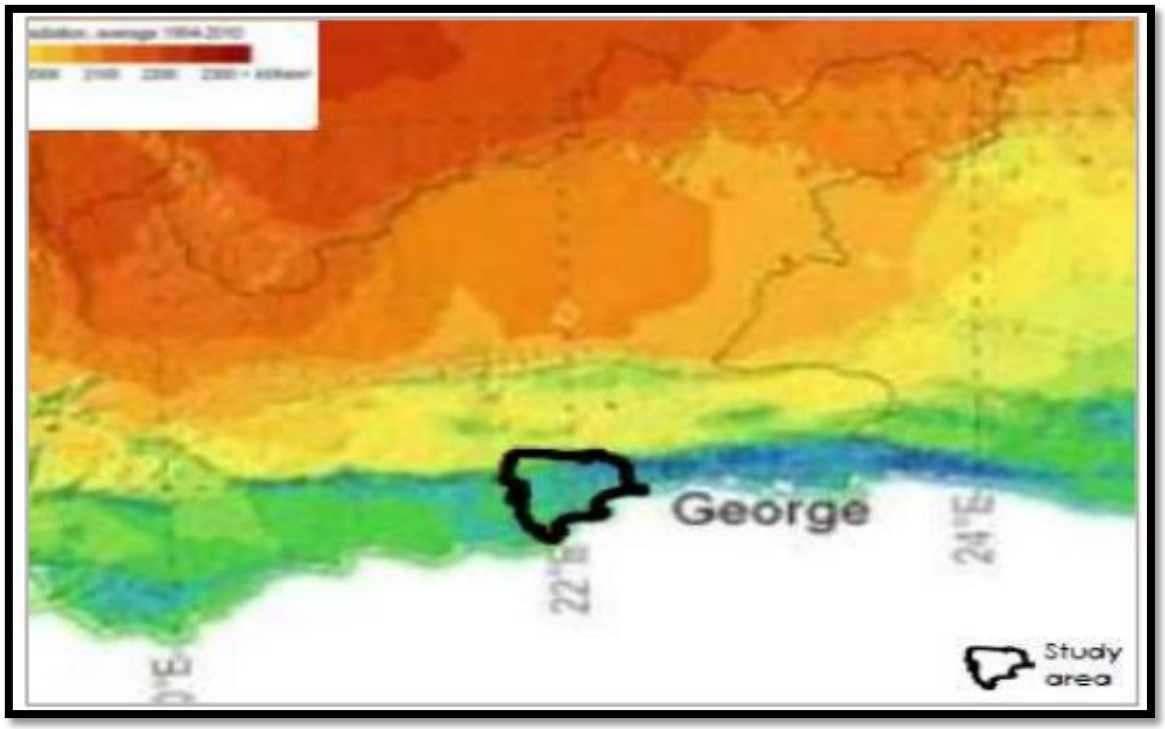

Figure 15: SA Solar Radiation Map (Municipality, 2019)

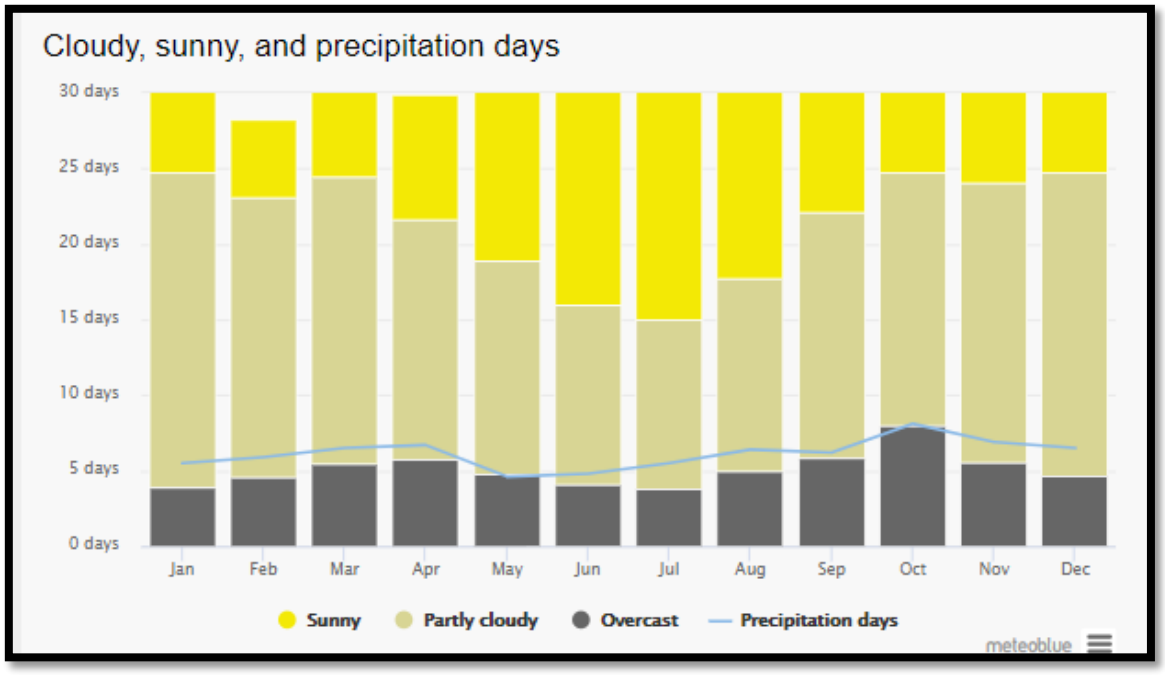

Figure 16: Cloudy, sunny and precipitation days of Mossel Bay (Meteoblue, Meteoblue, 2019).

The maximum temperature diagram for Mossel Bay displays how many days per month reach certain temperatures. As indicated in the figure below, the hottest temperatures occur during the summer season with temperatures reaching from 18.4 °C in July to 26 °C in January. The region is the coldest during July when the mercury drops to 7.6 °C on average during the night (Meteoblue, Meteoblue, 2019) (Explorer, 2019).

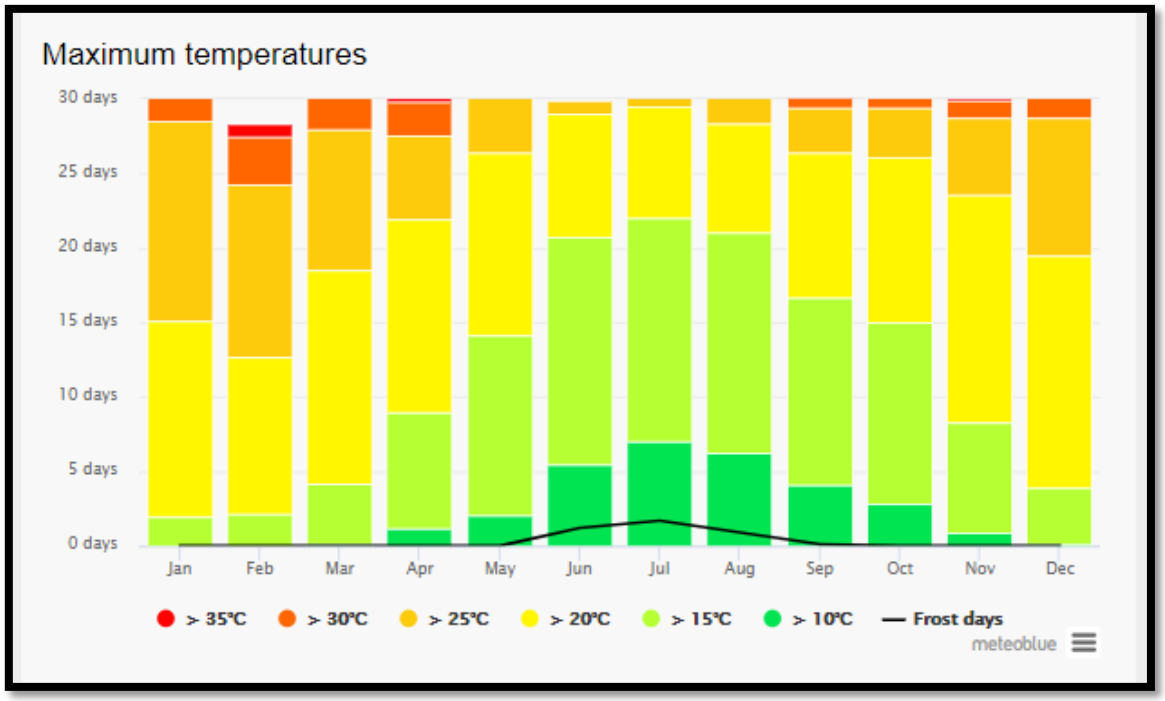

Figure 17: Maximum temperatures of Mossel Bay (Meteoblue, Meteoblue, 2019).

The precipitation diagram for Mossel Bay shows on how many days per month, certain precipitation amounts are reached. In tropical and monsoon climates, the amounts may be underestimated. According to SA Explorer, Mossel Bay normally receives about 333mm of rain per year, with rainfall occurring throughout the year. The chart below (lower left) shows the average rainfall values for Mossel Bay per month. It receives the lowest rainfall (21mm) in July and the highest (36mm) in October (Meteoblue, Meteoblue, 2019) (Explorer, 2019).

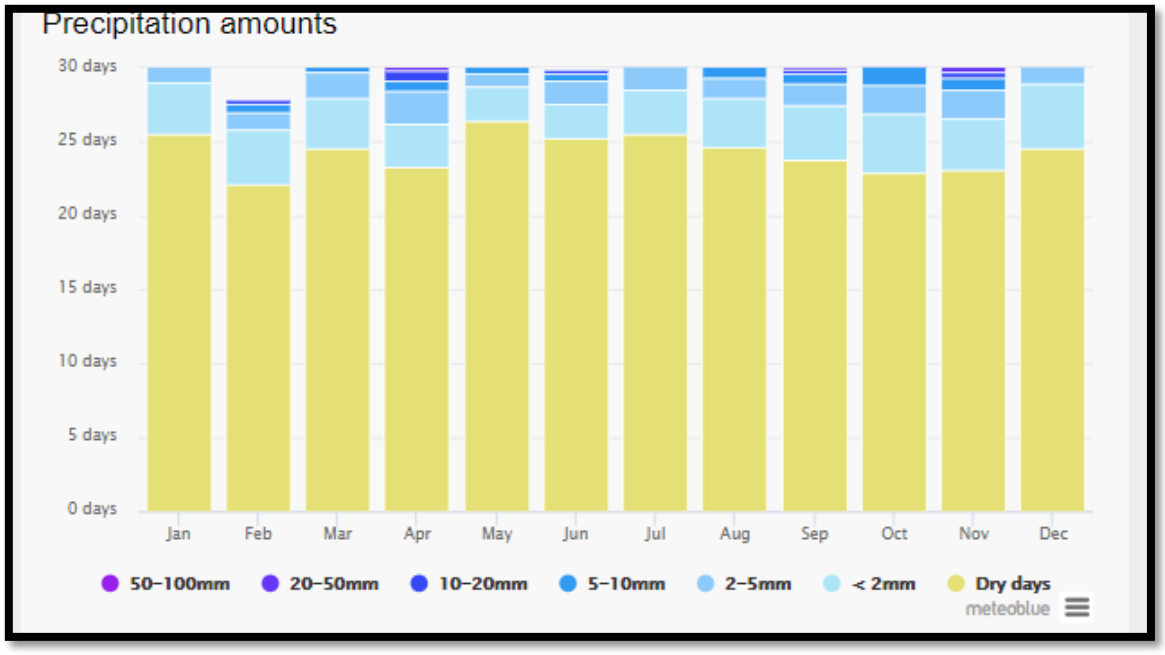

Figure 18: Precipitation amounts for Mossel Bay.

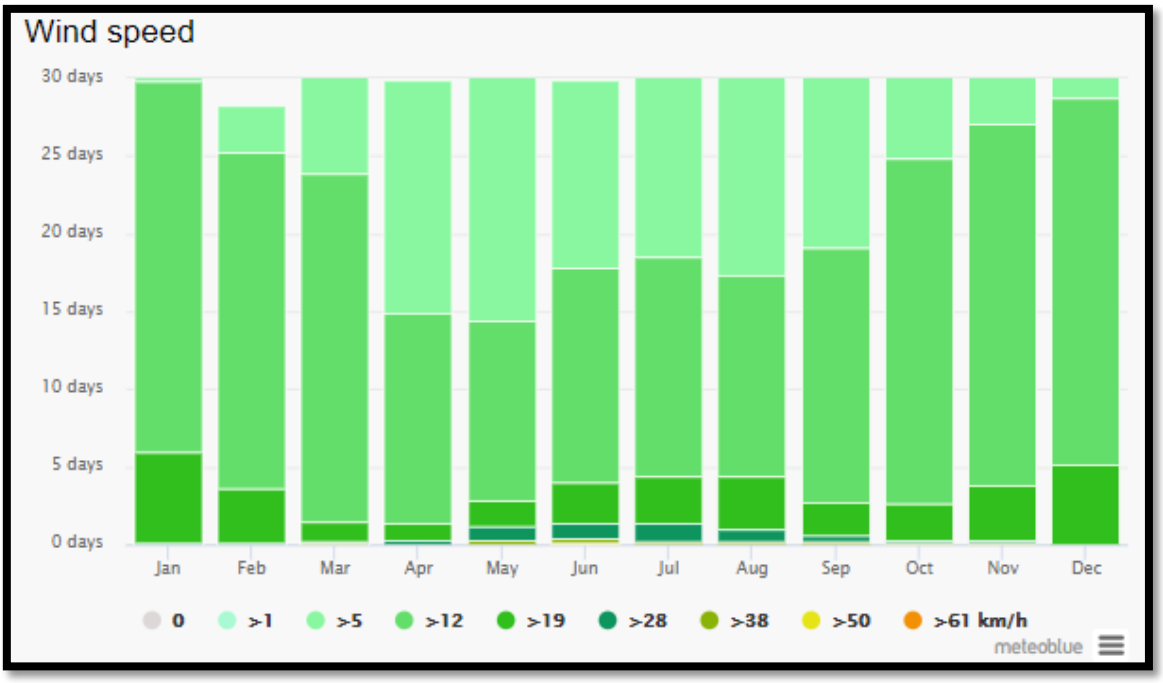

Figure 19: Average wind speeds in Mossel Bay (Meteoblue, Meteoblue, 2019)***.***

The diagram for Mossel Bay shows the days per month, during which the wind reaches a certain speed. As seen from the figure above, the average wind speeds over the summer season is calculated to be about 12 km/h whereas in the winter season in drops to 5km/h.

The wind rose for Mossel Bay shows how many hours per year the wind blows from the indicated direction. Wind in die Mossel Bay area is predominantly from the South and South-South Eastern Direction with average speeds of 12km/h, this can be during winter and summer times.

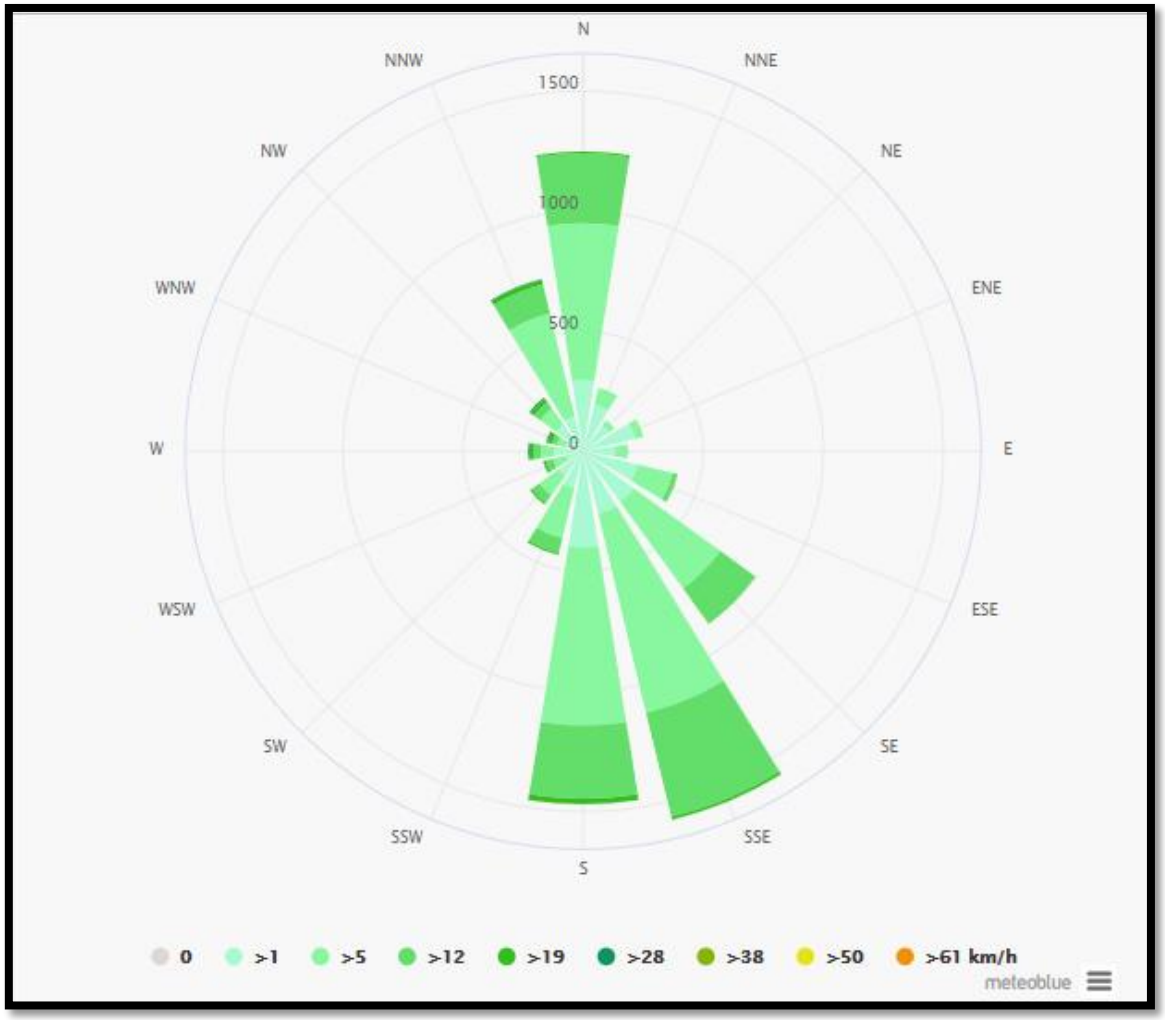

Figure 20: Wind rose for Mossel Bay (Meteoblue, Meteoblue, 2019).

The northern part of Mossel Bay Municipality along the Outeniqua Mountains is estimated to have a mean annual wind speed of 7-8 m/s with most of the Municipality being between 4-7m/s. This indicates that this region of the Municipality has some potential for providing wind-generated energy.

Figure 21: Frost in the Driefonteinen Quarry Area

ii. Geology

The general geology of the region consist of quarzitic sandstone rock as outcrops, and colluvial and alluvial transported soils are found throughout the area in lower lying areas. The quarry area comprises of large quantities of quartzites sandstone rock at surface or very close to the surface.

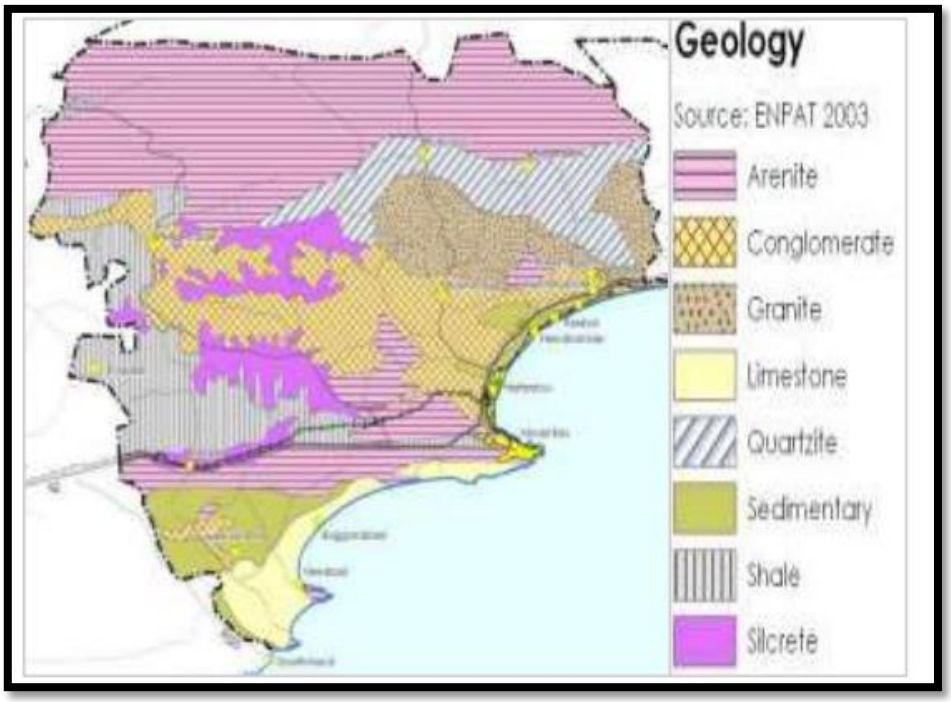

Figure 22: Geology pattern of Mossel Bay Area

Figure 22 indicates the general pattern of the geology for the Mossel Bay municipal district. The municipality contains eight types of geological formations. Most of the Municipality is comprises of Arenite and Conglomerate. Arenite is found in the northern portion of the municipal district along the high mountains and along the N2. The conglomerate deposits occur in the central portion of the Municipality. Sedimentary soils are found along the coast and the south-western part of the Municipality.

iii. Topography

The topography features are varied. The terrain is high and relatively step in places. Erosion, together with repeated subsidence and upliftment events have over the course of millions of years created the landscape views today.

The outcrops can be categorised as gentle to steep, north facing slopes, not much dissected over much of the range. Surface is gently sloping foothills of Waboomsberg, Warmwaterberg and Aasvoëlberg. The Cedarberg shale band is prominent in the east, mainly as a smooth side-valley, along which most of the hiking trails are oriented. Vegetation is mainly proteoioid sand restioid Fynbos, with ericaceous Fynbos as higher altitudes and asteraceous Fynbos on the lower slopes. Old African surface conglomerated (mapped as part of this unit) on the lower slopes have asteraceous Fynbos dominated by *Dodonea viscose var. angustifolia*. Ravines support Cape thicket, dominated by *Buddleja saligna*, and species of *Pelargonium, Rhus and Salvia*.

The Plains and undulating hills with numerous dune slacks – forming the most extensive area of sand Fynbos within the limestone Fynbos area and occupying most of the depressions, valley and lower slopes.

Vegetation is characterised by medium tall (1.5-2m tall) open shrub layer, together with a dens stratum of 1-1.2m tall shrubs and hermicryptophytes. It is structurally predominantly proteoioid Fynbos, bit with extensive restioid Fynbos in the watercourses and coastal edges.

\

Figure ***23*** shows the topography of the Mossel Bay Municipality. The topography of the municipality is characterised by:

- The Outeniqua Mountains which create a great west-east spine on the northern boundary of the municipality;
- A hilly region of undulating, rolling river valleys reaching to the coast east of Mossel Bay town; and,
- A flat coastal plain west of Mossel Bay town. Landscapes can be characterised into three, based on elevation of the landscape, are identifiable, namely classic, romantic and cosmic. (source: Schultz, 1979) Subdivision alignments tend to be informed by landscape topography.

All three of these landscape types are noticeable in the Municipality:

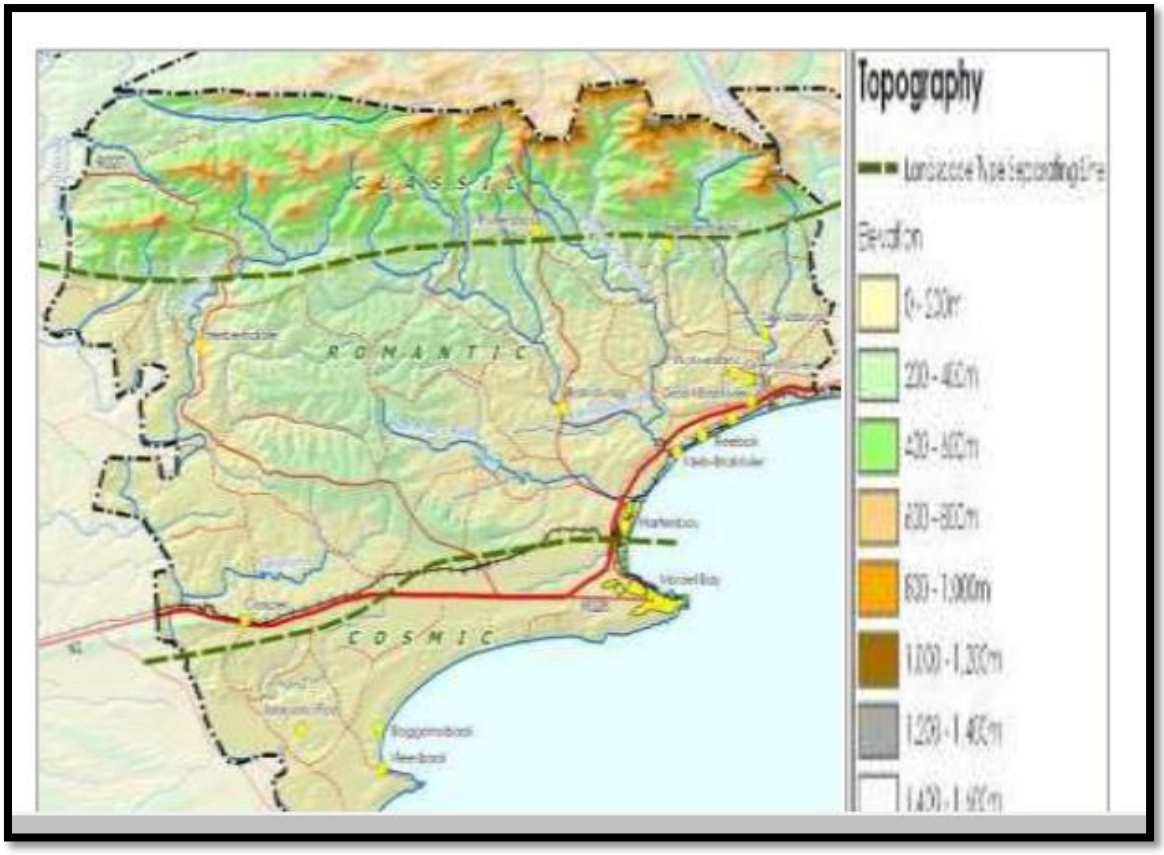

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Figure 23: Topography of the Mosselbay Area.

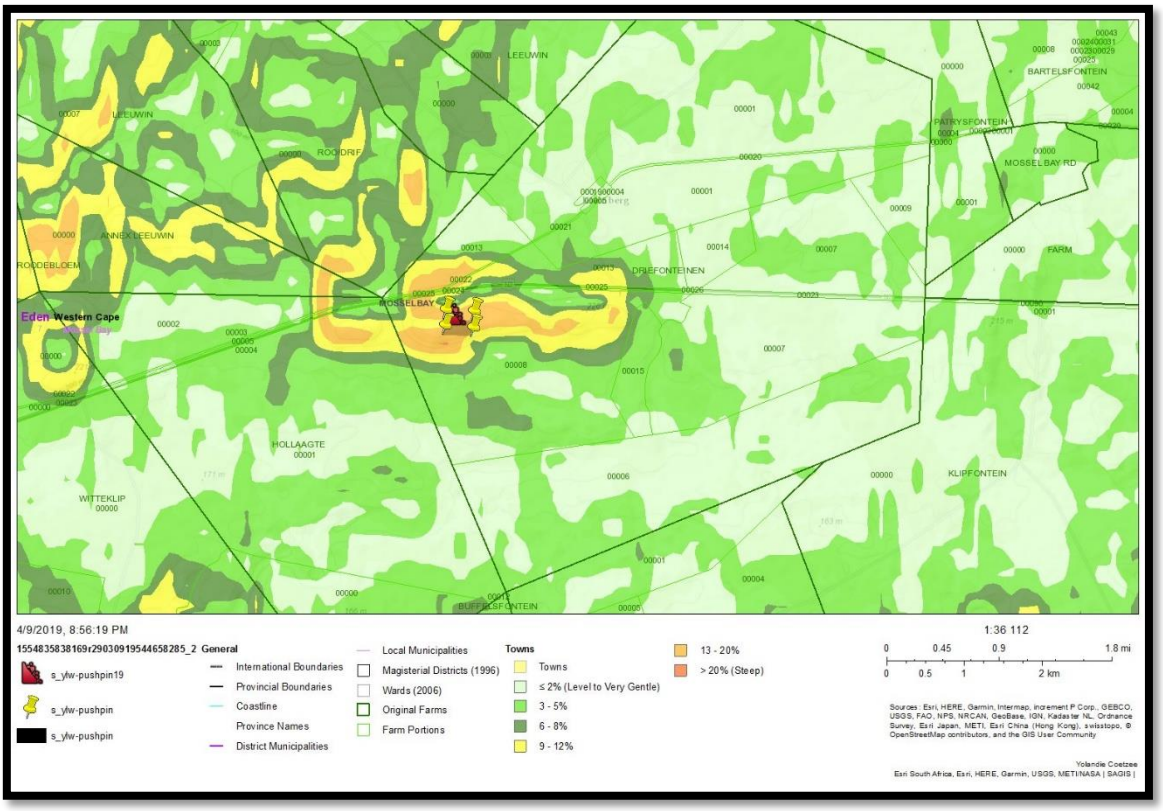

Figure 24: Slope of the area.

As described in Figure 24 above, the slope of the area is at a 13-20% at the mountain (ridge) and at the lowest 3-5% whereas the flatter areas is at a slop of <2% which is a very gentle slope.

iv. Soil, Land Use and Land Capability

Soils with a marked clay accumulation, strongly structured and a non-reddish colour. They may occur associated with one or more of vertic, melanic and plinthic soils. Deep neutral to acid l usually red, tertiary sands associated with limestone of the Bredasdorp formation, but also acid sands derived from alluvial deposits from the Gouritz River. Acid tertiary sands, usually grey, from Potberg and Aasvolgeberg are locally predominant. Land types mainly Fc, Hb and Db.

The area is overlain by soils that is formed from the local geology that mainly consist of rocks of the Table Mountain Group of the Cape Super group. These soils are typically AR1, classified as red, excessively drained sandy soils with a high base status. The farm and surrounding farms have soils with a sandy texture, leached and with subsurface accumulation of the organic matter, iron and aluminium oxides, either deep or on hard weather rock (in this case the quartzite).

Acidic lithosols soils derived from Ordovician sandstones of the Table Mountain Group (Cape Supergroup). Land types mainly lc, lb, Db and Fc. Deep neutral to acid, usually red, Tertiary sand associated with limestone of Bredasdorp Formation, but also acid sand derived from alluvial deposits from Gouritz River. Acid tertiary sand, usually grey, from Potberg and Aasvogelberg are locally prominent. Land types mainly Fc, Hb, and Db.

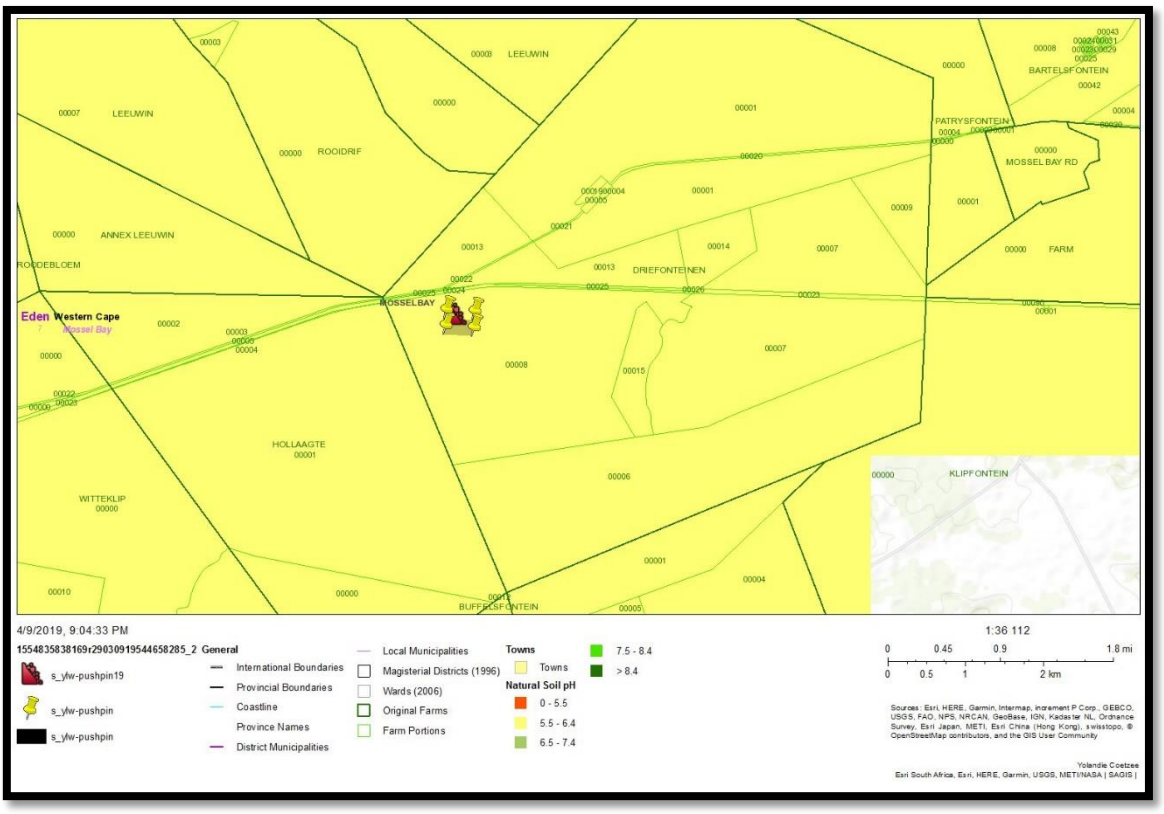

Figure 25: Soils of the surrounding area (DAFF, 2019)

The natural soil pH, as described in Figure 25 of the area is between 5.5 and 6.4.

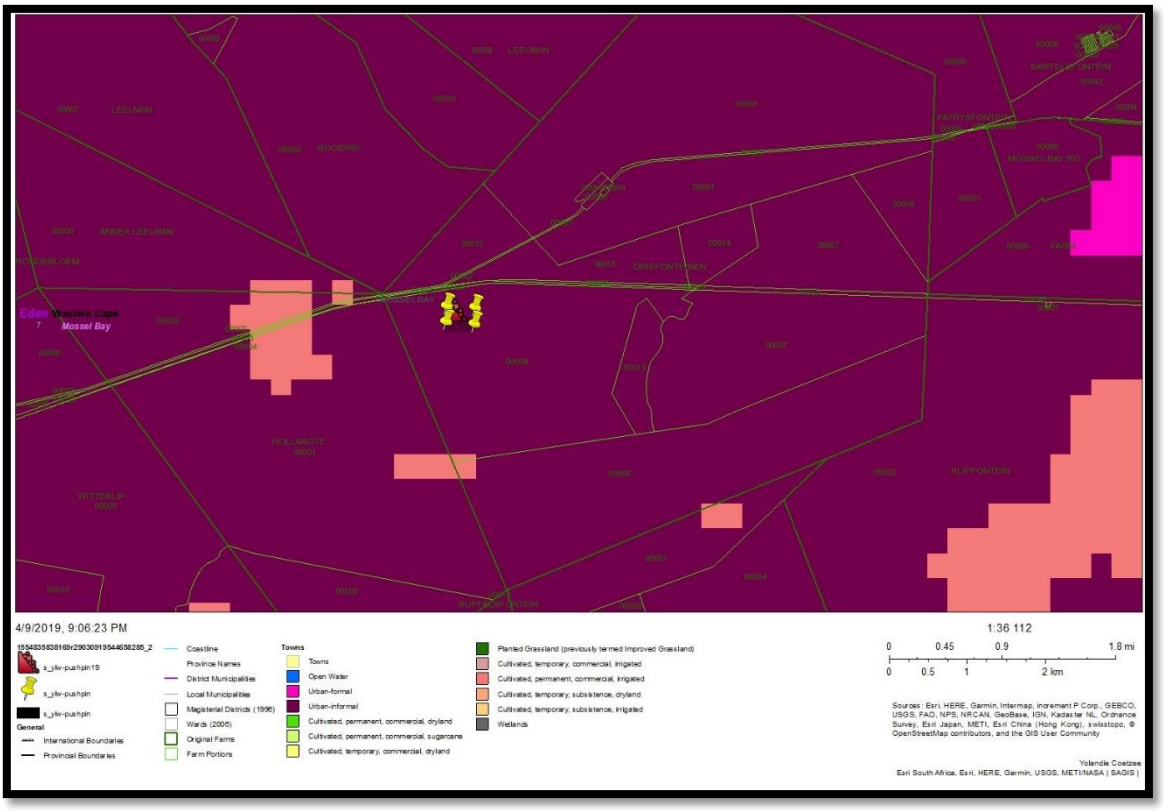

Figure 26: Soil Conservation

The soil conservation status of the area is classified as urban – informal as described above in Figure 26.

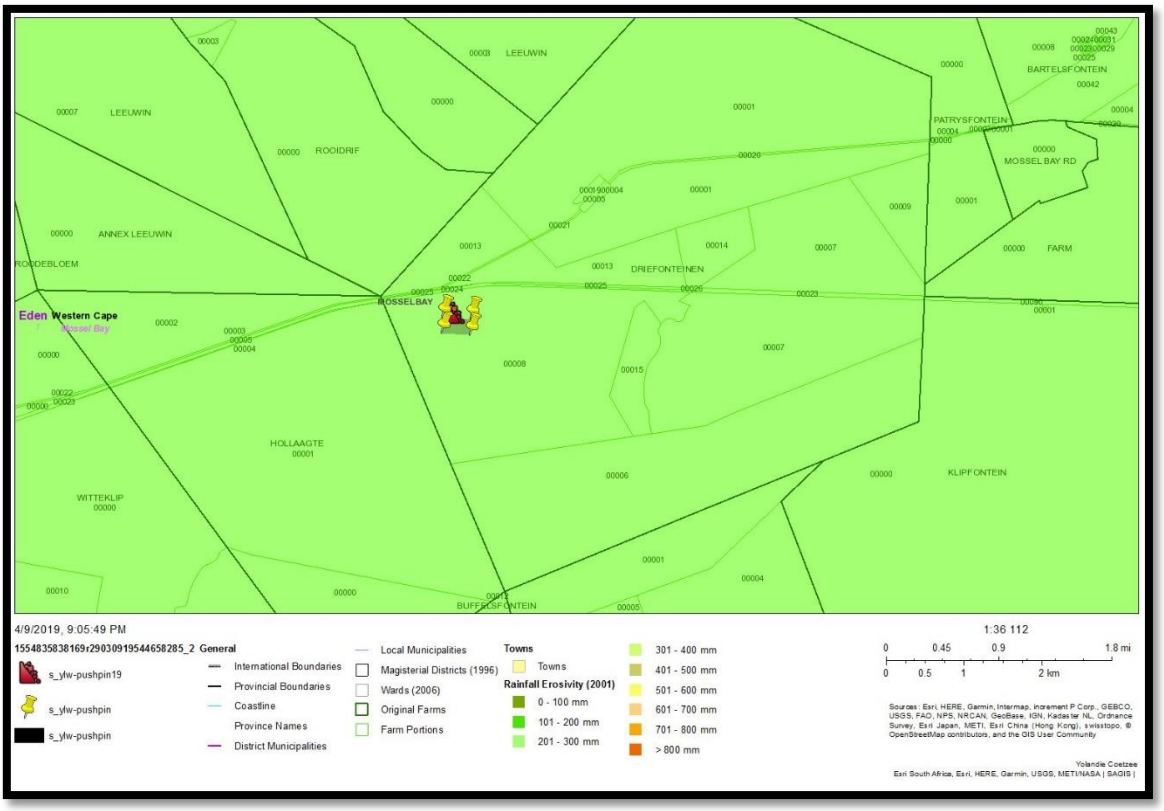

Figure 27: Soil erosion of the surrounding area.

The soil erosion status of the surrounding area as described in Figure 28 with a rainfall erosivity of between 201 - 300mm. this indicated that if the rainfall in the specific area is more than 300mm the soil erosion is high.

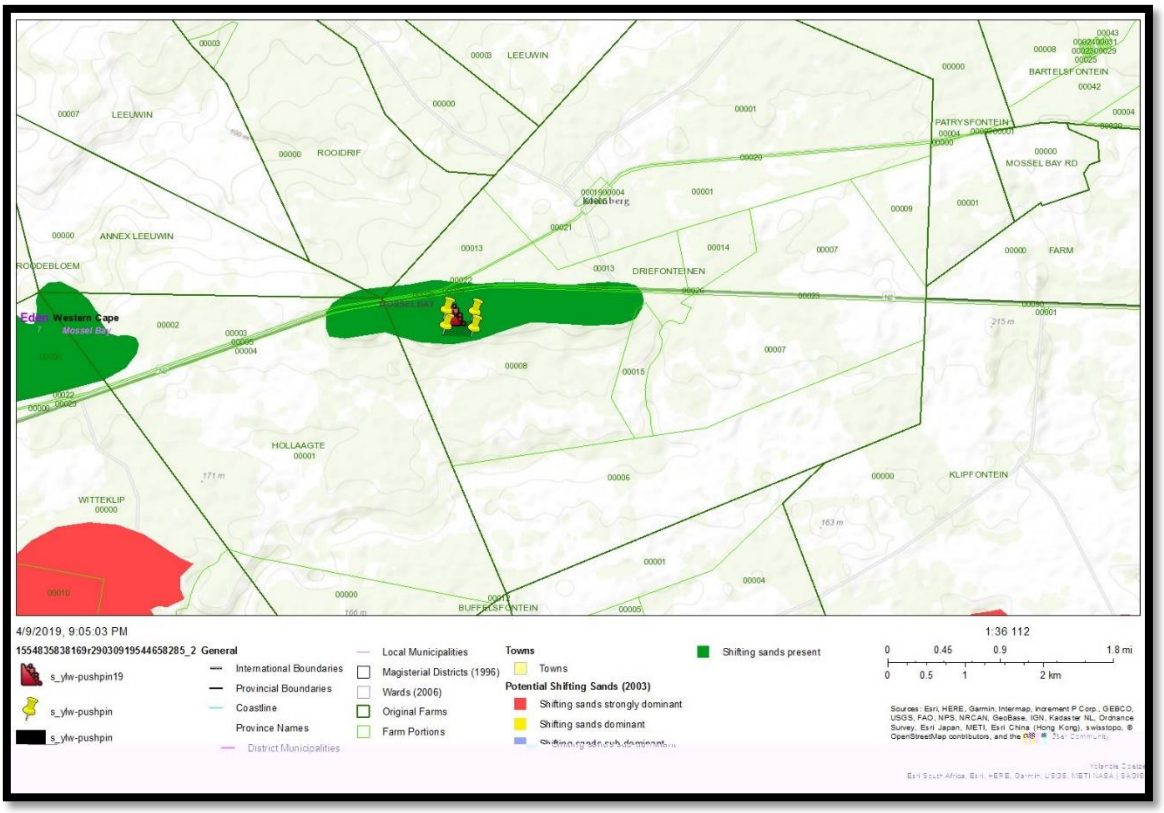

Figure 28: Soil management of the surrounding area.

The soils management of the surrounding area is classified as shifting sand are present.

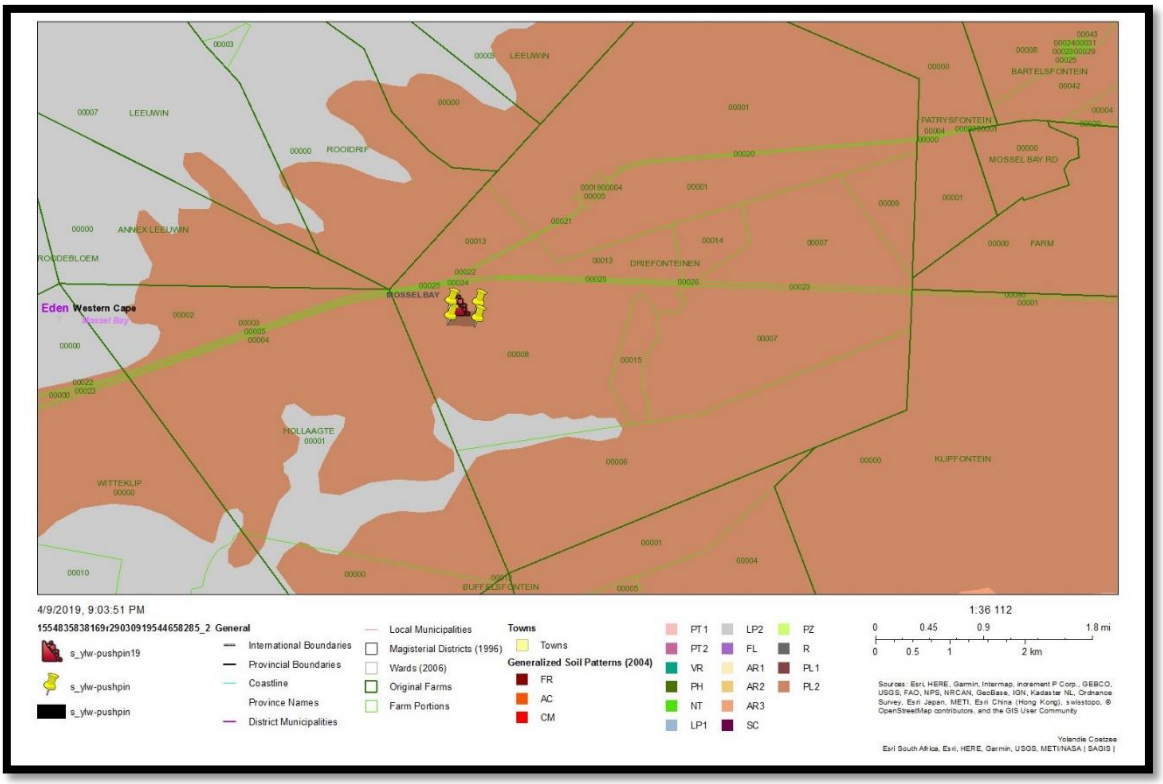

Figure 29: Soil of the surrounding area.

From Figure 30 above, the general soils present in the area is from the AR3 a soil forms. Please refer to the description above for the soil descriptions.

The site is currently not in use, and was an active borrow pit (last used in 1999). Surrounding fields are used for grazing of livestock and crop farming (Canola, Barley and Wheat). De Heus Feeds and PetroSA is located in close proximity to the proposed mining area.

Mining at the quarry will only be temporary where after land use will revert to grazing.

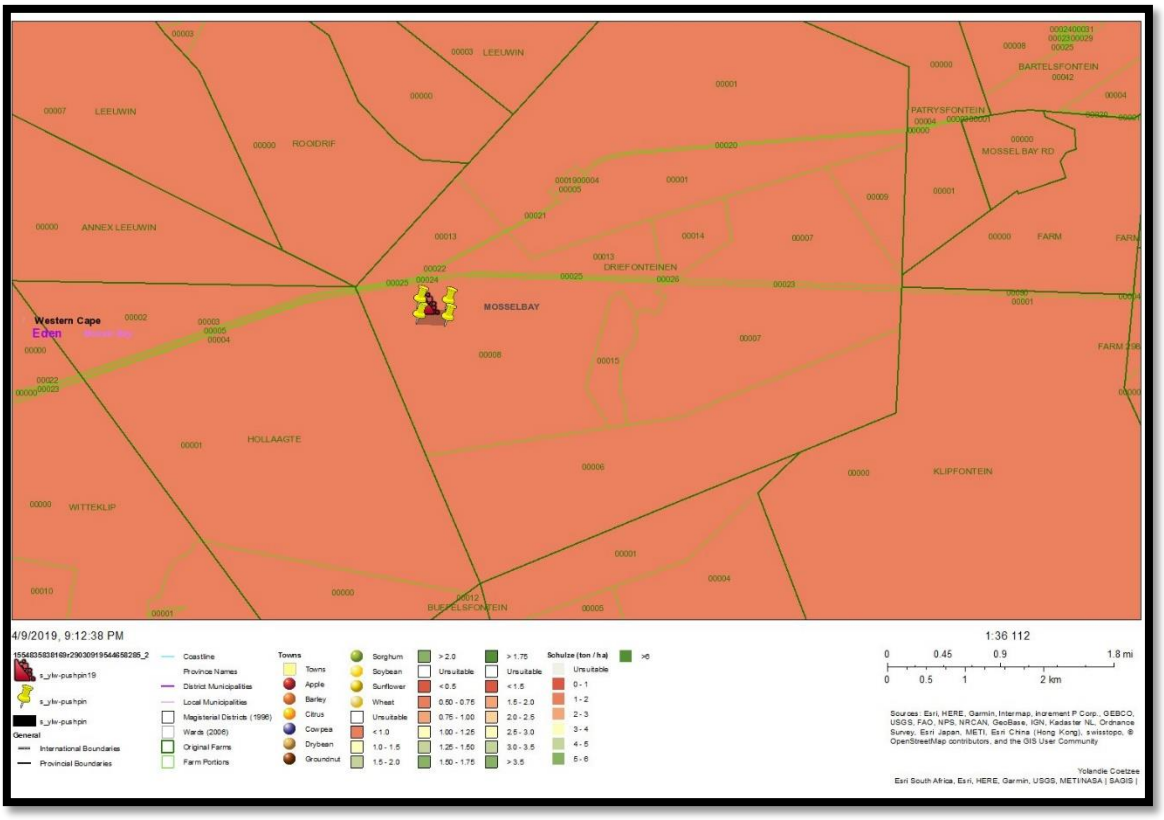

Figure 30: Crops in the surrounding area.

Crops harvested in the surrounding area is mostly, as stated above for Canola, Barley and Wheat. The area <1.0 suitable for crop farming.

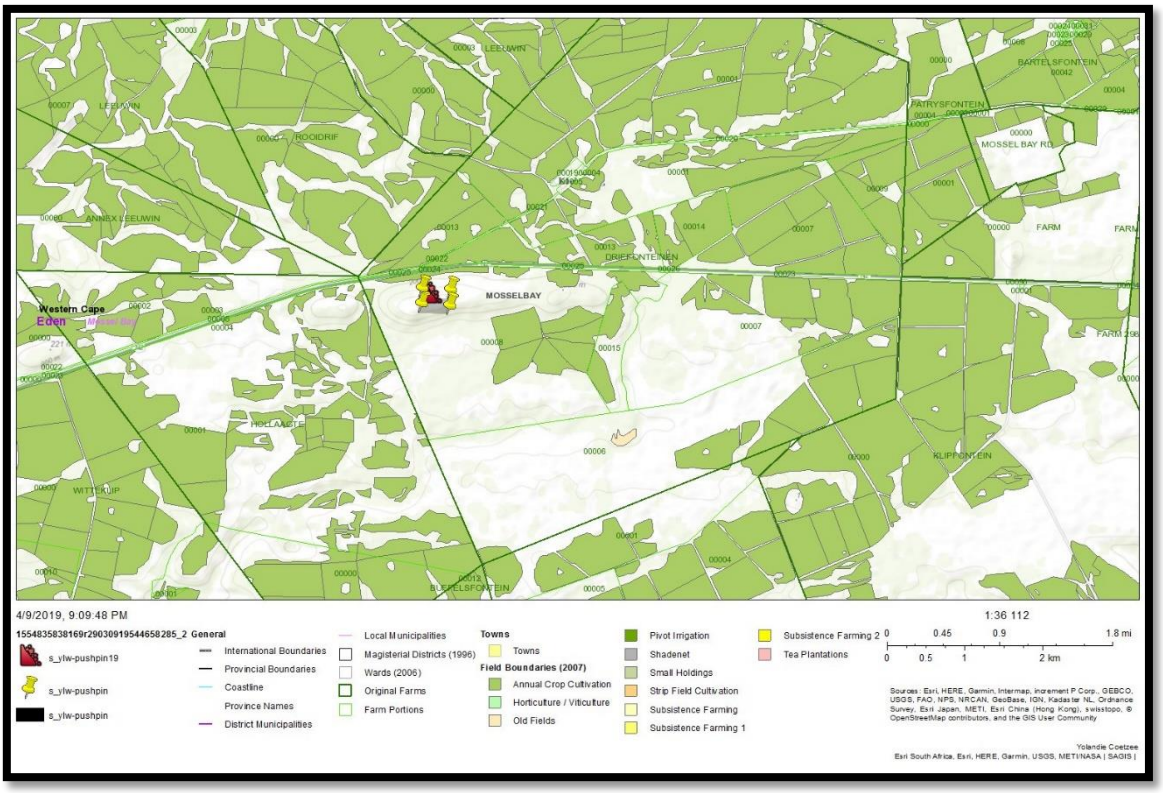

Figure 31: Field Boundaries of the area.

The agricultural and grazing fields are indicated in the Figure 31 above. The green field in the area is utilised for annual crop cultivation. The areas that does not have a colour assigned to them, indicated that these areas are not utilised in the agricultural sector.

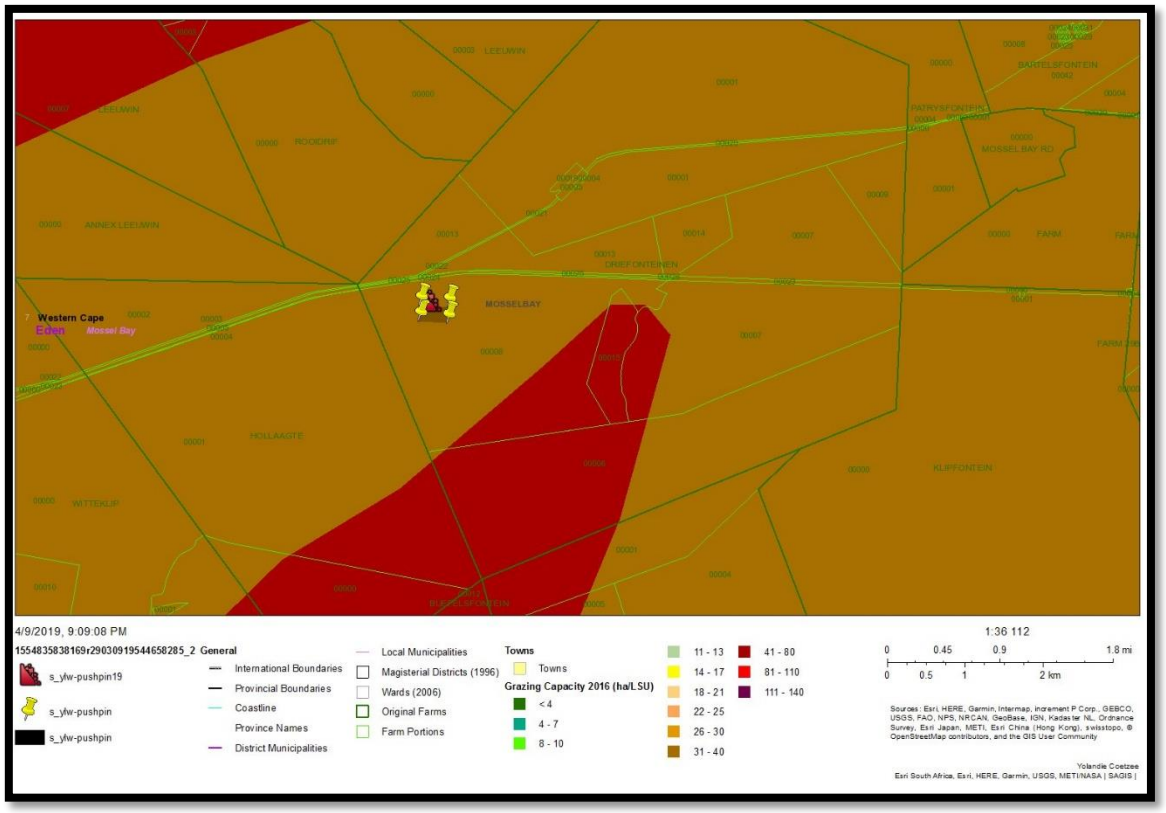

Figure 32: Grazing Capacity

The grazing capacity of the area, as from the Figure 32 above, can be classified to have a capacity of 31-40ha per stock unit.

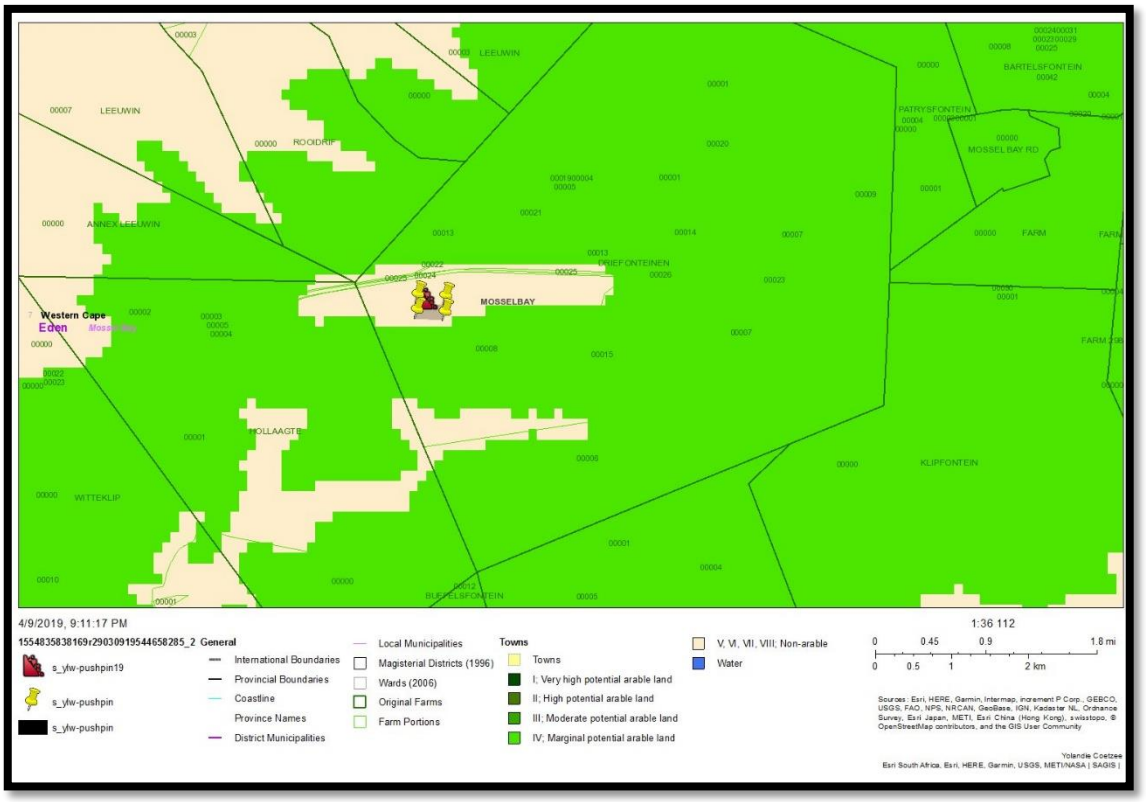

Figure 33: Land Capability

The land capability of the area, as classified as above in Figure 33, is marginal potential arable land.

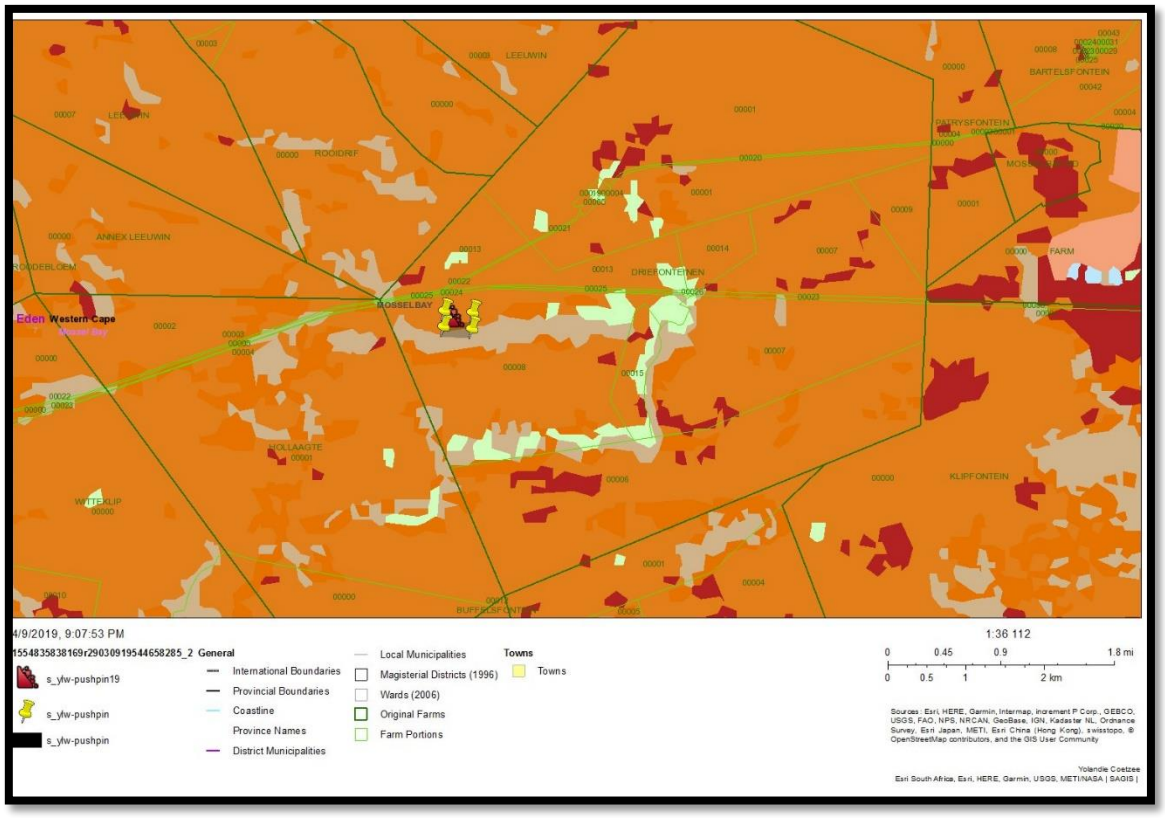

Figure 34: Land Cover

The land cover of the area can be seen in Figure 34 above.

Figure 35 shows the variation in soil depths in the Municipality. The areas with the greatest soil depths (more than 750mm deep) are located along the southern coast, around Herbertsdale and Brandwacht. Soil depths surrounding the major settlements are between 450mm and 750mm. Although there are also deeper soils along the coast, it can be seen from these figures that they are not as suitable for agriculture as the inland soils, due to the harsh coastal environment. Most the municipality has a soil clay percentage of less than 15%. Various areas around the centre of the municipality have a clay percentage of between 15% and 35%.

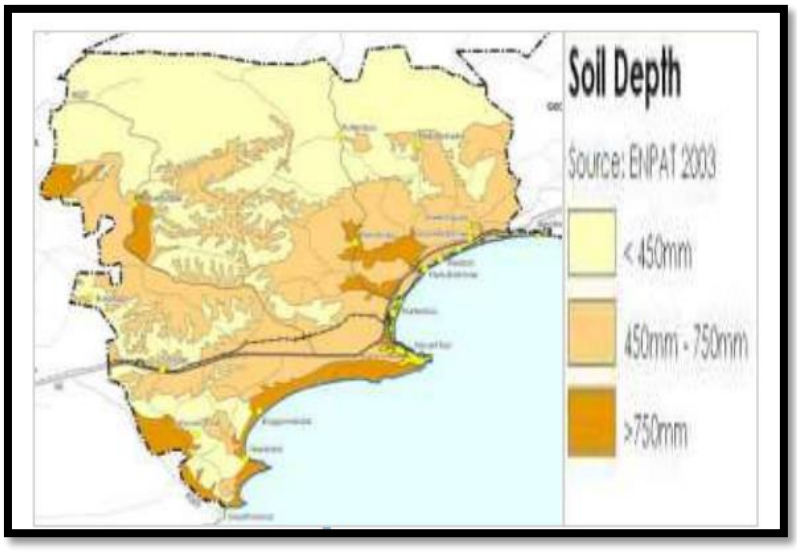

Figure 35: Soil and Clay Depth in Mossel Bay Area

Areas with high clay content, sandy and estuarine soils, and previous quarries and land fill sites are of Concern for future urban development.

- Detailed geo-technical studies should be undertaken prior to development.
- It is important from an agricultural land use perspective that the soils with greater soil depths should be protected from being converted to non-agricultural land uses.

v. Flora

In Mossel Bay fourteen indigenous vegetation types dominate the landscape, with a distinction between Fynbos, Renosterveld and Strandveld being apparent. The top five vegetation types in Mossel Bay ranked per land area covered is as follows: Great Brak Dune Strandveld (84, 98%), Mossel Bay Sha In Mossel Bay fourteen indigenous vegetation types dominate the landscape, with a distinction between Fynbos, Renosterveld and Strandveld being apparent. The top five vegetation types in Mossel Bay ranked per land area covered is as follows: Great Brak Dune Strandveld (84, 98%), Mossel Bay Shale Renosterveld (43,28%), Garde Critical Biodiversity Areas were identified and mapped for the SANBI Fine Scale Biodiversity mapping project. CBA's represent an estimate of the minimum area that needs to be protected in order to meet terrestrial and aquatic fauna and flora biodiversity objectives within the Mossel Bay municipal area. In addition to mapping CBA areas, Ecological Support Areas (ESA) were also mapped. Specific land use objectives were then assigned to each category e.g. only low impact recreational development allowed in CBA's Route Granite Fynbos (32,18%) and Central Coastal Shale Band Vegetation (29,02%) asserts that 57% of the land is still considered natural or near natural. le Renosterveld (43,28%), Garden Route Granite Fynbos (32,18%) and Central Coastal Shale Band Vegetation (29,02%) asserts that 57% of the land is still considered natural or near natural.

Conservation

This vegetation type is least threatened (North langeberg sandstone Fynbos), with a target of 30%. Statutorily conserver (13%) in the Boosmansbos Wilderness Area with an additional 45% in the mountain catchment areas such as Langeberg –oos and Langeberg-west and Matroosberg. Some 8% transformed (due to cultivation).

The Albertina Sand Fynbos is classified as Vulnerable, with a target of 32%. About 5% statutorily converted in De Hoop, Pauline Bohnen, Geelkranz, Kleinjongensfontein, Skulpiesbaai and Blomboschfontein Nature reserves, with an additional 2% protected in private conservation areas such as Rein's Coastal (Gouriqua) Nature Reserve, Die Duine etc. some 26% transformed for cultivation (Pasture) and pine plantations, but a large proportion has also been transformed by alien plants (*Acacia cyclops and A. Saligna*). In addition, large areas have been converted from proteoid Fynbos to restoid Fynbos by bush cutting for thatching. Erosion very low.

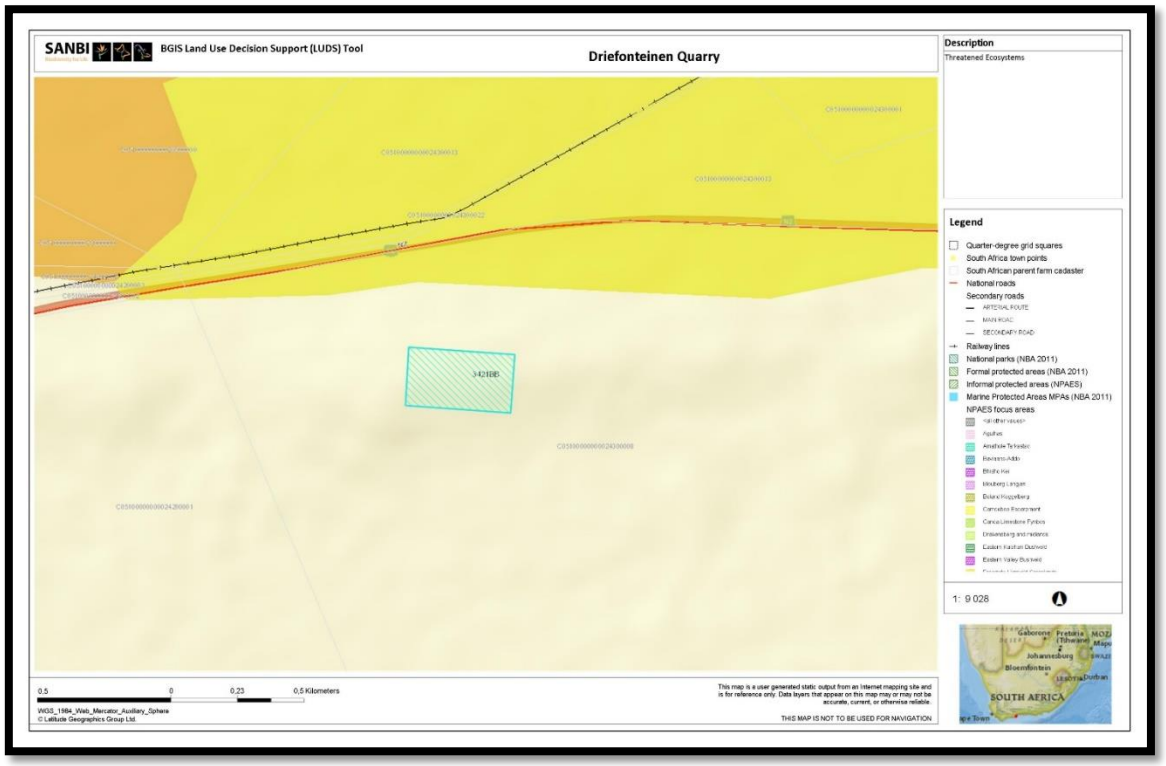

Figure 36: Threatened Ecosystems in the vicinity of the Driefonteinen Quarry.

The eastern boundary of the North Langeberg sandstone fynbos has been set oat Cloete's pass, but could equally well have been set at Robinsons pass. The area between the Robinsons and Cloete's passes has at least two near endemic proteaciea (*Leucospermum saxatile, paranmus longicaulis*) which extend west of the Gouritz river gap. More fata are needed to determine an optimal boundary between the north Langeberg sandstone fynbos and FFs18 north Outeniqua sandstone fynbos bases on species distributions and associated vegetation patterns.

The coastal range of the Aasvoëlberg, although isolated clearly fits within the FFs15 North Langeberg sandstone fynbos. However, we have tentatively included the southern slopes of the Aasvoëlberg within this unit.

From the figure above, it is indicated that the proposed Driefonteinen Quarry does not fall within the threatened ecosystem area.

Alien vegetation

Alien vegetation include *Pinus pinaster, Hakea sericea, Acacia mearsnii, Acacia cyclops* and *A. Saligna*, erosion is very low to moderate. Please refer to Appendix N for the Alien Invasive Management Plan for Driefonteinen Quarry.

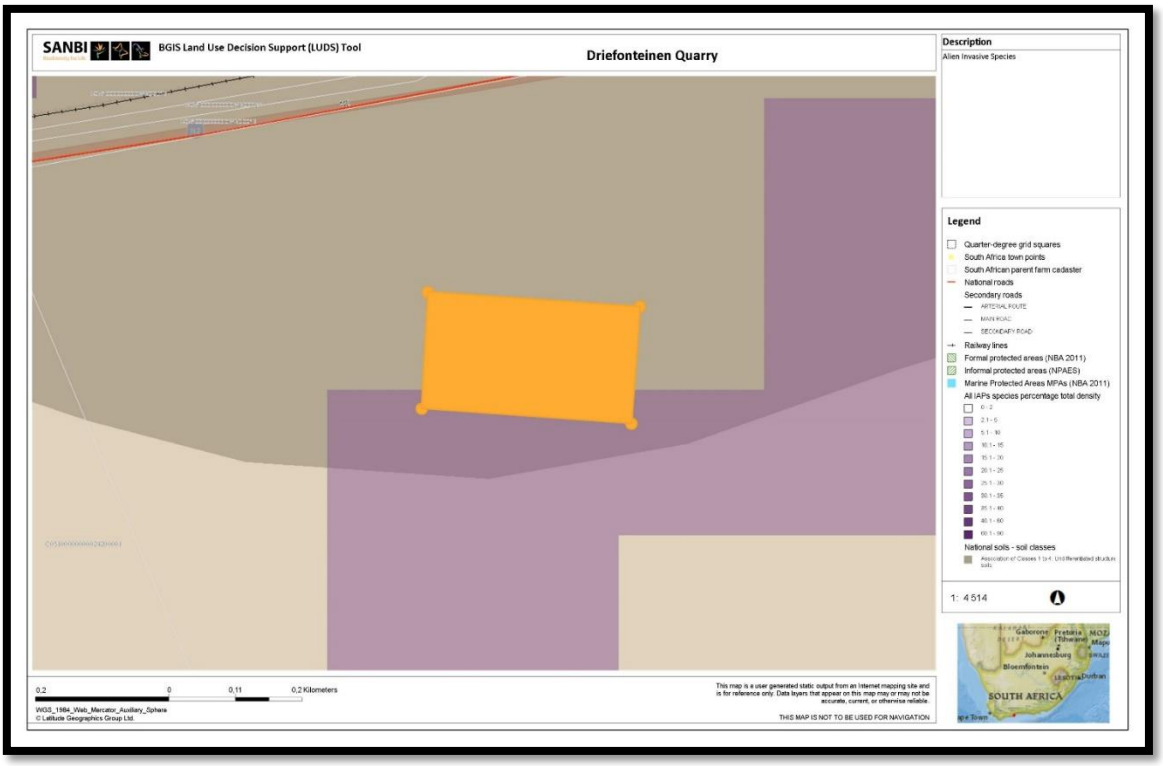

Figure 37: Alien Vegetation of the Driefonteinen Quarry

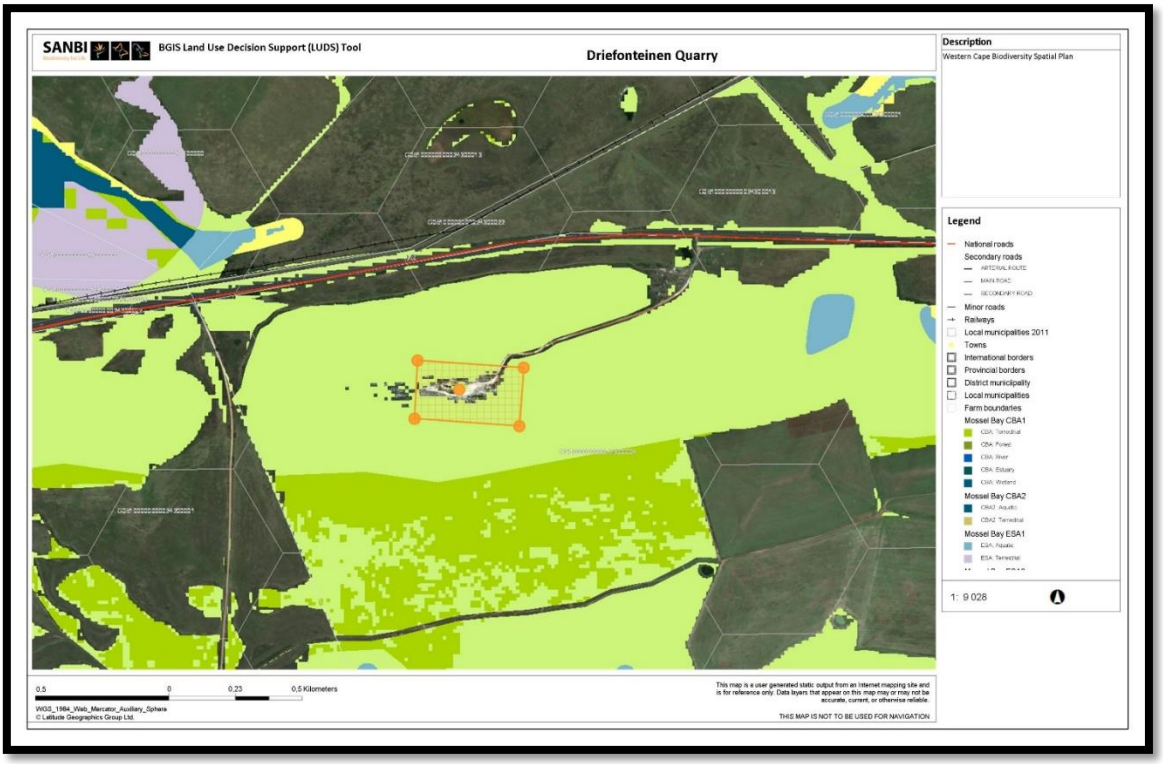

Figure 38: CBA of the Driefonteinen Quarry Area

Prominent species are as follow:

Small Tree found within Wetland areas

Protea nitida

Tall shrubs

Leucadendron eucalyptiflium	*Metalasia densa*	*Protea neriifolia*
Chrysanthemoides monigera	*Dodonaea viscosa var augistifolia*	*Protea eximia*
Psoralea pinata	*P. repens*	*Cassine peragua subsp peragua*
Protea susannae	*Nylandtia spinose*	*Passerina corymbosa*

Low Shrubs

Agathosma ovata	*Diosma tenella*	*Erica anguliger*
E. hispidula	*E. melanthere*	*E. rosacea subsp rosacea*
E. versicolor	*Leucadendron saligum*	*Leucospermum calligerum*
Passerina obtusfolia	*Phylica oinea*	*Agathosma cerefolium,*
Anthospermum spathulatum subsp spathulatum,		*Aspalatihis granulate, A. iops,*
A. vulpona,	*Brezelia gallpipi,*	*Brunia marcocephela,*
Cyclopoa bowieana,	*elyttropappus hispidus,*	*Erica articularis,*
E. coarctata,	*E. cubcica,*	*E. tenios,*
Europs pinnatipartitus,	*Gnidia francisci,*	*Indigofera pappei,*
Leucadendrom cordatum,	*leucospermim cineiforme,*	*L. mundii,*
Lobelia cappilifolia,	*Lobostemom decorus,*	*Metalasie massonii,*
M. pulcherniima,	*f pallescens,*	*mimetes cucullatus,*
Muraltia heisteria,	*paranomus cindicans,*	*penaea cneorum sibsp riscofolia,*
phaenocoma profleia,	*phylica axillaris,*	*protea aspera,*
P. lorifloria,	*Stoebe aethiopica,*	*S., cinerea,*
S. saxatalisis,	*syncarpha milleflora,*	*ursinia hsipida,*
U. rigidula,	*Wahlenbergia tenella*	*Chironia baccifera*
Cliffirtia ilicifolia	*C. stricta*	*Erica imbricate*
Lachnaea axillaris	*Agathosma bifida*	*A. scaberula*
Amphithalea tomentosa	*Aulax umbellate*	*Carpacoce vaginellata*
Chrysocoma ciliate	*Cliffortia drepanoides*	*Diospyros dichrophylla*
Erica discolour	*E. pulchella*	*E.sessiliflora*
E.versicolor	*Euryops ericoides*	*Leucadendron meridianum*
L.salignum	*Muraltia cilliraru*	*passerine galpinii*
P.rigida	*Phylica parviflora*	*Psoralea laxa*

Senecio iliciflolius	*Staavia radiate*	*Struthiolaciliata subs. Incana*
Syncarpha paniculuata	*Trichocephalus stipularis*	*Trichogyne repens*

Succulent Shrubs

Adromischus triglotus,	*Crassula atropurpurea var atropurpurea*	*machairopjyllum*
albidum,	*oscularia deltiodes,*	*Senecio aisoides.*

Woody succulent climbers

Zygophyllum fulvum,

Semi parasitic shrub

Thesoum subnudum

Herbs

Lobeleia pubescnes var pubescens	*Centella virgata,*	*linum gracile,*
peucedanum ferulaceum,	*polygala refractha*	*uesinia nudcaulis*
Edmondia Sesamoides	*Senecio laeeviagatus*	

Geophytic herbs

Lanararia lanata	*Aristea racemose*	*Pterdium aquilinum*
Bobartia robusta	*Bulbine frutescens*	*Romulea dichotoma*
R.gigantea		

Herbaceous Parasitic climber

Cassytha ciliolate

Graminoids

Ceratocaryum decipiens	*ethrharta dura,*	*E ramsosa subsp. Aphylla,*
elegia filacea,	*e. galphinii,*	*hetropogon contortus,*
hypodiscus argenteur	*H. aristatis,*	*H. striatus,*
Merxmeuellera decora,	*penthaschisistis colorata,*	*P. eriostoma,*
restion filiformis,	*R. inconspicuous ,*	*Staberoha cernua,*
tertraria bromoides,	*T. flexuosa,*	*T, ustalata,*
Willdeniowia bolussii,	*calposis filliformsis,*	*c. rigida,*
Cannomois parviflora,	*elgia asperiiflora,*	*ficinia acumainata,*
F, laciniata,	*f. rheichodes,*	*hydporsicus laevifatus,*
H, ontanus,	*ischgyrolepos capensisis,*	*i. sieberi,*

Mastersiella purpurea, pemtameris macrocalycina, pentashisitis malouinensis, restio peculiaris, r.stictus. R triticeus, Rhodocoma fruticose, tetreainvolucrata, t. thermailis, Thamnochorus cinereus. Calopss adpressa Elgia stipularis Ischyrolepsis leptoclados Thamnochortus insignis Cynodon dactlyon Elgia muirii E, tectorum Mastersiella spathulata Staberoha distachyos Thamnochortus erectus T. fructicosus Wildenowia teres

Endemic Taxa

Low Shrubs

Serruria balanocephala Acmadenia latifolia A. nivenii
A. Trigona Amphitthalea cymbifolia Anderbergia fallaz
A.spalathus longifila A. verbasciformis Clifforita alata
C pulchella Clutia govaertsoo Erica astropurpea
E. barrydalensis E chlorosepala Egiganthea
E.langerberges\nsis Eleucidesmia E.chlorosepala
E.gigantea E.langebergensis E.leucodesmia
E.rhodantha E.rudolfii Felicia cana,
F.comptonii, Leucospermum erubscens, L.saxatile,
Lobostemom muirii, Lotononis purpurescens, Metalasia gaplhpinii,
Paranomus spathulatus, Perlargonium denticulatum, Phylica brachycelhala,
P.mairei, Polygala langebergensis, Prismiatocarpus lasiophyllus,
Proteia holosericisea, Wahlenbergia fruticose, W. olgantha.

Succulent Shrubs

Antimima verucosula Drosanthemum croceum Erepsia polita
Lampranthus laethus L. marcidula L. verecundus

Geophytic Herbs

Disa schlechteriana, Ixia stolinifera

Graminoids

Plathycaulos acutus Restio implicates R. preserverans
Thamnochortus amoena T.ellipticus T.karooica

vi. Fauna

Various small mammals and reptiles occur on the property. Larger herbivore species are very scares or absent due to the conflicting land use.

vii. Surface Water

The proposed site falls within the Gouritz Water Management Area (WMA), specifically in the Gouritz/Goukou/Duiwenhos Sub Water Management Area, in the J40E quaternary catchment area.

The Gouritz Water Management Area (WMA) is situated in the southwest region of South Africa and falls almost entirely within the Western Cape Province. It derives its name from the largest river within its boundaries, namely the Gouritz River. The WMA borders on the Olifants/Doring WMA to the northwest, on the Breede WMA to the west, on the Lower Orange WMA to the north and on the Fish to Tsitsikamma WMA in the east. The southern border is the Indian Ocean.

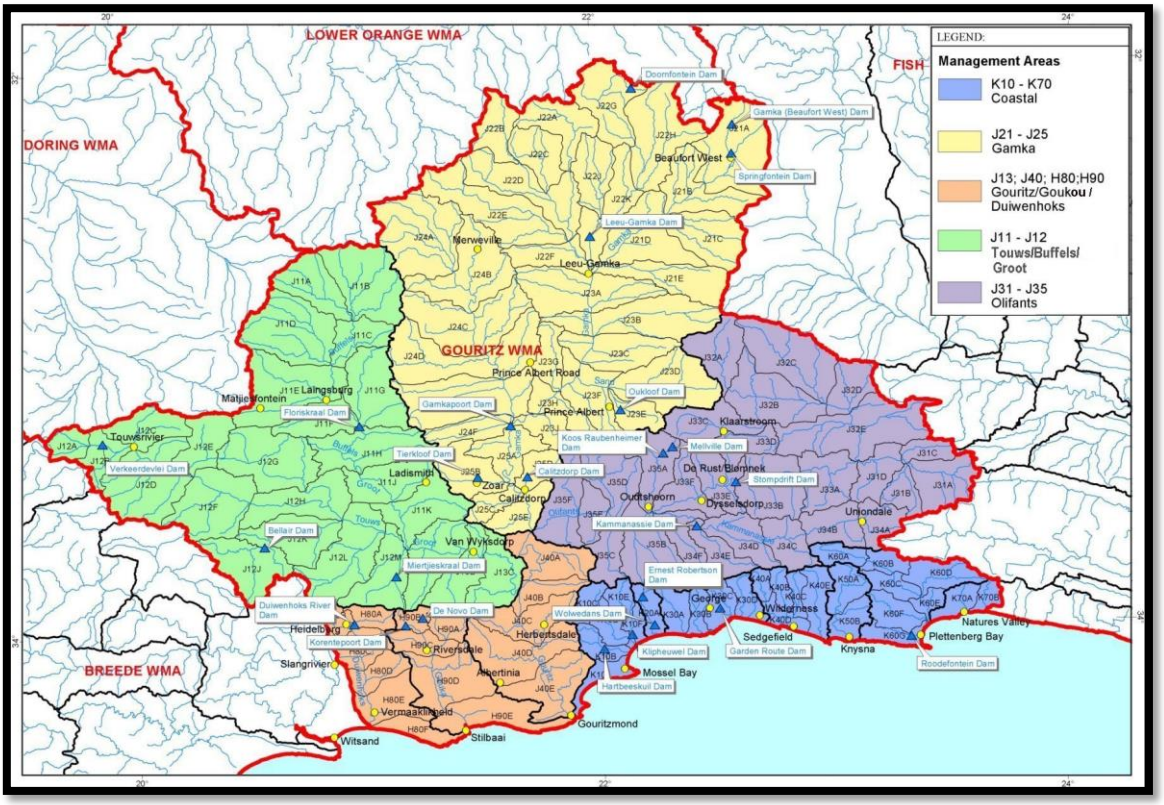

Figure 39: Sub Catchments in the WMA

This sub-area constitutes the coastal catchments of the lower Gouritz River (J40A – J40E), the Goukou River catchment (H90A – H90E) and the Duiwenhoks River catchment (H80A - H80F). The mean annual precipitation (MAP) at tertiary catchment level (H80, H90 and J40) is 504mm per annum for H80, 493mm per annum for H90 and 452mm per annum for J40. The Duiwenhoks River rises in the Langeberg Mountains and flows via the town of Heidelberg to the sea. The Goukou River flows through the town of Riversdale.

The Lower Gouritz River flows through the Langeberg Mountains and drains towards Gouritzmond. In quaternary catchment J40E, to the east of the Gouritz River, rolling hills and sand dunes are prevalent, with endoeric areas (areas from which there is no flow of surface water to downstream catchments or the sea).

The three main dams in this sub-area are:

- Duiwenhoks River Dam (H80A) has a capacity of 6,4 million m_3 and an estimated 1 in 50 year yield of 9,8 million m_3/a. It is owned by DWAF, and operated by the Duiwenhoks River Irrigation Board, which utilises approximately 3, 7 million m_3/a (1 in 50 year level of assurance of supply) for irrigation purposes. A further 1, 1 million m_3/a is used to supply the Duiwenhoks Rural Water Supply Scheme, of which 0, 7 million m_3/a is transferred into the Breede WMA to supply farmers. The town of Heidelberg is currently also supplied from the dam and has an estimated annual requirement of approximately 1 million m_3/a. The potential to supply the town of Witsand out of yield from the dam has been identified as an option to augment the supply to that town.
- Korentepoort Dam (H90B; also referred to as the Korente-Vette Dam), on the Korente-Vette River is owned by DWAF and operated by the Korente-Vette Irrigation Board and is the main source of supply to the Korente-Vette Irrigation Scheme. The dam has a capacity of 8, 3 million m_3 and a yield of 5, 8 million m_3/a. It is used primarily for irrigation purposes, whilst also providing municipal supply to the town of Riversdale.
- De Novo Dam (H90B) on the Vette River is a small dam owned by DWAF, operated by the Korente-Vette Irrigation Board and used to supplement the supply to the Korente-Vette Irrigation Scheme by feeding into the irrigation system canals. The capacity of the dam is approximately 0, 1 million m_3 and it has an estimated yield of 0, 15 million m_3/a. There is limited groundwater usage, mainly for stock watering and supplies to coastal resorts.

An estimated 63 km^2 (6300 ha) of irrigated land is found within the total 5 299 km^2 (529 900 ha) of this subarea. The assurance of supply very much higher than that of the inland catchments of the Karoo and it is estimated that all land under irrigation is harvested annually. Opportunistic irrigation is therefore less prevalent here. Vineyards, lucerne and pasture are the dominant crop types under irrigation.

Of significance is the extent of invasive alien plant infestation in this sub-area. This coverage is estimated to be equivalent to approximately 530 km^2 of dense alien plant infestation, with a reduction in surface water runoff of 43 million m^3/a. This has an estimated impact on the yield of this sub-area of some 10 million m^3/a. The infestation is most prevalent in the Goukou and Duiwenhoks catchments, in which the reduction in yield contributes to 8, 5 million m^3/a of the 10 million m^3/a. The Removal of Invasive Alien Plants Strategy discusses this in more detail. Approximately 27 km^2 of afforestation is found in this sub-area, all of which is located in the Duiwenhoks and Goukou River catchments. This has an average annual reduction in surface water runoff of 5 million m^3/a, with an estimated reduction in yield of 1 million m^3/a at the 98% level of assurance of supply. Refer also to the Afforestation Strategy (DWAF, 2004)

The surface water in the upper reaches of the Duiwenhoks River and Goukou River catchments is of good quality. Water quality in the lower Gouritz River (J40 catchment) is classified as unacceptable due to high salinity, mainly from the cumulative contributions of the upstream Touws/Buffels/Groot and Olifants sub-areas. The quality of water arising from the Gamka sub-area has less impact on the quality of the Gouritz River water than the aforementioned two sub-areas. Information on the quality of surface water in the lower reaches of the Duiwenhoks and Goukou Rivers is available but still needs to be analysed. Managing salinity is further addressed under the Water Quality Management Strategy.

The WWTW at the coastal towns rely primarily on primary screening, de-gritting and the use of oxidation or evaporation ponds. During the peak season, the capacity of these basic systems is often exceeded, with the result that spills occur. At Riversdale for example, the WWTW sludge dams are situated in close proximity to the Goukou River. The works has reached its design capacity, posing a risk of spills during the peak season whilst seepage into the river from the ponds remains an ongoing risk. The Water Quality Management Strategy (2.4) addresses these concerns (DWAF, 2004) .

Figure 14 shows the distribution of the rivers and tributaries through the municipal area. Perennial rivers flowing throughout the municipality are the Langtou, Kamma, Kayaking, Stink, Hartenbos, Kleinbrak and Brakrivers. The main inland water bodies are the Wolwedans Dam north of Great Brak rivier and the Kilpheuwel Dam north of Little Brakrivier. In terms of SANBI: National Freshwater Ecosystem Priority Areas (2007), the rivers to the west of the Municipality are Critically Endangered. All the rivers in the east are classified as Endangered and Vulnerable.

Figure 14 shows the distribution of the rivers and tributaries through the municipal area. Perennial rivers flowing throughout the municipality are the Langtou, Kamma, Kayaking, Stink, Hartenbos, Kleinbrak and Brakrivers. The main inland water bodies are the Wolwedans Dam north of Great Brak River and the Kilpheuwel Dam north of Little Brakrivier. In terms of SANBI: National Freshwater Ecosystem Priority Areas (2007), the rivers to the west of the Municipality are Critically Endangered. All the rivers in the east are classified as Endangered and Vulnerable.

The interior of Mossel Bay is the location of the headwaters for the three largest rivers in the area namely the Little Brak, Great Brak and the Hartenbos River. The catchments of all three rivers have been extensively modified via a number of land uses that range from agriculture to residential and institutional use.

Table 7: River catchment and their management details

Attribute		Hartenbos	Great Brak River	Little Brak River
Location		34deg06'58.07''; 22deg06'45.84''	34o03'09.69''; 22deg13'58.27''	34º05' S; 22º08' E
Catchment size		144 km2	555km2	562km2
Length		32 km	5km	15km
Government Dams	Name	Ernst Robertson	Wolwedans	None
	Capacity	500 000 cubic meters	25 530 000 cubic meters	N/A
	Purpose/ Water Use	Irrigation: too brackish for potable use	Main supply of potable water to Mossel Bay	N/A
	Operator	Department of Water and Sanitation	Department of Water and Sanitation	N/A
Land use in catchment	Upper catchment	Grain, wheat and dairy farming	Grain, wheat and dairy farming. Game farming and pine plantation	Dry land crop production, Irrigated crop farming, forestry and livestock grazing (e.g. cattle).
	Lower Catchment	Sand mining, grazing, residential and resort.	Residential and commercial development. Subsistence vegetable farming	Residential development, livestock grazing
Conservation ranking (out of 100, with importance decreasing as one moves towards 100)		74	46	93

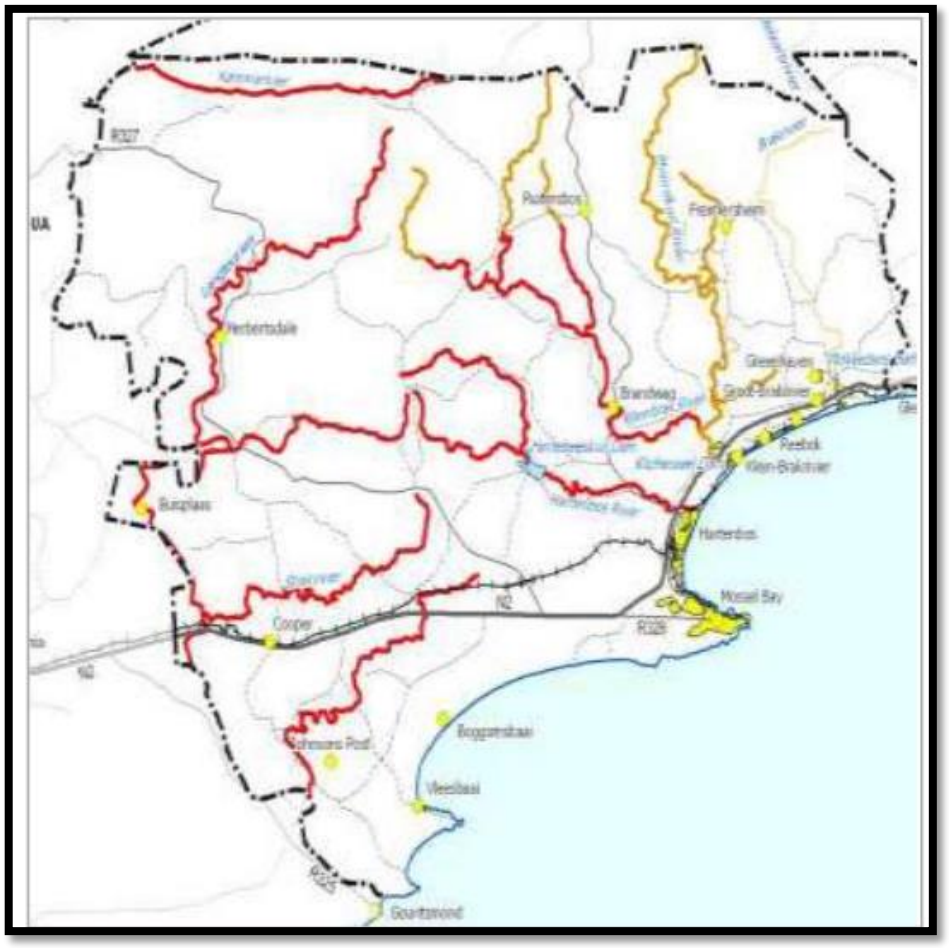

Figure 40: River conservation status

viii. Air Quality

The background air quality of the surrounding area is very good due to low industrial activity and very low population density. The mining operations at the existing quarry could contribute to the dust levels of the immediate area. Dust to be generated by the proposed mining activities will imitate the dust levels generated by the current mining activities at the site, and are therefore seen as a cumulative impact. It is expected that the generation of dust will be localised within the confines of the mining area, and can be mitigated through the implementation of dust suppression measures.

ix. Ambient Noise

The background noise level of the surrounding area is highly impacted on by traffic travelling along the N2 road passing the property. The background noise level of the surrounding area is the same as for other agricultural areas and at present such noise levels are below 55dBA. The surrounding areas are characterised by an agricultural setting in which vehicles and farm equipment operate. The traffic on the N2 also contributes to the ambient noise of the area. The mining activities at the existing quarry increase the natural noise levels at the proposed mining site. Due to the remote setting of the mining area noise generated by the activities at the site is not anticipated to have a negative impact on any surrounding landowner.

The limit for the air blast or "noise" generated by a blasting event is 134dB. Blasting noise is instantaneous and of short duration. If the blast is designed so that the maximum amount of energy released by the explosive goes into breaking and displacing the rock, the air blast is limited. Blasting will only occur once every six (6) to eight (8) weeks. Site management has to notify the surrounding landowners in writing prior to blasting occasions. In order to minimise the noise impact, blasting has to occur between 8:00 and 15:00 Monday – Fridays.

The nuisance value of noise generated by heavy earthmoving equipment for residence in the near vicinity is deemed to be of low – medium significance, as the mine is expected to be operational 24 hours a day for 6 days a week. The distance of residents from the mining area (>2 km) will however assist in the mitigation of the noise impact. All mining vehicles will also be equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996 (Act No 93. of 1996).

x. Archaeological and Cultural Interest:

No sites of archaeological or cultural importance were identified during the site inspection in the proposed vicinity of the quarry area. As the proposed mining activity will take place within an area previously utilized for mining purposes, the activity is not anticipated to have a negative impact on any archaeological or cultural aspects.

xi. Visual Exposure

The mining area was identified to constitute the lowest possible visual impact on the surrounding environment. Due to the historic mining disturbance nearby the area the site has a low aesthetic value. The proposed prospecting area will visible from the surrounding farms and will therefore have a visual impact on the immediate surrounding area.

The applicant should ensure that housekeeping is managed to standard, as this will mitigate the visual impacts during the operational phase of the stockpile area. Upon closure of the prospecting area and decommissioning of the site, the area should be fully rehabilitated and all exposed areas should be seeded to enhance vegetation recovery should natural vegetation not establish within six months of completion of rehabilitation.

The proposed mining area will be operated within the vicinity of an existing quarry. All stockpiling will be done on previously disturbed areas within the processing area, which will be rehabilitated upon closure of the mining area. Although the proposed mining at the site will have a visual impact the establishment of the quarry in an already disturbed area will help to mitigate this impact.

xii. Regional Socio Economic Structure:

The Mossel Bay Local Municipality is a Category B municipality situated within the Garden Route District in the Western Cape Province. It is bordered by the municipalities of Oudtshoorn to the north, George to the east, and Langeberg to the west. Its northern boundary is the Outeniqua Mountains and its western boundary the Gouritz River. To the east it stretches to the Maalgate River. The municipality is one of seven in the district.

The Garden Route District Municipality fulfils a coordinating function in the area, although each of the local municipalities remains autonomous. Mossel Bay Local Municipality is situated on the N2 approximately halfway between the coastal cities of Cape Town and Port Elizabeth.

Mossel Bay Municipal area is 2007 square kilometres in size and is situated along the Southern Coast of South Africa. The Gourits River, the Outeniqua Mountains and the Maalgate River serve as the western, northern and eastern boundary of the municipal area. Mossel Bay Municipality lies within two of the three biodiversity hotspots that have been identified in South Africa. These are the Cape Floristic region (CFR) and the Succulent Karoo (SK) region. The Fynbos biome is probably the most important element of the Cape Floristic Region, and it exhibits high levels of biodiversity and species endemism.

Mossel Bay was proclaimed a town late in the 19th century and assumed its current form following the introduction of the New Democratic Local Government dispensation in 2005. The municipal area is an amalgamation of a number of smaller towns consisting of: Mossel Bay, Boggom's Bay, Brandwag, Buisplaas, D'Almeida, Dana Bay, Glentana, Fraaiuitsig, Friemersheim, Great Brak River, Hartenbos, Herbertsdale, Hersham, KwaNonqaba, Little Brak River, Outeniqua Beach, Reebok, Ruiterbos, Southern Cross, Tergniet and Vleesbaai .

(a) Demographic Profile

The current demographics of the Gouritz WMA were assessed for input to the Gouritz Water Resources Availability and Utilisation Report (also referred to as the Gouritz WMA Report), which provides input to the NWRS. The Gouritz WMA is one of the WMAs with the lowest population in the country. The total population is estimated at 436 800. The arid inland parts are particularly sparsely populated. Close to 60% (242 800) of the total WMA population is concentrated in the narrow coastal strip from Mossel Bay eastwards. Of these approximately 90% reside in urban areas. The economic activity and employment opportunities have, and will continue to attract people to that area. Similarly in the rural Karoo area, it is estimated that almost 80% of the population residing in that area, live in towns and villages. Future population trends are likely to be influenced by economic opportunities and job creation. It is anticipated that the growth in the coastal catchments is likely to be relatively strong, particularly in the larger urban centres such as Mossel Bay and George, and to a lesser extent, Knysna and Plettenberg Bay. Due to the lack of economic stimulant in the Great Karoo region, together with the general trend towards urbanisation, a decline in population is expected in that area. Little change is expected in the Gouritz and Olifants sub-areas, although there is likely to be some migration towards Oudtshoorn, out of the rural areas, because of potential employment opportunities (Municipality, 2019).

Mossel Bay has the third largest population in the Eden District with a population size of 96 120 as per the 2018 Socio-Economic Profile results. According to the forecasts of the Western Cape Department of Social Development, the population is estimated to reach 101 680 in 2021. This total gradually increases across the 5-year planning cycle and is expected to reach 107 829 by 2024. Equates to a 1.9 per cent annual average growth rate. The estimated population annual growth rate of Mossel Bay is on par with that of the Garden Route District (1.9 per cent) over the period from 2019 to 2024. The total population is broken down into three different groups: Age 0 - 14: children; Age 15 - 65: working age population; Age 65+: seniors. The comparison with the base year (2011) and the estimated numbers for 2023 shows growth in all age cohorts with the highest growth in the working age population for Mossel Bay.

(b) Households

To ensure basic service delivery to all, municipal budget allocations should be informed by credible and accurate assumption regarding the number of households within a municipal area. According to the SEP for 2017, there are 31 766 households within the greater Mossel Bay region.

The annual income for households is divided into three categories, namely the proportion of people that fall within the low, middle- and high -income brackets. Poor households fall under the low-income bracket, which ranges from no income to just over R50 000 annually (R4 166 per month). An increase in living standards can be demonstrated by a rising number of households entering the middle- and high-income brackets. Approximately 52, 8 per cent of households fall within the low-income bracket, of which 18 per cent have no income. Less than 50 per cent of households fall within the middle to higher income categories, split between 39, 2 per cent in middle income group and 8 per cent in the higher income group. A sustained increase in economic growth is needed if the 2030 NDP income target of R110 000 per person, per annum is to be achieved.

Table 8: Household Income

Amount (2016)	Eden	Mossel Bay	
No income	13,4	18,0	Low income
R1 – R6 327	2,8	2,9	
R6 328 – R12 653	4,4	4,2	
R12 654 – R25 306	14,3	12,6	
R25 307 – R50 613	19,8	15,1	
R50 614 – R101 225	16,9	15,6	Middle Income
R101 226 – R202 450	12,0	13,1	
R202 451 – R404 901	9,0	10,5	
R404 902 – R809 802	5,1	5,2	High income
R809 803 – R1 619 604	1,5	1,8	
R1 619 605 – R3 239 208	0,5	0,6	
R3 239 209 or more	0,3	0,4	

The lower poverty headcount shows that the number of poor people within the Mossel Bay municipal area decreased from 3, 2 per cent of the population in 2011 to 2, and 1 per cent in 2016. The decreasing poverty headcount is positive as it means less strain on municipal financial resources. The intensity of poverty, i.e. the proportion of poor people that are below the poverty line decreased from 43, 5 per cent in 2011 to 43 per cent in 2016. This percentage is still high and should be moving towards zero as income of more households within the municipal area move away from the poverty line.

Table 9: Poverty headcount and intensity

Area	Poverty Headcount (Percentage)		Poverty Intensity (Percentage)	
	2011	2016	2011	2016
Mossel Bay	3,2	2,1	43,5	43,0
Eden District	3,9	2,2	42,2	40,5
Western Cape	3,6	2,7	42,6	40,1

(c) Age and Gender

The majority of Mossel Bay's population is concentrated between the ages of 20 to 39, which is possibly reflective of an influx of young working professionals into the region (increased employment opportunities as a result of positive economic growth in the region). It is also noticeable that the population numbers in the older age categories remain relatively high in comparison to other districts. This trend can be attributed to the fact that Mossel Bay and its surrounding areas remain a popular retirement destination.

Mossel Bay's dependency ratio will increase from 49, 7 in 2011 to 53.9 in 2018 before stabilising at 53, 3 towards 2023. As higher dependency ratios imply greater strain on the working age to support their economic dependents (children and aged), this increase will have far reaching social, economic and labour market implications. An increase in the dependency ratio is often associated with a relative decrease in the working age population.

From a national perspective, the relative decrease in the working age population will result in lower tax revenues, pension shortfalls and overall inequality as citizens struggle to attend to the needs of their dependents amidst increased economic hardship. At the municipal level, this decrease in the working population will also result in a smaller base from which local authorities can collect revenue for basic services rendered and will necessitate the prioritisation of municipal spending.

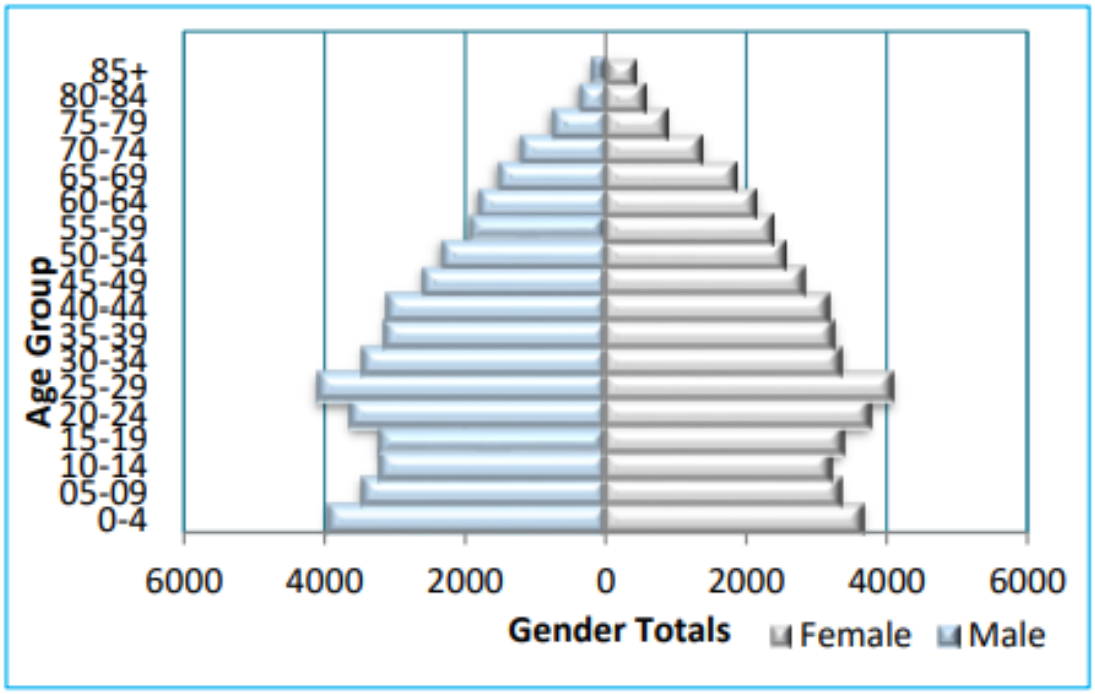

Figure 41: Mossel Bay Population 1001-2003

Table 10: Age distribution

Year	Children 0-14 Years	Working Age 15-65 Years	Aged +65	Dependency Ratio
2011	20 683	59 727	9 020	49,7
2017	22 953	63 892	11 137	53,4
2023	23 763	68 840	12 953	53,3

(d) Education

Education and training improve access to employment opportunities and help to sustain and accelerate overall development. It expands the range of options available from which a person can choose to create opportunities for a fulfilling life. Through indirect positive effects on health and life expectancy, the level of education of a population also influences its welfare.

Literacy is used to indicate a minimum education level attained. A simple definition of literacy is the ability to read and write, but it is more strictly defined as the successful completion of a minimum of 7 years of formal education. Literacy rate is calculated as the proportion of those 14 years and older who have successfully completed a minimum of 7 years of formal education. The literacy rate was recorded at 85, 7 per cent in 2011 which is higher than the average literacy rates of Eden (82, 6 per cent), but lower than the Western Cape (87, 2 per cent and higher than the rest of South Africa (80, 9 per cent).

The drop-out rates for learners within Mossel Bay municipal area increased from 28.8 to 32.5 per cent between 2015 and 2016. The rate increased to 36.5 per cent in 2017, which does not bode well for education outcomes in the area. These high levels of drop-outs are influenced by a wide array of economic factors including unemployment, poverty, indigent households, high levels of households with no income or rely on less than R515 a month and teenage pregnancies.

(b) Description of the current land uses.

The farm Driefonteinen 243, Portion 8 (Remaining Extent) is situated in an agricultural setting, intersected by road, rail, telephone lines and electrical infrastructure. Historically the property was used for agriculture (grazing) and mining.

The main land use of the surrounding properties is for agricultural and industrial purposes. The site is currently not in use, and was an active borrow pit (last used in 1999). Surrounding fields are used for grazing of livestock and crop farming (Canola, Barley and Wheat). De Heus Feeds and PetroSA is located in close proximity to the proposed mining area.

Mining at the quarry will only be temporary where after land use will revert to grazing.

The land use of the property comprises of the following:

- Agriculture – Crop farming and grazing
- Mining – Historically mined.

The land use of the surrounding properties comprises of the following:

- Industrial – Petro SA, Mossindustria
- Transport – N2, and railway line
- Agriculture – Grazing, Crop Farming and De Heus Feeds.

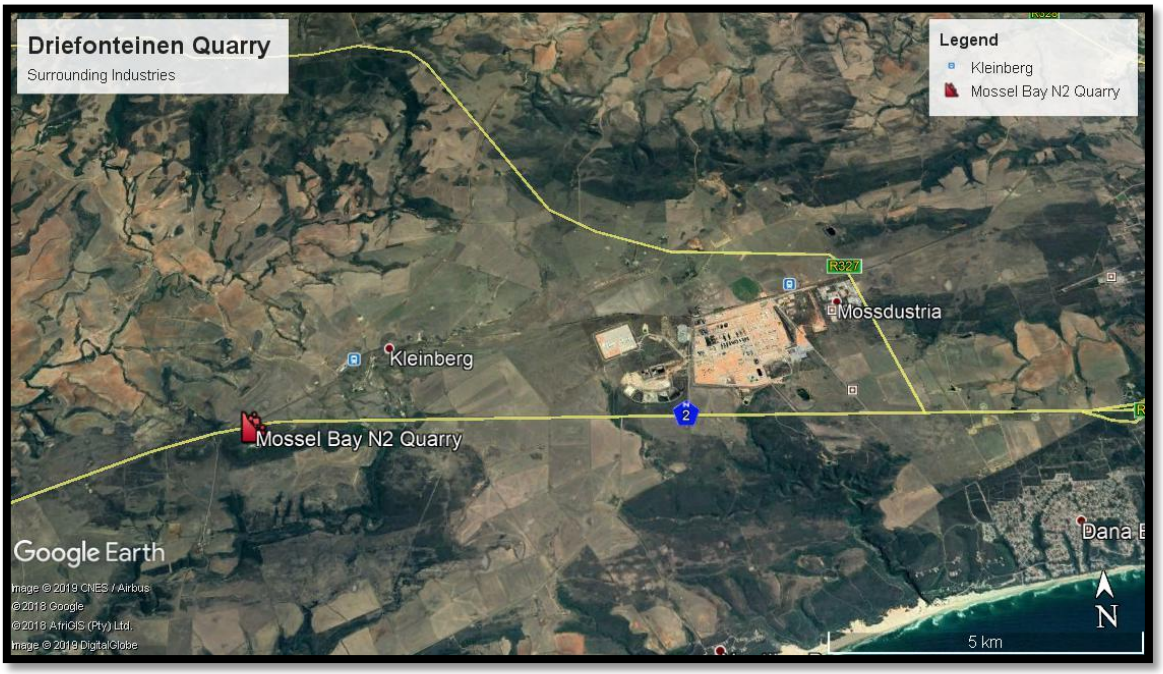

Figure 42: Industries in close proximity to Driefonteinen Quarry

The following table provides a description of the land uses and/or prominent features that currently occur within a 500 m radius of the site:

Table 11: Land uses and/or prominent features that occur within 500 m radius of the site.

LAND USE CHARACTER	YES	NO	DESCRIPTION
Natural area	**YES**	-	The proposed mining site is surrounded by natural areas used for agricultural and grazing purposes.
Low density residential	-	**NO**	
Medium density residential	-	**NO**	
High density residential	-	**NO**	
Informal residential	-	**NO**	
Retail commercial & warehousing	-	**NO**	
Light industrial	**YES**	-	De Heus Feeds and PetroSA is in close proximity to the proposed quarry pit area.
Medium industrial	-	**NO**	
Heavy industrial	-	**NO**	
Power station	-	**NO**	Mossindustria is located 7km from the proposed quarry area.

LAND USE CHARACTER	YES	NO	DESCRIPTION
Telecoms Tower	**YES**	-	Telecoms tower is located approximately 60m from the quarry pit area.
High voltage power line	-	**NO**	
Office/consulting room	-	**NO**	
Military or police base / station / compound	-	**NO**	
Spoil heap or slimes dam	-	**NO**	
Quarry, sand or borrow pit	**YES**	-	This application is for the extension of the existing quarry pit area.
Dam or reservoir	-	**NO**	
Hospital/medical centre	-	**NO**	
School/ crèche	-	**NO**	
Tertiary education facility	-	**NO**	
Church	-	**NO**	
Old age home	-	**NO**	
Sewage treatment plant	-	**NO**	
Train station or shunting yard	-	**NO**	
Railway line	**YES**	-	The railway line is approximately 450 km north of the proposed site.
Major road (4 lanes or more)	**YES**	-	The N2 pass the proposed site ±270 m to the north, north-east.
Airport	-	**NO**	
Harbour	-	**NO**	
Sport facilities	-	**NO**	
Golf course	-	**NO**	
Polo fields	-	**NO**	
Filling station	-	**NO**	
Landfill or waste treatment site	-	**NO**	
Plantation	-	**NO**	
Agriculture	**YES**	-	As mentioned earlier the proposed mining area is situated within an area used for grazing purposes.
River, stream or wetland	-	**NO**	
Nature conservation area	-	**NO**	
Mountain, hill or ridge	**YES**	-	The proposed mining area is situated against the side of the hill on the property.
Museum		**NO**	
Historical building		**NO**	
Protected Area		**NO**	
Graveyard		**NO**	There is a family graveyard located close to the farm house approximately 2km from the proposed quarry pit area.
Archaeological site		**NO**	
Other land uses (describe)		**NO**	

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

The proposed mining area is approximately 5 ha in extent and the applicant, Haw and Inglis Civil Engineering (Pty) Ltd, intents to win material from the area for at least 2 years with a possible extension of another 3 years. The aggregate / stone gravel to be removed from the quarry will be used for road construction and various other projects in the vicinity

i. Geology

The proposed quarry rest within the outcrop of the Table Mountain Group Peninsula Formation for the Cape Supergroup which covers the area. The table mountain sandstone is a group of rock formation within the cape Supergroup sequences of rocks. The term table mountain Supergroup is widely used in common parlance, the terms table mountain sandstone is longer formally recognized, and was changed to the peninsula formation sandstone, which forms part of the table mountain group.

The table mountain sandstone is made up predominantly of quartzites sandstone laid down between 510 and 400 million years ago. It is the hardest, and most erosion resistant layer of the cape Supergroup. It therefore forms most of the highest and most conspicuous peaks in the Western Cape, as well as the steepest cliffs on the cape fold mountains, despite being the oldest, and therefore, lower most to the cape Supergroup.

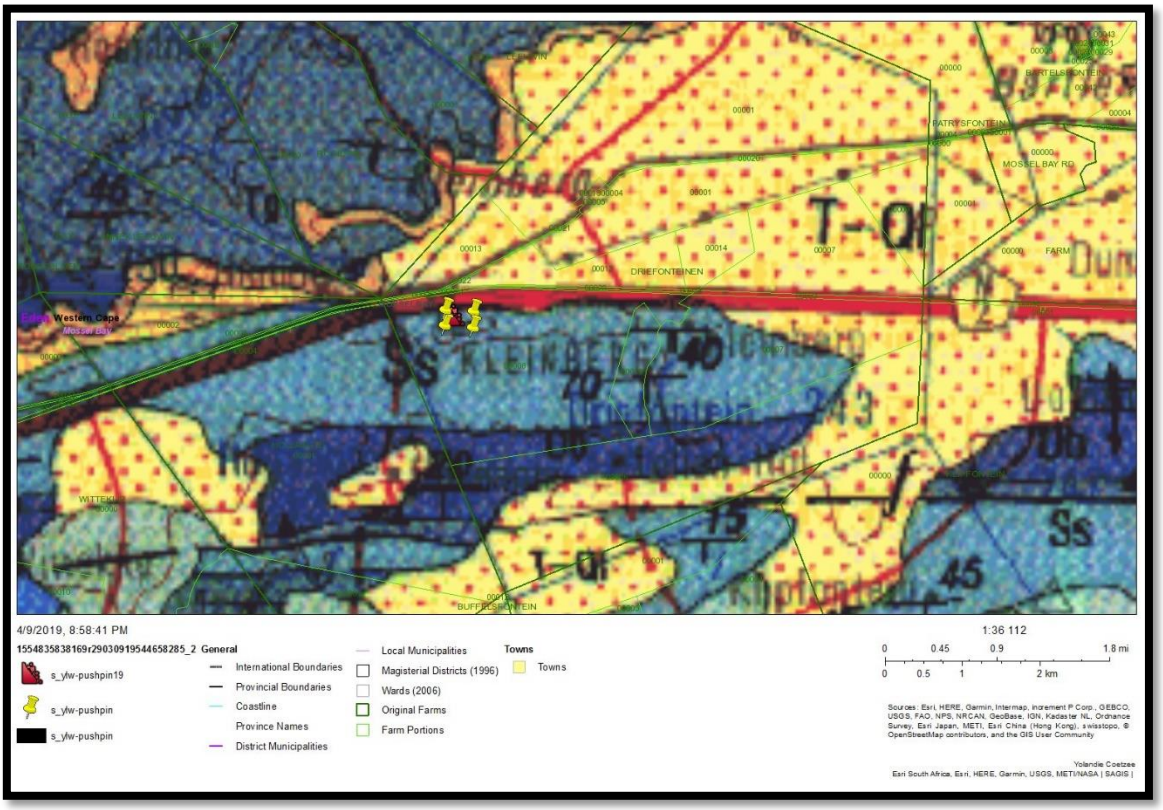

Figure 43: Site specific geology.

ii. Topography

The site is located on the ridge of a koppies and the ground slopes in all directions. There are no natural draining lines running through the site. Excavation did take place on the eastern side, on top of the koppies. The site is however not visible from the N2 due to the northern side being left in place. The elevation of the Driefonteinen Quarry ranges between 235-250m above sea level.

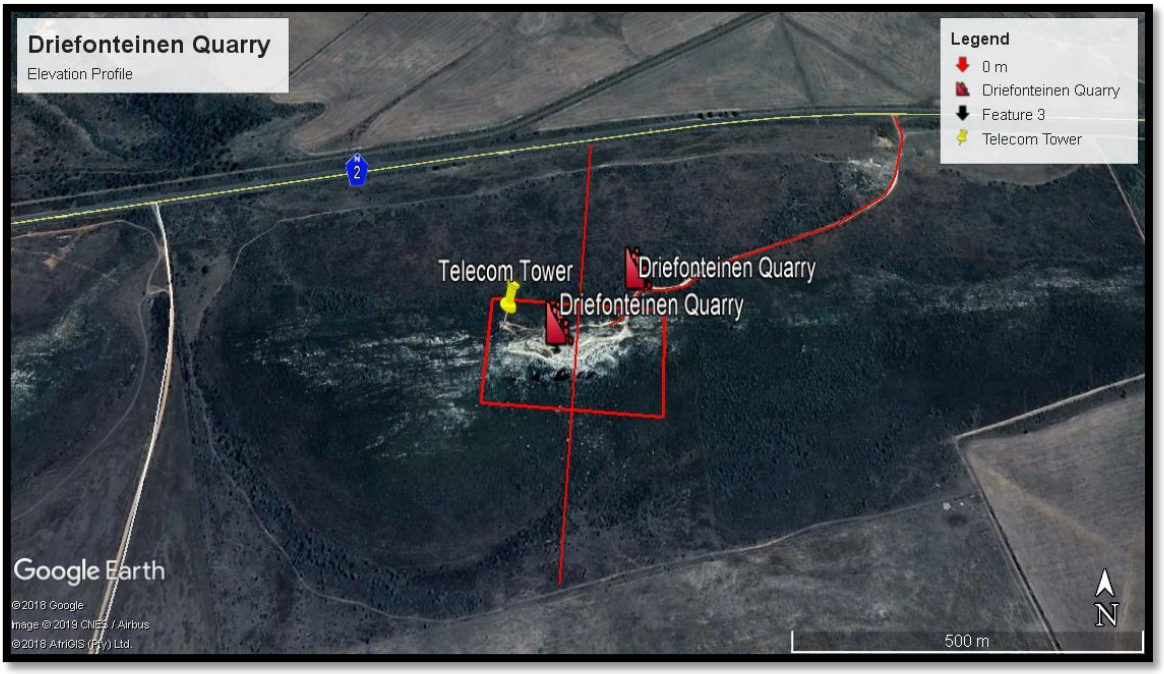

Figure 44: North-South elevation profile.

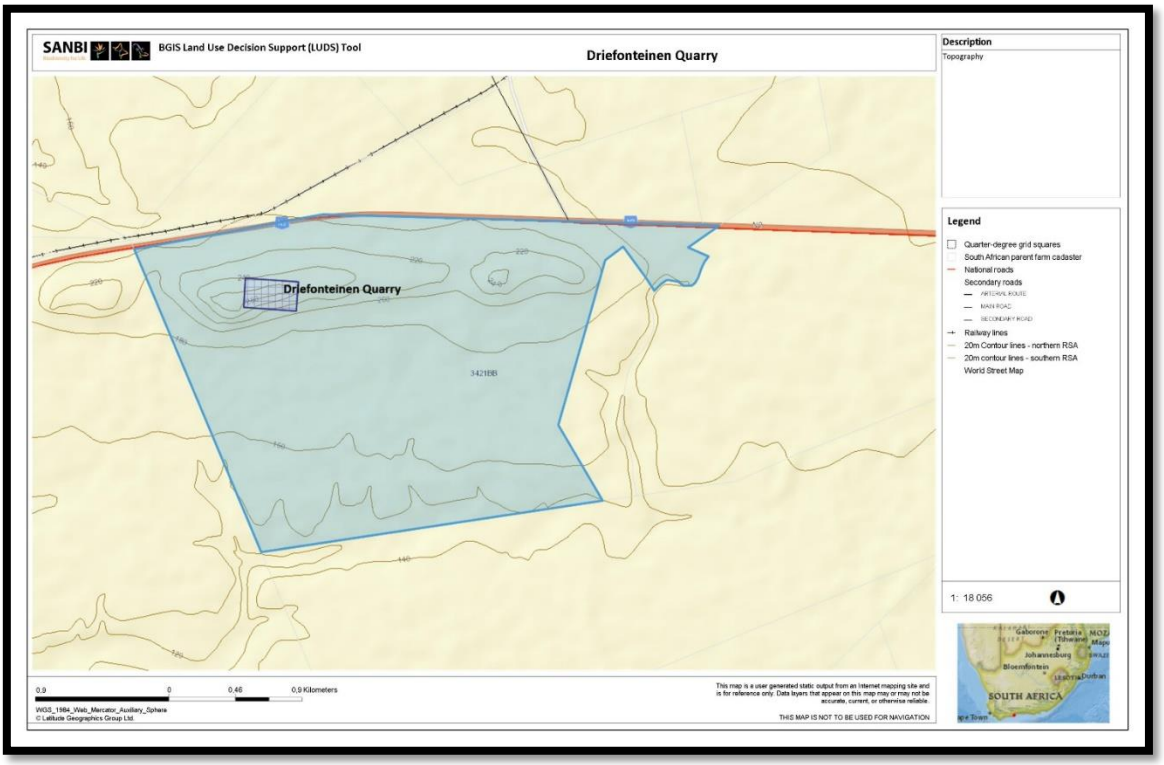

Figure 45: Topography of Driefonteinen Quarry

iii. Visual / Sense of Place

The proposed Driefonteinen quarry will be visible from the north and south due to its position against the raise of the hill. The hill will act as a visual screen.

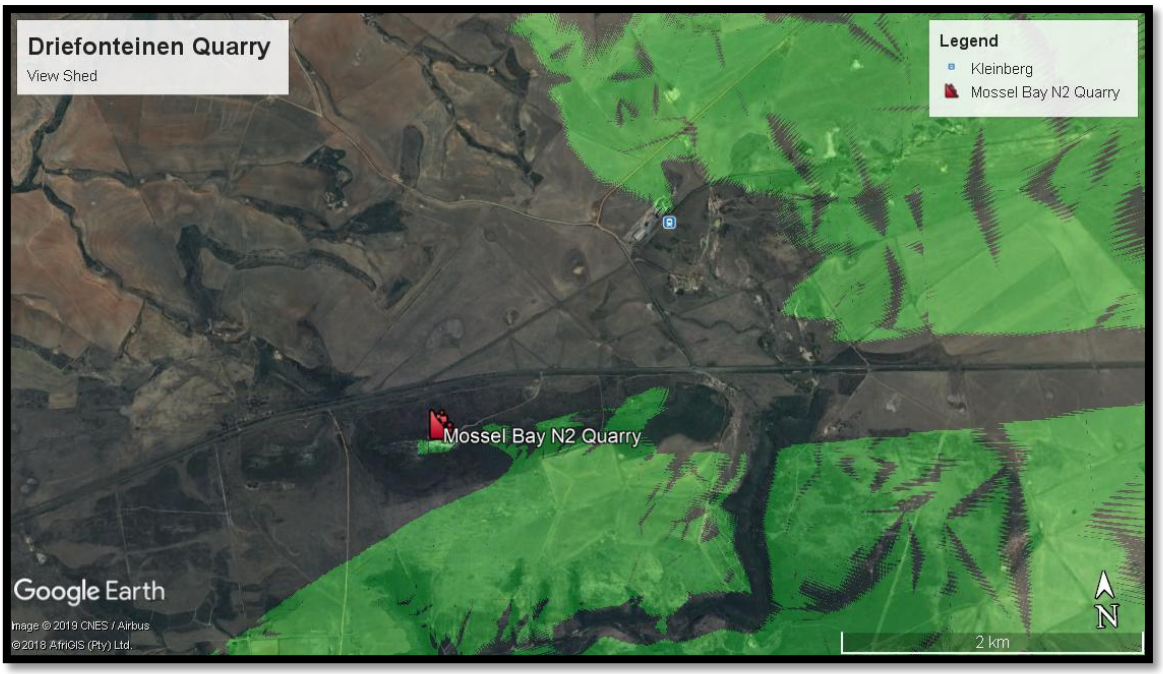

Figure 46: Visual impact.

From the above figure, the green areas indicated the areas that will be visible from the surrounding area. From the above figure it is indicated that the mining area will be visible from the surrounding properties. Please note that the quarry pit area is to be located in the hill, due to the hill, the hill will create a visual barrier for surrounding land users.

iv. Air quality and Noise

The nearest residential dwelling to the proposed mining area is that of the farm house of the currently land owner approximately 1.9km east of the quarry pit area. As mentioned earlier the prevalent wind direction distribution of the study area is in a south – south- eastern direction. Currently the air quality of the study area is impacted on by the operations of De Heus Feeds, the N2 road users, Petro SA, and to a lesser extend agricultural practices.

Emission into the atmosphere is controlled by the National Environmental Management: Air Quality Act, 2004. The proposed mining activity does not trigger an application in terms of the said act, and emissions to be generated is expected to mainly entail dust due to the displacement of soil and transport of material on gravel roads. As the prevalent wind direction is in a south – south- eastern direction the hill will screen dust generated at Driefonteinen quarry from the operations/residents on the opposite side. Should the Applicant however implement the mitigation measures proposed in this document and the EMPr the impact on the air quality of the surrounding environment is deemed to be of low-medium significance.

As with air quality, the current activities on the property and surrounding environment already impact the noise ambiance of the study area. Traffic along the N2, as well as the PetroSA and De Heus Feeds operations of on the adjacent property increase the natural noise levels of the receiving environment. The noise to be generated at the Driefonteinen quarry will contribute to these daily noise levels. The proposed activity will contribute noise generated as a result of blasting, as well as loading, and transporting of material. The nuisance value of noise generated by heavy earthmoving equipment, to residence in the near vicinity is deemed to be of low significance, as the hill will act as a sound barrier to the nearest occupants. The noise caused by blasting will be instantaneous and of short duration.

Although the proposed activity will have a cumulative impact on the ambient noise levels, the development will not take place in a pristine environment, and the impact is therefore deemed compatible with the current operations and of low significance.

v. Surface Water

The proposed site falls within the Gouritz Water Management Area (WMA), specifically in the Gouritz/Goukou/Duiwenhos Sub Water Management Area, in the J40E quaternary catchment area. The quarry area will be located in the mountain area of the farm above the original ground level. Groundwater will not be impacted by during this mining operation.

A borehole will be drilled for the proposed water use, for the abstraction of water from this borehole. No water is located in the quarry pit, except during rainfall events, which then quickly drained into the ground. A WULA application will be made.

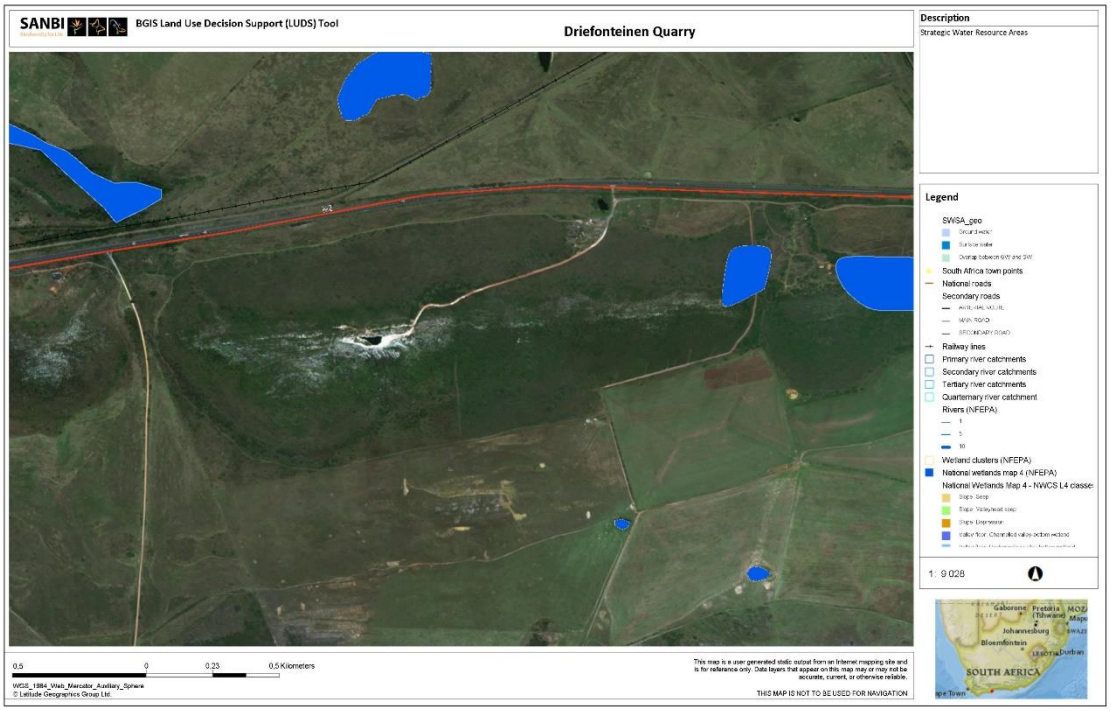

Figure 47: Surface water bodies in close proximity to the Driefonteinen Quarry.

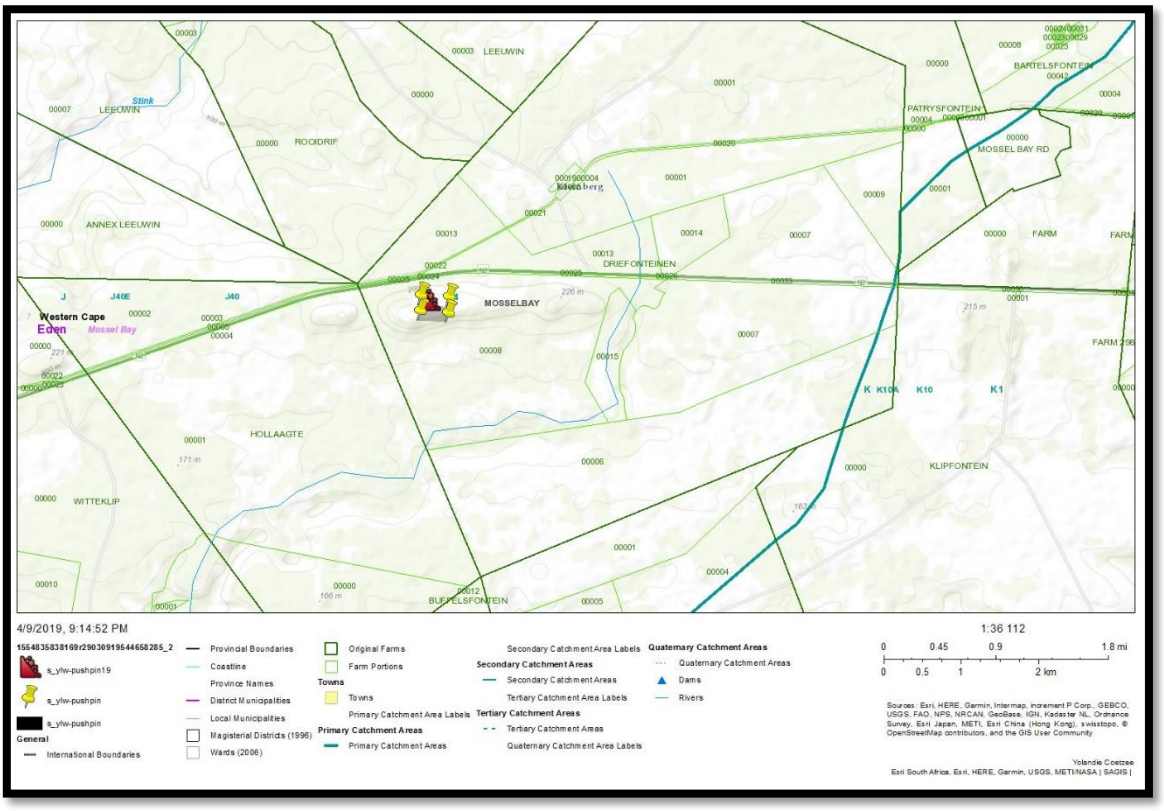

Figure 48: Rivers in close proximity to the Driefonteinen Quarry.

There are no wetlands on pans in close proximity to the proposed quarry. The closest river to the site is a subsidiary to the Gouritz River, running south from the proposed quarry.

vi. Flora

The site specific vegetation of the proposed mining footprint is a natural to near natural state within a well-established plant layer that represents the North Langeberg Sandstone Fynbos and the Albertina Sand Fynbos Vegetation units as classified by Mucina and Rutherford (2012).

The proposed Driefonteinen Quarry falls within the Fynbos biome. The prominent vegetation type found in the area of the proposed mining operation is the North Langeberg Sandstone Fynbos (FFs15, status LT) is a tall dense high rainfall form of fynbos shrubland on Table Mountain Sandstone that is rich in species of *Erica, Proteaceae and Restionaceae (*Cape Reeds). It occurs on hills from Albertina to Mossel Bay. Fragments of this type along the inland verge of the N2 are not in good condition on the inland verge, and have been converted to grass in places. Vegetation on the wider coastal verge is in better condition. There are no Threatened Red List species records for the N2 in section 23.

The quarry area also falls within the Albertina Sand Fynbos (FFd9) vegetation type. This vegetation unit occurs within isolated unmapped outliers near the Groot Brak River and between Potberg and De Hoop vlei. The

patches of this vegetation unit almost always border a limestone fynbos type. When enclosed by limestone, it is often found in depressions which can be extensive. Plains and undulating hills with numerous dune slacks-forming the most extensive area of sand fynbos within the limestone fynbos area and occupying most of the depressions, valley and lower slopes. The vegetation is characterised by medium tall (1.5 – 2m tall) open shrub layer, together with a dense stratum of 1-1.2m tall shrubs and hemicryptopphytes. It is structurally predominantly proteoid fynbos, but with extensive restoid fynbos in the watercourses and coastal edges.

Although all the vegetation within the area has been removed. Small indigenous bushes, shrubs and grazing land surround the area. Any extensions to the mining area would extend into these areas, and the farm owner provisionally agreed to this.

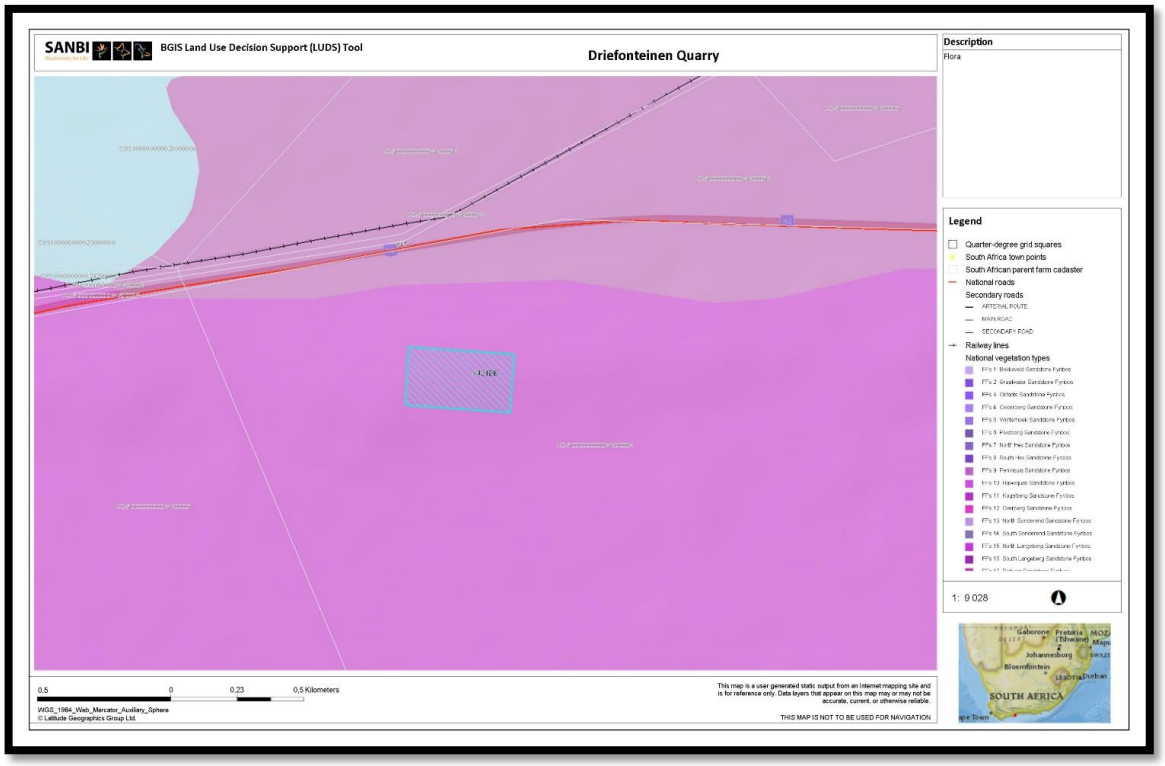

Figure 49: Vegetation of the Driefonteinen Quarry Area

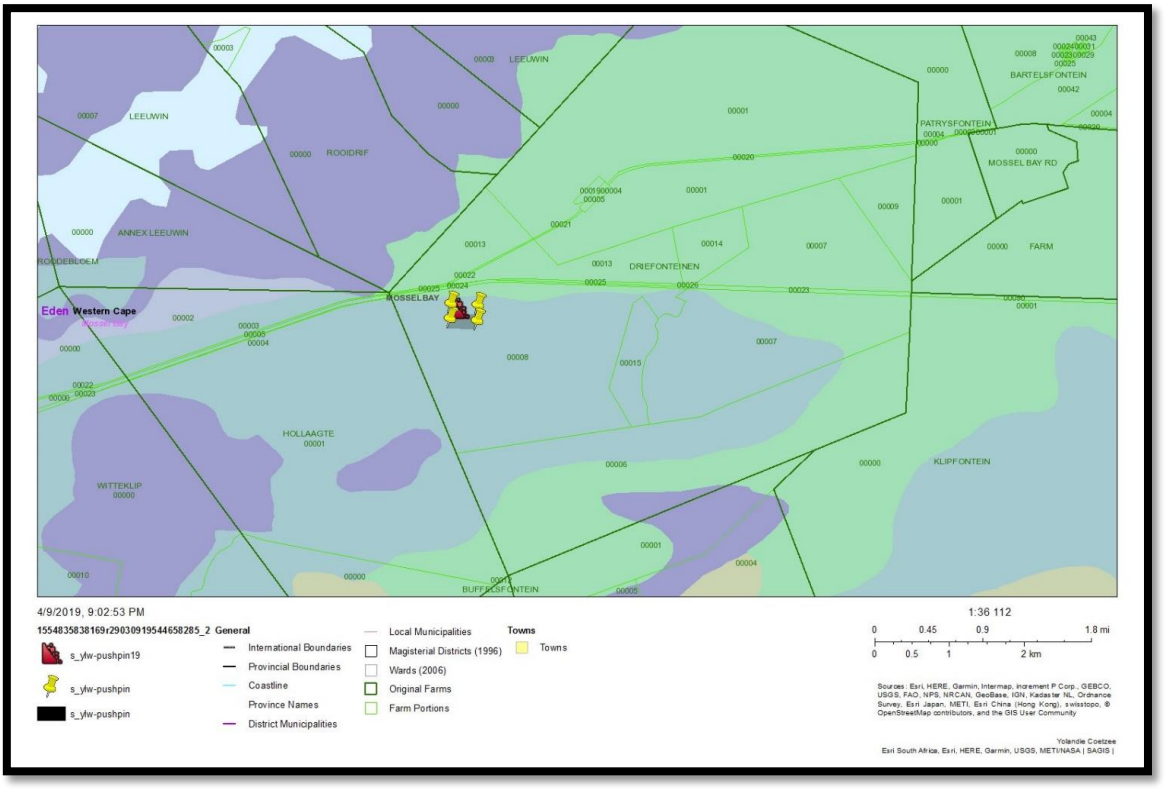

Figure 50: Vegetation of the Driefonteinen Quarry Area

From the figure above, it can be seen that the proposed Driefonteinen farm portion is located over 2 vegetation units.

The tree density is indicated below in Figure 51. From the figure it can be seen that the trees are not very dense in the area.

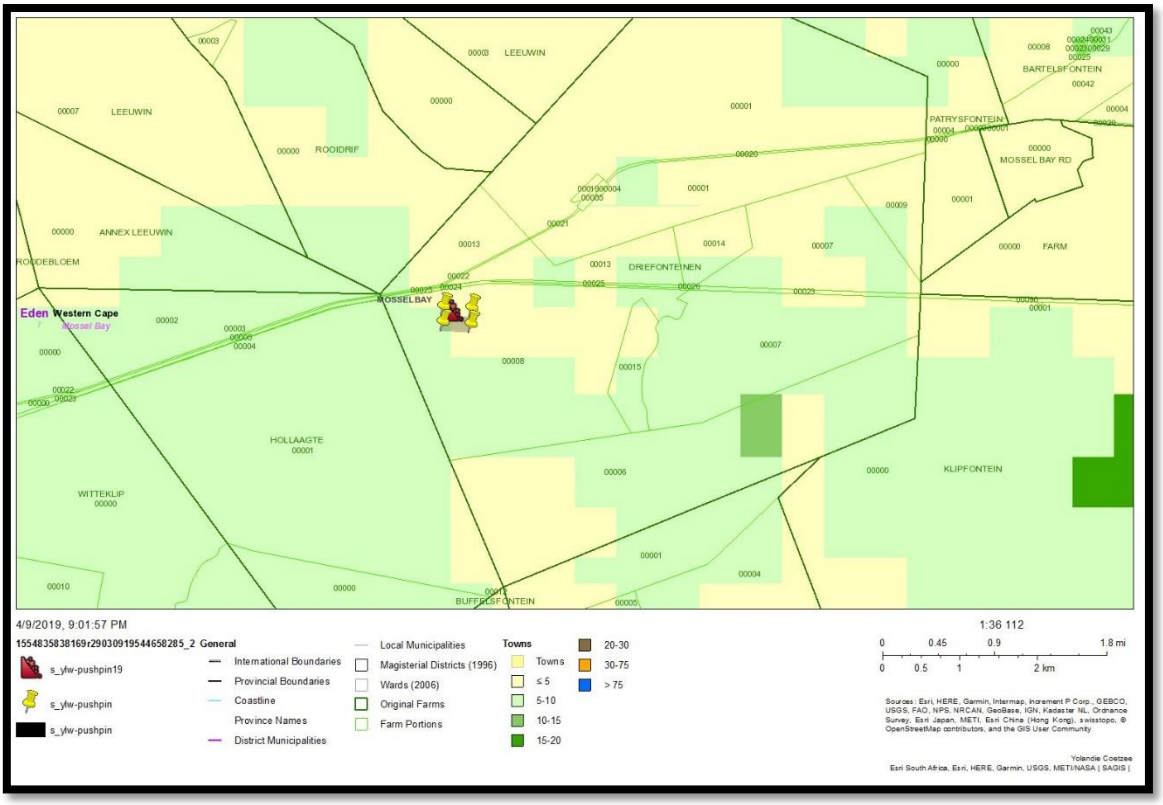

Figure 51: Tree Density

vii. Mining and Biodiversity conservation areas

According to the Mining and Biodiversity guidelines (as presented in ***Figure 52***) the mining area does fall within the Mining and Biodiversity area. Areas that are highlighted in brown falls within the highest risk biodiversity importance area which have a high risk for mining (DEA, 2013).

From the guideline, as mentioned above the area falls within a high biodiversity importance area. Please refer to the table below:

Category	Biodiversity property areas	Risk for mining	Implications for mining
Highest Biodiversity Importance	• Critical endangered and endangered ecosystems • CBA form provincial and spatial biodiversity plans • River and wetlands FEPAs and a 1km buffer around these FEPA's • Ramsar sites	Highest risk for mining	• Environmental screening, EIAs and their associated specialist studies should focus on confirmed the, and to provide site specific basis on which to apply the mitigation hierarchy to inform regulatory decision making for mining, WULA's, and EA's. • If they are confirmed, the likelihood of a fatal flaw for new mining projects is very high because of the significant of the biodiversity features in these areas and the associated ecosystems services. These areas are viewed as necessary to ensure protection of biodiversity, environment, sustainability and human wellbeing. • An EIA should include the strategic assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity. This assessment should take fully into account the environmental sensitivity if the area, the overall environmental and socio-economic cost and benefits of mining, as well as the potential strategic importance of the minerals to the country. • Authorisations may well not be granted. If granted, the authorisation may set limits on the allowed activities, impacts, and may specify biodiversity offset that would be written into licence agreements and/or authorisations.

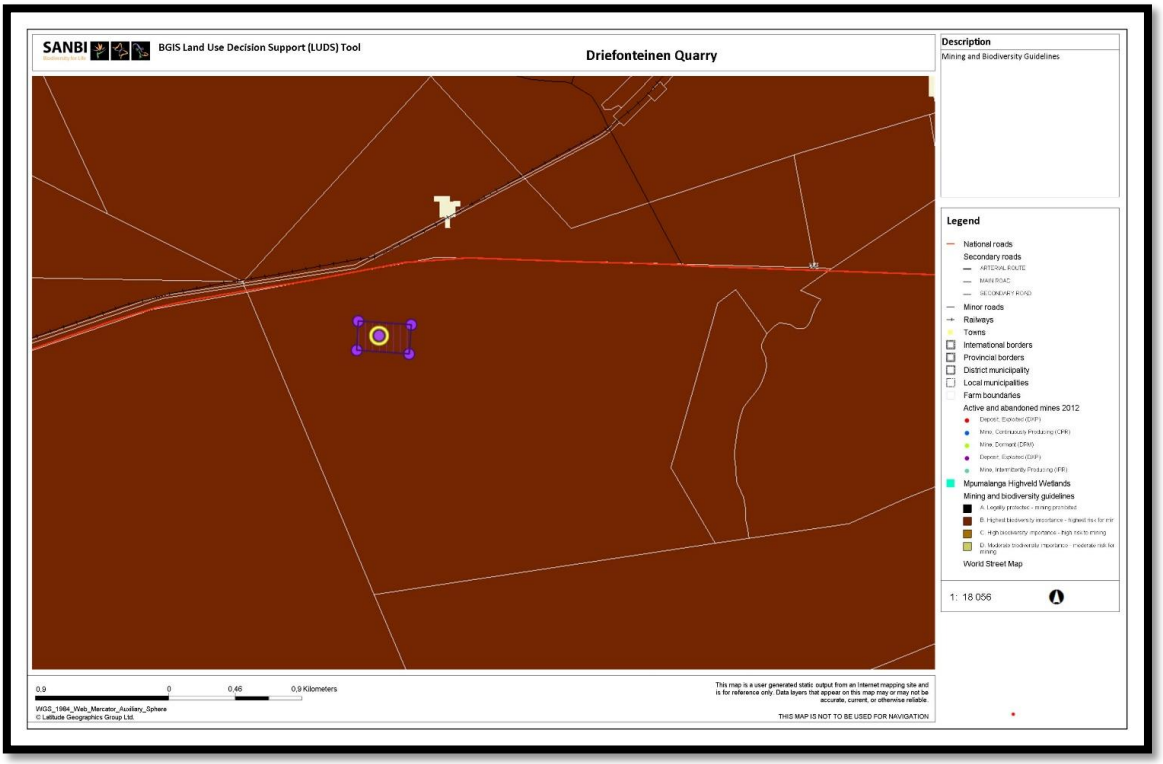

Figure 52: Mining and Biodiversity Guidelines Map (SANBI) (DEA, 2013).

However, due to the proposed location of the existing quarry, the mining and biodiviersuty guidelines will still be applicable to the area outside of the mining permit application area. The proposed quarrry pit area falls within an area that was previously used for quarrying since the 1933's.

Biodiversity priority areas	Description	Information sources
Critically endangered and Endangered ecosystems listed as threatened ecosystems in terms of the Biodiversity Act	Threatened ecosystems listed in terms of the Biodiversity Act47 have protection under law and particular activities within these areas require authorisation in terms of the EIA regulations 46**,** of NEMA. Further loss and degradation of natural habitat in critically endangered and endangered ecosystems will be available avoided. **Critically endangered** ecosystems (CR) are ecosystem types that have very little of their original extent left in natural or near- natural condition. National biodiversity targets for these habitat types cannot be met, and further loss would hence be unacceptable. **Endangered ecosystems** (EN) are ecosystems that are close to becoming critically endangered. Any further loss of natural habitat or deterioration of condition in CR or EN ecosystem types should be avoided, and the remaining healthy examples should be the focus of conservation action. Critically endangered and Endangered ecosystem types are Included in Listing Notice 3 of NEMA (GN No. R546 of 2010). Threatened terrestrial ecosystems were listed in terms of the Biodiversity Act in December 2011. Over time, marine, estuarine, river and wetland types will also be listed in terms of the Biodiversity Act.	**Data**: Terrestrial CR and EN ecosystems are currently viewable on http://bgis.sanbi.org River, wetland and marine CR and EN ecosystems should be as part of the National Biodiversity Assessment (NBA) 2011 and are viewable on http://bgis.sanbi.org **Associated legislation**: Section 52 of the Biodiversity Act, 2004 (No. 10 of 2004)

Critical Biodiversity Areas (CBAs), or areas of similar value such as irreplaceable and highly significant areas from provincial spatial biodiversity plans	• CBAs are areas required to meet biodiversity targets for ecosystems, species and ecological processes, as identified in a systematic biodiversity plan. Some provinces use different terms for areas equivalent to CBAs, such as 'irreplaceable areas' or 'highly significant areas'. • CBAs are terrestrial (land) and aquatic (water) features (e.g. vlei, rivers and estuaries) in the landscape that are critical for conserving biodiversity and maintaining ecosystem functioning in the long term (which is particularly important in the face of climate change). The desired management objective for CBAs is for them to remain in a natural or near-natural ecological condition, i.e. to prevent further loss or degradation of natural habitat in areas these areas. Therefore CBAs are biodiversity priority that must be afforded special attention in assessing and evaluating impacts of prospecting or mining. • Although CBAs have been identified at a very fine spatial scale in some provinces (Gauteng, Western Cape, KwaZulu Natal), in other areas they have been identified more at a broader scale (Eastern Cape, Northwest, Limpopo and the Namakwa district of the Northern Cape). All CBAs require field verification, but this is particularly the case for broad scale CBAs where it is only in the intact areas of the CBA that mining should be prohibited. Over time, CBAs will be identified in the Free State, and remaining areas of the Northern Cape, and may be identified at a finer scale in additional provinces. • Marine ecosystem priority areas are under development, Ezemvelo KZN Wildlife has identified Critical Biodiversity Areas in the seascape for the inshore and offshore area adjacent to KZN's coastline.	**Data**: Most provinces have developed or are in the process of developing provincial spatial biodiversity plans that provide maps of CBAs. CBA maps for the Western Cape, Northwest, Eastern Cape, Mpumalanga, and Namakwa District in Northern Cape (2009), are available on http://bgis.sanbi.org for download. CBA maps for Gauteng are available from GDARD on request; and for KZN is available from EKZN Wildlife on request. Some metropolitan municipalities have developed CBA maps (Nelson Mandela Bay and City of Cape Town) or are in the process of developing them (City of Johannesburg, City of Tshwane, Ekurhuleni and eThekwini. **Associated legislation**: These gain legal recognition when they are published in bioregional plans (in terms of the Biodiversity Act), or are taken up into municipal Spatial Development Frameworks (Section 26(e) Municipal Systems Act (No.32 of 2000)), and Environmental Management Frameworks (EMF; in terms of Sections 24(5) and 44 NEMA and EMF regulations (R547 of 2010).

River and wetland Freshwater Ecosystem Priority Areas (FEPAs), and 1km buffer of river and wetland FEPAs	• FEPAs are rivers and wetlands required to meet biodiversity targets or freshwater ecosystems. River FEPAs are an essential part of a sustainable water resource strategy. Buffers of healthy natural vegetation should be maintained around river and wetland FEPAs to maintain a good ecological condition to manage and conserve freshwater ecosystems, and to protect water resources for human use. • FEPAs are not formally protected in terms of law but are areas that are considered to be strategic spatial priorities for conserving South Africa's freshwater ecosystems and supporting sustainable use of water resources, and should be maintained in good ecological condition. • Because of the importance of these freshwater ecosystems to lives and livelihoods, and the likelihood that their ecological condition would deteriorate if mining activities took place in or close to them (i.e. within a 1km buffer of river and wetland FEPAS), it is recommended that mining should be avoided in these areas.	**Data**: Atlas of Freshwater Ecosystem Priority Areas for South Africa (Nel et al 2011); available on http://bgis.sanbi.org **Associated legislation**: Not currently protected by law.
Ramsar sites	• Ramsar sites are internationally recognised by the Convention on Wetlands of International Importance (or Ramsar Convention). • Ramsar sites have global significance.	**Data**: DEA: Enterprise Geospatial Information Management **Associated legislation**: Although many Ramsar sites fall inside protected areas, Some Ramsar sites do not currently have any legal status in terms of South African legislation.

viii. Fauna

The site specific fauna of the study area represents the fauna of the surrounding environment, and no protected or red data species were identified to be resident within the proposed footprint area. The fauna at the site will not be impacted on by the proposed mining activity as they will be able to move away or through the site, without being harmed. Workers must be educated and managed to ensure that no fauna at the site is harmed.

ix. Cultural and heritage environment

No sites of archaeological or cultural importance were identified during the site inspection at the proposed quarry pit area consultation with the interested and affected parties did not identify any potential area of concerns and the SAHRA paleontological sensitive map shows that the area falls within and area of insignificant concern. The potential impact on the proposed mining activities on the cultural and /or heritage environment is therefore deemed insignificant.

x. Infrastructure

The proposed mining area will be developed in a green fields area as an extension of the existing quarry. The telecoms tower might be impacted upon during blasting.

(a) Environmental and current land use map.

(Show all environmental and current land use features)

The environmental and current land use map is attached as Appendix D. Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts

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.)

The following potential impacts were identified of each main activity in each phase. The significance rating was determined using the methodology as explained under *vi) Methodology Used in Determining and Ranking the Significance*. The impact rating listed below was determined for each impact **prior** to bringing the proposed mitigation measures into consideration. The degree of mitigation indicates the possibility of partial, full or no mitigation of the identified impact.

Table 12: Impact Assessment Prior to mitigation.

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
CONSTRUCTION / SITE ESTABLISHMENT PHASE												
ACTIVITY:	**DEMARCATION OF SITE WITH VISIBLE BEACONS.**											
	No impact could be identified other than the beacons being outside the boundaries of the approved processing area.	Neu										
ACTIVITY:	**ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRACTURE WITHIN BOUNDARIES OF SITE.**											
	If the infrastructure is established within the boundaries of the approved mining area, no impact could be identified.	Neu										
Social & Safety	Influx of unsuccessful job seekers which may informally settle in area. Potential danger to surrounding communities	Neg	Reversible	1	1	4	2	3	5	3	6	Low-Med
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Geology	Disturbance of geological strata	Neg	Irreversible	1	3	5	3	5	5	5	15	Med-High
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	1	4	4	3	5	5	5	15	Low-Med
Topography	Alteration of topography	Neg	Irreversible	1	2	5	3	2	5	4	9,33	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	2	3	3	3	5	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	1	5	5	4	1	1	1	3,67	Low
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	1	2	4	2	3	1	2	4,67	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med
SUB ACTIVITY: ABLUTION FACILITIES												
Groundwater	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Surface water	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	4	7	Low-Med
Soils	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med
SUB ACTIVITY: ACCESS ROADS												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med
SUB ACTIVITY: SITE OFFICES												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
	Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.											
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med
SUB ACTIVITY: VEHICLE SERVICE AREA												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
SUB ACTIVITY: WASH BAY												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med
SUB ACTIVITY: WORKSHOP												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	1	4	4	3	5	5	5	15	Med-High
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med
SUB ACTIVITY: SALVAGE YARD												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med
SUB ACTIVITY: BUNDED DIESEL AND OIL STORAGE FACILITIES												

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med
SUB ACTIVITY: GENERATOR AREA (BUNDED)												
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med
SUB ACTIVITY: WEIGH BRIDGE												

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med
SUB ACTIVITY: PARKING AREA												
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
SUB ACTIVITY: WASTE AREA												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	1	2	4	2	3	1	2	4,67	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med
ACTIVITY:	**STRIPPING AND STOCKPILING OF TOPSOIL**											
Geology	Disturbance of geological strata	Neg	Irreversible	1	3	5	3	5	5	5	15	Med-High
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
	Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.											
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	2	3	3	3	5	5	5	13,3	Med-High
Topography	Alteration of topography	Neg	Irreversible	1	2	5	3	2	5	4	9,33	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	2	3	3	3	5	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	4	7	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	1	5	5	4	1	5	3	11	Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Dust generation	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	1	2	4	2	3	1	2	4,67	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies.	Neg	Reversible	2	3	5	3	4	2	3	10	Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
	Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.											
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med
OPERATIONAL PHASE												
ACTIVITY:	**DRILLING AND BLASTING**											
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med
Noise	Noise nuisance generated by drilling equipment and blasting	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	2	3	3	3	5	5	5	13,3	Med-High
Topography	Alteration of topography	Neg	Irreversible	1	2	5	3	2	5	4	9,33	Low-Med
Geology	Disturbance of geological strata	Neg	Irreversible	1	3	5	3	5	5	5	15	Med-High
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	2	3	3	3	5	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	4	7	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	1	5	5	4	1	5	3	11	Med
Noise	Noise nuisance generated by drilling equipment and blasting	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Dust generation	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	1	2	4	2	3	1	2	4,67	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Social & Safety	Health and Safety Risk by Blasting Activities. Potential danger to surrounding communities	Neg	Reversible	1	4	4	3	3	3	3	9	Low-Med
ACTIVITY:	**EXCAVATION**											
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	2	3	3	3	5	5	5	13,3	Med-High
Geology	Disturbance of geological strata	Neg	Irreversible	1	3	5	3	5	5	5	15	Med-High

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Topography	Alteration of topography	Neg	Irreversible	1	2	5	3	2	5	4	9,33	Low-Med
Hazardous Waste	Dust nuisance due to loading and transportation of the material	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	2	3	3	3	5	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	4	7	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	1	5	5	4	1	5	3	11	Med
Noise	Noise nuisance generated by excavation equipment	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Dust generation	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	1	2	4	2	3	1	2	4,67	Low
Social & Safety	Unsafe working conditions for employees	Neg	Reversible	1	4	4	3	3	3	3	9	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med
ACTIVITY:	**CRUSHING AND SCREENING OF AGGREGATES**											
Noise	Noise nuisance caused by crushing plant.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Hazardous Waste	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	4	7	Low-Med
Air quality	Dust generation	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	1	2	4	2	3	1	2	4,67	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies.	Neg	Reversible	2	3	5	3	4	2	3	10	Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
	Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.											
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med
ACTIVITY:	**TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS**											
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med
Hazardous Waste	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	4	7	Low-Med
Noise	Noise nuisance caused by vehicles	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Dust generation	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
Traffic and Safety	Road degradation. Increased potential for road incidences Potential distraction to road users	Neg	Reversible	2	2	4	3	3	2	3	6,67	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med
DECOMMISSIONING PHASE												
ACTIVITY:	**SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**											
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	4	2	3	9	Low-Med
Soils	Soils replaced and ameliorated	Pos	Reversible	1	3	4	3	3	5	4	10,7	Med
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	2	3	3	3	5	5	5	13,3	Med-High
Topography	Alteration of topography	Neg	Irreversible	1	2	5	3	2	5	4	9,33	Low-Med
Topography	Eradication of trenches and berms. Re-contouring of area for free surface water drainage. Eradication of stockpiles	Pos	Irreversible	1	2	5	3	2	5	4	9,33	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	2	3	3	3	5	Low-Med
Visual aspect	Improved aesthetics through rehabilitation	Pos	Reversible	2	1	3	2	2	5	4	7	Low-Med
Noise	Noise nuisance caused by machinery	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Dust nuisance caused during landscaping activities	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	4	2	3	6	Low-Med
Fauna	Reintroduction of fauna attracted to flora to the area	Pos	Reversible	2	2	4	3	3	5	4	10,7	Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Fauna	Reintroduction of fauna attracted to flora to the area	Pos	Reversible	2	1	3	2	1	5	3	6	Low-Med
Social & Safety	Health and safety risk posed by un-sloped areas	Neg	Reversible	1	4	4	3	3	3	3	9	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Surface water	Containment of dirty water. Improve response to issues relating to deterioration of surface water quality or quantity. Free drainage resorted to area. Revegetation of disturbed areas reduces risk of silt loading on downstream water bodies. Large area of surface water runoff return to catchment	Pos	Reversible	2	3	5	3	4	2	3	10	Med
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	5	3	4	2	3	10	Med
Groundwater	Improve response to issues relating to deterioration of groundwater quality or quantity	Pos	Reversible	2	3	5	3	4	2	3	10	Med
ACTIVITY: Application for Closure Certificate												

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.)

Methodology for the assessment of the potential environmental, social and cultural impacts

DEFINITIONS AND CONCEPTS:

Environmental significance:

The concept of significance is at the core of impact identification, evaluation and decision-making. The concept remains largely undefined and there is no international consensus on a single definition. The following common elements are recognised from the various interpretations:

- Environmental significance is a value judgement
- The degree of environmental significance depends on the nature of the impact
- The importance is rated in terms of both biophysical and socio-economic values
- Determining significance involves the amount of change to the environment perceived to be acceptable to affected communities.

Significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e. intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e. level of acceptability) (DEAT (2002) Impact Significance, Integrated Environmental Management, Information Series 5).

The concept of risk has two dimensions, namely the consequence of an event or set of circumstances, and the likelihood of particular consequences being realised (Environment Australia (1999) Environmental Risk Management).

Impact

The positive or negative effects on human well-being and / or the environment.

Consequence

The intermediate or final outcome of an event or situation OR it is the result, on the environment, of an event.

Likelihood

A qualitative term covering both probability and frequency.

Frequency

The number of occurrences of a defined event in a given time or rate.

Probability

The likelihood of a specific outcome measured by the ratio of a specific outcome to the total number of possible outcomes.

Environment

Surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation (ISO 14004, 1996).

Methodology that will be used

The environmental significance assessment methodology is based on the following determination:

Environmental Significance = Overall Consequence X Overall Likelihood

Determination of Overall Consequence

Consequence analysis is a mixture of quantitative and qualitative information and the outcome can be positive or negative. Several factors can be used to determine consequence. For the purpose of determining the environmental significance in terms of consequence, the following factors were chosen: ***Severity/Intensity, Duration and Extent/Spatial Scale***. Each factor is assigned a rating of 1 to 5, as described in the tables below.

Determination of Severity / Intensity

Severity relates to the nature of the event, aspect or impact to the environment and describes how severe the aspects impact on the biophysical and socio-economic environment.

Table 13 will be used to obtain an overall rating for severity, taking into consideration the various criteria.

Table 13: Rating of Severity

Type of criteria	Rating				
	1	2	3	4	5
Quantitative	0-20%	21-40%	41-60%	61-80%	81-100%
Qualitative	Insignifiant / Non-harmful	Small / Potentially harmful	Significant/ Harmful	Great/ Very harmful	Disastrous Extremely harmful
Social/ Community response	Acceptable / I&AP satisfied	Slightly tolerable / Possible objections	Intolerable/ Sporadic complaints	Unacceptable / Widespread complaints	Totally unacceptable / Possible legal action
Irreversibility	Very low cost to mitigate/ High potential to mitigate impacts to level of insignificance/ Easily reversible	Low cost to mitigate	Substantial cost to mitigate/ Potential to mitigate impacts/ Potential to reverse impact	High cost to mitigate	Prohibitive cost to mitigate/ Little or no mechanism to mitigate impact Irreversible
Biophysical (Air quality, water quantity and quality, waste production, fauna and flora)	Insignificant change / deterioration or disturbance	Moderate change / deterioration or disturbance	Significant change / deterioration or disturbance	Very significant change / deterioration or disturbance	Disastrous change / deterioration or disturbance

Determination of Duration

Duration refers to the amount of time that the environment will be affected by the event, risk or impact, if no intervention e.g. remedial action takes place.

Table 14: Criteria for the rating of duration.

Rating	Description
1	Up to ONE MONTH
2	ONE MONTH to THREE MONTHS (QUARTER)
3	THREE MONTHS to ONE YEAR
4	ONE to TEN YEARS
5	Beyond TEN YEARS

Determination of Extent/Spatial Scale

Extent or spatial scale is the area affected by the event, aspect or impact.

Table 15: Criteria for the rating of extent / spatial scale

Rating	Description
1	Immediate, fully contained area
2	Surrounding area
3	Within Business Unit area of responsibility
4	Within the farm/neighboring farm area
5	Regional, National, International

Determination of Overall Consequence

Overall consequence is determined by adding the factors determined above and summarized below, and then dividing the sum by 3.

Table 16: Example of calculating the overall consequence

Consequence	Rating
Severity	Example 4
Duration	Example 2
Extent	Example 4
SUBTOTAL	**10**
TOTAL CONSEQUENCE: (Subtotal divided by 3)	**3.3**

Determination of Likelihood:

The determination of likelihood is a combination of Frequency and Probability. Each factor is assigned a rating of 1 to 5, as described below and in tables 16 and 17.

Determination of Frequency

Frequency refers to how often the specific activity, related to the event, aspect or impact, is undertaken.

Table 17: Criteria for the Rating of Frequency:

Rating	Description
1	Once a year or once/more during operation
2	Once/more in 6 Months
3	Once/more a Month
4	Once/more a Week
5	Daily

Determination of Probability

Probability refers to how often the activity or aspect has an impact on the environment.

Table 18: Criteria for the Rating of Probability:

Rating	Description
1	Almost never / almost impossible
2	Very seldom / highly unlikely
3	Infrequent / unlikely / seldom
4	Often / regularly / likely / possible
5	Daily / highly likely / definitely

Overall Likelihood

Overall likelihood is calculated by adding the factors determined above and summarised below, and then dividing the sum by 2.

Table 19: Example of calculating Overall Likelihood

Consequence	Rating
Frequency	Example 4
Probability	Example 2
SUBTOTAL	**6**
TOTAL LIKELIHOOD (Subtotal divided by 2)	**3**

Determination of Overall Environmental Significance:

The multiplication of overall consequence with overall likelihood will provide the environmental significance, which is a number that will then fall into a range of **LOW**, **LOW-MEDIUM**, **MEDIUM**, **MEDIUM-HIGH** or **HIGH**, as shown in the table below.

Table 20: Determination of Overall Environmental Significance

Significance or Risk	Low	Low-Medium	Medium	Medium-High	High
Overall Consequence X Overall Likelihood	1 - 4.9	5 - 9.9	10 - 14.9	15 – 19.9	20 - 25

Qualitative description or magnitude of Environmental Significance

This description is qualitative and is an indication of the nature or magnitude of the Environmental Significance. It also guides the prioritisations and decision making process associated with this event, aspect or impact.

Table 21: Description of Environmental Significance and related action required

Significance	Low	Low-Medium	Medium	Medium-High	High
Impact Magnitude	Impact is of very low order and therefore likely to have very little real effect. Acceptable.	Impact is of low order and therefore likely to have little real effect. Acceptable.	Impact is real, and potentially substantial in relation to other impacts. Can pose a risk to company	Impact is real and substantial in relation to other impacts. Pose a risk to the company. Unacceptable	Impact is of the highest order possible. Unacceptable. Fatal flaw.
Action Required	Maintain current management measures. Where possible improve.	Maintain current management measures. Implement monitoring and evaluate to determine potential increase in risk. Where possible improve	Implement monitoring. Investigate mitigation measures and improve management measures to reduce risk, where possible.	Improve management measures to reduce risk.	Implement significant mitigation measures or implement alternatives.

Based on the above, the significance rating scale has been determined as follows:

High — of the highest order possible within the bounds of impacts which could occur. In the case of negative impacts, there would be no possible mitigation and / or remedial activity to offset the impact at the spatial or time scale for which it was predicted. In the case of positive impacts, there is no real alternative to achieving the benefit.

Medium-High	Impacts of a substantial order. In the case of negative impacts, mitigation and / or remedial activity would be feasible but difficult, expensive, time-consuming or some combination of these. In the case of positive impacts, other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.
Medium	Impact would be real but not substantial within the bounds of those, which could occur. In the case of negative impacts, mitigation and / or remedial activity would be both feasible and fairly easily possible, in case of positive impacts; other means of achieving these benefits would be about equal in time, cost and effort.
Low-Medium	Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and / or remedial activity would be either easily achieved of little would be required, or both. In case of positive impacts alternative means for achieving this benefit would likely be easier, cheaper, more effective, less time-consuming, or some combination of these.
Low	Impact would be negligible. In the case of negative impacts, almost no mitigation and or remedial activity would be needed, and any minor steps, which might be needed, would be easy, cheap and simple. In the case of positive impacts, alternative means would almost all likely be better, in one or a number of ways, than this means of achieving the benefit
Insignificant	There would be a no impact at all – not even a very low impact on the system or any of its parts.

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 preferred site alternative identified by the applicant, and names site alternative 1 in this documents, entails the expansion of the existing quarry pit. Site Alternative 1 was identified during the planning phase by the Applicant and the project team, as the preferred and only viable site alternative based on the following:

- The mining site offers the mineral sought after;
- The proposed sites were previously used for mining activities, thus minimal environmental damage will occur;
- The mining area can be reached by an existing farm access road that connects to N2. No new road infrastructure need to be constructed;
- Due to the small size of the activity and the remote location of the mining area the potential impacts on the surrounding environment, associated with mining is deemed to be of low significance; and

- No residual waste as a result of the mining activity will be produced that needs to be treated on site. Any general waste that may be produced on-site will be contained in sealed refuse bins to be transported to the local municipal landfill site. The amount of hazardous waste to be produced at the site will be minimal and will mainly be as a result of accidental leakage. Contaminated soil (contained in sealed bins) will be collected from site by a hazardous waste handling Removal Company to be disposed of at a registered hazardous waste handling site.

The following potential impacts were identified that may have a negative impact on the receiving environment:

- Visual intrusion as a result of the mining activities;
- Potential negative impact on the nearby critical biodiversity area;
- Potential loss of protected or red data plant species;
- Potential impact on fauna within the footprint area;
- Potential impact on areas/infrastructure of heritage or cultural concern;
- Dust nuisance due to the mining activities;
- Noise nuisance generated by the proposed activity;
- Loss/contamination of stockpiled topsoil;
- Potential infestation of the topsoil heaps with weeds or invader plant species;
- Potential contamination of footprint area and surface runoff as a result of hydrocarbon spillages;
- Potential erosion of denuded areas;
- Health and safety risk posed by blasting;
- Unsafe working environment for employees; and
- Safety risk posed by un-sloped areas.

Potential positive impacts associated with the project includes:

- The quartzite to be mined will be used for the upgrading of roads and construction industry in the vicinity of the mining site, thereby indirectly contributing to infrastructure development,
- The project will assist the landowner and lawful users in diversification of the land use of the property.

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 mitigation 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)

The following mitigation measures are proposed to address / minimise the impact of the proposed activity on the surrounding environment.

Visual Mitigation:

As the proposed quarry is situated against the northern slope of the hill, the mining area will be highly visible from the N2 and will have a high visual impact on the surrounding environment. The visual mitigation measures therefore relate more to management practices, a housekeeping than the riddance of the actual impact.

- The site needs to have a neat appearance and be kept in good condition at all times.
- Mining equipment must be stored neatly in dedicated areas when not in use.
- The permit holder must limit vegetation removal, and stripping of topsoil may only be done immediately prior to the mining/use of a specific area.
- The excavation must be contained within the approved footprint of the permitted area.Upon closure the site needs to be rehabilitated to insure that the visual impact on the aesthetic value of the area is kept to a minimum.

Archaeological, Heritage and Paleontological Aspects:

The impact on archaeological, heritage and paleontological aspects, as a result of the proposed mining activities, can be reduced to being negligible through the implementation of the mitigation measures listed below:

- All mining must be confined to the development footprint area.
- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area.
- The senior on-site Manager must inform the ECO of the chance find and its immediate impact on operations. The ECO must then contact a professional archaeologist for an assessment of the finds who must notify the SAHRA.

- Work may only continue once the go-ahead was issued by SAHRA.

Dust Handling:

The risk of dust, generated from the proposed mining activity, having a negative impact on the surrounding environment can be reduced to being Low-Medium through the implementation of the mitigation measures listed below:

- The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents.
- The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression.
- Speed on the access roads to site (farm road) is limited to 20 km/h to prevent the generation of excess dust.
- Roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.
- Areas devoid of vegetation, which could act as a dust source, must be minimized and vegetation removal may only be done immediately prior to mining.
- Fallout dust monitoring needs to be conducted on a monthly basis.
- All dust generating activities shall comply with the National Dust Control Regulations, GN No R827 promulgated in terms of NEM: AQA (Act 39 of 2004) and ASTM D1739 (SANS 1137:2012).
- Best practice measures shall be implemented during the stripping of topsoil, excavation, and transporting of material from site to minimize potential dust impacts.

Noise Handling:

The risk of noise, generated from the proposed mining activity, having a negative impact on the surrounding environment can be reduced to being Low through the implementation of the mitigation measures listed below:

- The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site, both during work hours and after hours.
- No loud music may be permitted at the mining area.
- All mining vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act, Act No 93 of 1996.
- The type, duration and timing of the blasting procedures must be planned with due cognizance of other land users and structures in the vicinity. Surrounding land owners must be notified in writing prior to each blasting occasion.
- Best practice measures shall be implemented in order to minimize potential noise impacts.
- A qualified occupational hygienist must be contracted to quarterly monitor and report on the personal noise exposure of the employees working at the mine. The monitoring must be done in accordance with the SANS 10083:2004 (Edition 5) sampling method as well as NEM: AQA, 2004, SANS 10103:2008.

Management of weed or invader plants:

The risk of weeds or invader plants invading the disturbed area can be reduced to being low through the implementation of the mitigation measures listed below:

- A weed and invader plant control management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014 Species regarded as need to be eradicated from the site on final closure.
- Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. The following control methods can be used:
  - "The plants can be uprooted, felled or cut off and can be destroyed completely."
  - "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide."
  - The temporary topsoil stockpiles need to be kept free of weeds.

Erosion Control and Storm Water Handling:

The erosion potential and risk of contamination through dirty storm water escaping from work areas, or erosion or loss of stockpiled topsoil caused due to uncontrolled storm water flowing through the mining area can be reduced to being low through the implementation of the mitigation measures listed below:

- Storm water must be diverted around the topsoil heaps, and access roads to prevent erosion and loss of material.
- The runoff from compacted surfaces must be slowed down and dispersed sufficiently to prevent accelerated erosion.
- Erosion control measure must be put in place to minimise erosion along the proposed mining area. Extra precautions must be taken in areas where the soils are deemed highly erodible. Erosion control measures could include the use of sand bags, hessian sheets, retention or replacement of vegetation.
- Stockpiling of soil must not be allowed on or near steep slopes. This is to prevent pollution or the impediment of surface run-off.
- Drainage must be controlled to ensure that runoff from the project area does not culminate in off-site pollution, flooding or result in any damage to infrastructure downstream or any storm water discharge points.

- Mining must be conducted only in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department may impose:
    - Runoff water should be diverted around the site areas with trenches and contour structures to prevent erosion of the work areas.
    - Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems.
    - Dirty water must be collected and contained in a system separate from the clean water system.
    - Dirty water must be prevented from spilling or seeping into clean water systems.
    - The storm water management plan must apply for the entire life cycle of the mining activity and over different hydrological cycles (rainfall patterns).
    - The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management plan.

Handling of Hazardous Materials and Substances:

- All hazardous materials or substances should be stored in a closed storage facility with an impermeable floor.
- The storage area should meet the following conditions:
    - The storage area should be constructed on a level area to prevent offsite migration of any spilled product.
    - The floor of the storage area should be impermeable to prevent seepage of spilled products into the ground or ground water.
    - The storage area should be out of the 1:100-year flood line or further than 100m from the edge of a watercourse, whichever is greatest.
    - The facility should be such that access to the materials/substances can only take place with the prior notification of an appropriate staff member.
- All fuel storage tanks should have secondary containment in the form of an impermeable bund wall and base within which the tanks sits, raised above the floor, on plinths. This bund capacity should be sufficient to contain 110% of the tank's maximum capacity.
- The distance and height of the bund wall relative to that of the tank should also be taken into consideration to ensure that any spillage does not result in oil spouting beyond the confines of the bund.
- The site manager should establish a formal inspection routine to check all equipment in the bund area, as well as the bund area itself for malfunctions or leakages. The bund area should be inspected at least weekly and any accumulated rainwater removed. All valves and outlets should be checked to ensure that they are intact and closed securely.
- The bund base must slope towards a rainwater sump of sufficient size.

- Contaminated water may not be allowed to mix with clean water, and contained until it can be collected by a registered hazardous waste handling contractor or be disposed of at a registered hazardous waste handling facility.
- Drip trays should be available to be place underneath all stationary equipment or vehicles.
- The layer of material at the vehicle service area should be removed and if contaminated with hazardous substances such as hydrocarbons should be disposed of as hazardous waste by an appropriately qualified waste handling contractor. The compacted areas should be ripped and the topsoil returned over the area.
- The site should be cleared of all hazardous substances once decommissioning has been completed and should be disposed of by an appropriately qualified waste handling contractor.

Waste Management:

The risk of waste generation having a negative impact on the surrounding environment can be reduced to being low through the implementation of the mitigation measures listed below:

- Regular vehicle maintenance, repairs and services may only take place at the off-site workshop and service area of Driefonteinen Quarry. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 litre closed container/bin to be removed from the emergency service area to the workshop in order to ensure proper disposal.
- If a diesel bowser is used on site, it must be equipped with a drip tray at all times. Drip trays must be used during each and every refuelling event. The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling.
- No waste stockpile area may be established outside the boundaries of the mining area.
- Vehicle maintenance may only take place within the service bay area of the workshop.
- The diesel bowser needs to be equipped with a drip tray at all times. Drip trays have to be used during each and every refuelling event.
- The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling.
- Site management must ensure drip trays are cleaned after each use. No dirty drip trays may be used on site.
- Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognised facility.
- Spills must be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing it at a recognised facility. Proof should be filed.
- Suitable covered receptacles should be available at all times and conveniently placed for the disposal of waste.

- Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc, should be stored in a container with a closable lid at a collecting point and collected on a regular basis and disposed of at a recognised landfill site. Specific precautions should be taken to prevent refuse from being dumped on or in the vicinity of the mine area.
- Biodegradable refuse generated should be handled as indicated above.
- Water from the wash bay should drain into the oil sump from where it should be removed by an approved contractor.
- Drip trays should be available to be place underneath all stationary equipment or vehicles.
- Waste material of any description, including receptacles, scrap, rubble and tyres, should be removed entirely from the mining area and disposed of at a recognized landfill facility once decommissioning has been completed. It will not be permitted to be buried or burned on the site.
- Site management must ensure drip trays are cleaned after each use. No dirty drip trays may be used on site.
- Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. The hazardous waste generated at the mining area can be incorporated (upon mutual agreement thereto) into the existing hazardous waste handling system at Driefonteinen Quarry.
- Spills must be cleaned up immediately, within two hours of occurrence, to the satisfaction of the Regional Manager (DMR) by removing the spillage together with the polluted soil and incorporating it into the existing hazardous waste handling system of Driefonteinen Quarry (if possible), or by disposing it at a recognised facility. Proof must be filed.
- All general waste must be contained within the site vehicles and daily be removed from the mining area to the general waste storage area of Driefonteinen Quarry (upon mutual agreement thereto).
- Re-use or recycling of waste products must be encouraged on site.
- No waste may be buried or burned on the site.
- The permit holder must ensure that employees make use of the formal ablution facilities of Driefonteinen Quarry, alternatively the employees must be provided with a chemical toilet that must be serviced at least once a week by an accredited liquid waste handling contractor.
- The use of any temporary, chemical toilet facilities must not cause any pollution to water sources or pose a health hazard. In addition, no form of secondary pollution should arise from the disposal of refuse or sewage from the temporary, chemical toilets. Any pollution problems arising from the above are to be addressed immediately by the permit holder.
- When small volumes of wastewater are generated during the life of the mine the following is applicable:
    - Water containing waste must not be discharged into the natural environment.
    - Measures to contain the waste water and safely dispose thereof must be implemented.
- It is important that any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities is reported to the Department of Water and Sanitation and other relevant authorities.

Management of Health and Safety Risks:

The health and safety risk, posed by the proposed mining activity can be reduced to being low through the implementation of the mitigation measures listed below:

- Workers must have access to the correct personal protection equipment (PPE) as required by law.
- All operations must comply with the Occupational Health and Safety Act, Act No 85 of 1993.
- The type, duration and timing of the blasting procedures must be planned with due cognizance of other land users and structures in the vicinity.
- The surrounding landowners and communities must be informed in writing ahead of any blasting event.
- Measures to limit flyrock must be taken. All flyrock (of diameter 150 mm and larger) which falls beyond the working area, together with the rock spill must be collected and removed.
- Audible warning of a pending blast must be given at least 3 minutes in advance of the blast.

Protection of fauna and flora:

The following mitigation measures are proposed to prevent the mining activity impacting on the nearby CBA, and subsequently lower the significance of the potential impact from High to Low:

- The Applicant must demarcate a 20 m no-go buffer zone from the boundary of the critical biodiversity area (CBA), and no mining must be allowed behind the demarcation.
- Measures must be implemented to limit flyrock falling in this area. All flyrock (of diameter 150 mm and larger) which falls beyond the working area, together with the rock spill must be collected and removed.
- Employees must be informed of the no-go buffer area and no unauthorised entrance may be allowed.
- The site manager should ensure that no fauna is caught, killed, harmed, sold or played with.
- Workers should be instructed to report any animals that may be trapped in the working area.
- No snares may be set or nests raided for eggs or young.
- No plants or trees may be removed without the approval of the ECO.
- Clearing of vegetation has to be restricted to the smallest possible area.
- The Applicant must arrange that a botanist conduct a plant rescue walk-through of the mining footprint, prior to any bush-clearance, to identify the plants in need of a destruction/removal permit.
- The Applicant must then apply for a permit for the removal or destruction of all protected and red listed plants that will be affected. This application must be made to the Department of Economic Development, Environmental Affairs and Tourism – Eastern Cape Province (DEDEAT-EC).
- Bush-clearance may only commence once the recommendations of the specialist has been implemented.

- No plants may be removed without the approval of the ECO.

Management of Access Roads:

The risk on the condition of the roads, as a result of the proposed mining activities, can be reduced to being low-medium through the implementation of the mitigation measures listed below:

- Storm water should be diverted around the access roads to prevent erosion.
- Erosion of access road: Vehicular movement must be restricted to existing access routes to prevent crisscrossing of tracks through undisturbed areas. Rutting and erosion of the access road caused as a result of the mining activity should be repaired by the applicant.
- On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, should be scarified to a depth of at least 300mm and graded to an even surface condition and the previously stored topsoil should be returned to its original depth over the area.

Topsoil Handling:

The risk of loss of topsoil can be reduced to being low through the implementation of the mitigation measures listed below:

- Where applicable the first 300 mm of topsoil should be removed in strips and stored along the boundary of the mining area. Stockpiling of topsoil must be done to protect it from erosion, mixing with overburden or other material. The topsoil must be used to cover the rehabilitated area and improve the establishment of natural vegetation.
- The temporary topsoil stockpiles should be kept free of weeds.
- Topsoil stockpiles should be placed on a levelled area and measures should be implemented to safeguard the piles from being washed away in the event of heavy rains/storm water.
- Topsoil heaps should not exceed 1.5 m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen.
- Should natural vegetation not establish on the heaps within 6 months of stockpiling it should be planted with an indigenous grass species.
- Storm- and runoff water should be diverted around the topsoil stockpiles and access roads to prevent erosion.
- The stockpiled topsoil must be evenly spread over the rehabilitated area upon closure of the site.
- The permit holder must strive to re-instate topsoil at a time of year when vegetation cover can be established as quickly as possible afterwards, so that erosion of returned topsoil by both rain and wind, before vegetation is established, is minimized. The best time of year is at the end of the rainy season, when there is moisture in the soil for vegetation establishment and the risk of heavy rainfall events is minimal.
- A cover crop must be planted and established immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. The cover crop must be fertilized for optimum production. It is important that rehabilitation be taken up to the point of cover crop stabilization. Rehabilitation cannot be considered complete until the first cover crop is well established.

- Run-off water must be controlled via temporary banks during mining, where necessary on the slopes, to ensure that accumulation of run-off does not cause down-slope erosion.
- The rehabilitated area must be monitored for erosion, and appropriately stabilized if any erosion occurs for at least 12 months after reinstatement.

Rehabilitation of the Excavated Area:

The risk of unsloped and unrehabilitated areas posing a safety risk can be reduced to being Low through the implementation of the mitigation measures listed below:

- 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.
- No waste may be permitted to be deposited in the excavations.
- Once overburden, rocks and coarse natural materials have been added to the excavation and it was profiled with acceptable contours and erosion control measures, the topsoil previously stored must be returned to its original depth over the area.
- The area must be fertilized 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, should natural vegetation not re-establish within 6 months from closure of the site.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a vegetation seed mix to his or her specification.

Final Rehabilitation:

Final rehabilitation of the mining area must adhere to the mitigation measures listed below:

- Rehabilitation of the surface area shall entail landscaping, levelling, top dressing, land preparation, seeding (if required) and maintenance, and invasive plant species clearing.
- All infrastructure, equipment, temporary equipment and other items used during the mining period must be removed from the site (section 44 of the MPRDA).
- Waste material of any description, including receptacles, scrap, rubble and tyres, must be removed entirely from the mining area and disposed of at a recognized landfill facility. It may not be permitted to be buried or burned on the site.
- Invasive plant species clearing must be done in a sporadic manner during the life of the mining activities. Species regarded as Category 1a or b invasive species in terms the National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004) and the Alien and Invasive Species list, 2016 need to be eradicated from the site.
- Final rehabilitation must be completed within a period specified by the Regional Manager (DMR).

ix) Motivation where no alternative sites were considered.

As mentioned previously Site Alternative 1 is deemed to be the preferred and only viable site as it allowed for the extension of the existing quartzite pit.

Site alternatives where considered, but Site Alternative was deemed as the only viable site with the least environmental impacts. Existing infrastructure will be used as far as practicable and these will be expanded as required. The positioning of the proposed quarry pit is dictated but the position of the existing quarry and the existing access roads.

x) Statement motivating the alternative development location within the overall site.

(Provide a statement motivating the final site layout that is proposed)

Haw and Inglis Civil Engineering (Pty) Ltd Limited identified the need for gravel/aggregate in the area due to an increase in building, construction and road maintenance projects. As mentioned earlier the quarry pit on the property of the applicant has previously been used for mining purposes. In this light the applicant identified the proposed (site alternative 1) area as preferred and only viable site alternative. The facts that the existing quarries have not yet been mined out and will be extended were found to be the best option contrary to sustainable development in terms of site alternative 2 and 3.

The proposed site was identified as the preferred alternative due to the following reasons:

- The mining site offers the mineral sought after;
- The proposed sites were previously used for mining activities, thus minimal environmental damage will occur;
- The mining area can be reached by an existing farm access road that connects to N2. No new road infrastructure need to be constructed;
- Due to the small size of the activity and the remote location of the mining area the potential impacts on the surrounding environment, associated with mining is deemed to be of low significance; and
- No residual waste as a result of the mining activity will be produced that needs to be treated on site. Any general waste that may be produced on-site will be contained in sealed refuse bins to be transported to the local municipal landfill site. The amount of hazardous waste to be produced at the site will be minimal and will mainly be as a result of accidental leakage. Contaminated soil (contained in sealed bins) will be collected from site by a hazardous waste handling Removal Company to be disposed of at a registered hazardous waste handling site.

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 were 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)

During the impact assessment process the following potential impacts were identified of each main activity in each phase. An initial significance rating (listed under *v) Impacts and Risks Identified*) was determined for each potential impact should the mitigation measures proposed in this document not be implemented on-site. The impact assessment process then continued in identifying mitigation measures to address the impact that the proposed mining activity may have on the surrounding environment.

The significance rating was again determined for each impact using the methodology as explained under *VI) Methodology Used in Determining and Ranking the Significance*. The impact ratings listed below was determined for each impact **after** bringing the proposed mitigation measures into consideration and therefore represents the final layout/activity proposal.

Table 22: Impact assessment table after mitigation.

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
CONSTRUCTION / SITE ESTABLISHMENT PHASE												
ACTIVITY:	**DEMARCATION OF SITE WITH VISIBLE BEACONS.**											
	No impact could be identified other than the beacons being outside the boundaries of the approved processing area.	Neu										
ACTIVITY:	**ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRACTURE WITHIN BOUNDARIES OF SITE.**											
	If the infrastructure is established within the boundaries of the approved mining area, no impact could be identified.	Neu										
Social & Safety	Influx of unsuccessful job seekers which may informally settle in area. Potential danger to surrounding communities	Neg	Reversible	1	1	4	2	2	5	3	6	Low-Med
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Geology	Disturbance of geological strata	Neg	Irreversible	1	2	5	3	5	5	5	13,3	Med-High
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	2	1	2	4,5	Low
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	1	4	4	3	5	5	5	15	Low-Med
Topography	Alteration of topography	Neg	Irreversible	1	1	5	2	1	5	3	7	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	1	2	1	2	3	3	3,33	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	1	5	5	4	1	1	1	3,67	Low
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	1	2	4	2	2	1	2	3,5	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
SUB ACTIVITY: ABLUTION FACILITIES												
Groundwater	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Surface water	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	3	3	5	Low-Med
Soils	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	1	3	5	3	2	1	2	4,5	Low
SUB ACTIVITY: ACCESS ROADS												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	2	1	2	4,5	Low
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
SUB ACTIVITY: SITE OFFICES												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	2	1	2	4,5	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
SUB ACTIVITY: VEHICLE SERVICE AREA												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	2	1	2	4,5	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
SUB ACTIVITY: WASH BAY												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	2	1	2	4,5	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
SUB ACTIVITY: WORKSHOP												

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	2	1	2	4,5	Low
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	1	4	4	3	2	1	2	4,5	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
SUB ACTIVITY: SALVAGE YARD												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	2	1	2	4,5	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
SUB ACTIVITY: BUNDED DIESEL AND OIL STORAGE FACILITIES												
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	2	1	2	4,5	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
SUB ACTIVITY: GENERATOR AREA (BUNDED)												
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	2	1	2	4,5	Low
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
SUB ACTIVITY: WEIGH BRIDGE												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	2	1	2	4,5	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
SUB ACTIVITY: PARKING AREA												
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	2	1	2	4,5	Low
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med
SUB ACTIVITY: WASTE AREA												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	2	1	2	4,5	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	4	4	4	4	5	5	5	20	High
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	1	2	4	2	2	1	2	3,5	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
ACTIVITY:	**STRIPPING AND STOCKPILING OF TOPSOIL**											

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Geology	Disturbance of geological strata	Neg	Irreversible	1	2	5	3	5	5	5	13,3	Med-High
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	2	1	2	4,5	Low
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	1	3	2	2	2	2	2	4	Low
Topography	Alteration of topography	Neg	Irreversible	1	1	5	2	1	5	3	7	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	1	2	1	2	3	3	3,33	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	3	3	5	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	1	5	5	4	1	3	2	7,33	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	2	1	1	5	3	4	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Air quality	Dust generation	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	1	2	4	2	2	1	2	3,5	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
OPERATIONAL PHASE												
ACTIVITY:	**DRILLING AND BLASTING**											
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	2	1	2	4,5	Low
Noise	Noise nuisance generated by drilling equipment and blasting	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	1	3	2	2	2	2	2	4	Low
Topography	Alteration of topography	Neg	Irreversible	1	1	5	2	1	5	3	7	Low-Med
Geology	Disturbance of geological strata	Neg	Irreversible	1	2	5	3	5	5	5	13,3	Med-High
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	1	2	1	2	3	3	3,33	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	3	3	5	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	1	5	5	4	1	3	2	7,33	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Noise	Noise nuisance generated by drilling equipment and blasting	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Dust generation	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	1	2	4	2	2	1	2	3,5	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Social & Safety	Health and Safety Risk by Blasting Activities. Potential danger to surrounding communities	Neg	Reversible	1	4	1	2	2	1	2	3	Low
ACTIVITY:	**EXCAVATION**											
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	2	1	2	4,5	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	1	3	2	2	2	2	2	4	Low
Geology	Disturbance of geological strata	Neg	Irreversible	1	2	5	3	5	5	5	13,3	Med-High
Topography	Alteration of topography	Neg	Irreversible	1	1	5	2	1	5	3	7	Low-Med
Hazardous Waste	Dust nuisance due to loading and transportation of the material	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	1	2	1	2	3	3	3,33	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	3	3	5	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	1	5	5	4	1	3	2	7,33	Low-Med
Noise	Noise nuisance generated by excavation equipment	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Dust generation	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	1	2	4	2	2	1	2	3,5	Low
Social & Safety	Unsafe working conditions for employees	Neg	Reversible	1	4	1	2	2	1	2	3	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
ACTIVITY:	**CRUSHING AND SCREENING OF AGGREGATES**											
Noise	Noise nuisance caused by crushing plant.	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Hazardous Waste	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	2	1	2	4,5	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	3	3	5	Low-Med
Air quality	Dust generation	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	1	2	4	2	2	1	2	3,5	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
ACTIVITY:	**TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS**											

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	2	1	2	4,5	Low
Hazardous Waste	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	3	3	5	Low-Med
Noise	Noise nuisance caused by vehicles	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Dust generation	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med
Traffic and Safety	Road degradation. Increased potential for road incidences Potential distraction to road users	Neg	Reversible	2	1	4	2	2	2	2	4,67	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
DECOMMISSIONING PHASE												
ACTIVITY:	**SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**											

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	5	3	2	1	2	4,5	Low
Soils	Soils replaced and ameliorated	Pos	Reversible	1	3	4	3	2	3	3	6,67	Low-Med
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	1	3	2	2	2	2	2	4	Low
Topography	Alteration of topography	Neg	Irreversible	1	1	5	2	1	5	3	7	Low-Med
Topography	Eradication of trenches and berms. Re-contouring of area for free surface water drainage. Eradication of stockpiles	Pos	Irreversible	1	2	5	3	2	3	3	6,67	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	1	2	1	2	3	3	3,33	Low
Visual aspect	Improved aesthetics through rehabilitation	Pos	Reversible	2	1	3	2	2	3	3	5	Low-Med
Noise	Noise nuisance caused by machinery	Neg	Reversible	1	1	2	1	1	5	3	4	Low
Air quality	Dust nuisance caused during landscaping activities	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	2	2	3	2	3	5	Low-Med
Fauna	Reintroduction of fauna attracted to flora to the area	Pos	Reversible	2	2	4	3	2	5	4	9,33	Low-Med
Fauna	Reintroduction of fauna attracted to flora to the area	Pos	Reversible	2	1	3	2	1	3	2	4	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Social & Safety	Health and safety risk posed by un-sloped areas	Neg	Reversible	1	4	1	2	2	1	2	3	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Surface water	Containment of dirty water. Improve response to issues relating to deterioration of surface water quality or quantity. Free drainage resorted to area. Revegetation of disturbed areas reduces risk of silt loading on downstream water bodies. Large area of surface water runoff return to catchment	Pos	Reversible	1	3	1	2	2	2	2	3,33	Low
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	1	2	2	2	2	3,33	Low
Groundwater	Improve response to issues relating to deterioration of groundwater quality or quantity	Pos	Reversible	1	3	1	2	2	2	2	3,33	Low
ACTIVITY: Application for Closure Certificate												

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).

Table 23: Assessment of each identified potentially significant impact and risk.

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
whether listed or not listed	(Including the potential impacts for cumulative impacts)		In which impact is anticipated	if not mitigated	(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..)	if mitigated
(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.)	(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)		(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))		E.g. Modify through alternative method. Control through noise control. Control through management and monitoring. Remedy through rehabilitation.	
DEMARCATION OF SITE WITH VISIBLE BEACONS.	No impact could be identified other than the beacons being outside the boundaries of the approved processing area.	N/A	Construction / Site Establishment phase	N/A	N/A	N/A
ESTABLISHMENT OF BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **STRIPPING AND STOCKPILING OF TOPSOIL**	Deterioration in visual aesthetics of the area. Visual intrusion as a result of site establishment.	The visual impact may affect the aesthetics of the landscape.	Throughout all phases of mining.	High	Control: Implementation of proper housekeeping	High

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
DRILLING AND BLASTING **EXCAVATION** **CRUSHING AND SCREENING OF AGGREGATES** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	Visual intrusion associated with the excavation activities.					
ESTABLISHMENT OF BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **STRIPPING AND STOCKPILING OF TOPSOIL** **DRILLING AND BLASTING** **EXCAVATION** **CRUSHING AND SCREENING OF AGGREGATES** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	Dust nuisance caused by the disturbance of soil.	Dust will be contained within the property boundaries and will therefore affect only the landowner.	Throughout all phases of mining. .	Low-Medium	Control: Dust suppression	Low-Medium
	Emissions caused by vehicles and equipment	Emissions will be contained within the property boundaries and will therefore affect only the landowner.		Low-Medium	Control: Emissions	Low-Medium
	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.		Low-Medium	**Control:** Noise control measures	Low-Medium
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Flora		Medium-High	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation	Low-Med

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
					of work areas. Modify: Consider use of a less sensitive area	
• **ESTABLISHMENT OF BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.** • **STRIPPING AND STOCKPILING OF TOPSOIL** • **DRILLING AND BLASTING** • **EXCAVATION** • **CRUSHING AND SCREENING OF AGGREGATES** • **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** • **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	Portable Toilets Potential harm through sewage leaks	Groundwater Surface Water Soils Social	Construction / Site Establishment phase	Med	Control through proper site management	Low-Med
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.	Operational phase	Low-Med	**Control:** Storm water management Site Management Soil Management	Low
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed	Operational phase	Med	Control: Waste management	Low
	Alteration of topography	Topography	Operational phase	Low-Med	Control: Surface water Monitoring	Low-Med
	Loss of and disturbance to surface archaeological sites	Artefacts or graves	Operational phase	Med	**Control:** Survey area before site clearance	Low-Med
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination	Groundwater pollution	Operational phase	Med	Control: Proper site management.	Low

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
	through littering leeching into the groundwater table					
• **ESTABLISHMENT OF BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.** • **STRIPPING AND STOCKPILING OF TOPSOIL** • **DRILLING AND BLASTING** • **EXCAVATION** • **CRUSHING AND SCREENING OF AGGREGATES** • **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** • **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies	Operational phase	Med	<u>Control:</u> Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Low
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away	Operational phase	Low	<u>Control:</u> Implementation of fauna protection measures	Low
• **DRILLING AND BLASTING** • **EXCAVATION**	Veldt fire might seriously impact on surrounding	Land use	Operational phase	Low-Med	<u>Control:</u> <u>Fire</u>	Low-Med

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
• **CRUSHING AND SCREENING OF AGGREGATES** • **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** • **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)** •	land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming					
• **ESTABLISHMENT OF BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.** • **STRIPPING AND STOCKPILING OF TOPSOIL** • **DRILLING AND BLASTING** • **EXCAVATION** • **CRUSHING AND SCREENING OF AGGREGATES** • **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** • **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	Influx of unsuccessful job seekers which may informally settle in area. Potential danger to surrounding communities	Social	Construction / Site Establishment phase	Med	Control through proper site management	Low-Med
	Unsafe working conditions for employees	The Unsafe working conditions should only impact the applicant. Safety measures will be implemented	Operational phase	Low-Med	<u>Control:</u> Implementation of safety control measures	Low-Med
	Disturbance of geological strata	Geology	Operational phase	Medium -High	N/A	Medium -High
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.	Operational phase	Med	**<u>Control:</u>** Storm water management Site Management Soil Management	Low-Med

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
	Health and Safety Risk by Blasting Activities. Potential danger to surrounding communities	The Unsafe working conditions should only impact the applicant. Safety measures will be implemented	Operational phase	Low	Control: Implementation of safety control measures	Low
• **ESTABLISHMENT OF BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.** • **STRIPPING AND STOCKPILING OF TOPSOIL** • **DRILLING AND BLASTING** • **EXCAVATION** • **CRUSHING AND SCREENING OF AGGREGATES** • **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** • **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)** •	Road degradation. Increased potential for road incidences Potential distraction to road users	All road users will be affected	Operational phase	Low-Med	<u>Control & Remedy:</u> Road management	Low
	Health and safety risk posed by un-sloped areas	The impact on health and safety due to un-sloped areas will be contained within the site boundary.	Decommissioning phase	Medium	<u>Control:</u> Sloping of areas upon decommission	0
	Reintroduction of fauna attracted to flora to the area	Fauna returning to area	Decommissioning phase	Low-Med	<u>Control:</u> Implementation of fauna protection measures	Low
	Eradication of trenches and berms. Re-contouring of area for free surface water drainage. Eradication of stockpiles	Topography	Decommissioning phase	Low-Med	<u>Control:</u> Surface water Monitoring	Low-Med
	Improved aesthetics through rehabilitation	The visual impact may affect the aesthetics of the landscape.	Decommissioning phase	Low-Med	<u>Control:</u> Implementation of proper housekeeping	Low-Med

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

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):-

Table 24: Summary of specialist reports

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
Archaeological Study	No mitigation needed. If graves are located in the future, they should ideally be preserved in-situ or alternatively relocated according to existing legislation (SAHRA).	Will be included once the specialist study has been conducted. Specialist report will be send to the DMR.	PART A – h(iv)(1)(a) t (i)
No other specialist studies were deemed necessary for this project as the project entails the establishment of the mining area over an area previously used for agriculture and mining.			

l) Environmental impact statement

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

The key findings of the environmental impact assessment entail the following:

- The project entails the excavation mining of quartzite in an area previously used for mining. Due to the small area used for grazing and mining, mining of quartzite in the area was identified as a more viable use.
- The mining procedure will only entail the excavation and transporting of the quartzite by means of a front-end loader upon which it will be loaded onto trucks and transported from the mining site to the stockpiling site. The clients will then acquire the aggregate from the stockpiling site.
- The existing roads to the mine area can be used to gain access to the site. No new roads are needed.
- The proposed mining area will be visible from the N2 passing the property and will therefore have a visual impact on the immediate surrounding area.
- Mining activities will be contained within the boundaries of the permitted site. Proper storm water and waste management however needs to be implemented on the site in order to minimise the potential of pollution.

Mining and Biodiversity Conservation Areas:

- The environmental impact assessment identified a critical biodiversity area (CBA) that extends throughout the boundary of the proposed mining area. This area is also highlighted in terms of the Mining and Biodiversity Guideline as an area of high biodiversity importance with a corresponding rating of high risk for mining.

- In order to preserve the CBA and prevent mining having a negative impact on the biodiversity sensitive area, it is proposed that a 20 m no-go buffer be set from the border of the CBA line in which no mining may take place. The buffer area will reduce the mineable footprint from 4.9 ha to ±3.9 ha. Should the Applicant adhere to the proposed 20 m no-go buffer area (from the border of the CBA) the impact on the biodiversity sensitive area is deemed to be insignificant.

Other Site Specific Environmental Aspects:

- Driefonteinen quarry will be cut into the northern slope of the hill. Due to the nature of the activity, the topography of the hill will be altered in that a depression will be created with stepped side walls as mining progress. The quarry will be established within the mountain, with the crest of the mountain acting as a visual barrier. The rehabilitation option (upon closure) is to render the quarry safe and leave it as a minor landscape feature.

- Viewshed, as mentioned above, the quarry will be established within the mountain with the crest of the mountain acting as a visual barrier. The stockpiles and plant area will be visible from the N2.
- As the prevalent wind direction is in an the South and South-South Eastern direction the hill will screen dust generated at Driefonteinen quarry from the operations/residents on the opposite side (N2 side). Should the Applicant implement the mitigation measures proposed in this document and the EMPr the impact on the air quality of the surrounding environment is deemed to be of low-medium significance.
- Although the proposed activity will have a cumulative impact on the ambient noise levels, the development will not take place in a pristine environment, and the impact is therefore deemed compatible with the current operations and of low significance.
- There are no rivers, streams or wetlands within close proximity of the mining area.
- The fauna at the site will not be impacted on by the proposed mining activity as they will be able to move away or through the site, without being harmed.
- No sites of archaeological or cultural importance were identified during the site inspection located in the mining footprint area.

m) Final Site Map

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

See the map indicating site activities attached as Appendix C.

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

The positive impacts associated with the project include:

- The quartzite to be mined will be used for the upgrading of roads and construction industry in the vicinity of the mining site, thereby indirectly contributing to infrastructure development,
- The project will assist the landowner and lawful users in diversification of the land use of the property.

The negative impacts associated with the project that was deemed to have a Low-Medium or Medium significance includes:

- Visual intrusion due to the proposed project **Medium-High**
- Disturbance of the geological strata **Medium – High**
- Weeds and invader plant infestation of the area **Low – Medium**
- Dust nuisance stemming from proposed project **Low-Medium**
- Dust nuisance caused by the blasting activities **Low-Medium**
- Noise nuisance due to proposed activity **Low-Medium**

o) 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 condition of authorisation.

Table 25: Proposed impact management objectives and the impact management outcomes for the inclusion in the EMPr.

Management Objectives	Role	Management Outcomes
Visual Aspect	• Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. • Compliance to be monitored by the Environmental Control Officer.	• Ensure that the site have a neat appearance and is kept in good condition at all times. • Store mining equipment in a dedicated area when not in use. • Limit vegetation removal, only strip topsoil immediate prior to the mining / use of a specific area. • Contain excavations to the approved footprint area of the permitted area. • Remove all infrastructure upon rehabilitation of the processing area and return the area to its prior status.
Conservation of protected/red data plant species.	• Permit holder to apply for a destruction/removal plant permit from DEDEAT-WC. • Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. • Compliance to be monitored by the Environmental Control Officer.	• Arrange for a botanist to do a plant rescue walk-through of the mining footprint prior to any bush-clearance. Only commence with bush-clearance once the recommendations of the specialist has been implemented. • Apply for a destruction/removal plant permit, for the removal and/or relocation of all protected plants to be affected, prior to bush-clearance. • Only commence with bush-clearance once the recommendations of the specialist has been implemented. • Do not remove any plants without the approval of the ECO. • Contain all activities within the boundaries of the approved mining permit area. • Demarcate, signpost and manage the 20m buffer area as no-go area around areas with natural vegetation.
Management of weed/invader plants	• Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. • Compliance to be monitored by the Environmental Control Officer.	• Implement a weed and invader plant control management plan. • Control declared invader or exotic species on the rehabilitated areas. • Keep the temporary topsoil stockpiles free of weeds.
Fauna Management	• Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. • Compliance to be monitored by the Environmental Control Officer.	• Ensure no fauna is caught, killed, harmed, sold or played with. • Instruct workers to report any animals that may be trapped in the working area. • Ensure no snares are set or nests raided for eggs or young.

Protection of Cultural or Heritage Artefacts	• Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.
	• Compliance to be monitored by the Environmental Control Officer.
		• Confine all mining to the development footprint area.
		• Implement the following change find procedure when discoveries are made on site:
		  ○ Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities.
		  ○ Notify Heritage and the ECO immediately.

Management Objectives	Role	Management Outcomes
Dust Handling	• Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. • Compliance to be monitored by the Environmental Control Officer. • Dust monitoring consultant to check dust results and provide guidelines.	• Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. • Limit speed on the access roads to 40km/h to prevent the generation of excess dust. • Spray roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. • Assess effectiveness of dust suppression equipment. • Re-vegetate all disturbed or exposed areas as soon as possible to prevent any dust source from being created. • Thoroughly soak all stockpiles to ensure dust suppression on the site. • Conduct formal dust monitoring on a monthly basis.
Noise Handling	• Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. • Compliance to be monitored by the Environmental Control Officer. • Compliance to be monitored by the Noise Monitoring Specialist.	• Ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the mining area. • Ensure that all mining vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. • Plan the type, duration and timing of the blasting procedures with due cognisance of other land users and structures in the vicinity. • Notify surrounding land owners prior to blasting occasions. • Use soft explosives during blasting. • Compliance with the appropriate legislation with respect to noise will be mandatory. • Implement formal noise monitoring on a quarterly basis.
Topsoil management	• Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. • Compliance to be monitored by the Environmental Control Officer.	• Strip and stockpile the upper 300 mm of the soil before mining. • Carefully manage and conserve the topsoil throughout the stockpiling and rehabilitation process. • Ensure topsoil stripping, stockpiling and re-spreading is done in a systematic way. Plan mining in such a way that topsoil is stockpiled for the minimum possible time. • Ensure that topsoil heaps do not exceed 1.5 m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen. • Divert storm- and runoff water around the stockpile area to prevent erosion. • Vegetate the topsoil heaps to be stored longer than 6 months with an indigenous grass seed mix if vegetation does not naturally germinate within the first growth season. • Spread the topsoil evenly over the rehabilitated area upon closure of the site. • Strive to re-instate topsoil at a time of the year when vegetation cover can be established as quickly as possible afterwards, to that erosion of returned topsoil is minimized. The best time of year is at the end of the rainy season. • Plant a cover crop immediately after spreading topsoil to stabilise the soil and protect it from erosion. Fertilise the cover crop for optimum production. Rehabilitation extends until the first cover crop is well established.

Management Objectives	Role	Management Outcomes
		• Control run-off water with temporary banks, where necessary, to prevent accumulation of run-off causing down-slope erosion. • Monitor the rehabilitated area for erosion, and appropriately stabilize if erosion do occur, for at least 12 months after reinstatement.
Waste management	• Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. • Compliance to be monitored by the Environmental Control Officer.	• Ensure no waste storage area is established outside the boundaries of the mining area. • Ensure vehicle maintenance only take place within the service bay area of the off-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litre closed container/bin inside the emergency service area. • Ensure diesel bowser is equipped with a drip tray at all times. • Use drip trays during each and every refuelling event. • Ensure the nozzle of the bowser rests in a sleeve to prevent dripping after refuelling. • Keep drip trays clean. No dirty drip trays may be used on site. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognised facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognised facility. File proof on site. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Place all used oils, grease or hydraulic fluids therein and remove these receptacles from the site on a regular basis for disposal at a registered or licensed hazardous disposal facility. • Store non-biodegradable refuse such as glass bottles, plastic bags etc., in a container with a closable lid at a collecting point. Collection should take place on a regular basis and disposed of at the recognised landfill site. Prevent refuse from being dumped on or in the vicinity of the mining area. • Biodegradable refuse to be handled as indicated above. • Generated at the site recording the amount of different types of waste generated by the mine in excel spreadsheet format.
Surface and Storm water Handling	• Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. • Compliance to be monitored by the Environmental Control Officer.	• Divert storm water around the topsoil heaps and access roads to prevent erosion and loss of material. • Divert runoff water around the stockpile areas with trenches and contour structures to prevent erosion of the work areas. • Ensure that water from the wash bay into the oil sump. • Conduct mining in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department may impose.

Management Objectives	Role	Management Outcomes
Management of health and safety risks	• Site Manager to ensure compliance with the guidelines as stipulated in the EMP. • Compliance to be monitored by the Environmental Control Officer. • Blasting contractor to comply with national blasting requirements.	• Plan the type, duration and timing of the blasting procedures with due cognisance of other land users and structures in the vicinity, • Inform the surrounding landowners and communities of any blasting event, • Use soft explosives during blasting, • Limit fly rock, • Give audible warning of a pending blast at least 3 minutes in advance of the blast, • Remove all fly rock (of diameter 150mm and larger) which falls beyond the working area, together with the rock spill. • Ensure that workers have access to the correct PPE as required by law. • Ensure all operations comply with the Occupational Health and Safety Act.
Handling of Hazardous Materials and Substance	• Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer	• Store all hazardous materials or substances in a closed storage facility with an impermeable floor. • Storage area to meet the following conditions: • Construct storage area on a level area. • Floor of the storage area should be impermeable. • Storage area should be outside the 1:100-year flood line or further than 100m from the edge of a watercourse, whichever is greatest. • Access to the materials/substances may only take place with the prior notification of the site manager. • Fuel storage tanks should have an impermeable bund wall and base within which the tanks sits, raised above the floor, on plinths. The bund capacity should be sufficient to contain 110% of the tank's maximum capacity. • Consider the distance and height of the bund wall relative to that of the tank to ensure that oil does not spout beyond the confines of the bund. • Establish a formal inspection routine to check all equipment in the bund area, as well as the bund area itself for malfunctions or leakages. Inspection should be at least weekly and any accumulated rainwater should be removed. • All valves and outlets should be checked to ensure that they are intact and closed securely. • Slope the bund base towards a rainwater sump of sufficient size. • Contain contaminated water until it can be collected by a registered hazardous waste handling contractor or be disposed of at a registered hazardous waste handling facility. • Ensure availability of drip trays underneath all stationary equipment or vehicles.
Management of access roads	• Site Manager to ensure compliance with the guidelines as stipulated in the EMP. • Compliance to be monitored by the Environmental Control Officer.	• Maintain newly constructed access roads so as to minimise dust, erosion or undue surface damage. • Divert storm water around the access roads to prevent erosion. • Erosion of access road: Restrict vehicular movement to existing access routes to prevent crisscrossing of tracks through undisturbed areas.

Management Objectives	Role	Management Outcomes
Blast Monitoring	• Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Monitoring to be conducted by blasting contractor. • Compliance to be monitored by the Environmental Control Officer.	• Monitor ground vibration and air blast levels to USBM standards.
Rehabilitation Excavated Area and Final Rehabilitation	• Site Manager to ensure compliance with the guidelines as stipulated in the EMP. • Compliance to be monitored by the Environmental Control Officer.	• Use the excavated area as a final depositing are for the placement of overburden. • Dump rocks and coarse material removed from the excavation into the pit. • Prevent the deposition of any waste into the excavation. • Return the topsoil previously stored to its original depth over the area once overburden, rocks and coarse natural material have been added to the excavation and it was profiled with acceptable contours and erosion control measures. • If necessary, fertilize the area to allow vegetation to establish rapidly. Seed the site with a local or adapted indigenous seed mix should natural vegetation not re-establish within 6 months from closure. • Ensure rehabilitation entail landscaping, levelling, top dressing, land preparation, seeding (if required) and maintenance, and invasive plant species clearing. • Remove all infrastructure, equipment, temporary equipment and other items used during the mining period. • Remove waste material of any description, including receptacles, scrap, rubble and tyres, and dispose of it at a recognized landfill facility. No waste may be burned/buried on site. • Implement invasive plant species clearing during the life of the mine. Eradicate species regarded as Category 1a or b invasive species in terms of the NEM; BA, 2004 and AIS list, 2016. • Complete final rehabilitation within a period specified by the Regional Manager (DMR).
After care on rehabilitated areas	• Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. • Compliance to be monitored by the Environmental Control Officer.	• Control run-off water via temporary banks to ensure that accumulation of run-off does not cause down-slope erosion. • Only do topsoil spreading at a time of year when vegetation cover can be established as quickly as possible afterwards, so that erosion of returned topsoil by both rain and wind is minimized. The best time of year is at the end of the rainy season, when there is moisture in the soil for vegetation establishment and the risk of heavy rainfall events is minimal. • Plant a cover crop immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. Fertilize the cover crop for optimum production. • Ensure rehabilitation be taken up to the point of cover crop stabilization. Rehabilitation must not be considered complete until the first cover crop is well established. • Monitor all rehabilitated areas for erosion, and appropriately stabilized if any erosion occurs.

p) Aspects for inclusion as conditions of Authorisation.

Any aspects which must be made conditions of the Environmental Authorisation

The management objectives listed in this report under Point m above should be considered for inclusion in the environmental authorisation.

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

(Which relate to the assessment and mitigation measures proposed)

The assumptions made in this document which relate to the assessment and mitigation measures proposed, stem from site specific information gathered from the property owner, as well as site inspections, and background information gathering.

Uncertainty exist on the number of protected and/or red data listed plant species that is present within the proposed mining footprint. Should the applicant however appoint a botanist to conduct the plant rescue walk-through prior to bush clearance this matter will be addressed in the specialist report.

Site specific meteorological data was not available, instead meteorological data of the Mossel Bay area was used during this assessment.

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

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

Part of the proposed project (quarry pit area) will occur on an existing brownfields (Quartzite quarry) site which was previously disturbed. This would localise all impacts and minimise the footprint of the infrastructure development during its operations. No impact which are likely to cause detrimental harm to the environment were identified as part of this Basic Assessment, and therefore it is recommended that the proposed infrastructure development associated with the quarry mining operation included into this application, be approved by the competent authority with the condition that all prescribed mitigation measures be adhered to at all times. Should the mitigation measures and monitoring programmes proposed in this document be implemented on site, no fatal flaws could be identified that were deemed as severe as to prevent the activity continuing.

Should the proposed infrastructure development associated with the mining operation not be authorised to proceeds, it is anticipated that there will be a shortage in the supply of aggregate toe the local construction project and upgrading of roads in the area. This would not be a feasible option in this case as its safest that available quartzite reserves will not be exploited. This will have a negative impact on logistics and efficiently of the local construction industry's ability to deliver services timeously.

Furthermore it is also suggested that, where relevant, the competent authority stipulated any additional mitigates measures that they consider necessary as condition in the Environmental Authorisation.

ii) Conditions that must be included in the authorisation

The management objectives listed in this report under Point m should be considered for inclusion in the environmental authorisation.

s) Period for which the Environmental Authorisation is required.

The applicant requests the Environmental Authorisation to be valid for a five-year period in order to correspond with the validity of the mining permit.

t) 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 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.

u) Financial Provision

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

The annual amount required to manage and rehabilitate the environment was estimated to be R 1 380 769.52.

i) Explain how the aforesaid amount was derived

The annual amount required to manage and rehabilitate the environment was estimated to be R 1 380 769.52. Please see the explanation as to how this amount was derived at attached as Appendix K– Financial and Technical Competence. A Bank Guarantee will be provided for the proposed site.

ii) Confirm that this amount can be provided 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 Mining Work Programme as the case may be).

The mining operation will be self-funded through income generated by sales of the aggregate mined. Bridging finance, will be supplied where needed by Haw and Inglis Civil Engineering (Pty) Ltd Limited. Bridging finance, will be supplied where needed by Haw and Inglis Civil Engineering (Pty) Ltd Limited. The operating expenditure is provided for as such in the Finance and Technical Competence Report as attached in Appendix K to this report.

v) Specific Information required by the competent Authority

w) 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 Mining 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 following potential impacts were identified that may impact on socio-economic conditions of directly affected persons:

Visual exposure:

The mining area was identified to constitute the lowest possible visual impact on the surrounding environment. The surrounding areas have previously been disturbed by mining activities, and this application entails the extension of the existing mining areas. The quarry area falls within the mountain, the crest of the mountain acts as a visual barrier. The applicant should however ensure that housekeeping is managed to standard, as this will mitigate the visual impacts during the operational phase of the mine. Stockpiles will be visible from the N2.

Upon closure the site will be rehabilitated and sloped to insure that the visual impact on the aesthetic value of the area is kept to a minimum. The site will have a neat appearance and be kept in good condition at all times. It is believed that the residual impact on the activity will be medium upon rehabilitation of the footprint area.

Air Quality:

The background air quality of the surrounding area is relatively good due to low industrial activity. Factors contributing to air pollution are the burning of veld, agriculture, Petrol SA and Mossindustria in the area. Given the surrounding extent of mostly covered areas, no extreme dust generation under windy conditions is experienced.

Dust will be generated by the proposed operation through blasting and the movement of machinery and vehicles. Dust suppression measures should be implemented to prevent excessive dust on site. The impact on the surrounding environment is deemed to be of low-medium significance. There will be no residual impact after closure.

Noise:

The surrounding areas are characterised by an agricultural setting in which vehicles and farm equipment operate. The traffic on the N2 surrounding the property contributes to the ambient noise of the area. The noise to be generated at the proposed site (site alternative 1) operation is expected to temporarily increase the noise levels of the area. Blasting noise will be instantaneous and of short duration. Loading and transportation of the material will generate noise daily. The significance of noise on the surrounding environment is therefore deemed to be of low significance. Mitigation measures should be implemented to ensure employees conduct them in an acceptable manner while on site in order to lessen the noise impact of the proposed activity on the surrounding environment.

Existing Infrastructure:

It is expected that the proposed processing activity will have a very low impact on the surrounding environment as activities will be contained within the boundaries of the site. The proposed production of aggregate on the property will also reduce the amount of trucks delivering aggregate, from outside sources. This will have a direct positive impact on the traffic volumes of the surrounding roads and price of the aggregate.

(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 Mining 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 the 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).

No sites of archaeological or cultural importance were identified at the proposed mining permit area during the site inspection. These are classified in Section 3(2) of National Heritage Resources Act (NHRA), 1999. The area was previously used for mining and no areas of cultural importance could be identified within the footprint area of the site. However, the farm house and cemetery would need to be stayed clear of. The farm house and cemetery is located approximately 1.7km from the mining footprint area.

x) Other matters required in terms of section 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 mentioned previously Site Alternative 1 is deemed to be the preferred and only viable site as it allows for the extension of the existing aggregate quarry pit.

The site and project alternatives investigated during the impact assessment process were done at the hand of information obtained during the site investigation, public participation process as well as desktop studies conducted of the study area. As discussed earlier the following alternatives were considered:

1. Site Alternative 1 – The proposed mining area over a 5ha footprint area (Preferred Alternative).
   Positive aspects of this area includes:
   - It will lower the initial setup and production cost of the permit holder;
   - Lessen the impact on the receiving environment both directly (e.g. dust and noise generation, risk of pollution, visual impact), and indirectly (e.g. need for electricity, water and maintenance services); and
   - Processing related impact will be contained to a designated area on the property (that was previously used for processing during the SANRAL permit).
2. Site Alternative 2 – The proposed mining area over a 5ha footprint area in a rehabilitated quarry pit area – can be classified as green fields area. This area falls within the Gouritz Cluster Biosphere reserve area and is classified as an CBA area.
3. No-go Alternative.

PART B: ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1. DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME.

a) Details of the EAP

(Confirm that the requirements 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 and expertise of Yolandie Coetzee of Greenmined Environmental that acts as EAP on this project has been included in Part A Section 1(a) as well as Appendix J as required.

b) Description of the Aspects of the Activity

(Confirm that the requirements to describe the aspects of the activity that are covered by the final environmental management programme is already included in PART A, section (1)(h) herein as required).

The aspects of the activity that are covered by the final environmental management programme has been described and included in Part A, section (1)(h).

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 aspects of the activity that are covered by the final environmental management programme has been described and included in Part A, section (1)(h), this map has been compiled and is attached as Appendix C to this document.

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)

Mining activities are to be undertaken in a manner which facilitates site rehabilitation and the restoration of existing land capabilities. The primary objectives for rehabilitation includes:

- The facilitation of the re-establishment of the land use and capability to as close as reasonably to the original conditions;
- Removal of all infrastructure and material introduced to site;
- Removal of all wastes and their and their related disposal; and
- And promotion of the rapid re-establishment of natural vegetation and the restoration of site ecology.

The disturbed areas shall be rehabilitated to ensure that:

- The biodiversity habitat is encouraged by the new land use after the mining;
- Future public health and safety are not compromised;
- The site is reversed to almost its original state;
- Environmental and resources are not subject to physical and chemical deterioration;
- The after-use of the site is beneficial and sustainable in the long term;
- Any adverse socio-economic impacts are minimized; and
- All socio-economic benefits are maximized.

This will be done by complying with the conditions in the environmental management program below, and relevant statuary requirements. The contractor and employee will be made aware of their environmental responsibilities and will be empowered to execute the work program in compliance with the requirements of this EMPR.

The following closure objectives are proposed with regard to rehabilitation of the mining area:

- On completion of operations, all structures or objects shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002):
  - Where sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
- Upon cessation of the mining activities, the area will be fully rehabilitated.
- The perimeter walls of the opencast pit will either be sloped at 1:3 to the pit floor, to prevent soil erosion, or be stepped by creating benches of not more than 3 meters high.
- No trees to be removed over areas where mining is required.
- Fill and topsoil could be placed over the slopes to provide a suitable medium for the establishment of vegetation.
- No waste will be permitted to be deposited in the excavations.

- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a vegetation seed mix to his or her specification.
- Photographs of the office sites and plant infrastructure before and during the mining operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the Regional Manager.
- Prior to replacing the topsoil, the material that was removed from these areas will be replaced in the same order as it originally occurred.
- All temporary infrastructures, equipment, plant, temporary housing and other items used during the mining period will be removed from the site.
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognized landfill facility, proof of this removal will be kept on file at the applicant's office. It will not be permitted to be buried or burned on the site.
- Weed / Alien clearing will be done in a sporadic manner during the life of the Mining activities. Species regarded as the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014 Species regarded as need to be eradicated from the site on final closure. Final rehabilitation shall be completed within a period specified by the Regional Manager.
- Final rehabilitation shall be completed within a period specified by the Regional Manager.

Rehabilitation of the excavated area:

Due to the impracticality of importing large volumes of fill to restore the quarry area to its original topography, the rehabilitation option is to develop the quarry into a minor landscape feature. This will entail creating a series of irregular benches along the quarry faces, the top edges of each face being blasted away to form slopes (40º) on the benches below, thereby reducing the overall face angle.

Fill and topsoil could be placed over the benches to provide a suitable medium for the establishment of vegetation, especially trees which will break up the line of the faces and enhance their appearance. The floor of the quarry should be capped with suitable soil material and re-vegetated.

Rocks and coarse material removed from the excavation must be dumped into the excavation.

No waste will be permitted to be deposited in the excavations. Once rocks and coarse natural materials has been dumped into the excavated area and profiled with acceptable contours and erosion control measures, topsoil shall be returned over the area.

The area shall be fertilized 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 Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a vegetation seed mix to his or her specification.

Rehabilitation of plant, office and service areas:

Coarse natural material used for the construction of ramps must be removed and dumped into the excavations. Stockpiles will be removed during the decommissioning phase, the area ripped and the topsoil returned to its original depth to provide a growth medium. On completion of operations, all structures or objects shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002):

- Where sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
- Areas containing French drains shall be compacted and covered with a final layer of topsoil to a height of 10cm above the surrounding ground surface.
- The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.

Photographs of the office sites and workshop, before and during the mining operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the Regional Manager.

On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, shall be scarified and graded to an even surface condition. Where applicable / possible topsoil needs to be returned to its original depth over the area.

Prior to replacing the topsoil, the material that was removed from these areas will be replaced in the same order as it originally occurred. The area shall then be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix.

If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a seed mix to his or her specification.

Final rehabilitation:

Rehabilitation of the surface area shall entail reshaping, levelling, top dressing, land preparation, seeding and maintenance, and weed / alien clearing.

All infrastructures, equipment, plant, temporary housing and other items used during the mining period will be removed from the site.

Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognized landfill facility. It will not be permitted to be buried or burned on the site.

Weed / Alien clearing will be done in a sporadic manner during the life of the mining activities. Species regarded as the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014 Species regarded as need to be eradicated from the site on final closure. Site management must implement an invasive plant species management plan (Appendix N) during the 12 months aftercare period to address germination or problem plants in the area.

Final rehabilitation shall be completed within a period specified by the Regional Manager.

Seeding of the area:

Once the pit slopes have been shaped and the soil replaced, the initial goal is to establish a good cover of a robust grass that will stabilise the soil and start the accumulation of soil organic carbon. This will be done using a combination of hydro seeding and physical planting of runners to apply a mix of commercial and indigenous species that includes both tufted and creeping species. The plants that were collected during the establishment and operational phases and kept in the designated area will be replanted.

ii) Volume and rate of water use required for the operation

The water needed for the proposed activity will stem from the need for dust suppression within the excavation and along the hail roads as well as for the processing of the mineral on the plant equipment. Water will be abstracted from a borehole to be located on site, that will be drilled. A water truck will be used to spray access roads to alleviate dust generation. It is proposed that the mining activities will require to a maximum of 2000 – 4000 l of water per day.

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

A borehole located on site for the abstraction of groundwater for the use on site for dust suppression and plant equipment (processing) will be drilled for the proposed activity. This water use will be licensed with DWS in accordance with NWA (Act No. 104 of 1998), Section 21 activities.

iv) Impacts to be mitigated in their respective phases

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

Table 26: Impacts to be mitigated in their respective phases.

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
whether listed or not listed	(volumes, tonnages and hectares or m^2)	In which impact is anticipated			
(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.)		(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))			
DEMARCATION OF SITE WITH VISIBLE BEACONS.	5ha	Construction / Site Establishment phase	Demarcation of the site will ensure that all employees are aware of the boundaries of the processing area and that work stay within approved area.	Mining of the dolerite aggregate is only allowed within the boundaries of the approved area. • MPRDA, 2008 • NEMA, 1998	Beacons need to be in place throughout the life of the activity.

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	±2ha	Site Establishment phase & Operational phase	<u>Visual Mitigation:</u> • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • The permit holder must limit vegetation removal, and stripping of topsoil, may only be done immediately prior to the mining / use of a specific area. • The excavation must be contained within the approved footprint of the permit area. • Upon closure all infrastructure must be removed and the area must be returned to its prior status. • Screens will be considered if I&AP complaints are received. • Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. • Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	Management of the mining activities must be in accordance with the: • MPRDA, 2008 • NEMA, 1998	Throughout the site establishment- and operational phases.

ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	Operational phase & Decommissioning phase	±4ha	**<u>Dust Handling:</u>** • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents that contains no PCB's (e.g. DAS products). • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the haul roads must be limited to 20 km/h to prevent the generation of excess dust. • Roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. • Areas devoid of vegetation, which could act as a dust source, must be minimized and vegetation removal may only be done immediately prior to mining. • The fallout dust monitoring system to be placed at Driefonteinen Quarry. • All dust generating activities shall comply with the National Dust Control Regulations, GN No R827 promulgated in terms of NEM:AQA (Act 39 of 2004) and ASTM D1739 (SANS 1137:2012).	Dust generation on site must be managed in accordance with the: • NEM:AQA, 2004 Regulation 6(1) • National Dust Control Regulations, GN No R827 • ASTM D1739 (SANS 1137:2012)	Throughout operational and decommissioning phases.

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			▪ Best practice measures shall be implemented during the stripping of topsoil, excavation, and transporting of material from site to minimize potential dust impacts.		

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	Operational phase & Decommissioning phase	±4ha	**Emission Handling:** • All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases.

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	Operational phase & Decommissioning phase	±4ha	**<u>Noise Handling:</u>** • Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received. • The Applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the mining area. • All mining vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996 (Act No 93 of 1996). • The type, duration and timing of the blasting procedures must be planned with due cognizance of other land users and structures in the vicinity. Surrounding land owners must be notified in writing prior to each blasting occasion. • Best practice measures shall be implemented in order to minimize potential noise impacts. • A qualified occupational hygienist must be contracted to quarterly monitor and report on the personal noise exposure of the employees working at the mine. The monitoring must be done in accordance with the SANS 10083:2004 (Edition 5) sampling method as well as NEM:AQA, 2004, SANS 10103:2008.	Noise generation on site must be managed in accordance with the: • NEM:AQA, 2004 Regulation 6(1) • NRTA, 1996	Throughout operational and decommissioning phases.

ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	±3ha	Site Establishment phase	**<u>Flora:</u>** • Ensure permits are obtained to remove protected species. • Relocate all protected species with aid of specialists. • Only remove species in areas designated for activity and do not disturb surrounding areas. • Plan activities carefully so that only vegetation that needs to be impacted is impacted. Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. • Limit activity to area of disturbance and revegetated impacted areas as soon as possible. • Eradicate and control all alien invasive species on site. • Rehabilitate and revegetated all areas where alien invasive species were removed. • Applicant must arrange that a botanists conduct a plant rescue walk-through of the mining footprint, prior to any bush clearance to identify the plants in need of a destruction / removal permit. • The Applicant must then apply for a permit for the removal or destruction of all protected and red listed plants that will be affected. This application must be made to the Department of Economic Development, Environmental Affairs and Tourism – Western Cape Province (DEDEAT-WC). • Bush-clearance may only commence once the recommendations of the specialist has been implemented. • No plants may be removed without the approval of the ECO. Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004	Throughout the site establishment- and operational phases.

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the habilitated areas. The following control methods can be used • "The plants can be uprooted, felled or cut off and can be destroyed completely." • "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.		

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
STRIPPING AND STOCKPILING OF TOPSOIL & SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	±3ha	Operational phase and Decommissioning Phase	• Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. • Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. • Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. • Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. • Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented.	• Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un-vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 • Bare areas need to be re-vegetation to prevent soil erosion.	Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	±3ha	Operational phase and Decommissioning Phase	• Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION**	Site Establishment phase	±3.9 ha	**Archaeological, Heritage and Palaeontological Aspects:** • All mining must be confined to the development footprint area. • If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. • It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area. • The senior on-site Manager must inform the ECO of the chance find and its immediate impact on operations. The ECO must then contact a professional archaeologist for an assessment of the finds who must notify the SAHRA. • Work may only continue once the go-ahead was issued by SAHRA.	Cultural/heritage aspects on site must be managed in accordance with the: • NHRA, 1999	Throughout operational and decommissioning phases.

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. & STRIPPING AND STOCKPILING OF TOPSOIL & DRILLING AND BLASTING & EXCAVATION & CRUSHING AND SCREENING OF AGGREGATES & TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS & SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	3ha	Operational phase And Deconditioning Phase	• Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. • All leaks will be cleaned up immediately using an absorbent material. • Rigs will be regularly serviced to reduce risk of leaks. Pans will be placed under potential leak sites. • Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. • Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. • Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. • All hydrocarbons will be stored in mobile bunded containers fitted with taps. • Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company.	Mining related waste must be managed in accordance with the: • NWA, 1998 • NEM:WA, 2008	Throughout operational and decommissioning phases

STRIPPING AND STOCKPILING OF TOPSOIL & SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Operational phase & Decommissioning phase	±3.9 ha	**<u>Erosion Control and Storm Water Handling:</u>** • The runoff from compacted surfaces must be slowed down and dispersed sufficiently to prevent accelerated erosion. • Erosion control measure must be put in place to minimise erosion along the proposed mining area. Extra precautions must be taken in areas where the soils are deemed highly erodible. Erosion control measures could include the use of sand bags, hessian sheets, retention or replacement of vegetation. • Stockpiling of soil must not be allowed on or near steep slopes. This is to prevent pollution or the impediment of surface run-off. • Drainage must be controlled to ensure that runoff from the project area does not culminate in off-site pollution, flooding or result in any damage to infrastructure downstream or any storm water discharge points. • Mining must be conducted only in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department may impose: ○ Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water	Erosion and storm water must be managed in accordance with the: • CARA, 1983 • NEMA, 1998 • NWA, 1998	Throughout operational and decommissioning phases.

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			system. You must prevent clean water from running or spilling into dirty water systems. ○ Dirty water must be collected and contained in a system separate from the clean water system. ○ Dirty water must be prevented from spilling or seeping into clean water systems. ○ A storm water management plan must apply for the entire life cycle of the mining activity and over different hydrological cycles (rainfall patterns).		

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			• The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into a storm water management plan. • Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. • All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. • Large leaks will be cleared by reputable oil recycling company. • Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. • Ensure water management facilities are operating adequately. Clean out silt build up over dry season. • Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.		

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES**	±5ha	Site Establishment Phase	<u>Protection of Fauna:</u> • Inform staff, contractors and visitors to not harm fauna in the area. • Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. • Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. • Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. • Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. • Conduct annual surveys to monitor faunal biodiversity. Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.	<u>Negative impact on fauna that may enter the area:</u> • NEM:BA, 2004 Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	Throughout the operational phase.

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
DRILLING AND BLASTING & EXCAVATION & CRUSHING AND SCREENING OF AGGREGATES & TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS	±5ha	Operational Phase	• Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA. • Should it be found that after mining operation have ceased, that the natural vegetation of the area is unacceptable, the area would be re-vegetated with an indigenous s grass seed mix.	Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout the operational phase.
DRILLING AND BLASTING	5ha	Operational phase	Ensure baseline photographs are taken of all structures which may be impacted for photographic evidence prior to any blasting. Ensure procedures in place to compensate for damage. All neighbour's need to be notified of each blasting activity. The N2 roads needs to be beacons off during the blasting event. Ensure that all power-related structures are adequately marked with relevant signs and warnings and fenced off.	The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure. • MHSA, 1996 • OHSA, 1993	Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS	Operational phase & Decommissioning phase	5 ha	All intersections with main tarred roads will be clearly signposted. drivers will be enforced to keep to set speed limits. Trucks will be road-worthy condition. A fund will be set aside to maintain the serviceability of the road verge where the trucks approach or depart from the main road. Ensure directional floodlights are utilized that focus light on the necessary areas and reduce light pollution to surrounding environment.	Degradation of the gravel access road: • NRTA, 1996 The gravel access road needs to be monitored for signs of degradation. Should any signs become apparent immediate rectification actions must be implemented.	
STRIPPING AND STOCKPILING OF TOPSOIL & DRILLING AND BLASTING & EXCAVATION & CRUSHING AND SCREENING OF AGGREGATES	Operational phase & Decommissioning phase	5 ha	Ensure that all stuff are made aware of all working conditions on site	The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure. • MHSA, 1996 • OHSA, 1993	

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	Operational phase & Decommissioning phase	• 5 ha	**<u>Management of health and safety risks:</u>** • Workers must have access to the correct personal protection equipment (PPE) as required by law. • All operations must comply with the Mine Health and Safety Act, 1996 (Act No. 29 of 1996). • The type, duration and timing of the blasting procedures must be planned with due cognizance of other land users and structures in the vicinity. • The surrounding landowners and communities must be informed in writing ahead of any blasting event. • Measures to limit flyrock must be taken. All flyrock (of diameter 150 mm and larger) which falls beyond the working area, together with the rock spill must be collected and removed. • Audible warning of a pending blast must be given at least 3 minutes in advance of the blast.	Health and safety aspects on site must be managed in accordance with the: • MHSA, 1996 • OHSA, 1993 • OHSAS 18001	Throughout operational and decommissioning phases.

e) Impact Management Outcomes

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

Table 27: Impact Management Outcomes.

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
whether listed or not listed	**(Including the potential impacts for cumulative impacts)**		**In which impact is anticipated**	**(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. 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.)	**(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)**		**(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))**	**E.g. Modify through alternative method. Control through noise control. Control through management and monitoring. Remedy through rehabilitation.**	
DEMARCATION OF SITE WITH VISIBLE BEACONS.	No impact could be identified other than the beacons being outside the boundaries of the approved processing area.	N/A	Construction / Site Establishment phase	Control through management and monioting	Mining of the aggregate is only allowed within the boundaries of the approved area: • MHSA, 1996 • OHSA, 1993 • MPRDA, 2008; • NEMA, 1998

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	Deterioration in visual aesthetics of the area	The visual impact may affect the aesthetics of the landscape.	Operational phase	<u>Control:</u> Implementation of proper housekeeping	Management of the mining activitites must be in accordance with the: • MHSA, 1996 • OHSA, 1993 • MPRDA, 2008; • NEMA, 1998

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
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NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	• Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). • Degrading of grazing potential for livestock farming	Land use	Decommissioning phase	Control: • Fire	Every precaution must be taken to prevent contamination. The precautionary principal must apply.

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ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. & STRIPPING AND STOCKPILING OF TOPSOIL & DRILLING AND BLASTING & EXCAVATION & CRUSHING AND SCREENING OF AGGREGATES & TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS & SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Alteration of topography	Topography	Decommissioning phase	N/A	N/A

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	Loss of and disturbance to surface archaeological sites	• Artefacts or graves • Could impact on the cultural and heritage legacy of the receiving environment.	Operational phase	**Control:** • Survey area before site clearance	Loss of Artefacts and Graves: • National Heritage Resources Act No. 25 of 1999

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NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	• Alienation of animals from the area. • Potential risk to avifauna. • Potential harm through littering. • Loss of food, nest sites and refugia • Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. • New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. • Impact to nocturnal insects and their predators and other nocturnal animals.	• The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away	Operational phase	<u>Control:</u> • Implementation of fauna protection measures • Implement good management practices.	<u>Negative impact on fauna that may enter the area:</u> • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	• Noise nuisance caused by machinery stripping and stockpiling the topsoil. • Noise nuisance generated by earthmoving machinery. • Noise nuisance as a result of blasting. • Noise nuisance generated by excavation equipment and earthmoving machinery. • Noise nuisance generated during the landscaping phase.	• The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.	Site Establishment-, Operational-, and Decommissioning Phase	**Control:** • Noise control measures • Proper housekeeping methods	**Noise Handling:** • NEM: AQA, 2004 Regulation 6(1) • All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, Act No 93 of 1996.

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	Emissions caused by vehicles and equipment	Emissions will be contained within the property boundaries and will therefore affect only the landowner.	Operational phase	Control: Emissions	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)

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ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	• Potential compaction of soils in neighbouring areas. • Potential contamination through littering. • Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. • Potential hydrocarbon contamination to soils.	• Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.	Operational phase	**Control:** • Storm water management • Site Management • Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un-vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 • Bare areas need to be re-vegetation to prevent soil erosion.

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	• Contamination of area with hydrocarbons or hazardous waste materials	• Contamination may cause surface or ground water pollution if not addressed	Operational phase	• <u>Control:</u> • Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	• Potential hydrocarbon contamination leeching into the water table. • Reduction of local groundwater. • Potential contamination through littering leeching into the groundwater table • Potential silt-loading of drainage lines, downstream and surrounding water bodies. • Potential hydrocarbon contamination which may reach downstream surface water bodies. • Potential surface water contamination if leaks escape into the environment. • Potential impact of mining activities on the runoff and infiltration of storm water.	• Groundwater pollution • Surface water Bodies	Operational phase	• <u>Control:</u> • Proper site management. • Surface water Management • Implement storm water control measures. • Measures will be implemented as subscribed by DWS.	• <u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> • NWA, 1998

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NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	Influx of unsuccessful job seekers which may informally settle in area. Potential danger to surrounding communities	Social	Construction / Site Establishment phase	Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.
TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS	Road degradation. Increased potential for road incidences Potential distraction to road users	All road users will be affected	Operational phase	Control & Remedy: Road management	Degradation of the gravel access road: • NRTA, 1996 The gravel access road needs to be monitored for signs of degradation. Should any signs become apparent immediate rectification actions must be implemented.
SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Soils replaced and ameliorated	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.	Decommissioning phase	**Control:** • Storm water management • Site Management • Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 • Bare areas need to be re-vegetation to prevent soil erosion.

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Improve response to issues relating to deterioration of groundwater quality or quantity	Groundwater improvement	Decommissioning phase	Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:
SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Reintroduction of fauna attracted to flora to the area	Fauna returning to area	Decommissioning phase	Control: • Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.
SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	• Eradication of trenches and berms. • Re-contouring of area for free surface water drainage. • Eradication of stockpiles	Topography	Decommissioning phase	Control: • Surface water Monitoring	
SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Improved aesthetics through rehabilitation	The visual impact may affect the aesthetics of the landscape.	Decommissioning phase	Control: • Implementation of proper housekeeping	

f) Impact Management Actions

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

Table 28: Impact Management Action

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
whether listed or not listed	**(Including the potential impacts for cumulative impacts)**	**(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. 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.)	**(E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...Etc..)**	**E.g., Modify through alternative method. Control through noise control. Control through management and monitoring. Remedy through rehabilitation.**		
DEMARCATION OF SITE WITH VISIBLE BEACONS.	No impact could be identified other than the beacons being outside the boundaries of the approved mining area.	Control through management and monitoring.	Mining of the aggregate is only allowed within the boundaries of the approved area. • MHSA, 1996; • OHSA, 1993; • MPRDA, 2008; and • NEMA, 1998.	Beacons need to be in place throughout the life of the activity.

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	• Visual intrusion as a result of site establishment. • Visual intrusion associated with the excavation activities.	<u>Control:</u> Implementing proper housekeeping.	Management of the mining activities must be in accordance with the: • MPRDA, 2008 • NEMA, 1998	Throughout site establishment- and operational phases.

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	• Loss of biodiversity. • Potential damage to vegetation in neighbouring areas. • Alien invasive encroachment. • Potential negative impact on the nearby critical biodiversity area. • Potential loss of protected or red data plan species.	<u>Control & Remedy:</u> • Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. • Adherence to the 20m no go buffer zone. • Implementation of good management practices and adhering to the recommendations of the botanist. <u>Modify:</u> • Consider use of a less sensitive area	<u>Management of weed- or invader plants:</u> • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area. <u>Protected and/or red data species must be protected in accordance with the:</u> • NEMBA (Act No. 10 of 2004).	Throughout operational and decommissioning phases. Applicable during the site establishment phase.

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	• Alienation of animals from the area. • Potential risk to avifauna. • Potential harm through littering. • Loss of food, nest sites and refugia • Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. • New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. • Impact to nocturnal insects and their predators and other nocturnal animals.	• <u>Control:</u> • Implementation of fauna protection measures • Implement good management practises.	<u>Negative impact on fauna that may enter the area:</u> • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. & STRIPPING AND STOCKPILING OF TOPSOIL & DRILLING AND BLASTING & EXCAVATION & CRUSHING AND SCREENING OF AGGREGATES & TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS & SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Loss of and disturbance to surface archaeological sites	**Control:** • Survey area before site clearance. • Implement good management practices.	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999	Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	• Dust nuisance caused by the disturbance of soil. • Dust nuisance caused by blasting activities. • Dust nuisance due to excavation and from loading and vehicles transporting the material.	Control: Dust suppression methods and proper housekeeping.	Dust generation on site must be managed in accordance with the: • NEM:AQA, 2004 Regulation 6(1) • National Dust Control Regulations, GN No R827 • ASTM D1739 (SANS 1137:2012)	Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	• Noise nuisance caused by machinery stripping and stockpiling the topsoil. • Noise nuisance generated by earthmoving machinery. • Noise nuisance as a result of blasting. • Noise nuisance generated by excavation equipment and earthmoving machinery. • Noise nuisance generated during the landscaping phase.	**Control:** • Noise control measures • Proper housekeeping.	• **Noise Handling:** • NEM: AQA, 2004 Regulation 6(1) • All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	• Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	• Emissions caused by vehicles and equipment	<u>Control:</u> • Emissions by vehicles on site.	<u>Dust Handling:</u> • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	• Potential compaction of soils in neighbouring areas. • Potential contamination through littering. • Potential for loss of soil & damage to soil characteristics. • Initial increased potential for loss of soils and soil erosion. • Potential hydrocarbon contamination to soils. • Loss / contamination of stockpiled topsoil. • Loss of reinstated topsoil from denuded areas. • Potential infestation of the topsoil heaps with invader plans species.	**Control:** • Storm water management • Site Management • Soil Management • Proper housekeeping • Implementation of an invasive plant species management plan.	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 • CARA, 1983 • Bare areas need to be re-vegetation to prevent soil erosion.	Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	• Contamination of area with hydrocarbons or hazardous waste materials • Potential contamination of footprint area and surface runoff as a result of hydrocarbon spillages. • Potential contamination of environment as a result of improper waste disposal. • Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	<u>Control & Remedy:</u> • Proper housekeeping and implementation of an emergency response plan and waste management plan.	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	• Potential erosion of denuded areas. • Soil erosion. • Potential silt-loading of drainage lines, downstream and surrounding water bodies. • Potential hydrocarbon contamination which may reach downstream surface water bodies. • Potential surface water contamination if leaks escape into the environment. • Potential impact of mining activities on the runoff and infiltration of storm water. • Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. • Potential contamination through littering leeching into the groundwater table • Improve response to issues relating to deterioration of groundwater quality or quantity	<u>Control & Remedy:</u> • Control of storm water runoff and implementation of a closure plan with erosion protection aspects. • Surface water Management Implement storm water control measures. • Measures will be implemented as subscribed by DWS. • Proper site management.	<u>Erosion and storm water must be managed in accordance with the</u>: • CARA, 1983 • NEMA, 1998 • NWA, 1998	Throughout operational- and decommissioning phases.

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. & STRIPPING AND STOCKPILING OF TOPSOIL & DRILLING AND BLASTING & EXCAVATION & CRUSHING AND SCREENING OF AGGREGATES & TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS & SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	• Health and safety risk posed by blasting activities. • Unsafe working environment for employees. • Safety risk posed by un-sloped areas.	<u>Stop & Control:</u> • Adherance to the blasting rules and regulations, demarcation of the mining area and proper housekeeping.	<u>Health and safety aspects on site must be managed in accordance with the:</u> • MHSA, 1996 • OHSA, 1993 • OHSAS 18001	Throughout operational- and decommissioning phases.
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. & STRIPPING AND STOCKPILING OF TOPSOIL & DRILLING AND BLASTING & EXCAVATION	Alteration of topography	N/A	N/A	Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	• Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). • Degrading of grazing potential for livestock farming	<u>Control:</u> • Fire Management	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. & STRIPPING AND STOCKPILING OF TOPSOIL & DRILLING AND BLASTING & EXCAVATION & CRUSHING AND SCREENING OF AGGREGATES & TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS & SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	• Influx of unsuccessful job seekers which may informally settle in area. • Potential danger to surrounding communities	Control through proper site management	N/A	Construction / Site Establishment phase
STRIPPING AND STOCKPILING OF TOPSOIL	Disturbance of geological strata	N/A	N/A	Throughout operational and decommissioning phases
TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS	• Road degradation. • Increased potential for road incidences • Potential distraction to road users	<u>Control & Remedy:</u> • Road management	<u>Degradation of the gravel access road:</u> • NRTA, 1996 The gravel access road needs to be monitored for signs of degradation. Should any signs become apparent immediate rectification actions must be implemented.	Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Soils replaced and ameliorated	**Control:** • Storm water management • Site Management • Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 • Bare areas need to be re-vegetation to prevent soil erosion.	Throughout operational phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	• Containment of dirty water. • Improve response to issues relating to deterioration of surface water quality or quantity. free drainage resorted to area. • Revegetation of disturbed areas reduces risk of silt loading on downstream water bodies. Large area of surface water runoff return to catchment	Control: • Surface water Management Implement storm water control measures. • Measures will be implemented as subscribed by DWS.	NWA, 1998	Throughout operational and decommissioning phases
SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	• Reintroduction of fauna attracted to flora to the area	Control: • Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	Throughout operational and decommissioning phases
SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	• Eradication of trenches and berms. • Re-contouring of area for free surface water drainage. • Eradication of stockpiles	Control: • Surface water Monitoring		Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	• Improved aesthetics through rehabilitation	<u>Control:</u> • Implementation of proper housekeeping	<u>Land use zoning:</u> • Western Cape LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	Throughout operational and decommissioning phases

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 primary objective is to obtain a closure certificate at the end of the life of the mining permit at minimum cost and in as short a time period as possible whilst still complying with the requirements of the Minerals and Petroleum Resources Development Act, 2002. To realise this, the following objectives must be achieved:

- Remove all temporary infrastructure and waste from the site as per the requirements of this EMPR and of the Provincial Department of Mineral Regulation;
- Demolish / rehabilitate all roads with no post -Mining use potential;
- Clear all aggregate material from site;
- Clear boulders form site;
- Remove all waste from site;
- The perimeter walls of the opencast pit to be sloped at 1:3 to the pit floor, to prevent soil erosion, or to be stepped by creating benches of not more than 3meters high.
- Future public health and safety are not compromised;
- Ensure that no threat to surface and underground water quality remains;
- Ensure that all permanent changes in topography are sustainable and do not cause erosion or the damming up of runoff;
- Shape and contour all disturbed areas in compliance with the EMPR;
- The stockpiled topsoil (that is available) will be spread over the disturbed area to a depth of at least 300 mm;
- Make safe any dangerous excavations or subsidence on the surface;
- Rehabilitate all disturbed areas in compliance with the EMPR and of the Provincial Department of Mineral Regulation;
- Ensure that all rehabilitated areas are safe, stable and self-sustaining in terms of vegetation;
- Control of weeds and alien invasive plant species is an important aspect after topsoil replacement and seeding has been done in an area;
- The applicant will comply with the minimum closure objectives as prescribed by DMR;
- Any adverse socio-economic impacts are minimised; and
- All socio-economic benefits are maximised.

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

This report, the Draft Basic Assessment Report, includes all the environmental objectives in relation to closure and will be made available for perusal of I&AP's and stakeholders over a 30-day period. Any additional comments received during the commenting period will be added to the Final Basic Assessment Report to be submitted to DMR for approval.

(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 requested rehabilitation plan is attached in Appendix E. Upon closure of the Mining activity all infrastructure will be removed. The compacted areas will be ripped and levelled, upon which the topsoil will be replaced. No permanent structures will remain upon closure of the site. The rehabilitation plan shall entail removal of all generated waste, infrastructures and materials, re-vegetation of disturbed and cleared areas, rehabilitation of access roads, ensuring the growth of the existing grasses and plants species and cleaning of spillages etc. Please refer to the Closure plan for the Driefonteinen Quarry as attached in Appendix O.

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

The rehabilitation of the Mining area as indicated on the rehabilitation plan attached as Appendix E will comply with the minimum closure objectives as prescribed by DMR and detailed below, and therefore is deemed to be compatible:

Rehabilitation of the excavated area:

- Due to the impracticality of importing large volumes of fill to restore the quarry area to its original topography, the rehabilitation option is to develop the quarry into a minor landscape feature.
- This will entail creating a series of irregular benches along the quarry faces, the top edges of each face being blasted away to form slopes on the benches below, thereby reducing the overall face angle. Oversized rocks and overburden will be used to make the quarry safe.
- Fill and topsoil could be placed over the benches to provide a suitable medium for the establishment of vegetation, especially trees which will break up the line of the faces and enhance their appearance. The floor of the quarry should be capped with suitable soil material and re-vegetated.
- Rocks and coarse material removed from the excavation must be dumped into the excavation.
- No waste will be permitted to be deposited in the excavations.
- The area shall be fertilized 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 Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a vegetation seed mix to his or her specification.

Rehabilitation of plant, office and service areas:

- Coarse natural material used for the construction of ramps must be removed and dumped into the excavations.
- Stockpiles will be removed during the decommissioning phase, the area ripped and the topsoil returned to its original depth to provide a growth medium.
- On completion of operations, all structures or objects shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act [MPRDA], 2002 (Act No. 28 of 2002):
    - Where sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
    - Areas containing French drains shall be compacted and covered with a final layer of topsoil to a height of 10cm above the surrounding ground surface.
    - The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- Photographs of the workshop and office sites, before and during the mining operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the Regional Manager.
- On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, shall be scarified and graded to an even surface condition. Where applicable / possible topsoil needs to be returned to its original depth over the area.
- Prior to replacing the topsoil, the material that was removed from these areas will be replaced in the same order as it originally occurred.
- The area shall then be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a seed mix to his or her specification.

Final rehabilitation:

- Rehabilitation of the surface area shall entail reshaping, levelling, top dressing, land preparation, seeding and maintenance, and weed / alien clearing.
- All Infrastructures, equipment, plant, and other items used during the mining permit period will be removed from the site.
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining permit area and disposed of at a recognized landfill facility; proof of this removal will be kept on file at the applicant's office. It will not be permitted to be buried or burned on the site.

- Weed / Alien clearing will be done in a sporadic manner during the life of the Mining activities. Species regarded as the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014 Species regarded as need to be eradicated from the site on final closure. Final rehabilitation shall be completed within a period specified by the Regional Manager.
- Final rehabilitation shall be completed within a period specified by the Regional Manager.
- Seeding of the area:

    - Once the pit slopes (40º) have been shaped and the soil replaced, the initial goal is to establish a good cover of a robust grass that will stabilise the soil and start the accumulation of soil organic carbon. This will be done using a combination of hydro seeding and physical planting of runners to apply a mix of commercial and indigenous species that includes both tufted and creeping species. The plants that were collected during the establishment and operational phases and kept in the designated area will be replanted.

The closure plan will assist Haw and Inglis Civil Engineering (Pty) Ltd to achieve the following objectives:

- Protect and enhance the reputation of Haw and Inglis as a responsible corporate citizen;
- Ensure shareholder values is preserved;
- Establish Haw and Inglis management accountability and ownership of closure activity;
- Ensure that stakeholders needs, concerns and aspiration are taken into account when considering closure;
- Comply with relevant and applicable legislative requirements;
- Ensure health , safety and welfare of all humans and animals are safeguarded from hazards resulting from mining operations that have been terminated;
- Limit or mitigate adverse environmental affects to an extent that it is acceptable by all parties;
- Mitigation socio-economic impacts in relation to a particular area in which an operation is located following decommissioning and subsequent closure as far as reasonably practical;
- Help protect indigenous values;
- Provide a reasonably basis on which the financial consequences of closure can be estimated, recognised and managed including any tax consequences so that mines are closed efficiently and cost effectively;
- Avoid or minimises cost and long term liabilities to the company and to the government and public;
- Ensure land is rehabilitated to, as far as practicable, its natural state, or to a predetermined and agreed standard or land use which conforms with the concepts of sustainable development; and
- Ensure investment decision include appropriate consideration of closure, including both quantitative and qualitative impacts of closure.

In terms of the Mine closure plans for the proposed Driefonteinen Quarry, Haw and Inglis requires that planning processes be developed and implemented to ensure that the quarry disturbance cab be satisfactory rehabilitated and that the residual liability for mine closure is tolerable. Effective planning and final landform design during operations is central to ensuring cost effective, sustainable objectives can be met.

The intent is that the closure phase should be effectively planned, designed, managed and adequately financially provided for. Objectives, strategies and commitments have been identified that meet current stakeholder expectations.

The closure plan will be reviewed annually and updated every two years or as significant changes to the mine plan occur, as nearing closure. Please refer to the closure plan as attached in Appendix O.

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

The calculation of the quantum for financial provision was according to Section B of the working manual.

Mine type and saleable mineral by-product

According to Tables B.12, B.13 and B.14

Mine type	Aggregate and Gravel
Saleable mineral by-product	None

Risk ranking

According to Tables B.12, B.13 and B.14

Primary risk ranking (either Table B.12 or B.13	Class C (Low risk).
Revised risk ranking (B.14)	N/A

Environmental sensitivity of the mine area

According to Table B.4

Environmental sensitivity of the mine area	Med

Level of information

According to Step 4.2:

Level of information available	Limited Information

Identify closure components

According to Table B.5 and site-specific conditions

Component No.	Main description	Applicability of closure components (Circle Yes or No)	
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	Yes	
2(A)	Demolition of steel buildings and structures		No
2(B)	Demolition of reinforced concrete buildings and structures		No
3	Rehabilitation of access roads		No
4(A)	Demolition and rehabilitation of electrified railway lines		No
4(B)	Demolition and rehabilitation of non-electrified railway lines		No
5	Demolition of housing and facilities		No
6	Opencast rehabilitation including final voids and ramps	Yes	
7	Sealing of shafts, adits and inclines		No
8(A)	Rehabilitation of overburden and spoils	Yes	
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing)		No
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich)		No
9	Rehabilitation of subsided areas		No
10	General surface rehabilitation, including grassing of all denuded areas	Yes	
11	River diversions		No
12	Fencing	Yes	No
13	Water management (Separating clean and dirty water, managing polluted water and managing the impact on groundwater)		No
14	2 to 3 years of maintenance and aftercare	Yes	

Unit rates for closure components

According to Table B.6 master rates and multiplication factors for applicable closure components. The master rate from DMR Master Rates table for financial provision of 2019 has been used.

Component No.	Main description	Master rate	Multiplication factor
1	Dismantling of **processing plant and related structures** (including overland conveyors and power lines)	R 16	1.00
2(A)	Demolition of **steel buildings and structures**		
2(B)	Demolition of **reinforced concrete buildings and structures**		
3	Rehabilitation of **access roads**		
4(A)	Demolition and rehabilitation of **electrified railway lines**		
4(B)	Demolition and rehabilitation of **non-electrified railway lines**		
5	Demolition of **housing and facilities**		
6	**Opencast rehabilitation** including final voids and ramps	R238 697	0.04
7	Sealing of **shafts, adits and inclines**		
8(A)	Rehabilitation of **overburden and spoils**	R159 131	
8(B)	Rehabilitation of **processing waste deposits and evaporation ponds (basic, salt-producing)**		
8(C)	Rehabilitation of **processing waste deposits and evaporation ponds (acidic, metal-rich)**		
9	Rehabilitation of **subsided areas**		
10	**General surface rehabilitation**, including grassing of all denuded areas	198195	1.00
11	**River diversions**		
12	**Fencing**	144	1.00
13	**Water management** (Separating clean and dirty water, managing polluted water and managing the impact on groundwater)		
14	2 to 3 years of **maintenance and aftercare**		

Determine weighting factors

According to Tables B.7 and B.8

Weighting factor 1: Nature of terrain/accessibility	1.20 (Rugged)
Weighting factor 2: Proximity to urban area where goods and services are to be supplied	1.05 (Peri-Urban)

Calculation of closure costs

The amount that will be necessary for the rehabilitation of damages caused by the operation, both sudden closures during the normal operation of the project and at final, planned closure gives a sum total of **R 1 380 469.52.**

Table B.10 Template for Level 2: "Rules-based" assessment of the quantum for financial provision							
CALCULATION OF THE QUANTUM							
Mine:	**Haw and Inglis - Driefonteinen Quarry**			**Location:**	**Mossel Bay**		
Evaluators:	**Yolandie Coetzee**			**Date:**			**25-Mar-19**
No	**Description**	**Unit**	**A Quantity**	**B Master rate**	**C Multiplication factor**	**D Weighting factor 1**	**E=A *B*C*D Amount (rands)**
			Step 4.5	**Step 4.3**	**Step 4.3**	**Step 4.4**	
	Description		**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 power lines)	m^3	2 500	16	1	1,2	R 48 000,00
2a	Demolition of steel buildings and structures	m^2	0	228	1	1,2	R 0,00
2b	Demolition of reinforced concrete buildings and structures	m^2	0	336	1	1,2	R 0,00
3	Rehabilitation of access roads	m^2	0	41	1	1,2	R 0,00
4a	Demolition and rehabilitation of electrified railway lines	m	0	395	1	1,2	R 0,00
4b	Demolition and rehabilitations of non-electrified railway lines	m	0	216	1	1,2	R 0,00
5	Demolition of housing and/or administration facilities	m^2	0	455	1	1,2	R 0,00
6	Opencast rehabilitation including final voids and ramps	ha	2	238 697	0,52	1,2	R 297 893,86
7	Sealing of shaft, audits and inclines	m^3	0	122	1	1,2	R 0,00
8a	Rehabilitation of overburden and spoils	ha	2	159 131	1	1,2	R 381 914,40
8b	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	ha	0	198 195	1	1,2	R 0,00
8c	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	ha	0	575 653	0,51	1,2	R 0,00
9	Rehabilitation of subsided areas	ha	0	126 059	1	1,2	R 0,00
10	General surface rehabilitation	ha	1	126 059	1	1,2	R 151 270,80
11	River diversions	ha		126 059	1	1,2	R 0,00
12	Fencing	m		144	1	1,2	R 0,00
13	Water Management	ha		47 931	0,6	1,2	R 0,00
14	2 to 3 years of maintenance and aftercare	ha	5	17 782	1	1,2	R 106 692,00
15a	Specialists study	Sum				1,2	R 0,00
15b	Specialists study	Sum				1,2	R 0,00
							R 985 771,06
	Multiply Sum of 1-15 by Weighting factor 2 (Step 4.4)			1,05		**Sub Total 1**	R 1 035 059,61

	General and prelim		6% of subtotal 1				R 62 103,58
	Contingency			10.0% of Subtotal 1			R 103 505,96
	(Subtotal 1 plus management and contingency)					**Sub Total 2**	R 1 200 669,15
	Vat (15%)					**Sub Total 3**	R 180 100,37
	(Subtotal 3 plus VAT)					**GRAND TOTAL**	R 1 380 769,52

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

Herewith I, the person, whose name is stated below confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application. I herewith confirm that the company will provide the amount that will be determined by the Regional Manager in accordance with the prescribed guidelines.

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

h) Monitoring of Impact Management Actions

i) Monitoring and reporting frequency

j) Responsible persons

k) Time period for implementing impact management actions

l) Mechanisms for monitoring compliance

Table 29: Mechanisms for monitoring compliance

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
whether listed or not listed			(FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
DEMARCATION OF SITE WITH VISIBLE BEACONS.	Maintenance of beacons	• Visible beacons need to be established at the corners of the processing area. • A 20m buffer area (if applicable) from any natural areas need to be demarcated. • A 30m buffer area from a watercourse needs to be demarcated if applicable.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure beacons are in place throughout the life of the activity.	• Throughout Operational Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	Surface and Groundwater	• Monitor portable toilets for any leaks. • Equipment's needs to be monitored to prevent any hydrocarbon spills. <u>Stormwater control:</u> • Storm water management structures such as berms to direct storm- and runoff water around the stockpiled topsoil area.	<u>Responsibility:</u> • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. <u>Role:</u> • Divert storm- and runoff water around the stockpile area to prevent erosion. • Control run-off water with temporary banks, where necessary, to prevent accumulation of run-off causing down-slope erosion. • Conduct the activity in accordance with the Best Practice Guideline for small-scale mining as stipulated by DWS	• Applicable Throughout all Phases • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	<u>Geology and Soil:</u> • Loss/contamination of stockpiled topsoil. • Loss of reinstated topsoil from denuded areas.	<u>Soil contamination:</u> • Monitor portable toilets for any leaks. <u>Stormwater control:</u> • Storm water management structures such as berms to direct storm- and runoff water around the stockpiled topsoil area. <u>Soil Management:</u> • Excavating equipment to remove the first 500 mm of topsoil from the proposed work areas. The applicant already has this equipment available. • Berms to be made to direct storm- and runoff water around the stockpiled topsoil area. • Ensure that topsoil is being kept separate form overburden. <u>Erosion monitoring:</u> • Grader to restore areas prone to soil erosion. • Planting of a cover crop to stabilize re-instated soil • Erosion prevention equipment.	<u>Responsibility:</u> • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. <u>Role:</u> • Strip and stockpile the upper 500 mm of the soil before mining. • Carefully manage and conserve the topsoil throughout the stockpiling and rehabilitation process. • Ensure topsoil stripping, stockpiling and re-spreading is done in a systematic way. Plan mining in such a way that topsoil is stockpiled for the minimum possible time. • Consider stockpiling the topsoil at the existing topsoil storage area (Existing Quarry area), alternatively place topsoil heaps on a levelled area within the mining footprint area and implement measures to safeguard the piles from being washed away. Do not stockpile topsoil in undisturbed areas. • Ensure that topsoil heaps do not exceed 1.5 m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen. • Divert storm- and runoff water around the stockpile area to prevent erosion. • Vegetate the topsoil heaps to be stored longer than 6 months with an indigenous grass seed mix if vegetation does not naturally germinate within the first growth season. • Spread the topsoil evenly over the rehabilitated area upon closure of the site.	• Applicable Throughout all Phases • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			• Strive to re-instate topsoil at a time of the year when vegetation cover can be established as quickly as possible afterwards, to that erosion of returned topsoil is minimized. The best time of year is at the end of the rainy season. • Plant a cover crop immediately after spreading topsoil to stabilise the soil and protect it from erosion. Fertilise the cover crop for optimum production. Rehabilitation extends until the first cover crop is well established. • Control run-off water with temporary banks, where necessary, to prevent accumulation of run-off causing down-slope erosion. • Monitor the rehabilitated area for erosion, and appropriately stabilize if erosion do occur, for at least 12 months after reinstatement. • Remove topsoil at right angles to the slope to slow down surface runoff and prevent erosion. • Conduct topsoil stripping, stockpiling and re-spreading in a systematic way. Ensure topsoil is stockpiled for the minimum possible time. • Protect topsoil stockpiles against losses by water and wind erosion through the establishment of plants on the stockpiles. • Conduct the activity in accordance with the Best Practice Guideline for small-scale mining as stipulated by DWS.	

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	• Visual intrusion as a result of site establishment. • Visual intrusion associated with the excavation activities.Monitoring of visual impacts. Inspect area for illegal littering and dumping	• Ensure that the site have a neat appearance and is kept in good condition at all times. • Control the height of the stockpiles to minimize the visual impact on the surrounding environment. • Remove all infrastructure upon rehabilitation of the processing area and return the area to its prior status. • Minimize the visual impact of the activity on the surrounding environment through proper site management and implementing good housekeeping practices	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure that the site have a neat appearance and is kept in good condition at all times. • Store mining equipment in a dedicated area when not in use. • Limit vegetation removal, and only strip topsoil immediately prior to the mining/use of a specific area. • Contain excavations to the approved footprint of the permitted area. • Remove all equipment upon rehabilitation of the mining area and return the area to its prior status.	• Applicable Throughout all Phases • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	Air Quality: • The dust generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods. • Dust nuisance caused by the disturbance of soil. • Dust nuisance caused by blasting activities. • Dust nuisance due to excavation and from loading and vehicles transporting the material. • Dust nuisance due to landscaping activities.	Dust Handling and Monitoring: • Dust suppression equipment such as a water car and water dispenser. The applicant already has this equipment available. Dust Monitoring will also be conducted on site on a monthly basis. • Fallout dust monitoring equipment. • Gravimetric dust monitoring equipment. • Dust suppression equipment such as a water car, water dispenser and sprayers on the crusher plant. • Signage that clearly reduce the speed on the access roads.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. • Dampen the stockpiles during periods of high wind spells. • Assess effectiveness of dust suppression equipment. • Limit speed on the access roads to 40km/h to prevent the generation of excess dust. • Spray gravel roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. • Minimise areas devoid of vegetation, and only remove vegetation immediately prior to mining. • Ensure dust-generating activities comply with the National Dust Control Regulations, GN No R827 promulgated in terms of NEM:AQA, 2004 and ASTM D1739 (SANS 1137:2012). • Implement best practice measures during the stripping of topsoil, excavation, and transporting of material from site to minimize potential dust impacts	• Applicable Throughout all Phases • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	Emission Monitoring: • The emissions generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.	Emission Handling and Monitoring: • Emissions will be monitored	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • All vehicles in good working order to reduce risk of emissions	• Applicable Throughout all Phases • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	Noise Monitoring • The noise impact should be contained within the boundaries of the property, as it will represent the current activities.	Noise Handling and Monitoring: • Site manager to ensure that the vehicles are equipped with silencers and maintained in a road worthy condition. • Compliance with the appropriate legislation with respect to noise will be mandatory.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the processing area. • Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act, 1996. • Plan the type, duration and timing of the blasting procedures with due cognizance of other land users and structures in the vicinity. Notify the surrounding land owners in writing prior to each blasting occasion. • Implement best practice measures to minimise potential noise impacts. • Contract a qualified occupational hygienist to quarterly monitor and report on the personal noise exposure of the employees working at the mine. Monitoring must be in accordance with SANS 10083:2004 (Edition 5) sampling method as well as NEM: AQA 2004, SANS 10103:2008.	• Applicable Throughout all Phases • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	• Management of weed or invader plants • The presence of weed and/or invader plants must be continuously monitored, and any unwanted plants must be removed. • Loss of natural vegetation. <u>Critical Biodiversity Area:</u> • Potential negative impact on the nearby critical biodiversity area <u>Groundcover:</u> • Potential loss of protected or red data plant species.	• Inspect progress of construction & ensure activity is in designated areas. • Inspect area for damage to flora species. <u>Establish alien invasive monitoring programme</u> • Botanist plant rescue walk-through report. • Destruction/removal plant permit issued by DEA-WC. • Proof of implementation of the specialist recommendations. <u>Management of weed or invader plants:</u> • Removal of weeds must be manually or by the use of an approved herbicide. • Designated team to cut or pull out invasive plant species that germinated on site. • Herbicide application equipment. <u>Management of buffer areas:</u> • Site management has to ensure the use of visible beacons to demarcate the boundaries of the approved area. • The 20 m no-go buffer area from the CBA needs to be demarcated with visible beacons.	<u>Responsibility:</u> • Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPr. • Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. • Botanist to identify plants of importance. <u>Role:</u> • Demarcate a 20 m no-go buffer zone from the boundary of the CBA, and do not allow any mining within this area. • Implement measures to limit flyrock falling in this area. Collect and remove all flyrock (diameter 150 mm and larger) which falls in the buffer area together with rock spill. • Inform employees of the no-go buffer area and prevent unauthorised entry. • Implement a weed and invader plant management plan. • Control declared invader or exotic species on the rehabilitated areas. • Keep the temporary topsoil stockpiles free of weeds. • Arrange for a botanist to do a plant rescue walk-through of the mining footprint prior to any bush-clearance. Only commence with bush-clearance once the recommendations of the specialist has been implemented. • Apply for a destruction/removal plant permit, for the removal and/or relocation of all protected plants to be affected, prior to bush-clearance. • Only commence with bush-clearance once the recommendations of the specialist has been implemented. • Do not remove any plants without the approval of the ECO. • Implement an invasive plant species management plan to control all invasive	• Applicable Throughout all Phases • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			plant species on site in terms of NEM:BA, 2004 and CARA, 1983. • Keep all stockpiles (topsoil & overburden) free of invasive plant species. • Control declared invader or exotic species on the rehabilitated areas.	

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	Protection of Fauna	• Monitor any ecologically sensitive species should they be observed on site. • Toolbox talks to educate employees how to handle fauna that enter the work areas. Protection of fauna: • Site management has to protect fauna that enters the processing area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Contain all activities within the boundaries of the approved processing area. • Demarcate, signpost and manage the 20 m buffer area as no-go area around areas with natural vegetation. • Ensure no fauna is caught, killed, harmed, sold or played with. • Instruct workers to report any animals that may be trapped in the working area. • Ensure no snares are set or nests raided for eggs or young.	• Applicable Throughout all Phases • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION** **&** **CRUSHING AND SCREENING OF AGGREGATES** **&** **TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS** **&** **SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**	<u>Waste Management:</u> • Management of waste must be a daily monitoring activity. • Hydrocarbon spills need to be cleaned immediately and the site manager must check compliance daily. • Contamination of area with hydrocarbon or hazardous waste material. • Potential contamination of environment as a result of improper waste disposal	<u>Waste Management:</u> • Closed containers for the storage of general of hazardous waste until waste is removed to the appropriate landfill site. • A hydrocarbon spill kit to enable sufficient clean-up of contaminated areas. • Drip trays must be available to place underneath equipment parked for the night. • Should a vehicle have a break down, it must be decommissioned immediately and removed from site to be serviced. • Waste disposal register and file for the keeping of safe disposal records. • Ensure that hazardous substances if any are stored within a securely fenced area. • Formal waste disposal system with waste registers of Driefonteinen Quarry.	<u>Responsibility:</u> • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. <u>Role:</u> • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the recognized landfill site at Robertson. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment.	• Applicable Throughout all Phases • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

			• Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution. • Equip the diesel bowser with a drip tray if used on site. The nozzle of the bowser must rest in a sleeve to prevent dripping after refuelling. • Clean drip trays after use. Do not use dirty drip trays. • Collect all hazardous waste products in a suitable receptacle and remove from the site, either for resale or for appropriate disposal at a recognised facility. • Clean spills immediately, within 2 hours of occurrence, to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and disposing it into the existing hazardous waste handling system of Driefonteinen Quarry (if possible), or at a recognised facility. File proof. • Contain all general waste within the site vehicles and daily remove it from the mining area to the general waste storage area. • Encourage re-use or recycling of waste products. • Prevent the burning or burying of waste on site. • Ensure employees make use of the ablution facilities. • Ensure that the use of temporary, chemical toilet facility do not cause pollution of water sources, or pose a health hazard. In addition, prevent any form of secondary pollution from the disposal of refuse or sewage. Address any pollution problems immediately. • Contain waste water and safely dispose thereof when small volumes of wastewater is generated during the life of the mine. No	

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			discharge into the natural environment allowed.	

ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE. **&** **STRIPPING AND STOCKPILING OF TOPSOIL** **&** **DRILLING AND BLASTING** **&** **EXCAVATION**	Protection of Cultural and Heritage Artefacts	Should any artefacts be discovered the area needs to be demarcated and work needs to be stopped.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Western Cape and the ECO immediately. • Work may only commence once the area was cleared by Heritage Northern Cape. • Confine all mining to the development footprint area. • Implement the following change find procedure when discoveries are made on site: • If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. • It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area. • The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.	• Applicable Throughout all Phases • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	Fire Management	• Management to ensure that all employees understand that no fires area allowed on site.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • No fires allowed on site • All employees to know the location of the fire extinguishers. • Only smoke in designated smoking areas.	• Applicable Throughout all Phases • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
DRILLING AND BLASTING & EXCAVATION & CRUSHING AND SCREENING OF AGGREGATES & TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS & SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Health and Safety: • Health and safety risk posed by blasting activities. • Unsafe working environment for employees. • Safety risk posed by un-sloped areas.	• Stocked first aid box. • Level 1 certified first aider. • All appointments in terms of the Mine Health and Safety Act, 1996.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure workers have access to the correct personal protection equipment (PPE) as required by law. • Manage all operations in compliance with the Mine Health and Safety Act, 1996 (Act No 29 of 1996). • Plan the type, duration and timing of blasting with due cognizance of other land users and structures in the vicinity. • Limit fly rock, and collect and remove flyrock and rock spill that falls beyond the working area. • Give audible warning of a pending blast at least 3 minutes in advance of the blast.	• Applicable Throughout all Phases • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
TRANSPORTATION OF AGGREGATES FROM STOCKPILE AREA TO CLIENTS	• Management of Access Roads • The condition of the access road must be continuously monitored.	Management of Access Roads: • Dust suppression equipment such as a water car and dispenser. • Grader to restore the road surface when needed. Inspect intersections and roads will be clearly signposted. • Drivers will be enforced to keep to set speed limits. Trucks will be in worthy condition with reflective strips	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Divert storm water around the access roads to prevent erosion. • Restrict vehicular movement to existing access routes to prevent crisscrossing of tracks through undisturbed areas. • Repair rutting and erosion of the access roads caused by the processing activities	• Applicable Throughout all Phases • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Inspect area for erosion and pooling.	Inspect area for erosion and pooling.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the recognized landfill site at Robertson. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment.	• Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			• Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution.	

SLOPING, RESHAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Rehabilitation of Mining Area: • Rehabilitation of excavation. • Final rehabilitation.	• Earthmoving equipment to reinstate mined-out areas. • Cover crop to be established on reinstated area. • Erosion control infrastructure (when needed).	Responsibility: • Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPr. • Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. Role: • Use the excavated area as a final depositing are for the placement of overburden. • Dump rocks and coarse material removed from the excavation into the pit. • Prevent the deposition of any waste into the excavation. • Return the topsoil previously stored to its original depth over the area once overburden, rocks and coarse natural material have been added to the excavation and it was profiled with acceptable contours and erosion control measures. • If necessary, fertilize the area to allow vegetation to establish rapidly. Seed the site with a local or adapted indigenous seed mix should natural vegetation not re-establish within 6 months from closure. • Ensure rehabilitation entail landscaping, levelling, top dressing, land preparation, seeding (if required) and maintenance, and invasive plant species clearing. • Remove all infrastructure, equipment, temporary equipment and other items used during the mining period. • Remove waste material of any description, including receptacles, scrap, rubble and tyres, and dispose of it at a recognized landfill facility. No waste may be burned/buried on site. • Implement invasive plant species clearing during the life of the mine. Eradicate species regarded as Category 1a or b invasive	• Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			species in terms of the NEM:BA, 2004 and AIS list, 2016. • Complete final rehabilitation within a period specified by the Regional Manager (DMR).	

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

The Environmental Audit Report in accordance with Appendix 7 as prescribed in Regulation 34 of the EIA Regulation, 2014 (as amended) will annually be submitted to the DMR for compliance monitoring purposes or in accordance with the time period stipulated by the Environmental Authorisation.

n) Environmental Awareness Plan

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

The purpose of this section is to outline the methodology that will be used to educate the mine's employees and contractors of any environmental risks associated with their work and the manner in which these risks must be dealt with so as to avoid pollution and minimize the degradation of the environment.

Once Mining of the proposed area starts, a copy of the Basic Assessment Report and Environmental Management Programme report will be handed to the site manager during the site establishment meeting. Issues such as topsoil handling, site clearance, fire principals and hazardous waste handling will be discussed. An induction meeting will be held with all the site workers to inform them of the Basic Rules of Conduct with regard to the environment. Please refer to Appendix L for the Environmental Awareness Plan for the proposed Mining permit area.

The operations manager must ensure that he/she understands the EMPR document and its requirement and commitments. An Environmental Control Officer needs to check compliance of the Mining activities to the management programmes described in the EMPR.

Training Needs

A training needs analysis will be performed through all levels of the organization including those within the administration, plant and Mining worker sectors. Each of the categories / levels of the organization have different responsibilities and roles, accordingly different knowledge requirements are applicable. These are summarized in Table 29 below.

After the training needs have been identified, it is the responsibility of the SHE Office to ensure that personnel attend the relevant identified training.

Training will also address the specific measures and actions as listed in the EMPR. This Environmental Awareness Plan (EAP) is intended to supplement the Safety, Health and Environmental (SHE) training and awareness requirements. Issues such as topsoil handling, site clearance, fire principals and waste handling will be discussed with the manager to ensure that he understands the goals as set out in the EMPR. An induction meeting will also be held with all the site workers to inform them of the basic steps towards environmental awareness with regard to the environment.

Table 30: Environmental Awareness Plan

OCCUPATION CATEGORY	ENVIRONMENTAL MANAGEMENT RESPONSIBILITY / ROLE	REQUIRED KNOWLEDGE AND INPUT	TRAINING REQUIRED	INTERVAL
Senior Management including Process Managers and Head of Department	Managing the Social & Environmental Assessment & Management System (SEAMS), and the Safety, Health & Environmental (SHE) Management System	Understanding the purpose of the SEAMS and SHE Management System	General in-house, management training	Once off
		Knowledge of the significant impacts as described in the EIA/EMP during the various phases		
		Knowledge of the commitments made in the EMP relevant to the various phases		
		Setting and reviewing the mine's Environmental objectives		
		Directing the SEAMS and SHE management system, and monitoring their progress		
		Accessing the legal register and searching for details	Training on the legal register	Once off
		Emergency preparedness and response		
Environmental Management Representative, SHE Officer & Internal Auditor	Managing the SEAMS and the SHE Management System Monitoring and auditing	Understanding the purpose of the SEAMS and SHE Management System	General in-house, management training	Once off
		Knowledge of the significant impacts as described in the EIA/EMP during the various phases		
		Knowledge of the commitments made in the EMP relevant to the various phases		
		Directing the SEAMS and SHE management system, and monitoring their progress		
		Current knowledge of South African regulatory requirements, best practice guidelines and applicable legislation	Training on the legal register	On going
		Emergency preparedness and response		
		Knowledge in spill management, stockpile management, discard management, water management and waste management	Meetings and Talk Topics	Continuous
		Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting		
		Knowledge of the SABS standards and other relevant legislation regarding the correct storage of chemicals	Training on the SABS standards and other legislation	Annual

Table 30: Environmental Awareness Plan

OCCUPATION CATEGORY	ENVIRONMENTAL MANAGEMENT RESPONSIBILITY / ROLE	REQUIRED KNOWLEDGE AND INPUT	TRAINING REQUIRED	INTERVAL
		Knowledge of auditing techniques and report writing	Auditor training	Annual
Section Managers & Section Engineers	Implementation and daily management of the SEAMS and the SHE Management System	Understanding the purpose of the SEAMS and SHE Management System	General in-house, management training	Once off
		Knowledge of the relevant department's significant impacts as described in the EIA/EMP during the construction and operational phases		
		Actively implementing actions to achieve SEAMS Management Plans and Environmental Objectives.	Meetings and talk topics	Continuous
		Knowledge in stockpile management, discard management, water management and waste management		
		Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting		
		Knowledge in the correct storage of chemicals		
Engineering HOD & General Engineering Supervisor	Implementation and daily management of the SEAMS and the SHE Management System	Understanding the purpose of the SEAMS and SHE Management System	General in-house, management training	Once off
		Knowledge of the relevant department's significant impacts as described in the EIA/EMP during the construction and operational phases		
		Actively implementing actions to achieve SEAMS Management Plans and Environmental Objectives.		
		Knowledge in spill management and waste management	Meetings and talk topics	Continuous
		Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting		
		Knowledge in the correct storage of chemicals		

Table 30: Environmental Awareness Plan

OCCUPATION CATEGORY	ENVIRONMENTAL MANAGEMENT RESPONSIBILITY / ROLE	REQUIRED KNOWLEDGE AND INPUT	TRAINING REQUIRED	INTERVAL
Mine Captain & General Engineering Supervisors	Implementation and daily management of the SEAMS and the SHE Management System	Understanding the purpose of the SEAMS and SHE Management System Knowledge of the relevant department's significant impacts as described in the EIA/EMP during the construction and operational phases Actively implementing actions to achieve SEAMS Management Plans and Environmental Objectives.	General in-house, management training	Once off
		Knowledge in spill management and waste management Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting Knowledge in the correct storage and handling of chemicals Understanding the requirements for not polluting the environment	Meetings and talk topics	Continuous
Supervisors, Shift Boss & Forman	General Environmental Awareness and job specific impacts	Understanding the purpose of the SEAMS and SHE Management System Knowledge of the relevant department's significant impacts as described in the EIA/EMP during the construction and operational phases Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting Knowledge in spill management and waste management Understanding the requirements for not polluting the environment	General in-house, management training	Once off
Operators, tradespersons & Floor Employees	General Environmental Awareness and job specific impacts	General Awareness of aim and purpose of the SEAMS and SHE Management System Understanding the SEAMS Management Plan relevant to their operations Understanding the requirements for not polluting the environment General understanding of the relevant Operational procedures, Emergency Response Plans and Incident reporting	Environmental Awareness Training	Annual

Table 30: Environmental Awareness Plan

OCCUPATION CATEGORY	ENVIRONMENTAL MANAGEMENT RESPONSIBILITY / ROLE	REQUIRED KNOWLEDGE AND INPUT	TRAINING REQUIRED	INTERVAL
General Administration Staff	General Environmental Awareness and job specific impacts	General Awareness of aim and purpose of the SEAMS and SHE Management System Understanding the SEAMS Management Plan relevant to their operations Understanding the requirements for not polluting the environment General understanding of the relevant Operational procedures, Emergency Response Plans and Incident reporting	Environmental Awareness Training	Annual
Security	General Environmental Awareness and job specific impacts	General Awareness of aim and purpose of the SEAMS and SHE Management System Understanding the requirements for not polluting the environment General understanding of the relevant Operational procedures, Emergency Response Plans and Incident reporting	Environmental Awareness Training	Annual
Senior Management including Process Managers and Head of Department	Managing the Social & Environmental Assessment & Management System (SEAMS), and the Safety, Health & Environmental (SHE) Management System	Understanding the purpose of the SEAMS and SHE Management System	General in-house, management training	Once off
		Knowledge of the significant impacts as described in the BAR/EMP during the various phases		
		Knowledge of the commitments made in the EMP relevant to the various phases		
		Setting and reviewing the mine's Environmental objectives		
		Directing the SEAMS and SHE management system, and monitoring their progress		
		Accessing the legal register and searching for details	Training on the legal register	Once off
		Emergency preparedness and response		
Environ...		Understanding the purpose of the SEAMS and SHE Management System		

Table 30: Environmental Awareness Plan

OCCUPATION CATEGORY	ENVIRONMENTAL MANAGEMENT RESPONSIBILITY / ROLE	REQUIRED KNOWLEDGE AND INPUT	TRAINING REQUIRED	INTERVAL
	Managing the SEAMS and the SHE Management System Monitoring and auditing	Knowledge of the significant impacts as described in the EIA/EMP during the various phases	General in-house, management training	Once off
		Knowledge of the commitments made in the EMP relevant to the various phases		
		Directing the SEAMS and SHE management system, and monitoring their progress		
		Current knowledge of South African regulatory requirements, best practice guidelines and applicable legislation	Training on the legal register	On going
		Emergency preparedness and response		
		Knowledge in spill management, stockpile management, discard management, water management and waste management	Meetings and Talk Topics	Continuous
		Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting		
		Knowledge of the SABS standards and other relevant legislation regarding the correct storage of chemicals	Training on the SABS standards and other legislation	Annual
		Knowledge of auditing techniques and report writing	Auditor training	Annual
E Section Managers & n Section Engineers g..	Implementation and daily management of the SEAMS and the SHE Management System	Understanding the purpose of the SEAMS and SHE Management System	General in-house, management training	Once off
		Knowledge of the relevant department's significant impacts as described in the EIA/EMP during the construction and operational phases		
		Actively implementing actions to achieve SEAMS Management Plans and Environmental Objectives.	Meetings and talk topics	Continuous
		Knowledge in stockpile management, discard management, water management and waste management		
		Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting		
		Knowledge in the correct storage of chemicals		
		Understanding the purpose of the SEAMS and SHE Management System		

Table 30: Environmental Awareness Plan

OCCUPATION CATEGORY	ENVIRONMENTAL MANAGEMENT RESPONSIBILITY / ROLE	REQUIRED KNOWLEDGE AND INPUT	TRAINING REQUIRED	INTERVAL
	Implementation and daily management of the SEAMS and the SHE Management System	Knowledge of the relevant department's significant impacts as described in the EIA/EMP during the construction and operational phases	General in-house, management training	Once off
		Actively implementing actions to achieve SEAMS Management Plans and Environmental Objectives.		
		Knowledge in spill management and waste management	Meetings and talk topics	Continuous
		Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting		
		Knowledge in the correct storage of chemicals		
Mine Captain & General Engineering	Implementation and daily management of the SEAMS and the SHE Management System	Understanding the purpose of the SEAMS and SHE Management System. Knowledge of the relevant department's significant impacts as described in the BAR/EMP during the construction and operational phases Actively implementing actions to achieve SEAMS Management Plans and Environmental Objectives. Knowledge in spill management and waste management Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting Knowledge in the correct storage and handling of chemicals Understanding the requirements for not polluting the environment	General in-house, management training	Once off
			Meetings and talk topics	Continuous
Supervisors, Shift Boss & Forman	General Environmental Awareness and job specific impacts		General in-house, management training	Once off
Operators, tradespersons & Floor Employees		General Awareness of aim and purpose of the SEAMS and SHE Management System Understanding the SEAMS Management Plan relevant to their operations Understanding the requirements for not polluting the environment	Environmental Awareness Training	Annual

Table 30: Environmental Awareness Plan				
OCCUPATION CATEGORY	**ENVIRONMENTAL MANAGEMENT RESPONSIBILITY / ROLE**	**REQUIRED KNOWLEDGE AND INPUT**	**TRAINING REQUIRED**	**INTERVAL**
General Administration Staff				
Security				

Specialized Skills

The Training Department in conjunction with the SHE Officer are responsible for ensuring job specific training for personnel performing tasks, which can cause significant environmental and social impacts (e.g. receipt of bulk hazardous chemicals/fuel, hazardous materials handling, responding to emergency situations etc.). The Mining Right Manager with the assistance of the SHE Officer must identify relevant personnel and training courses.

On the job training is an essential tool in environmental awareness. Employees must be given details of the expected environmental issues and concerns specifically related to their occupation. Employees must be trained on how to respond if an environmental problem or source of environmental pollution arises. The training will be on-going, and all new employees will be provided with the same standard of training as existing employees.

Review of Training Material

Effectiveness of the environmental management training will be done by the management through task observations and during internal and external audits.

All training material for presentation to personnel and contractors will be reviewed annually to ensure consistency with organizational requirements and best practice guidelines. In addition to this, annual monitoring reports, audit results and all incident reports will be reviewed, any short comings and non-compliancy will be highlighted and management measures incorporated or improved upon within the training material.

Records

Records from the implementation of this EAP will be kept and controlled in accordance with the SHE Management System Control of Records Procedure, which is required to be implemented to provide evidence of conformity and effective operation of the relevant requirements of the SHE management system.

ii) Manner in which risk will be dealt with in order to avoid pollution or the degradation of the environment.

The operations manager must ensure that he/she understands the EMPR document and its requirement and commitments before any Mining takes place. An Environmental Control Officer needs to check compliance of the Mining activity to the management programmes described in the EMPR.

Please refer to Appendix M for the full Environmental Awareness Plan for Driefonteinen Quarry.

EMERGENCY RESPONSE PLAN AND PROCEDURES

As part of its management tools, a mine must have an Emergency Response Plan. These plans will be disseminated to all employees and contractors in the event of an emergency. In the case of a medical accident or problem, the mine has first aid kits available at various points and an emergency room. A First Aid officer will be on duty at all times. In the event of an emergency, the checklist of emergency response units must be consulted and the relevant units notified.

Communication is vital in an emergency and thus communication devices, such as mobile phones, two-way radios, pagers or telephones, must be placed around the mine. Should the emergency have the potential to affect the surrounding communities, they will be alerted via alarm signals or contacted in person.

Emergency services will be sourced from the nearest main town, Mossel Bay wherever possible. Contact details for the emergency services and local authorities are listed below; these will be displayed on site and made available to all employees and contractors.

Police Station (Mossel Bay):	044 606 2805
Ambulance	044 691 3170
SPCA	044 693 0824
Fire Department	044 691 3722
Hospitals	
Bay View Private Hospital	044 691 3718
Provincial Hospital	044 691 2011
Department of Water and Sanitation:	021 546 3452
Department of Mineral Resources:	(021) 427 1000
Department of Environment and Nature Conservation:	021 483 4091

The following list represents the basic steps towards environmental awareness, which all participants in this project must consider whilst carrying out their tasks.

Site Management

- Stay within boundaries of site – do not enter adjacent properties;
- Keep tools and material properly stored;
- Smoke only in designated areas; and
- Use toilets provided – report full or leaking toilets.

Water Management and Erosion

- Check that rainwater flows around work areas and are not contaminated;
- Report any erosion;
- Check that dirty water is kept from clean water;

- Do not drink from streams;
- After a heavy rainstorm or at least every 3 months, all water pollution control structures like storm water berms and trenches will be checked for signs of damage or change in its capacity;
- Any damage to any water pollution structures will be repaired immediately; and
- Any of the above actions will be included in the performance assessment report to the Department of Mineral Resources (DMR).
- Maintenance activities shall not lead to undue damage, blockages or disruption of the drainage lines or storm water channels on site or concentrate storm water sheet flow into erosive channels.
- Sediment to be removed on a need basis from all drainage channels, culverts and pipes under roads to prevent blocked pipes and erosion damage to road sides due to disrupted flow.
- Significant erosion in the drainage lines or storm water channels or swales shall be addressed by implementing water slowing measures e.g. temporary straw bales or sand bags or permanent gabion weirs and stabilised overflows and crossings to prevent recurrence.
- All erosion channels anywhere on site shall be repaired immediately through backfilling with appropriate material and stabilising to prevent recurrence.
- Where vegetation has been washed away or damaged as a result of the erosion this shall be reinstated once the area has been stabilised.
- Stabilisation measures e.g. grass blocks shall be maintained in good repair.
- No materials or wastes shall be dumped into storm water channels, in the drainage lines or their buffer zones. Any litter or foreign material blown or washed into these areas inadvertently is to be removed regularly (minimum monthly) without undue disturbance to the vegetation and stability of the area.
- Fuel or oil or other chemical spills anywhere on site should be treated immediately with an appropriate mop-up or bio-remedial product as directed by manufacturers to prevent contamination of runoff.

Waste Management

- Take care of your own waste;
- Keep waste separate into labelled containers – report full bins;
- Place waste in containers and always close lid;
- Don’t burn waste; and
- Pick-up any litter laying around.

Hazardous Waste Management (Petrol, Oil, Diesel, Grease)

Hydrocarbons such as diesel, petrol, and oil, which are used as fuel for mine machinery which is kept on site, increases the possibility that spillage, may occur. As this is a product mine there is also the possibility of a product spillage occurring. In the event of a spillage, procedures must be put into place to ensure that there are minimal impacts to the surrounding environment.

Diesel, engine oil and hydraulic oil are the most likely hydrocarbons identified during impact assessments that can result in an emergency situation.

The following procedure applies to a hydrocarbon spill:

- If any spills take place, the contaminant together with the soil will be removed and placed in acceptable container to be removed with industrial waste to a recognised licence facility or licenced company.
- Bioremediation will be done on site to the satisfaction of Department of Environmental Affairs.
- A spill clean-up kit is available at the storage yard
- All personnel will be trained n spill clean-up methodologies.
- Every precaution will be taken to prevent the spill from entering the surface water environment;
- In the event of a large spillage, adequate emergency equipment for spill containment or collection, such as additional supplies of booms and absorbent materials, will be made available and if required, a specialised clean-up crew will be called in to decontaminate the area. The soil will be removed and treated at a special soil rehabilitation facility;
- If the spill is larger than 100 litres the Department of Environmental and Nature Conservation (Western Cape) will be notified by fax and or phone within 24-hour of the event.
- Reasonable measures must be taken to stop the spread of hydrocarbons and secure the area to limit access;
- Dispatch necessary services;
- The incident must be reported to the Environmental coordinator immediately;
- The Environmental Coordinator will assess the situation from the information provided, and set up an investigation team or relevant personnel. Included in this team could be the Mine Manager, Chief Safety Officer, the employee who reported the incident and any individual responsible for the incident;
- When investigating the incident, priority must be given to safety;
- Once the situation has been assessed, the Environmental Coordinator must report back to the Mine Manager;
- The Mine Manager and the investigation team must make a decision on what measures can be taken to limit the damage caused by the incident, and if possible any remediation measures that can be taken;
- The source / reason of the spill or leak will be addressed immediately;
- Never mix general waste with hazardous waste;
- Use only sealed, non-leaking containers;
- Keep all containers closed and store only in approved areas;
- Always put drip trays under vehicles and machinery;
- Empty drip trays after rain;
- Stop leaks and spills, if safe;
- Keep spilled liquids moving away;
- Immediately report the spill to the site manager/supervision;
- Locate spill kit/supplies and use to clean-up, if safe;
- Place spill clean-up wastes in proper containers; and
- Label containers and move to approved storage area.

Breakdown of vehicles or equipment outside vehicle maintenance yard:

If any equipment of vehicles breaks down inside the pit or outside the storage yard the following emergency procedure will be followed:

- Drip pans will be placed at all point s where diesel, oil or any hydraulic fluid can rip and contaminate the oil;
- All efforts will be made to remove the vehicle or equipment to the storage area;
- If the vehicle or equipment cannot be removed the broken part will be drained of all fluid and the specific part remove to the service area;
- No repairs will be allowed to take place outside the maintenance yard or service area; and
- Any spills will be managed as described in the hydrocarbon section above.

Explosions

Explosions can occur in the plant and workshop areas when working with gas cylinders and chemicals.
These could result in large numbers of employees being injured and requiring medical assistance.
The procedure to be followed is:

- Alternative evacuation routes will be devised, should a rock fall occur as a result of the explosion; and
- All relevant emergency response units must be notified and hospitals informed of incoming patients.

Discoveries:

- Stop work immediately;
- Notify site manager/supervisor; and
- Includes – Archaeological finds, Cultural artefacts, Contaminated water, Pipes, Containers, Tanks and drums, any buried structures.

Air Quality:

- Wear protection when working in very dusty areas;
- Implement dust control measures:
- Sweep paved roads;
- Water all roads and work areas;
- Minimize handling of material; and
- Obey speed limit and cover trucks.

Driving and Noise

- Use only approved access roads;
- Respect speed limits;
- Only use turn-around areas – no crisscrossing through undisturbed areas;
- Avoid unnecessary loud noises; and

- Report or repair noisy vehicles.

Flora and Fauna

- Do not remove any plants or trees without approval of the site manager;
- Do not collect fire wood;
- Do not catch, kill, harm, sell or play with any animal, reptile, bird or amphibian on site;
- Report any animal trapped in the work area; and
- Do not set snares or raid nests for eggs or young.

Fire Management

Veld fires and fires resulting from other sources must be handled with extreme caution. Fire extinguishers will be placed around the mine.

The following procedures apply to fires:

- In the event of a fire an alarm will be activated to alert all employees and contractors;
- Identify the type of fire and the appropriate extinguishing material. For example, water for a grass fire, and mono ammonium phosphate based fire extinguisher for chemical and electrical fires;
- In the event of a small fire the fire extinguishers placed around the mine will be used to contain and extinguish the fire;
- In the event of a large fire, the fire department will be notified and must react timeously;
- All staff will receive training in response to a fire emergency on site;
- A Fire Protection Association will be set up with the mine and surrounding land owners to facilitate communication during fire events and assist in fighting fires, where necessary;
- Fire breaks has been established and will be maintained around the Mining area for the duration of the project;
- If possible all surrounding drains, such as storm water drains need to be covered and or protected to prevent any contaminated water from entering the drains
- In case of a chemical or petroleum fire, run-off from the area will be contained as far as possible using the most appropriate measures e.g. spill absorbent cushions, sand or a physical barrier;
- Contaminated run-off must be diverted into an oil sump, or cleaned up;
- All firefighting equipment will be inspected at least monthly to ensure that these are functioning;
- Do not light any fires on site, unless contained in a drum at demarcated area;
- Put cigarette butts in a rubbish bin;
- Do not smoke near gas, paints or petrol;
- Know the position of firefighting equipment;
- Report all fires; and
- Don’t burn waste or vegetation.

In addition to the induction meeting to be held with the site employees to inform them of the basic steps towards environmental awareness, the operators of earth moving equipment should be informed of the following requirements:

- Mining within demarcated areas;
- No-go areas;
- Establishment of access roads;
- Handling of hazardous waste and their storage facilities;
- Handling of biodegradable and non-degradable waste;
- Vehicle maintenance;
- Mining methods to be followed;
- Handling and storing of topsoil;
- Capping of drill holes;
- Speed control in order to reduce dust;
- Emergency procedure awareness;
- Labourers must be informed of the following during “toolbox talks”:
- Reporting of unusual observations to management (e.g. fossils, graves, etc.);
- Reporting of spills to management;
- Felling or damaging trees for firewood not allowed;
- Making fires not allowed;
- Hunting and killing of animals not allowed;
- Demarcated areas for mining;
- Establishing of access roads and erection of gates in fence lines;
- Toilet facilities and hygiene measures;
- Handling of waste;
- Vehicle maintenance and vehicle maintenance yard;
- Handling of topsoil; and
- Emergency procedures awareness.

Flora and Fauna including alien invasive species

- Do not remove any plants or trees without approval of the site manager;
- Do not collect fire wood;
- Do not catch, kill, harm, sell or play with any animal, reptile, bird or amphibian on site;
- Report any animal trapped in the work area; and
- Do not set snares or raid nests for eggs or young.

Maintenance and Infrastructure Management

- Infrastructure visibly in good repair and operational areas kept tidy.

- The footprint of the operations and vehicular circulation is clearly defined with no "spill over" into other areas of the site.
- Roads are stable and in good repair and
- Fences and gates are in good repair.

o) Specific information required by the Competent Authority

(Among others, confirm that the financial provision will be reviewed annually)

The applicant undertakes to annually review and update the financial provision calculation, upon which it will be submitted to DMR for review and approved as being sufficient to cover the environmental liability at the time and for closure of the mine at that time.

Effectiveness of the environmental management training will be done by the management through task observations and during internal and external audits. All training material for presentation to personnel and contractors will be reviewed annually to ensure consistency with organizational requirements and best practice guidelines. In addition to this, annual monitoring reports, audit results and all incident reports will be reviewed, any shortcomings and non-compliancy will be highlighted and management measures incorporated or improved upon within the training material.

2. UNDERTAKING

The EAP herewith confirms

a) the correctness of the information provided in the reports **X**
b) the inclusion of comments and inputs from stakeholders and I&AP's **X**
c) the inclusion of inputs and recommendations from the specialist reports where relevant, and **X**
d) that the information provided by the EAP to interested and affected parties and any response by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein **X**

Signature of the environmental assessment practitioner:

Greenmined Environmental

Name of Company:

20 April 2019

Date:

-END-

APPENDIX LIST

Appendix A	***Regulation 2.2 Map***
Appendix B	***1:250 000 Map***
Appendix C	***Site Activities Map***
Appendix D	***Surrounding Land Use Map***
Appendix E	***Rehabilitation Plan***
Appendix F	***Alternatives Map***
Appendix G	***Public Participation Documents***
Appendix G1	***Landowner Consent***
Appendix G2	***Comments and Response Report***
Appendix G3	***Proof of Consultation***
Appendix H	***Supporting Impact Assessment***
Appendix I	***Photographs of the site***
Appendix J	***CV and Experience Record of EAP***
Appendix K	***Financial and Technical Competence***
Appendix L	***Specialist Reports***
Appendix M	***Environmental Awareness Plan***
Appendix N	***Alien Invasive Management Plan***
Appendix O	***Closure Plan***