PROPOSED AGGREGATE / GRAVEL MINE ON PORTION 4 OF THE FARM WAAI KRAAL 120, REGISTRATION DIVISION OF BEAUFORT WEST, WESTERN CAPE PROVINCE

FINAL BASIC ASSESSMENT REPORT

FEBRUARY 2021

REFERENCE NUMBER: *WC 30/5/1/3/2/10266 MP*

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EXECUTIVE SUMMARY

Lombardskraal Doleriet (Pty) Ltd, applied for environmental authorisation (EA) and a mining permit to mine aggregate / gravel from over an undisturbed area of the farm occasionally used for grazing on a portion of Portion 4 of the farm Waai Kraal 120, Registration Division of Beaufort West, Western Cape province. The mining method will make use of blasting in order to loosen the hard rock; the material will then be loaded and hauled to the crushing plant where it will be screened to various sized stockpiles. The aggregate will be stockpiled until it is transported from site using tipper trucks. All mining related activities will be contained within the approved mining permit boundaries.

The proposed mining area is approximately 4.9 ha in extent and the applicant, 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 the construction industry in the vicinity. The depth of the quarry will be approximately 15m. The proposed quarry will therefore contribute to the upgrading / maintenance of road infrastructure and building contracts in and around the Beaufort West 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 and Energy) when considering the environmental authorisation. This report, the Final Basic Assessment Report, forms part of the departmental requirements, and presents the first report of the EIA process.

Should the MP be issued and the mining of dolerite be allowed, the proposed project will comprise of activities that can be divided into three key phases namely the:

(1) *Site establishment/construction phase* which will involve the demarcation of the permitted mining area. Site establishment will also necessitate the clearing of vegetation, the stripping and stockpiling of topsoil, and the introduction of mining machinery and equipment

(2) *Operational phase* that will entail the mining of dolerite 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 and Energy (DMRE). 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 DMRE 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).

Site Alternative 1 (Preferred and Only Viable Site Alternative):

Site Alternative 1 (S1) (Preferred Alternative and only site viable alternative): The Applicant, applied for a mining permit for the mining of aggregate / gravel, 4.9 ha on a portion of Portion 4 of the farm Waai Kraal No 120 situated in the Beaufort West magisterial district of the Western Cape Province. The proposed mining footprint will be 4.9 ha and will be developed over an undisturbed area of the farm occasionally used for grazing.

The proposed area is over an undisturbed area of the farm occasionally used for grazing but with very low agricultural potential due to the rocky surface, after consultation with the land owner the application footprint extends into an area with low agricultural potential. The proposed project will not necessitate the loss of agricultural field with high potential to the land owner. This was deemed the only viable site alternative as this is the only area that will be viable for the land owner due to the low agricultural potential.

This alternative will cause the destruction of the stone-walled kraal as per the Heritage impact assessment.

An alternative layout for the quarry, which avoids the kraal and preserves it on its southern boundary, has been proposed in the Final BAR – Site Alternative 2 but not found viable as explained below.

Site Alternative 2:

Site Alternative 2 (S2) was assessed for the proposed mining but found not environmentally and practically suitable. The earmarked area is also a greenfield site that will have a higher visual impact to be disturbed for the quarry to be established. Site alternative 1, was deemed the only viable site alternative as this is the only area that will be viable for the land owner due to the low agricultural potential.

This alternative site was not deemed to be the preferred option as the face of the quarry will directly face the N1 therefor the area will have very high visual impact on the surrounding area.

From a heritage perspective this alternative quarry layout is less preferred because although the original quarry layout will mean the loss of the kraal, the alternative layout will open the face of the quarry to the N1 and there will be a marked visual impact on the cultural landscape and sense of place of the area surrounding the quarry that will result from its visibility from the N1.

Although the position of Site Alternative 2 will still allow the development of the quarry on the property, it is believed that the visual impact associated with this site alternative is of higher significance without the need or motivation justifying it.

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 / gravel to be mined will be sold to the building, road rehabilitation/maintenance and associated construction industry, if however, the no-go alternative is implemented the Applicant could not utilise the mineral resource on this property and the construction industry of Beaufort West will not benefit from diversification of gravel sources which will escalating product costs.

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 the Die Coerier on 6 November 2020, and two on-site notices were placed at conspicuous places. Interested and Affected Parties (I&AP's). A 30-days commenting period was allowed which expired on 9th of December 2020. 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 was distributed for comment and perusal to the I&AP's and stakeholders. A 30-day commenting period, ending 29th of January 2021, was allowed for perusal of the documentation and submission of comments. The comments received on the DBAR were incorporated into the Final Basic Assessment Report (FBAR) for decision making to DMRE.

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:

Topography:

- The natural topography the proposed excavated area can be described extremely irregular to slightly undulating plains covered with dwarf spiny shrubland dominated by Karoo dwarf shrubs (e.g. Chrysocoma ciliata, Eriocephalus ericoides) with rare low trees (e.g. Euclea undu-Jata). Dense stands of drought-resistant grasses (Stipagrostis, Aristida) cover (especially after abundant rains) broad sandy bottom lands. The elevation loss from the proposed mining footprint to the town of Beaufort West to be 182 m over 29.4 km.

Visual Characteristics:

- The viewshed analysis showed that the visual impact of the proposed gravel mining operation will be of medium significance. The small scale of the proposed operation, and the mining area will be located between two hills in order to minimize the visual impact. Should the Applicant successfully rehabilitate the mining area (upon closure), no residual visual impact is expected upon closure of the mine

Air and Noise Quality:

- The proposed activity will contribute the emissions mechanical mining equipment to the receiving environment for the duration of the operational phase. Should the permit holder 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 significance and compatible with the current land use. The potential impact on the noise ambiance of the receiving environment is expected to be of low significance and representative of the traffic of the surrounding area.

Geology and Soil:

- The geology of the study area comprises mostly rimitive, skeletal soils in rocky areas devel-oping over sedimentary rocks such as mudstones and arenites of the Adelaide Subgroup of the Karoo Supergroup and to a lesser extent also the Ecca Group (Waterford and Volksrust Formations) as well as Jurassic dolerite sills and dykes and subsummit positions of mesas and butts with dolerite boulder slopes. Almost entirely Ib land type.

  Mudstones and sandstones of the Beaufort Group (Adelaide Subgroup) with some Ecca (Fort Brown Formation) shales supporting very shallow and stony soils of the Glenrosa and/or Mispah forms, typical of Fe land type.

Hydrology:

- The proposed project does not require a Water Use Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No 36 of 1998). No activity will take place in or within 1km radius of any water bodies. Any water required for the implementation of the project will be bought from a registered source and transported to on site. The use of potable water for dust suppression should be avoided.

Mining, Biodiversity and Groundcover:

- Ground-truthing showed that the proposed footprint of the mining area is an undisturbed area of the farm occasionally used for grazing but with very low agricultural potential due to the rocky surface. The Applicant will make use of the existing access roads to the mining area. Should the Applicant implement the mitigation measures proposed in the EMPr the impact of the proposed activity on the vegetation and groundcover in general is deemed to be of low significance.

- The desktop agricultural compliance statement done by Dr Darren Bouwer (PhD Soil Science Pri Nat Sci 400081/16) confirmed that the proposed development site is of a "low" Agricultural sensitivity, as classified by the DEA Screening Tool. The landtypes of the area predict shallow rocky soils. This is further substantiated by satellite images of the survey area. These soils will have a low water holding capacity which will limit crop production and are not deemed suitable for irrigation. The grazing potential of 28 ha/LSU is very low and typical of the area. This is further substantiated by the low rainfall. It is the specialist's opinion that the proposed development site is of a low agricultural sensitivity and that the development at the proposed site will not significantly impact agricultural activities. In terms of agricultural sensitivity, the proposed development should thus be allowed to proceed at the identified site subject to recommendations provided.

Fauna:

- Various small mammals and reptiles occur are likely to on the property. The fauna at the site will not be impacted by the proposed mining activities as they will be able to move away or through the site, without being harmed. Workers should be educated and managed to ensure that no fauna at the site is harmed. At this stage no resident protected or red data faunal species could be identified within the earmarked footprint. The study area falls over a property that is noted to be an operational game farm, should this mining permit be granted farm owner will be consulted prior to commencement of any activities to ensure that safety of animals and workers. Workers will be informed and managed to ensure that no fauna at the site is harmed. No poaching or hunting of animals will be allowed. All construction vehicles must adhere to a low speed limit (<20km/h) to avoid collisions with susceptible species such as snakes and tortoises. Trenches and deep excavations should not be left open for

extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench.

Cultural and Heritage Environment:

- The proposed quarry is located on a spur of hills that extend out from the eastern Nieuweveldsberge of the Great Southern Escarpment. The site overlooks the drainages of the Hoek se Sloot and Renosterspruit Rivers to the east, while the Platdoring River drainage lies immediately to the west (as per notification of intent to develop Section 38 (1) and Section 38 (8) of the National Heritage Resources Act (completed by John Gibble).

Heritage resources located within the footprint of the proposed mining area will be affected by quarrying activities, except if expressly excluded from quarrying activities.

The stripping for stockpiling of the topsoil from the site will result in the disturbance of any archaeological material (both pre-colonial and historical) present, and the destruction of any stratified sites. This includes the stone-walled kraal on the site and any associated artefacts.

The quarrying of the area will result in the loss and destruction of fossil material within the shales and mudstones that underly the site and which are the target resource of the proposed quarry.

No archaeological or other heritage studies have been identified from available literature in the immediate vicinity of the site, but a handful studies from the wider region provide general information about the history of the area.

A field survey by of the site has not yet been possible an archaeologist but Google Earth satellite imagery and a photo collected by the ecologist, who has visited the site indicates the presence within the proposed mining area of a stone-walled kraal see figure 15 and 16 further below in this document (Figure 5 and Plate 1 as per NID). The age of the kraal is unknown but its shape and structure suggests that it is historical, rather than pre-colonial. The Applicant will implement a chance-find protocol on site for the duration of the site establishment, operational- and decommissioning phase.

The available archaeological literature and assessment reports for this area of the Karoo suggest that an archaeological background “litter” of Middle Stone Age lithics can be expected within the quarry area. The lack of rocky overhangs or shelters means that any archaeological sites within the proposed quarry footprint are likely to be open, unstratified sites. The presence of rock engravings on the site is possible. The existence of a possible stone-walled kraal, of likely colonial period age has been confirmed.

The following pre-quarrying archaeological mitigation measures are recommended as per the Heritage Impact Assessment (Appendix N):

- An archaeological walkover survey of the site must be conducted by a suitably qualified professional archaeologist to identify any archaeological sites and/or materials and to assess the stone-walled structure;
- If any significant archaeological remains are located during this survey which cannot be avoided by, or excluded from the quarrying, they will require mitigation prior to any quarry-related activities on the site. A Workplan application will need to be made to HWC to conduct this work;
- Should any human remains be encountered at any stage during the works associated with the project, work must in the vicinity must cease immediately, the remains must be left in situ but made secure and the project archaeologist and HWC must be notified immediately in order to make a decision about how to deal with the remains.

The Palaeontological Impact Assessment conducted by Prof Marion Bamford indicates that, based on the geological record and fossil collecting map maintained by the Evolutionary Studies Institute, there is a chance that vertebrate fossils could occur on the site but none have been recorded to date. If dolerite is the material to be mined than there will be no fossils, but if mudstones and shales are to be mined there is a moderate chance that fossils will be present.

The following mitigation measures are, therefore, recommended:

- A site visit by a suitably qualified palaeontologist must take place prior to the commencement of quarrying to establish whether fossils are exposed on the site;
- A Fossil Chance Finds Protocol must be implemented once quarrying commences to ensure the reporting, safeguarding and recovery of any discoveries of fossils;
- The requirement to implement a Fossil Chance Finds Protocol, an example of which is attached as Appendix D of the Palaeontological Impact Assessment Report (Appendix N), must be included in the EMPr for the project; and
- If fossils are found during quarrying, they must be excavated and collected by a professional palaeontologist, working under a HWC permit and then housed in a recognised repository.

Site Specific Infrastructure:

- There is no existing infrastructure located within 500 m of the proposed mining area includes. The following is located within close proximity:

    - An existing SANRAL quarry is located 900m south east of the site.
    - Guest lodge on the farm is located 2km south of the site
    - The N1 – 2.5km towards the south of the site.

None of the above falls within 500m of the site area and will therefore not be affected.

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 381 917.81.

LIST OF ABBREVIATIONS

BID	Background Information Document
BGIS	Biodiversity GIS
CARA	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
CBA	Critical Biodiversity Area
DBAR	Draft Basic Assessment Report
DEDEAT	Department of Economic Development, Environmental Affairs and Tourism
DMRE	Department of Mineral and Resources and Energy
DoT	Department of Transport
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIA Regulations	Environmental Impact Assessment Regulations, 2014 (as amended 2017)
EISC	Ecological Importance and Sensitivity Category
EMPR	Environmental Management Programme
FBAR	Final Basic Assessment Report
FEL	Front-end-loader
FSBP	Western Cape Biodiversity Plan
GDP	Gross Domestic Product
GNR	Government Notice
I&AP's	Interested and Affected Parties
MHSA	Mine Health and Safety Act, 1996 (Act No. 29 of 1996)
MP	Mining Permit
MPRDA	Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:AQA	National Environmental Management: Air Quality Control Act, 2004 (Act No. 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act, 1999 (Act No 25 of 1999)
NRTA	National Road Traffic Act, 1996 (Act No. 93 of 1996)

NWA	National Water Act, 1998 (Act No. 36 of 1998)
PCB's	Polychlorinated Biphenyl
PCO	Pest Control Officer
PPE	Personal Protective Equipment
PSM	Palaeontological Sensitivity Map
RA	Risk Assessment
REC	Recommended Ecological Category
S1	Site Alternative 1
S2	Site Alternative 2
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SAMBF	South African Mining and Biodiversity Forum
USBM	US Bureau of Mines
WMA	Water Management Area
WULA	Water Use Licence Application

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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:	Lombardskraal Doleriet (Pty) Ltd
TEL NO:	Tel: 023-4152654
FAX NO:	N/A
POSTAL ADDRESS:	PO BOX 4288 George East,6529
PHYSICAL ADDRESS:	Boeteka Farm Beaufort West,
FILE REFERENCE NUMBER SAMRAD:	WC 30/5/1/3/2/10266 MP

IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 29 of 2002) as amended), the Minister must grant a prospecting or mining right if among others the mining "will not result in unacceptable pollution, ecological degradation or damage to the environment".

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it 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.

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. Lombardskraal Doleriet (Pty) Ltd appointed Greenmined Environmental to undertake the study needed. Greenmined Environmental has no vested interest in Lombardskraal Doleriet (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:	Mrs Sonette Smit (Senior Environmental Specialist)
Tel No.:	021 851 2673
Fax No.:	086 546 0579
E-mail address:	sonette.s@greenmined.co.za

ii) Expertise of the EAP.

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

Mrs. S Smit has fourteen years of experience in environmental legal compliance audits, (GIS) geographic information system, mining right and permit applications and applications for environmental authorisations & Water use applications.. Please find full CV attached in Appendix K.

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

Sonette Smit is an Environmental Consultant with 14 years' experience in the environmental sector. She specialized the last 8 years in the mining sector where she conducted the mining related report and programs. She has also been involved in a number of other environmental and water use application projects where she compiled environmental management plans, environmental impact assessments, environmental audits, IWULA's/IWWMP's.

b) Location of the overall Activity.

Table 1: Location of the proposed project.

Farm Name:	Portion 4 of the farm Waai Kraal 120, Registration Division of Beaufort West, Western Cape province
Application area (Ha)	4.9 ha
Magisterial district:	Beaufort West
Distance and direction from the nearest town	±32 km north of Beaufort West of the N1 Travelling north from Beaufort West toward Three Sisters, the site is located just off the N1 at road marker N1-8 (32.0N)
21 digit Surveyor General Code for each farm portion	C00900000000012000004

c) Locality map

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

The requested map is attached as Appendix B.

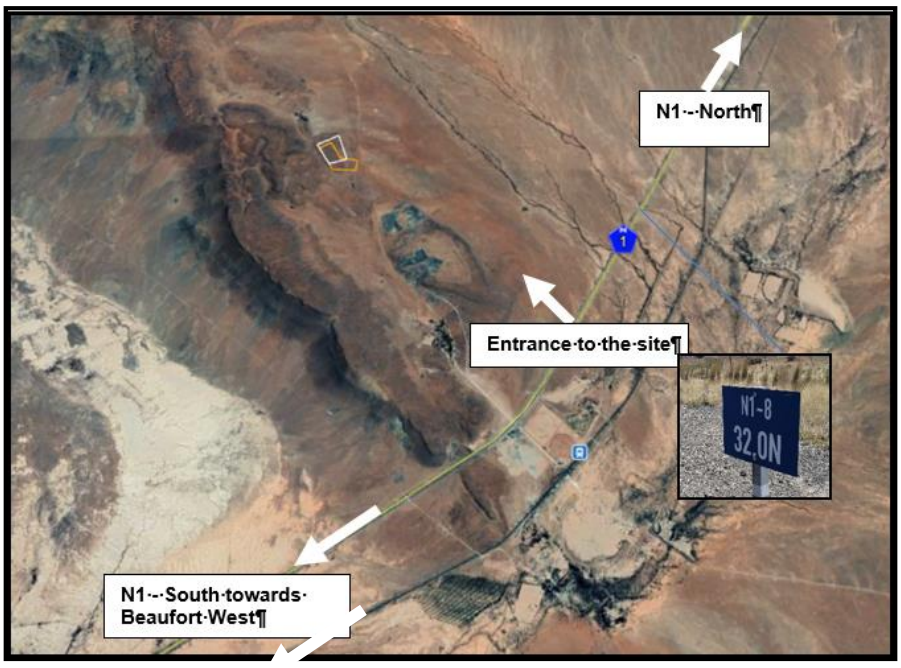


Figure 1: Satellite view of the proposed mining permit area site alternative 1 (orange polygon) and site alternative 2 (white polygon) of Lombardskraal Doleriet (Pty) Ltd (image obtained from Google Earth).

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

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

Lombardskraal Doleriet (Pty) Ltd (hereinafter referred to as “the Applicant”), applied for environmental authorisation (EA) and a mining permit to mine gravel on a portion of Portion 4 of the farm Waai Kraal 120, Registration Division of Beaufort West, Western Cape province.

The proposed mining footprint will be 4.9 ha and will be developed over an undisturbed area of the farm occasionally used for grazing. The mining method will make use of blasting in order to loosen the hard rock; the material will then be loaded and hauled to the crushing plant where it will be screened to various sized stockpiles. The aggregate will be stockpiled until it is transported from site using tipper trucks. All mining related activities will be contained within the approved mining permit boundaries.

The proposed mining area is approximately 4.9 ha in extent and the applicant, intents to win material from the area for at least 2 years with a possible extension of another 3 years. The gravel to be removed from the quarry will be used for construction industry in the vicinity. The depth of the quarry will be approximately 15m.The proposed quarry will therefore contribute to the upgrading / maintenance of road infrastructure and building contracts in and around the Beaufort West 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:

- Excavating equipment;
- Earth moving equipment;
- Mobile crushing and screening plants – (approximately 2800m²);
- Access Roads;
- Site office (approximately 6 Containers of 6.056 m (L) x 2.438m (W) x 2.592 m (H));
- Site vehicles;
- Parking area for visitors and site vehicles;
- Weighbridge (3 m x 16m);
- Ablution facilities (Chemical toilet - 2 x 6m Standard Containers).

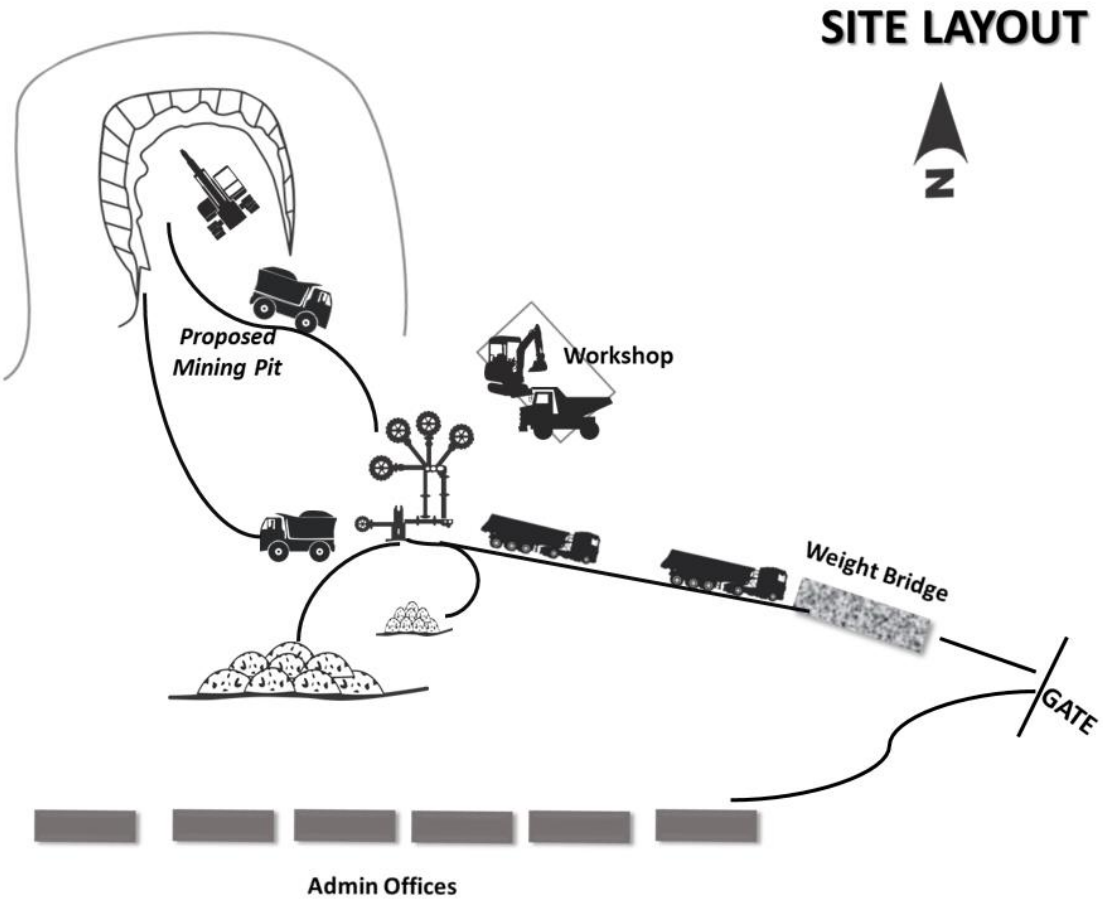


Figure 2: Site Layout Plan of the proposed Quarry.

Figure 3: Operation Plan of the proposed Quarry.

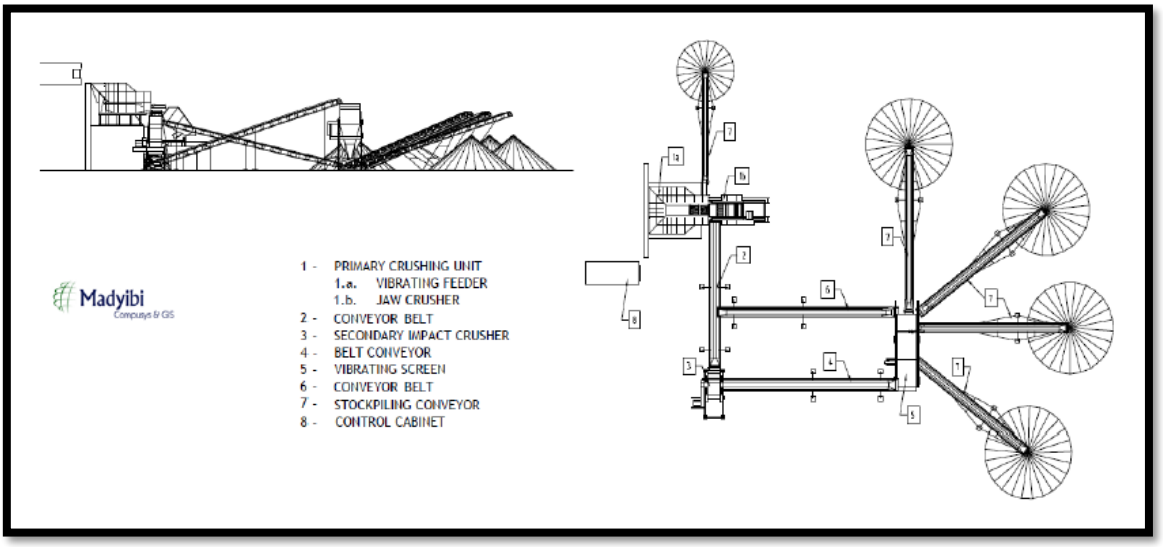


Figure 4: Operation Plan Crushing and Screening Plant of the proposed Quarry

See attached as Appendix C a copy of the site activities map for the proposed project.

i) Listed and specified activities

Table 2: Listed and specified activities triggered by the associated mining activities

NAME OF ACTIVITY (E.g. For prospecting – drill site, site camp, ablution facilities, 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 m^2	**LISTED ACTIVITY** Mark with an X where applicable or affected	**APPLICABLE LISTING NOTICE** (GNR 324, GNR 325, GNR 326 OR GNR 327)
Demarcation of site with visible beacons.	4.9 ha	N/A	Not listed
Site establishment	±4.9 ha	X	GNR 327 LN 1 Activity 27

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

The clearance of an area of 1 hectares or more, but less than 20 hectares of

indigenous vegetation, except where such clearance of indigenous vegetation is

required for—

(i) the undertaking of a linear activity; or

(ii) maintenance purposes undertaken in accordance with a maintenance management plan.

Mining of gravel / aggregate	±4.9 ha	X	GNR 327 LN 1 Activity 21, 28.

- GNR Environmental Impact Assessment Regulations 327 Listing Notice 1 of 2017 Activity 21:

Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 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 2014 Activity 28:

Residential, mixed, retail, commercial, industrial or institutional developments where

such land was used for agriculture, game farming, equestrian purposes or afforestation

on or after 01 April 1998 and where such development:

NAME OF ACTIVITY (E.g. For prospecting – drill site, site camp, ablution facilities, 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 m^2	**LISTED ACTIVITY** Mark with an X where applicable or affected	**APPLICABLE LISTING NOTICE** (GNR 324, GNR 325, GNR 326 OR GNR 327)
(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.			
Crushing, screening, stockpiling and transporting material from site.	±1 ha	X	GNR 327 LN 1 Activity 21, 28.

- GNR Environmental Impact Assessment Regulations 327 Listing Notice 1 of 2017 Activity 21:

Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 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 2014 Activity 28:

Residential, mixed, retail, commercial, industrial or institutional developments where

such land was used for agriculture, game farming, equestrian purposes or afforestation

on or after 01 April 1998 and where such development:

(i) will occur inside an urban area, where the total land to be developed is bigger

than 5 hectares; or

(ii) will occur outside an urban area, where the total land to be developed is bigger

NAME OF ACTIVITY (E.g. For prospecting – drill site, site camp, ablution facilities, 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 m^2	**LISTED ACTIVITY** Mark with an X where applicable or affected	**APPLICABLE LISTING NOTICE** (GNR 324, GNR 325, GNR 326 OR GNR 327)
than 1 hectare; *excluding where such land has already been developed for residential, mixed, retail,* *commercial, industrial or institutional purposes.*			
Sloping and landscaping upon closure of the mining area.	4.9 ha	X	GNR 327 LN 1 Activity 22.
▪ GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 22: *The decommissioning of any activity requiring a closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002.*			

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)

Portion 4 of the farm Waai Kraal 120, Registration Division of Beaufort West RD, Western Cape province is situated approximately ±32 km north of Beaufort West. The GPS coordinates of the proposed mining area are as follows:

Table 3: GPS Coordinates of the proposed mining footprint – Site Alternative 1.

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	32°10'50.045"	22°49'47.593"	-32.180568º	22.829887º
B	32°10'52.46"	22°49'43.997"	-32.181239º	22.828888º
C	32°10'59.696"	22°49'49.3"	-32.183249º	22.830361º
D	32°10'59.75"	22°49'57.436"	-32.183264º	22.832621º
E	32°10'56.204"	22°49'57.576"	-32.182279º	22.83266º
F	32°10'55.722"S	22°49'51.769"	-32.182145º	22.831047º

Table 4: GPS Coordinates of the proposed mining footprint – Site Alternative 2.

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
a	32°10'51.01"	22°49'42.96"	-32.180836º	22.8286º
b	32°10'47.323"	22°49'49.926"	-32.179812º	22.830535º
c	32°10'55.942"	22°49'53.868"	-32.182206º	22.83163º
d	32°10'57.738"	22°49'42.96"	-32.182705º	22.829966º

Project Proposal:

The proposed mining site will be over an undisturbed area of the farm occasionally used for grazing on a portion of Portion 4 of the farm Waai Kraal 120, Registration Division of Beaufort West, Western Cape province. The mining method will make use of blasting in order to loosen the hard rock; the material will then be loaded and hauled to the crushing plant where it will be screened to various sized stockpiles. The aggregate will be stockpiled until it is transported from site using tipper trucks. All mining related activities will be contained within the approved mining permit boundaries.

The proposed mining area is approximately 4.9 ha is extent and the applicant, intents to win material from the area for at least 2 years with a possible extension of another 3 years. The gravel to be removed from the quarry will be used for construction industry in the vicinity. The depth of the quarry will be approximately 15m.The proposed quarry will therefore contribute to the upgrading / maintenance of road infrastructure and building contracts in and around the Beaufort West area.

The mining activities will consist out of the following:

- Stripping and stockpiling of topsoil;
- Excavating;

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

The proposed mining activities will entail the following:

- An existing access road to the mining area will be used.
- The proposed mining site will be over an undisturbed area of the farm occasionally used for grazing
- The mining method will make use of blasting in order to loosen the hard rock; the material will then be loaded and hauled to the crushing plant where it will be screened to various sized stockpiles. The aggregate will be stockpiled until it is transported from site using tipper trucks. All mining related activities will be contained within the approved mining permit boundaries. The aggregate / gravel will be stockpiled and transported to clients via trucks and trailers.
- All activities will be contained within the boundaries of the site.

Should the MP be issued and the mining of gravel be allowed, the proposed project will comprise of activities that can be divided into three key phases (discussed in more detail below) namely the:

(1) *Site establishment/construction phase which will involve the demarcation of the permitted mining area. Site establishment will also necessitate the clearing of vegetation, the stripping and stockpiling of topsoil, and the introduction of mining machinery and equipment.*

(2) *Operational phase that will entail the mining of aggregate (dolerite) / gravel 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 and Energy (DMRE). 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 DMRE 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).

- Rehabilitation of the surface area shall entail landscaping, levelling, top dressing, land preparation, seeding (if required), and weed / alien clearing.

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

- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognised 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 categorised as weeds according to the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) [NEMBA] 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. Once the mining area was rehabilitated, the mining permit holder will submit a closure application to the DMRE 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).

PHASES OF THE PROJECT

1. *Site Establishment Phase:*

   Site establishment entails the demarcation of the mining boundaries, clearance of vegetation and stripping and stockpiling of topsoil (if needed) from the mining area, and the introduction of the mining equipment as detailed below:

- **Demarcation of 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 will be demarcated with visible beacons.

- **Access Road:**

  The farm road has a formal entrance, and was also used by SANRAL to transport aggregate / gravel from and existing quarry. No upgrading of the road is needed prior to commencement. An agreement with SANRAL will be obtained in order to use this access road.

  The proposed mining area will be reached via an existing farm road that passes the site. The applicant proposes to upgrade the road to allow comfortable movement of mining related equipment and vehicles. Haul roads into the excavation will be extended as mining progresses. The improvement of the access road, and establishment of haul roads will be below the threshold of the NEMA, 1998 EIA Regulations, 2017.

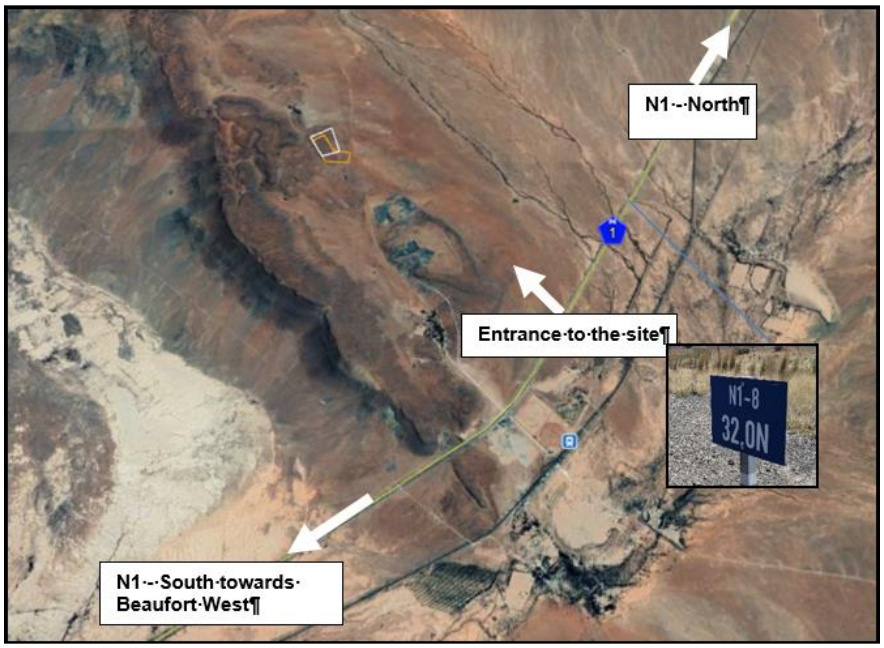


Figure 5: Satellite view showing the access road entrance (white arrow) to the proposed mining area site alternative 1(orange polygon) as well as site alternative 2(white polygon).

Figure 6: Satellite view showing the access road (white dashed line) to the proposed mining area site alternative 1(orange polygon) as well as site alternative 2(white polygon).

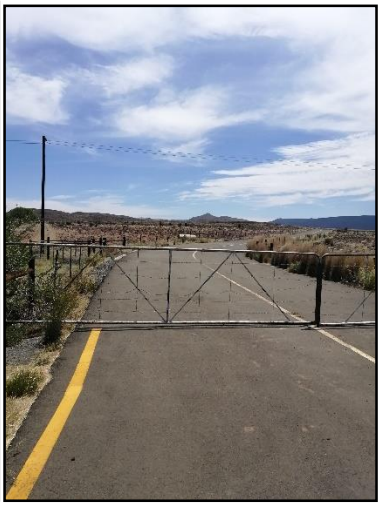


Figure 7: Photos showing the existing entrance into the mining area.

- **Clearing of Vegetation:**

According to Mucina and Rutherford (2012) the proposed mining area for both site alternative 1 and 2 extends over two vegetation types known as the NKI 1 Gamka Karoo and the NKu 2 Upper Karoo Hardeveld. Both is classified as Least Threatened. According to the Western Cape Biodiversity Conservation Plan (WCBCP) – the area is classified as other National Area Area (ONA). To mitigate this, the clearing of vegetation must be contained to the approved mining footprint, and no vegetation/bush clearance, outside the approved area, may be allowed.

- **Topsoil Stripping:**

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 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.

- **Introduction of Mining Machinery:**

The mining site will contain the following:

- Excavating equipment;
- Earth moving equipment;
- Mobile crushing and screening plants;
- Site office (Container);
- Site vehicles;
- Parking area for visitors and site vehicles;
- Weighbridge;
- Ablution facilities (Chemical toilet).

2. *Operational Phase:*

The operational phase will involve the loosening of the hard rock of the quarry by blasting, upon which it will be mechanically recovered with drilling-, excavating- and earthmoving equipment. The rock will then be delivered to the crushing and screening plant where it will be reduced to various sized aggregate. The screened material will be delivered to various size category stockpiles. Transportation of the final product will be from the stockpile area to the end point by means of trucks. The contractor will make use of permanent employees and any additional employees required will be sourced from the surrounding area and daily be transported to site. All activities will be contained within the boundaries of the site. The mining activities will consist out of the following:

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

- <u>Water Use:</u>

  As no gravel washing is proposed for this project, the Applicant will exclusively use water for dust suppression purposes on the access road and processing plant when needed. Approximately 5 - 10 000 litre water/day will be needed during the dry months.

  Dust generated on the access road will, as far as possible, be managed through alternative dust suppression methods to restrict water use to the absolute minimum.

  These measures will include a combination of the following:

  - The speed of all mining equipment/vehicles will be restricted to 40 km/h on the internal farm road to minimize dust generation;
  - When the truck leaves the mining area it will be covered (e.g. shade cloth material) to minimise windblown dust from the loads;
  - The Applicant will attempt to lessen denuded areas (dust source) to the absolute minimum.

Under very windy/dusty conditions the permit holder might have to substitute the above mentioned dust suppression methods with the spraying of water, in which case water will be bought and transported to the mining area in a water truck that will moisten the problem area. The water truck driver will receive proper training to ensure effective use of the water on problem areas preventing water wastage.

- Electricity:

The proposed project will make use of generators for power supply until a connection to the national grid can be secured.

- Waste Handling:

Solid (general) waste, generated during the operational phase, will be contained in sealable refuse bins that will be placed at the office area until the waste is transported to a recognised general waste landfill site. A recognized contractor will service the chemical toilets that will serve as ablution facilities to the employees.

Due to the nature of the project, the small scale of the proposed operation, and the fact that no permanent infrastructure will be established, very little to no 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 that will be removed from site and incorporated in an approved waste disposal system of the contractor.

Likewise, very little (if any) 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 at a designated off-site workshop where it will be disposed of as part of the hazardous waste by a registered hazardous waste handling contractor.

The chemical toilet, to be placed on site, will be serviced by a registered contractor.

- Servicing and Maintenance:

  A temporary workshop and wash bay will be established on site where minor servicing and emergency repairs of mining related equipment/machinery will take place. The wash bay will have an impermeable floor and drain into an oil sump that will be serviced by a qualified contractor. No wash water will be allowed to drain into the surrounding environment. No bulk storing of fuel (>30 000 l) will take place on site, and any chemicals needed at the workshop will be stored in accordance with the product specific safety data sheet specifications in temporary containers/secured cages.

  Regular vehicle maintenance, repairs and services may only take place in a demarcated service area. If emergency repairs are needed on equipment not able to move to the workshop / service area, 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. It will be undertaken on an impermeable surface to prevent contamination of soil and groundwater. Vehicles and equipment must be parked and stored on impermeable surfaces or make use of uPVC lining and drip trays when stationary

Decommissioning Phase:

The decommissioning phase will entail the reinstatement of the proposed mining footprint (4.9 ha).

The end objective is for the mining area to return to dormant agricultural use. No buildings/infrastructure, need to be demolished and the access road will remain intact.

The applicant will comply with the minimum closure objectives as prescribed DMRE and detailed below:

The decommissioning phase will entail the reinstatement of the processing area by removing the stockpiled material, and site infrastructure/equipment and landscaping the disturbed footprints. 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

scree slopes on the benches below, thereby reducing the overall face angle. The benches will be 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 (see Appendix L for the Closure Plan).

The decommissioning activities will therefore consist of the following:

- Sloping and landscaping the quarry pit;
- Removing all stockpiled material;
- Removing all mining machinery and equipment from site;
- Landscaping all disturbed areas and replacing the topsoil;
- Vegetating the reinstated area; and
- Controlling/monitoring the invasive plant species.

The future land use of the proposed area will be agriculture. Upon replacement of the topsoil, the area around the excavation will once again be available for grazing purposes, and the planting of the cover crop (to protect the topsoil) will tie in with the proposed land use.

The applicant will comply with the minimum closure objectives as prescribed by the DMRE and detailed below:

- <u>Rehabilitation of the excavated area:</u>

  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.

- 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 must 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 10 cm 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 camp 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 DMRE Regional Manager. _

On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 200mm and graded to an even surface condition. Where applicable/possible topsoil needs to be returned to its original depth over the area.

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 DMRE 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 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 and Energy 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 (as amended).

e) Policy and Legislative Context

Table 5: 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)
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983).	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity: *Physical Environment – Geology and Soil.* 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 CARA, 1983.
Mine Health and Safety Act, 1996 (Act No 29 of 1996) read together with applicable amendments and regulations thereto including relevant OHSA regulations.	Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Management of Health and Safety Risks.*	The mitigation measures proposed for the site includes specifications of the MHSA, 1996
Mineral and Petroleum Resources Development Act, 2002, (Act No. 28 of 2002) read together with applicable amendments and regulations thereto. ℑ Section 27	Part A(1)(d) Description of the scope of the proposed overall activity	Application for a mining permit submitted to DMRE-WC. Ref No: WC 30/5/1/3/2/10266 MP
National Environmental Management Act,1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2014 (as amended by GNR 326 effective 7 April 2017) • GNR 327 Listing Notice 1 Activity 21 • GNR 327 Listing Notice 1 Activity 22 • GNR 327 Listing Notice 1 Activity 27 • GNR 327 Listing Notice 1 Activity 28	Part A(1)(d)(i) Listed and specified activities.	Application for environmental authorisation submitted to DMRE-WC. Ref No: WC 30/5/1/3/2/10266 MP
National Environmental Management: Air Quality Control Act, 2004 (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.

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)
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.
National Environmental Management: Waste Act, 2008 (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(1)(d)(ii) Description of the activities to be undertaken	The mitigation measures proposed for the site take into account the NEM:WA.
National Heritage Resources Act. 1999 (Act No 25 of 1999).	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – *Human Environment*	The mitigation measures proposed for the site includes specifications of the NHRA, 1999.
National Water Act, 1998 (Act No 36 of 1998) read together with applicable amendments and regulations thereto.	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – *Hydrology.* Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk.	The proposed project does not require a Water Use Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No 36 of 1998). As mentioned earlier, no activity will take place in or within 1km radius of any water bodies. Any water required for the implementation of the project will be bought from a registered source and transported to on site. The mitigation measures proposed for the site includes specifications of the NWA, 1998.
Public Participation Guideline in terms of the NEMA EIA Regulations	Part A(1)(h)(ii) Details of the Public Participation Process Followed	Public participation was conducted in accordance with the guidelines published 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 / gravel from a permitted area. The proposed aggregate / gravel mining operation will entail the removal of aggregate / gravel, from an undisturbed area of the farm occasionally used for grazing. The mining of the mineral was identified as a feasible business opportunity that will also bring about the diversification of activities on the property, extending it from dormant agricultural land to include small scale mining.

The project will contribute to the local economy, both directly and through the multiplier effect that its presence will create, as equipment and supplies are purchased locally, and wages are spent at local businesses, generating both jobs and income in the area.

The dolerite mined from the earmarked area will be sold to the building, construction and road maintenance industry in the vicinity of the property. The mining of the aggregate from the proposed site will benefit the general society in that it will contribute to the upgrading of road infrastructure of the region, thereby enabling road users to safely travel through the district. The upgrading and maintenance of roads is of high priority and contributes to the improvement of the infrastructure network of South Africa.

The need and desirability of the proposed project was assessed in terms of the National Department of Environmental Affairs' Guideline on Need and Desirability (first version published in terms of section 24J of the NEMA in 2014, and second version in 2017)). The following table shows the questions that were considered in this regard.

Table 6: Need and desirability determination.

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
How were ecological integrity considerations taken into account? How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity?	As discussed under Part A(1)(g)(iv)(1)(a) Type of environment affected by the proposed activity, when the mining footprint is layered over the Mining and Biodiversity Map, it does not fall over and area of any specified for risk of mining therefore the risk is seen to be insignificant. Ground truthing, by the specialists, however in terms of local-level biodiversity, the site is not exceptional and the site is not highly sensitive in this regard, as there are no Species of Conservation Concern or unique and range restricted species present within the proposed mining as well as no unique habitats which are not widely available in the wider landscape. As a result, the majority of impacts associated with the development of the site are likely to be local in nature and not of wider significance. Only one provincially protected species has been recorded within the proposed mining area namely *Babianna hypogeae*. This species is however not regarded as rare and the loss of the affected individuals from the development footprint would not be of wider significance or compromise the viability of the local populations of these species. In terms of the likely botanical impacts associated with the mine, impacts on vegetation during the operation phase are likely to be relatively moderate (rated mostly as medium significance prior to mitigation) and are difficult to mitigate as little can be done to avoid the large amounts of disturbance associated with this phase of the development. As the affected vegetation type is relatively widespread and the footprint area is regarded as limited, the impact on vegetation, as already mentioned, is likely to be of locally high intensity but is not considered to be of broader significance. Potential cumulative impacts are also furthermore regarded limited and of low significance. Subsequently the proposed development area is largely well located in terms of avoiding sensitive receptors and the development will not compromise the survival of any specific flora or terrestrial vertebrate species on the study area or beyond if mitigation measures are fully implemented. and concluded that the earmarked footprint (S1) is not of high conservation	Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
	priority. The botanist deduced that the impacts on the vegetation do not constitute a fatal flaw to the proposed mining operation and so there is no reason to block the project in that regard. Also refer to: - Part A(1)(d)(ii) Description of the activities to be undertaken – Clearing of Vegetation; - Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – Mining and Biodiversity; - Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – Biodiversity Conservation Areas; - Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – Groundcover; - Part A(1)(h)(iv)(1)(c) Description of specific environmental features and infrastructure on the site – Site Specific Terrestrial Biodiversity, Conservation Areas and Groundcover, - Part A(1)(h)(viii) The possible mitigation measures that could be applied and the level of risk. As discussed under *Part A(1)(g)(iv)(1)(a)*. The Applicant will make use of the existing access point to the mining area. Should the Applicant implement the mitigation measures proposed in the EMPr the impact of the proposed activity on the vegetation and groundcover in general is deemed to be of low significance.	
How will this development pollute and/or degrade the biophysical environment?	Due of the nature of the proposed activity, it is inevitable that the present vegetation cover of the earmarked footprint will eventually be removed to allow access to the aggregate (dolerite) / gravel resource, only to be replaced (to some extend) during the rehabilitation phase. Taking the above mentioned into consideration, the botanical assessment concluded that the quarry will have relatively little impact on the vegetation and fauna around it provided that the mitigation measures are adhered to. Therefore, should the permit holder adhere to the mitigation measures proposed in this report it is believed that the impact on the biophysical environment is of acceptable significance.	Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
What waste will be generated by this development?	The general waste to be generated at the mine will mainly consist of paper, plastic, tin, and/or glass from the office, workshop and processing area. All general waste will be contained in sealable refuse bins that will be placed at the office area until it is transported to a recognised general waste landfill site. A recognized contractor will service the chemical toilets and be responsible for the removal of the sewerage to a registered sewerage handling facility. As mentioned earlier, hazardous waste may result from accidental spillages/breakdowns. Such contaminated areas will immediately (within two hours of occurrence) be cleaned and the contaminated soil will be contained in a designated hazardous waste container that will be kept in a bunded area with impermeable surface until it is removed from site by a registered hazardous waste handling contractor to an approved facility. No waste will be disposed of, buried, burned or treated on the site.	Highly Desirable
How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage?	The proposed quarry is located on a spur of hills that extend out from the eastern Nieuweveldsberge of the Great Southern Escarpment. The site overlooks the drainages of the Hoek se Sloot and Renosterspruit Rivers to the east, while the Platdoring River drainage lies immediately to the west (as per notification of intent to develop Section 38 (1) and Section 38 (8) of the National Heritage Resources Act (completed by John Gibble). Heritage resources located within the footprint of the proposed mining area will be affected by quarrying activities, except if expressly excluded from quarrying activities. The stripping for stockpiling of the topsoil from the site will result in the disturbance of any archaeological material (both pre-colonial and historical) present, and the destruction of any stratified sites. This includes the stone-walled kraal on the site and any associated artefacts.	Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
	The quarrying of the area will result in the loss and destruction of fossil material within the shales and mudstones that underly the site and which are the target resource of the proposed quarry. No archaeological or other heritage studies have been identified from available literature in the immediate vicinity of the site, but a handful studies from the wider region provide general information about the history of the area. A field survey by of the site has not yet been possible an archaeologist but Google Earth satellite imagery and a photo collected by the ecologist, who has visited the site indicates the presence within the proposed mining area of a stone-walled kraal see figure 15 and 16 further below in this document (Figure 5 and Plate 1 as per NID). The age of the kraal is unknown but its shape and structure suggests that it is historical, rather than pre-colonial. The Applicant will implement a chance-find protocol on site for the duration of the site establishment, operational- and decommissioning phase. The available archaeological literature and assessment reports for this area of the Karoo suggest that an archaeological background "litter" of Middle Stone Age lithics can be expected within the quarry area. The lack of rocky overhangs or shelters means that any archaeological sites within the proposed quarry footprint are likely to be open, unstratified sites. The presence of rock engravings on the site is possible. The existence of a possible stone-walled kraal, of likely colonial period age has been confirmed. The following pre-quarrying archaeological mitigation measures are recommended: • An archaeological walkover survey of the site must be conducted by a suitably qualified professional archaeologist to identify any archaeological sites and/or materials and to assess the stone-walled structure;	

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
	• If any significant archaeological remains are located during this survey which cannot be avoided by, or excluded from the quarrying, they will require mitigation prior to any quarry-related activities on the site. A Workplan application will need to be made to HWC to conduct this work; • Should any human remains be encountered at any stage during the works associated with the project, work must in the vicinity must cease immediately, the remains must be left *in situ* but made secure and the project archaeologist and HWC must be notified immediately in order to make a decision about how to deal with the remains. The Palaeontological Impact Assessment indicates that, based on the geological record and fossil collecting map maintained by the Evolutionary Studies Institute, there is a chance that vertebrate fossils could occur on the site but none have been recorded to date. If dolerite is the material to be mined than there will be no fossils, but if mudstones and shales are to be mined there is a moderate chance that fossils will be present. The following mitigation measures are, therefore, recommended: • A site visit by a suitably qualified palaeontologist must take place prior to the commencement of quarrying to establish whether fossils are exposed on the site; • A Fossil Chance Finds Protocol must be implemented once quarrying commences to ensure the reporting, safeguarding and recovery of any discoveries of fossils; • The requirement to implement a Fossil Chance Finds Protocol, an example of which is attached as Appendix D of the Palaeontological Impact Assessment Report (Appendix N), must be included in the EMPr for the project; and • If fossils are found during quarrying, they must be excavated and collected by a professional palaeontologist, working under a HWC permit and then housed in a recognised repository.	

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
How will this development use and/or impact on non-renewable natural resources?	Beaufort West Quarry is a dolerite/gravel resource of at least 1000 000 m^3 that shows a potential life of mine of would still be available for many years. In light of this, it is believed that the mining permit holder could responsibly consume the dolerite resource on the property over a period of 5 years.	Desirable
How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part?	It is proposed that approximately 20 000 litres of water will be needed per day during the dry months to manage dust emissions from the proposed operation. As mentioned earlier, the contractor will strive to manage dust generation through alternative suppression methods to restrict water use to the absolute minimum. Presently, it is proposed that water will be bought and transported to site. The contractor will be encouraged to consider the use of non-potable water for mining related activities. The use of solar power should also be considered as an alternative power source to the offices and/or workshops.	Desirable
How were a risk-averse and cautious approach applied in terms of ecological impacts?	If the proposed mitigation measures and monitoring programs, as proposed in this document, is implemented, it is believed that ecological impacts should be fully mitigated.	Desirable
How will the ecological impacts resulting from this development impact on people's environmental right?	Should the mining activities be approved the potential visual-, dust-, and noise impacts associated with the proposed activity will be of low significance. If the proposed mitigation measures and monitoring programs, as proposed in this document, is implemented, it is believed that no environmental rights of the surrounding residents/public will be affected by the ecological impacts associated with the proposed activity.	Highly Desirable
Describe the linkages and dependencies between human wellbeing, livelihoods and		Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts.	If the proposed mitigation measures and monitoring programs, as proposed in this document, is implemented, it is believed that the mining activities will not affect the physical, psychological, cultural or social needs of the community in a negative manner nor will the it impact negatively on the socio-economic status of the area.	
Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?		
Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified, resulted in the selection of the "best practicable environmental option" in terms of ecological considerations		
2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
What is the socio-economic context of the area?	Please refer to Heading 2(h)(iv)(1)(a) Socio-economic Environment.	Highly Desirable
Considering the socio-economic context, what will the socio-economic impacts be of the development, and specifically also on the socio-economic objectives of the area?	As mentioned earlier, should this mining permit be approved the applicant will be able to, • Provide employment opportunities; • the people/businesses of Beaufort West will benefit from diversification of gravel sources which will result in competitive product costs. • It will also diversify the income of the property as well as potential employees and clients.	
How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	If the proposed mitigation measures and monitoring programs, as proposed in this document, is implemented, it is believed that the mining activities will not affect the physical, psychological, cultural or social needs of the community in a negative manner nor will the it impact negatively on the socio-economic status of the area.	Highly Desirable
Will the development result in equitable impact distribution, in the short- and long-term?	The mining activities proposes to operate in a socially and economically sustainable manner during both the short- and long term.	Highly Desirable
In terms of location, describe how the placement of the proposed development will contribute to the area.	As mentioned above the proposed area is over an undisturbed area of the farm occasionally used for grazing but with very low agricultural potential due to the rocky surface, after consultation with the land owner the application footprint extends into an area with low agricultural potential. The Applicant will make use of the existing access point to the mining area. Should the Applicant implement the mitigation measures proposed in the EMPr the impact of the proposed activity on the surrounding area in general is deemed to be of low significancethereby keeping the impact on the receiving environment as low as possible.	Highly Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
	The desktop agricultural compliance statement done by Dr Darren Bouwer (PhD Soil Science Pri Nat Sci 400081/16) confirmed that the proposed development site is of a "low" Agricultural sensitivity, as classified by the DEA Screening Tool. The landtypes of the area predict shallow rocky soils. This is further substantiated by satellite images of the survey area. These soils will have a low water holding capacity which will limit crop production and are not deemed suitable for irrigation. The grazing potential of 28 ha/LSU is very low and typical of the area. This is further substantiated by the low rainfall. It is the specialist's opinion that the proposed development site is of a low agricultural sensitivity and that the development at the proposed site will not significantly impact agricultural activities. In terms of agricultural sensitivity, the proposed development should thus be allowed to proceed at the identified site subject to recommendations provided.	
How were a risk-averse and cautious approach applied in terms of socio-economic impacts?	No negative socio-economic impacts could, at this stage, be identified that cannot be managed through the implementation of mitigation measures.	Highly Desirable
How will the socio-economic impacts resulting from this development impact on people's environmental right?	As mentioned in Heading *3(j)(1) Impact on the socio-economic condition of any directly affected person*, the activity may have an impact on the visual characteristics of the surrounding environment, and may potentially affect air quality and possibly the noise ambiance of the study area. However, should the mining activities be approved the potential visual-, dust-, and noise impacts associated with the proposed activity will be of low significance. If the proposed mitigation measures and monitoring programs, as proposed in this document, is implemented, it is believed that no environmental rights of the surrounding residents/public will be affected by the socio-economic impacts associated with the proposed activity	Highly Desirable
Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question	As mentioned above should the mining activities be approved the potential visual-, dust-, and noise impacts associated with the proposed activity will be of low significance. If the proposed mitigation measures and monitoring programs, as proposed	Highly Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
and how the development's socio-economic impacts will result in ecological impacts?	in this document, is implemented, it is believed that no environmental rights of the surrounding residents/public will be affected by the socio-economic impacts associated with the proposed activity.	
What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations? What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons?	Please refer to: • Part A(1)(g)(vii) The positive and negative impacts that the proposed activity and alternatives will have on the environmental and the community that may be affected.	Highly Desirable
What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	The mining site will (if approved) operate in accordance with, amongst others, the following: • CARA, 1983 – to ensure agriculture related compliance; • Financial Provision Regulations, 2015 – to ensure compliance in terms of rehabilitation; • Mine Health and Safety Act, 1996 (as amended) – to ensure employee safety; • MPRDA, 2002 (as amended) – to ensure mining related compliance; • NEM:AQA, 2004 – to ensure air quality related compliance; • NEM:BA, 2004 – to ensure biodiversity related compliance;	Highly Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	• NEM:WA, 2008 – to ensure waste related compliance; • NEMA, 1998 (as amended) – to ensure environmental related compliance;	
Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community that is consistent with the priority needs of the local area.	As mentioned earlier, should this mining permit be approved the applicant will be able to, • Provide employment opportunities; • the people/businesses of Beaufort West will benefit from diversification of aggregate (dolerite) / gravel sources which will result in competitive product costs. • It will also diversify the income of the property as well as potential employees and clients.	Highly Desirable
What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected.	The mining activities will be in accordance with the specifications of the Mine Health and Safety Act, 1996. Site management will have daily discussions with the drill rig operators regarding the work to be performed and the environment in which the work will take place. Grievances/concerns can be lodged during the daily site meetings.	Highly Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
Describe how the development will impact on job creation in terms of, amongst other aspects?	As mentioned earlier, should this mining permit be approved the applicant will be able to, • Provide employment opportunities; • the people/businesses of Beaufort West will benefit from diversification of aggregate (dolerite) / gravel sources which will result in competitive product costs. • It will also diversify the income of the property as well as potential employees and clients.	Highly Desirable
What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage.	Should the mining permit be approved the activities will operate under a valid mining permit issued by the DMRE, compliance of the mine with the approval conditions can be reported on as per the departmental specifications and also be managed in accordance with all the mining and environmental related legislations.	Highly Desirable
Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left.	It is believed that the mitigation measures proposed in this document is realistic and can be implemented (when needed) by the proposed activities. If the proposed mitigation measures and monitoring programs, as proposed in this document, is implemented, the residual impact on the environment is of low significance.	Highly Desirable
What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health	In terms of Section 41 of the MPRDA, 2002 a mining permit holder must submit a financial provision to the DMRE that is sufficient to rehabilitate or manage the negative environmental impacts related to the mining activity.	Highly Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
effects and of preventing, controlling or minimising further pollution environmental damage or adverse health effects will be paid for by those responsible for harming the environment.		
Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified, resulted in the selection of the best practicable environmental option in terms of socio-economic considerations	Please refer to: - Part A(1)(g)(i) Details of the development footprint alternatives considered; - Part A(1)(g)(iv)(1)(c) Description of specific environmental features and infrastructure on the site – Site Specific Socio-Economic Environment; - Part A(1)(g)(vii) The positive and negative impacts that the proposed activity and alternatives will have on the environmental and the community that may be affected.	Highly Desirable
Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area.	If the proposed mitigation measures and monitoring programs, as proposed in this document, is implemented, it is believed that the mining activities will not cause a cumulative socio-economic impact should the mining permit application be approved, seeing that there is no other rated activities in the vicinity.	Highly Desirable

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

The proposed site (Site Alternative 1) was identified as the preferred and only viable site alternative based on the following:

- The proposed area is over an undisturbed area of the farm occasionally used for grazing but with very low agricultural potential due to the rocky surface, after consultation with the land owner the application footprint extends into an area with low agricultural potential. The proposed project will not necessitate the loss of agricultural field with high potential to the land owner. This was deemed the only site alternative as this is the only area that will be viable for the land owner due to the low agricultural potential.
- The desktop agricultural compliance statement done by Dr Darren Bouwer (PhD Soil Science Pri Nat Sci 400081/16) confirmed that the proposed development site is of a "low" Agricultural sensitivity, as classified by the DEA Screening Tool. The landtypes of the area predict shallow rocky soils. This is further substantiated by satellite images of the survey area. These soils will have a low water holding capacity which will limit crop production and are not deemed suitable for irrigation. The grazing potential of 28 ha/LSU is very low and typical of the area. This is further substantiated by the low rainfall. It is the specialist's opinion that the proposed development site is of a low agricultural sensitivity and that the development at the proposed site will not significantly impact agricultural activities. In terms of agricultural sensitivity, the proposed development should thus be allowed to proceed at the identified site subject to recommendations provided.
- Access to the proposed mining area is possible via the existing access road with a formal (existing) entrance onto the N1.
- This alternative will cause the destruction of the kraal as per the Heritage impact assessment.
- An alternative layout for the quarry, which avoids the kraal and preserves it on its southern boundary, has been proposed in the Final BAR – Site Alternative 2 but not found viable as explained below.
- From a heritage perspective as per the HIA site alternative 2 quarry layout is less preferred because although the original quarry layout (Site Alternative 1) will mean the loss of the kraal, the alternative layout will open the face of the quarry to the N1 and there will be a marked visual impact on the cultural landscape and sense of place of the area surrounding the quarry that will result from its visibility from the N1.

The environmental impact assessment process assessed the feasibility of the proposed site alternative to identify fatal flaws that are deemed as severe as to prevent the activity continuing, or warrant another 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.

Due to the application being over an undisturbed area of the farm occasionally used for grazing, as indicated on the Regulation 2.2 Mine Plan (Appendix A), was identified as the preferred and only viable site alternative as it entails the mining of an area but with very low agricultural potential due to the rocky surface.

The desktop agricultural compliance statement done by Dr Darren Bouwer (PhD Soil Science Pri Nat Sci 400081/16) confirmed that the proposed development site is of a “low” Agricultural sensitivity, as classified by the DEA Screening Tool. The landtypes of the area predict shallow rocky soils. This is further substantiated by satellite images of the survey area. These soils will have a low water holding capacity which will limit crop production and are not deemed suitable for irrigation. The grazing potential of 28 ha/LSU is very low and typical of the area. This is further substantiated by the low rainfall. It is the specialist’s opinion that the proposed development site is of a low agricultural sensitivity and that the development at the proposed site will not significantly impact agricultural activities. In terms of agricultural sensitivity, the proposed development should thus be allowed to proceed at the identified site subject to recommendations provided.

Site Alternative 1 (S1) (Preferred Alternative): Site Alternative 1 entails the mining of an area over an undisturbed area of the farm occasionally used for grazing within the GPS coordinates as listed in the table below.

Table 7: GPS Coordinates of Site Alternative 1 (preferred and only viable site alternative)

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	32°10'50.045"	22°49'47.593"	-32.180568°	22.829887°
B	32°10'52.46"	22°49'43.997"	-32.181239º	22.828888°
C	32°10'59.696"	22°49'49.3"	-32.183249°	22.830361°
D	32°10'59.75"	22°49'57.436"	-32.183264°	22.832621°
E	32°10'56.204"	22°49'57.576"	-32.182279°	22.83266°
F	32°10'55.722"	22°49'51.769"	-32.182145°	22.831047°
A	32°10'50.045"	22°49'47.593"	-32.180568°	22.829887°

Figure 8: Satellite view showing the position of Site Alternative 1 (orange polygon) and site alternative 2 (white polygon) within the surrounding landscape.

Site Alternative 1 was identified during the assessment phase of the environmental impact assessment, by the Applicant and project team, as the **preferred and only viable site alternative** due to the following:

- The proposed area is over an undisturbed area of the farm occasionally used for grazing but with very low agricultural potential due to the rocky surface, after

consultation with the land owner the application footprint extends into an area with low agricultural potential. The proposed project will not necessitate the loss of agricultural field with high potential to the land owner. This was deemed the only site alternative as this is the only area that will be viable for the land owner due to the low agricultural potential.

- Access to the proposed mining area is possible via the existing access road with a formal (existing) entrance onto the N1.

Site Alternative 2 (S2): Site Alternative 2 entails the mining of an area over an undisturbed area of the farm occasionally used for grazing within the GPS coordinates as listed in the table below within the GPS coordinates as listed in the table below.

Table 8: GPS Coordinates of Site Alternative 2 (preferred and only site alternative)

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
a	32°10'51.01"	22°49'42.96"	-32.180836º	22.8286º
b	32°10'47.323"	22°49'49.926"	-32.179812º	22.830535º
c	32°10'55.942"	22°49'53.868"	-32.182206º	22.83163º
d	32°10'57.738"	22°49'42.96"	-32.182705º	22.829966º

Site Alternative 2 was identified during the assessment phase of the environmental impact assessment, by the Applicant and project team, but found **not environmentally and practically suitable** due to the following:

Site Alternative 2 (S2) was assessed for the proposed mining but found not environmentally and practically suitable. The earmarked area is also a greenfield site that will have a higher visual impact to be disturbed for the quarry to be established. Site alternative 1, was deemed the only site alternative as this is the only area that will be viable for the land owner due to the low agricultural potential.

This alternative site was not deemed to be the preferred option as the face of the quarry will directly face the N1 therefor the area will have very high visual impact on the surrounding area.

- Although both the site alternative are over undisturbed areas of the farm occasionally used for grazing but with very low agricultural potential due to the rocky surface, after consultation with the land owner the application footprint for site alternative 1 are deemed to be the preferred alternative.

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 / gravel to be mined from the existing quarry will be sold to the building, road rehabilitation/maintenance and associated construction industry, if however, the no-go alternative is implemented:

- the Applicant cannot utilise the mineral resource on this property;
- the proposed employment opportunities will be lost;
- the people/businesses of Beaufort West will not benefit from diversification of aggregate (dolerite) / gravel sources which will escalating product costs.

In light of this, the no-go alternative was no deemed to be the preferred alternative.

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.

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 or hand delivered directly to the contact persons. A 30-days commenting period was allowed which expired on 9th December 2020. The following I&AP's and stakeholders were informed of the project:

Table 9: List of the I&AP's and stakeholders that were notified of the proposed aggregate / gravel mine project.

SURROUNDING LANDOWNERS & INTERESTED AND AFFECTED PARTIES	STAKEHOLDERS
Surrounding landowners & lawful occupiers: • Gideon Vivier Boerdery Trust – Landowner – Waai Kraal 120 Portion 4 • Gideon Vivier Boerdery Trust – Riet Fontein 122 Portion 2 (Remaining Extent) • Gideon Vivier Boerdery Trust – Riet Fontein 122 Portion 9 (Remaining Extent) • Gideon Vivier Boerdery Trust – Rhenosterkop 155 Portion 4 (Remaining Extent) • Werner Koster Property Trust – Rhenosterkop 155 Portion 2 (Remaining Extent)	• Department of Environmental Affairs and Development Planning • Department of Environmental Affairs and Development Planning - George • Department of Social Development • Department of Social Development – Beaufort West • Department of Economic Development and Tourism; • Department of Transport and Public Works • Department of Public Works and Infrastructure; • Department of Agriculture; • Department of Agriculture Forestry and Fisheries;

SURROUNDING LANDOWNERS & INTERESTED AND AFFECTED PARTIES	STAKEHOLDERS
• Werner Koster Property Trust – Rhenosterkop 155 Portion 3 (Remaining Extent) • Werner Koster Property Trust – Waai Kraal 120 Portion 1 (Remaining extent) • Werner Koster Property Trust – Waai Kraal 120 Portion 1 (Remaining extent) • South African National Roads Agency SOC Ltd – Landowner – Waai Kraal 120 Portion 4 • Collin de Villiers Trust – Beaufort West Portion 0 • Tamarisk Trust – Rietfontein 122 Portion 5 • Tamarisk Trust – Farm 71 Portion 0 (Remaining Extent) • Tamarisk Trust – Welgevonden 69 0 (Remaining Extent)	• Department of Labour - Western Cape Provincial Office; • Department of Rural Development and Land Reform - Western Cape District Offices • Department of Water and Sanitation; • Breede-Gouritz Cathement Management Agency • Central Karoo District Municipality; • Beaufort West Local Municipality; • Beaufort West Local Municipality - Ward 2 • Heritage Western Cape • South African Heritage Resources Agency; • Cape Nature • Cape Nature - George • ESKOM • Transnet • South African National Roads Agency
I&AP'S AND STAKEHOLDERS THAT REGISTERED/COMMENTED DURING THE INITIAL NOTIFICATION PERIOD	
• None	

An advertisement was placed in the Die Coerier on 6 December 2020, and two on-site notices were placed at conspicuous places. A 30-days commenting period was allowed which expired on 9 December 2020. 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 was distributed for comment and perusal to the I&AP's and stakeholders. A 30-day commenting period, ending 29 January 2021, was allowed for perusal of the documentation and submission of comments. The comments received on the DBAR was incorporated into the Final Basic Assessment Report (FBAR) that was submitted for decision making to DMRE, which was allowed for perusal of the documentation and submission of comments. The comments received on the DBAR was incorporated into the Final Basic Assessment Report (FBAR) for decision making to DMRE.

iii) Summary of issues raised by I&APs

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

Table 10: Summary of issues raised by IAPs during initial PPP phase

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	**X**				
Landowner/s					
• Gideon Vivier Boerdery Trust – Landowner – Waai Kraal 120 Portion 4 • Riet Fontein 122 Portion 2 (Remaining Extent) • Riet Fontein 122 Portion 9 (Remaining Extent) • Rhenosterkop 155 Portion 4 (Remaining Extent)	X	No comments recevied			N/A.
Lawful occupier/s of the land					
N/A		N/A	N/A	N/A	
Landowners or lawful occupiers on adjacent properties	**X**	-	-	-	-
• Werner Koster Property Trust – Rhenosterkop 155 Portion 2 (Remaining Extent) • Rhenosterkop 155 Portion 3 (Remaining Extent)	X	No comments recevied	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.
• Waai Kraal 120 Portion 1 (Remaining extent) • Waai Kraal 120 Portion 1 (Remaining extent)					
• South African National Roads Agency SOC Ltd – Landowner – Waai Kraal 120 Portion 6	X	No comments recevied	N/A	N/A	N/A
• Collin de Villiers Trust – Beaufort West Portion 0	X	No comments recevied	N/A	N/A	N/A
• Tamarisk Trust – Rietfontein 122 Portion 5 • Farm 71 Portion 0 (Remaining Extent) • Welgevonden 69 0 (Remaining Extent)	X	No comments recevied	N/A	N/A	N/A
Municipal councillor					
Cllr. D Welgemoed (Ward 2)	X	No comments recevied	N/A	N/A	N/A
Municipality					

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.
Beaufort West Local Municipality	X	18 November 2020	Beaufort West Municipality hereby acknowledge receipt of your background information document in the above matter dated 9 November 2020. Please be advised that the owner of portion 4 of the farm Waai Kraal 120, Beaufort West, must apply for a consent use in terms of Section 15(0) of By-Law on Municipal Land Use Planning for Beaufort West Municipality, 2019 (Notice 21/2019) to allow for a quarry on the aforesaid property before any mining activity may commence.	Thank you for taking part in the public participation process and submitting valued comments for the proposed mining permit application. The applicant will apply for a consent use in terms of Section 15(0) of By-Law on Municipal Land Use Planning for Beaufort West Municipality in due course. All comments received from you will be incorporated in the Final Basic Assessment Report to be submitted to DMRE for consideration.	Appendix F2: Proof of public participation process
Central Karoo District Municipality	X				
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e					N/A
Department of Transport and Public Works	X	No comments recevied	N/A	N/A	N/A
Department of Public Works and Infrastructure;	X	No comments recevied.	N/A	N/A	N/A
Eskom	X	No comments recevied.	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.
Transnet	X	No comments recevied.	N/A	N/A	N/A
South African National Roads Agency and adjacent landowner of: • Waai Kraal 120 Portion 4	X	No comments recevied.	N/A	N/A	N/A
Communities	N/A	No community were identified within the study area.			
Dept. Land Affairs					
Department of Agriculture;	X	N/A	N/A	N/A	N/A
Department of Agriculture Forestry and Fisheries;	X	N/A	N/A	N/A	N/A
Traditional Leaders	N/A				
Dept. Environmental Affairs					
Department of Environmental Affairs and Development Planning	X	10 November 2020	Response received from Me Adri Lameyer on 10 November 2020: Thank you for the BID. Please register the Department as a commenting authority for the BA application. Kindly notify me when the Draft BAR is released for public comment? I note that the BID indicates that Activity 12 of LN 3 of the NEMA EIA Regulations, 2014 (as amended) is applicable, but that the	The DBAR will be available for comments. Please note that Activity 12 of LN 3 of the NEMA EIA Regulations, 2014 (as amended) is no longer applicable and was removed from the documentation the application for Environmental Authorisation will also be amended accordingly	Appendix F2: Proof of public participation process

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.
			vegetation type on the mining area is classified as having an ecosystem status of Least Threatened. Please relook at the applicability of said listed activity? (only applicable if the indigenous vegetation has an ecosystem status of Endangered or Critically Endangered). We will provide more detailed comment on the Draft BAR once available; however, individual directorates may provide comments on the BID directly to you by the deadline of 09 December 2020.		
	X	2 December 2020	Response received from Ryan Apolles on 2 December 2020: I'm just following up on the email sent to you from Adri La Meyer(subjoined below), to determine if the Draft BAR (BID 10266 MP) is available for comment as yet?	Thank you for your email. The commenting time for the BID ends 9 December 2020. We will send you an email notification to let you know when the DBAR will be available for comments.	Appendix F2: Proof of public participation process
Department of Environmental Affairs and Development Planning - George	X	No comments received			
Other Competent Authorities affected					
Department of Labour - Western Cape Provincial Office;	X	No comments received	N/A	NA	N/A
Department of Public Works and Infrastructure	X	No comments received	N/A	N/A	N/A
Department of Rural Development and Land Reform - Western Cape District Offices	X	No comments received	N/A	NA	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.
Department of Water and Sanitation	X	No comments received	N/A	N/A	N/A
Breede-Gouritz Catchment Management Agency	X	No comments received	N/A	N/A	N/A
South African Heritage Resources Agency	X	No comments received	N/A	N/A	N/A
Department of Social Development	X	No comments received	N/A	N/A	N/A
Department of Social Development – Beaufort West	X	No comments received	N/A	N/A	N/A
Department of Economic Development and Tourism;	X	No comments received	N/A	N/A	N/A
Heritage Western Cape	X	No comments received	N/A	N/A	N/A
Cape Nature	X	No comments received	N/A	N/A	N/A
Cape Nature - George	X	No comments received	N/A	N/A	N/A
OTHER AFFECTED PARTIES					
N/A					
INTERESTED PARTIES					
N/A					

Table 11: Summary of issues raised by IAPs during DBAR phase

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	**X**				
Landowner/s					
• Gideon Vivier Boerdery Trust – Landowner – Waai Kraal 120 Portion 4 • Riet Fontein 122 Portion 2 (Remaining Extent) • Riet Fontein 122 Portion 9 (Remaining Extent) • Rhenosterkop 155 Portion 4 (Remaining Extent)	X	No comments recevied			N/A.
Lawful occupier/s of the land					
N/A		N/A	N/A	N/A	
Landowners or lawful occupiers on adjacent properties	**X**	-	-	-	-
• Werner Koster Property Trust – Rhenosterkop 155 Portion 2 (Remaining Extent) • Rhenosterkop 155 Portion 3 (Remaining Extent) • Waai Kraal 120 Portion 1 (Remaining extent) • Waai Kraal 120 Portion 1 (Remaining extent)	X	No comments recevied	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.
• South African National Roads Agency SOC Ltd – Landowner – Waai Kraal 120 Portion 6	X	No comments recevied	N/A	N/A	N/A
• Collin de Villiers Trust – Beaufort West Portion 0	X	No comments recevied	N/A	N/A	N/A
• Tamarisk Trust – Rietfontein 122 Portion 5 • Farm 71 Portion 0 (Remaining Extent) • Welgevonden 69 0 (Remaining Extent)	X	No comments recevied	N/A	N/A	N/A
Municipal councillor					
Cllr. D Welgemoed (Ward 2)	X	No comments recevied	N/A	N/A	N/A
Municipality					
Beaufort West Local Municipality	X	No comments recevied	N/A	N/A	N/A
Central Karoo District Municipality	X				
Organs of state (Responsible for infrastructure that may be affected					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.
Roads Department, Eskom, Telkom, DWA e					
Department of Transport and Public Works	X	No comments recevied	N/A	N/A	N/A
Department of Public Works and Infrastructure;	X	No comments recevied.	N/A	N/A	N/A
Eskom	X	No comments recevied.	N/A	N/A	N/A
Transnet	X	No comments recevied.	N/A	N/A	N/A
South African National Roads Agency and adjacent landowner of: - Waai Kraal 120 Portion 4	X	No comments recevied.	N/A	N/A	N/A
Communities	N/A	No community were identified within the study area.			
Dept. Land Affairs					
Department of Agriculture;	X	9 February 2021	Lombardskraal Doleriet (Pty) Ltd wishes to commence with a mining activity.	Your comments received 9 February 2021 has reference.	Appendix S

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.
			A Portion 4 of the farm Waai Kraal NO. 120, Beaufort West Division. The activity includes the blasting of the hard rock where the material will be used for crusting and stock piling. The Department has been requested to provide comment on the Draft Basic Assessment Report for Environmental Authorization for Mining Permit for the mining of aggregate 4,9 hectares, on a portion 4 of the farm Waai Krral No. 120, Beaufort West. Amongst others, the Department of Agriculture, Land Reform & Rural Development: Sub-Directorate: Land Use Administration administers and implements the Subdivision of Agricultural Land Act (SALA), Act 70 of 1970. Agricultural land is defined in Section 1 of this Act. According to the records of the Department, Portion 4 of the farm Waai Kraal 120 is subjected to the provisions of this Act. As such the Department reserves the rights to comment at this stage, pending the submission of a formal application in terms of this Act.	The desktop agricultural compliance statement done by Dr Darren Bouwer (PhD Soil Science Pri Nat Sci 400081/16) confirmed that the proposed development site is of a “low” Agricultural sensitivity, as classified by the DEA Screening Tool. The landtypes of the area predict shallow rocky soils. This is further substantiated by satellite images of the survey area. These soils will have a low water holding capacity which will limit crop production and are not deemed suitable for irrigation. The grazing potential of 28 ha/LSU is very low and typical of the area. This is further substantiated by the low rainfall. It is the specialist’s opinion that the proposed development site is of a low agricultural sensitivity and that the development at the proposed site will not significantly impact agricultural activities. In terms of agricultural sensitivity, the proposed development should thus be allowed to proceed at the identified site subject to recommendations provided. All comments received for you as well as our response will be incorporated in the Final Basic Assessment Report to be submitted to DMRE for their consideration.	
Department of Agriculture Forestry and Fisheries;	X	N/A	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.
Traditional Leaders	N/A				
Dept. Environmental Affairs					
Department of Environmental Affairs and Development Planning	X	29 January 2021	• Directorate: Development Management(Region 3) – • Ms Shireen Pullen (Shireen.Pullen@westerncape.gov.za; Tel: (044) 805 8600): • According to the Draft BAR, two site alternatives were considered, being a portion of Portion 4 of the Farm Waai Kraal No. 120, situated in the magisterial district of Beaufort West (the preferred site alternative), and a greenfield site which was not preferred. The Draft BAR does not contain any information (e.g. property and environmental attributes description) and no further assessment on this site alternative. Please note that the aim of the consideration of alternatives in the environmental impact assessment ("EIA") process is to find the best environmentally practicable environmental option. Also note that the consideration of alternatives is not limited to site alternatives, but may also include, inter alia, layout, design, operational and technology alternatives. The EAP is therefore advised to comparatively assess all the feasible and reasonable alternatives in order to select the best practicable environmental option. • The cumulative impacts that may result from the proposed development, is the cumulative impact on the broad-scale ecological processes, and the impact on	• Comment noted, site alternative 2 has been comparatively assessed throughout the FBAR. • The cumulative impact was determined by the ecologist and also resulted in low significance. As the non-perennial centre line is located over 550m away from the preferred	Part A, 1 c,d,h,i Appendix M - Botanical Assessment Report

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.
			existing infrastructure as a direct result of the proposed mining operation. Both these cumulative impacts are regarded as having limited impacts and of low significance. It is however not clear how this significance rating was determined as the preferred site is located within proximity to a Critical Biodiversity Area, and a non-perennial centre line which is identified as an aquatic Ecological Support Area. Although the proposed mining area is not located directly within these sensitive environments, the cumulative impact of the proposed development should be adequately assessed, mitigated and reported on.	site the cumulative impact of the proposed development should be not have a significant impact if adequately mitigated. Please also refer to Appendix M - Botanical Assessment Report. As per the report, o The proposed development footprint is located outside of any CBA and ESA area as identified by the CapeNature (2017). o The closest CBA area is a CBA1 area located approximately 550m to the west of the proposed site and is regarded as an area in natural condition that are required to meet biodiversity targets for species, ecosystems or ecological process and infrastructure. Important features identified within this CBA are: o Suitable habitat for Cape Mountain Zebra o Watercourse Protection – Great Karoo o Shale Gass SEA Very High Significance Terrestrial o From a Floristic perspective this development will have no impact on the integrity of this CBA as this CBA is located within a plateau of a separate ridge/koppie system with its own micro-catchment, and it is highly unlikely that mining activities and their associated impacts will extend into this area due to the natural barrier created between the lower ridge system to be mined and the plateau of the steeper/higher ridge system. Subsequently this	

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.
				proposed development cannot contribute significantly to the integrity of the identified CBA areas. ○ The closest ESA area is the ESA1 associated with the extensive and broad ephemeral wash located approximately 1.06km to the east of the proposed development footprint. ESAs are areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of CBAs, and are often vital for delivering ecosystem services. This area has been classified as an ESA due to the presence of the fairly extensive ephemeral wash system acting as an important freshwater resource, as well as an important corridor for the movement of faunal and floral species. ○ It is unlikely that this proposed development will have an impact on downstream water resources due to the size of the development, distance from the freshwater resource and the relative low slope associated with the area between the mining area and the freshwater resource (±2%). With effective mitigation measures in place, including erosion control, stormwater management, and mine rehabilitation; the natural to near-natural vegetation between the mining area and the ESA1 will be maintained and subsequently the ESA will not be impacted.	

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.
			• It is noted that no Screening Tool Report, Site Sensitivity Verification Report, and Public Participation Plan was attached to the Draft BAR; however, page 131 of the Draft BAR states that the Screening Tool Report identified 13 specialist assessments for inclusion in the assessment report. Section 1(k) of the Draft BAR further lists the EAP's motivation/opinion why some of these specialist inputs are not required. Although this is noted, in terms of the Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for environmental authorisation ("the Protocols") published in Government Notice ("GN") No. 320 of 20 March 2020, the involvement of an agricultural specialist or soil scientist is required to provide a compliance statement, even for a low agricultural sensitivity. The agricultural specialist or soil scientist must be registered with the South African Council for Natural Scientific Professions ("SACNASP") in terms of the relevant Protocol. Please ensure all the relevant national protocols are complied with, as it is evident that this is not the case.	• Comment noted, these reports has been attached to the FBAR as Appendix P, Q, R, • A compliance statement was obtained and also attached to the FBAR as Appendix S - The desktop study confirmed that the proposed development site is of a "low" Agricultural sensitivity, as classified by the DEA Screening Tool. The landtypes of the area predict shallow rocky soils. This is further substantiated by satellite images of the survey area. These soils will have a low water holding capacity which will limit crop production and are not deemed suitable for irrigation. The grazing potential of 28 ha/LSU is very low and typical of the area. This is further substantiated by the low rainfall. It is the specialist's opinion that the proposed development site is of a low agricultural sensitivity and that the development at the proposed site will not significantly impact agricultural activities. In terms of agricultural sensitivity, the proposed development should thus be allowed to proceed at the identified site subject to recommendations provided.	Appendix P, Q, R Appendix S
			• The Botanical Study Assessment compiled by Nkurenkuru Ecology and Biodiversity dated 10 November 2020 is noted; however, it is unclear whether the specialist is registered with the SACNASP1. Please note that any specialist performing work related to any	• Mr Botha (Pr.Sci.Nat 400502/14 (Botanical and Ecological Science) has been registered with SACNASP – Please refer to Appendix M - Botanical Assessment Report Appendix 3 for curriculum vitae, Appendix 4 for relevant work experience and Appendix 5 for	Appendix M - Botanical Assessment Report

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.
			of the fields of practice listed in Schedule I of the Natural Scientific Professions Act, 2003 (Act No. 27 of 2003) must be registered with the SACNASP, in any of the prescribed categories [section 18] and further to this, only a person registered with the SACNASP may practice in a consulting capacity [section 20]. Proof of such registration must be provided to the competent authority. • The EMPr states that "*stormwater must be diverted around the topsoil heaps and mining areas to prevent erosion*." Due to the proposed mine's proximity to a watercourse, stringent stormwater management actions should also be included in the EMPr for the duration of the life-of-mine to manage erosion control and to prevent siltation of the nearby watercourse. The EMPr should therefore be amended to include specific stormwater management actions, not only for the prevention of erosion of topsoil, but also for the prevention of erosion of the entire mining area. (In this regard, please also refer to paragraph 2.3. below.)	SACNASP Registration for the CV and expertise of the specialist. • Comment noted, this has specific stormwater management actions have been added to the EMPr	Part B - d
	X	29 January 2021	Directorate: Pollution and Chemicals Management – Ms Monique Natus (Monique.Natus@westerncape.gov.za; Tel: (021) 483 6839): • Please provide a more detailed description of what the crusher plant may entail, and the extent of the area required to accommodate it.	• A detailed description has been added to the FBAR in figure 4	Part A – 1h

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.
			• The Draft BAR does not specify the maximum depth of the proposed mine/quarry. Please provide an indication thereof as the depth of the quarry would influence the visual impact.	• The proposed depth of the quarry will be approximately 15m	
			• Mining operations and/or excavation activities must be conducted in a manner that prevents the ponding or pooling of water on the surface. The proposal to install stormwater diversion channels around the mining area and topsoil stockpiles is supported. However, adequate measures must be installed to prevent the stormwater channels resulting in significant erosion and removal of topsoil from the surrounding area, and to ensure that on-site activities do not culminate in off-site pollution downslope.	• Comment noted, this has specific stormwater management actions have been added to the EMPr	Part B - d
			• The Draft BAR states that no watercourses occur within 1km of the mining area. However, according to available mapping resources, including Cape Farm Mapper, mapped non-perennial drainage lines do occur	• Comment noted, the non-perennial drainage lines occur within 550m from the mining area and has been added to the FBAR. Specific mitigation measures were also added in order to ensure that the proposed mine does not negatively impact on water resources in the area.	Part B – 1 d,f,k,

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.
			within 1km to the south and east of the proposed mining area. No information on these features has been provided, and the assumption has been included that the proposal will have no impact on any water resources. It is recommended that the report is amended to include a description of these watercourses, and that additional investigation and assessment of the potential impact(s) of the proposed activities on these features is provided. Clearer and more specific mitigation measures should be proposed to ensure that the proposed mine does not negatively impact on water resources in the area. • Per the EMPr, all vehicle maintenance or refuelling should be undertaken within the workshop and service area proposed within the mining area. Alternatively, if emergency repairs or refuelling are required, it must be undertaken on an impermeable surface to prevent contamination of soil and groundwater. Vehicles and equipment must be parked and stored on impermeable surfaces or make use	• Comment noted this will be implemented and adhered to	Part A – 1 d,f,k Part B – 1 d,h,m

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.
			of uPVC lining and drip trays when stationary. • The applicant must ensure that no excavation occurs below the level of the water table. • Please note that the use of potable water for dust suppression is not supported • Please amend the EMPr to include reference to section 30 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA") pertaining to the control of incidents. In the event of a significant accidental spill or leak of hazardous substances (e.g. petrol, diesel, etc.) during any phase of the proposed activities, such an incident(s) must be reported to all relevant authorities, including this Directorate, in accordance with section 30 of NEMA; and not only to the Department of Water and Sanitation, as stated in the report.	• Comment noted this will be implemented and adhered to. The estimate water table was confirmed by the landowner to be between 20 – 40 m • Comment noted this will be implemented and adhered to • Comment noted this will be implemented and adhered to	Part A – 1 h Part B – 1 d, Part B – 1 d,f,k
	x	29 January 2021	Directorate: Waste Management – Ms Hadjira Peck (H adjira.Peinke@westerncape.gov.za; Tel: (021) 483 3003): • The Draft EMPr should include the requirement that all safe disposal certificates, including hazardous waste and waste from the chemical ablution facilities, should be retained for a minimum period of five years.	• Comment noted this will be implemented and adhered to	Part A – 1 h,m Part B – 1 f

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.
			This requirement is stipulated in regulation 8(1) of the Waste Classification and Management Regulations published in GN No. R. 634 of 23 August 2013: "*All waste generators, transporters and managers subjected to the requirements of subregulations (1), (2), (4), (5), (6) and (7) must retain copies, or be able to access copies/records, of the waste manifest documentation for a period of at least five (5) years."* Waste registers, as described in the Draft BAR and EMPr, must be made available for review upon request by any relevant authority. • Per paragraph 2.8. above, any event resulting in the spill or leak of hydrocarbons or any other hazardous solvents into the ground and/or water resources, must be reported within the prescribed timeframes to all relevant authorities, including the Directorate: Pollution and Chemicals Management. Containment, clean-up and remediation must commence	• Comment noted this will be implemented and adhered to	Part B – 1 d,f,k

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.
			immediately in the case of NEMA section 30 incidents, and the necessary documentation must be completed and submitted within the prescribed timeframes. • The storage of hazardous and/or general waste in excess of 80m^3 and 100m^3 respectively, excluding the storage of waste in lagoons or the temporary storage of such waste, would require the applicant to comply with the National Norms and Standards for the Storage of Waste, published in GN No. 926 of 29 November 2013. Although the storage of general and hazardous waste below these mentioned thresholds is not regulated, section 28 of the NEMA, 1998 would apply to ensure that any waste storage does not impact negatively on the environment.	• Comment noted this will be implemented and adhered to	Part B – 1f,
	x	29 January 2021	Directorate: Development Facilitation – Mr Ryan Apolles (Ryan.Apolles@westernape.gov.za; Tel: (021) 483 2817): • The Draft BAR indicates that the proposed mining activities are likely to result in the destruction of the kraal structure and any potential associated artefactual material.	The comment refers to the absence in the Heritage Impact Assessment (HIA) in the Draft BAR of a field assessment of the site. This has since been addressed with the inclusion of the	Appendix N - HIA

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.
			The Heritage Impact Assessment compiled by ACO Associates cc dated December 2020 notes that an archaeological site visit was not undertaken, and recommended that a walkover survey by a suitably qualified professional archaeologist and a site visit by a suitably qualified palaeontologist would be required prior to the commencement of quarrying activities.	results of the required survey (which took place on 14 December 2020) in the revised HIA issued by ACO Associates on 23 December 2020. This field assessment found no archaeological sites and only a few pre-colonial artefacts on the site of the proposed quarry. The walkover survey also confirmed the presence of a roughly circular stone-walled kraal in the south-west of the quarry footprint, originally noted on a Google Earth satellite photograph of the site and referred to in the HIA included in the Draft BAR. The kraal consists of a low wall of dolerite cobbles from the immediate surrounds that have been piled rather than laid in courses. The age of the kraal is unknown but its shape and structure suggests that it is historical and is likely to be no more than perhaps 150 years old, rather than pre-colonial as these were constructed according to a different pattern. The kraal is also not associated with any cultural material to indicate that people in the past lived nearby, which might have made the site of greater interest. The site was assigned a grade of 3C in the HIA and is of relatively low, local heritage significance. The HIA notes that the quarrying of the proposed mining area is likely to result in the destruction of the kraal structure.	
			• The impacts associated with the destruction of the kraal structure were not included in section 1(vii) of the Draft BAR (positive and negative impacts that the proposed activity and alternatives will have on the environment and the community that may be affected). Please	• Comment noted the destruction of the kraal structure as a potential negative impact was included in the FBAR • As per the archaeologist response: o An alternative layout for the quarry, which avoids the kraal and preserves it on its southern	Part A 1h

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.
			amend the Draft BAR accordingly to specifically include the destruction of the kraal structure as a potential negative impact associated with the proposed activity. ▪ The location of the kraal structure must be indicated in Appendix C (site activities map).	boundary, has been proposed in the Final BAR. o From a heritage perspective this alternative quarry layout is less preferred because although the original quarry layout will mean the loss of the kraal, the alternative layout will open the face of the quarry to the N1 and there will be a marked visual impact on the cultural landscape and sense of place of the area surrounding the quarry that will result from its visibility from the N1. o It is our view that the visual impact of the alternative quarry layout is likely to outweigh the relatively minor loss to the heritage record that will result from the destruction of the kraal. Provided the mitigation proposed in the HIA is implemented (i.e. kraal is photographically recorded and its position accurately mapped) it remains our assessment that the loss of the kraal to the proposed quarrying is tolerable, particularly when assessed against the alternative quarry layout which would likely have a far more marked heritage-related impact. ▪ Comment noted the kraal structure was added to the site activities map	Appendix C Site Activities Map

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.
			• The Draft BAR failed to indicate whether the applicant and EAP considered the retention of the kraal structure in terms of layout alternatives.	• This option was assessed as part of site alternative 2	Part A, 1 c,d,h,i
			• The EAP is advised that final comment from Heritage Western Cape ("HWC") must be obtained prior to the submission of the Final BAR to the competent authority, as comment from HWC will inform whether the kraal structure may be destroyed or must be retained. Furthermore, the comments from HWC must be included in section 1(n) of the BAR (aspects for inclusion as conditions of the environmental authorisation).	Comment was requested form HWC but not yet received by the printing of this document, as soon as comments are received it will be forwarded to DMRE. • An aerial photograph has been added to indicate existing roads to the site.	N/A
			• Section 1(vii), page 103 of the Draft BAR identifies drilling and blasting as a potential negative impact of the proposed activity. Reference is made to potential damage to the power line and potential impact on the shale mining and brickworks infrastructure. No further information regarding the impacts to the mentioned infrastructure is provided, and no avoidance or mitigation measures were provided. The site activities map and the surrounding land use map (Appendix D) also failed to indicate the location of the mentioned infrastructure. Please ensure that further information regarding potential impacts to the infrastructure is provided and reported on.	• This was an error and been removed from the FBAR	N/A
			• The Draft BAR indicates that an existing road will be used to access the mining area and to transport material from the proposed mining area; however, the site activities map failed to indicate the location of the existing access road.	• As per Botanical Assessment Report – Appendix M - This study has been executed in accordance with and meet the responsibilities in terms of:	Figure 6: Satellite view showing the access road

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.
			Please further note that available aerial photography shows existing roads passing the eastern border of the mining area, but none providing direct access. The Botanical Study Assessment indicates that a field survey was undertaken on 14 November 2020. Whilst the specialist study indicates that the assessment was undertaken in terms of the Protocol for Biodiversity, it is unclear whether the Plant Species Assessment included in the Botanical Study Assessment was compiled in terms of the Terrestrial Plan Species Protocol published in GN No. 1150 of 30 October 2020. Please include a statement from the biodiversity specialist indicating whether the Plant Species Assessment meets the relevant Protocol criteria.	• NEMA, the Environmental Impact Assessment Regulations, 2014 (specifically in terms of regulation 13 of GN No. R. 326); • The "newly" Gazetted Protocols 3(a),(c) and (d) in terms of Section 24(5)(a) and 24(5)(h) of NEMA (Published on the 20th of March 2020); The Terrestrial Plant Species Protocol published in GN NO. 1105 of 30 October 2020;	Appendix M - Botanical Assessment Report
Department of Environmental Affairs and Development Planning - George	X	No comments received	Directorate: Air Quality Management – Mr Deon Stoltz (Deon.Stoltz@westernape.gov.za; Tel: (021) 483 2805): It is noted that fugitive dust emissions from mining activities and traffic on haul roads will occur during the preparation, operational, and decommissioning phases. It is recommended that: o Dust suppression methods be implemented through a dust monitoring programme / fugitive dust control plan during all three phases of the proposed project; and o All mitigation measures relating to dust emissions be	Comment noted this will be implemented and adhered to Comment noted this will be implemented and adhered to Comment noted this will be implemented and adhered to	Part A 1 d,h,m Part B 1 d,e,f,k Part A 1 d,h,m Part B 1 d,e,f,k Part A 1 d,h,m Part B 1 d,e,f,k

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.
			implemented strictly as per the EMPr. ○ It is noted that noise generated by the proposed activities will have a limited impact. This Directorate thus recommends that: ○ All noise levels of machinery and work activities within the mining area must be monitored and controlled; and Noise generated from blasting, excavations, crushing, stockpiling activities, loading of material, and the decommissioning/rehabilitation of the mining area must comply with the Western Cape Noise Control Regulations (Provincial Notice 200/2013) of 20 June 2013. The applicant is reminded of its "*general duty of care towards the environment*" as prescribed in section 28 of the NEMA, 1998 which states that "*Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment*." Comment noted this will be implemented and adhered to Comment noted this will be implemented and adhered to	Part B 1 d,e, Part B 1 m

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.
Department of Labour - Western Cape Provincial Office;	X	No comments received	N/A	NA	N/A
Department of Public Works and Infrastructure	X	No comments received	N/A	N/A	N/A
Department of Rural Development and Land Reform - Western Cape District Offices	X	No comments received	N/A	NA	N/A
Department of Water and Sanitation	X	No comments received	N/A	N/A	N/A
Breede-Gouritz Catchment Management Agency	X	No comments received	N/A	N/A	N/A
South African Heritage Resources Agency	X	No comments received	N/A	N/A	N/A
Department of Social Development	X	No comments received	N/A	N/A	N/A
Department of Social Development – Beaufort West	X	No comments received	N/A	N/A	N/A
Department of Economic Development and Tourism;	X	No comments received	N/A	N/A	N/A
Heritage Western Cape	X	No comments received	N/A	N/A	N/A
Cape Nature	X	No comments received	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.
Cape Nature - George	X	No comments received	N/A	N/A	N/A
OTHER AFFECTED PARTIES					
N/A					
INTERESTED PARTIES					
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)

This section describes the biophysical, cultural and socio-economic environment that may be affected and the baseline conditions, which are likely to be affected by the proposed mining activity.

PHYSICAL ENVIRONMENT

CLIMATE

According to the weather online website, Beaufort West lies on 1398m above sea level. Beaufort West is influenced by the local steppe climate. Annually, the rainfall is 548 mm. It receives the lowest rainfall (0.8 mm) in May and the highest (62.1 mm) in December - January. The monthly distribution of average daily maximum temperatures shows that the average midday temperatures for Beaufort West range from 10°C in August to 22°C in January. The region is the coldest during August when the mercury drops to 3°C on average during the night the maximum temperatures are usually experienced in January when temperatures rises to 30°C.

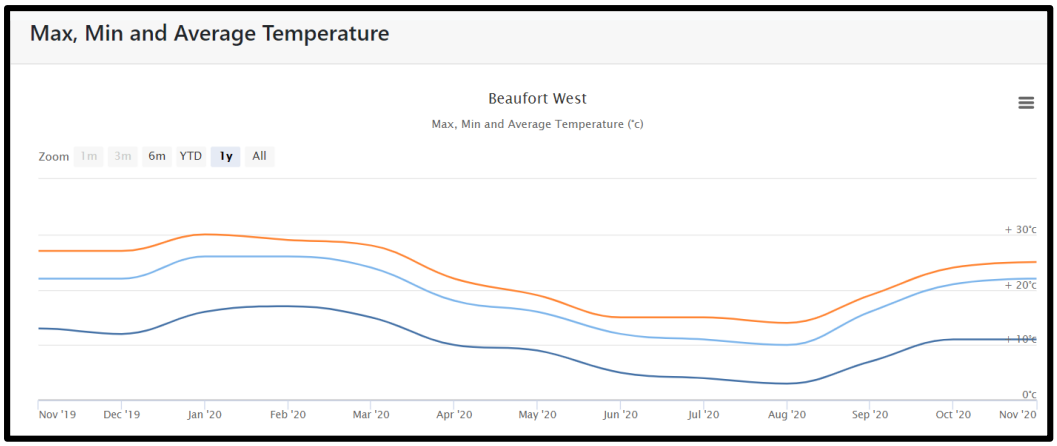


Figure 9: Statistical representation of the temperatures for the Beaufort West region (Chart obtained from http://www.worldweatheronline.com).

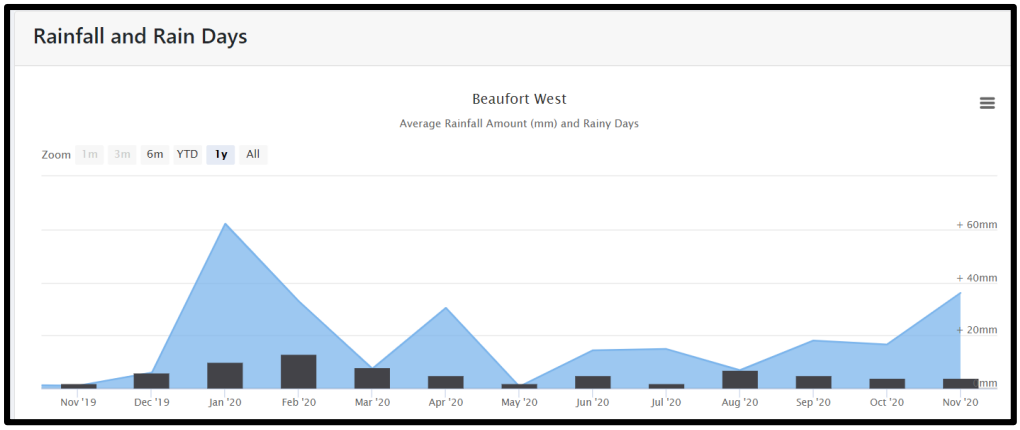


Figure 10: Statistical representation of the precipitation for the Beaufort West region (Chart obtained from http://www.worldweatheronline.com).

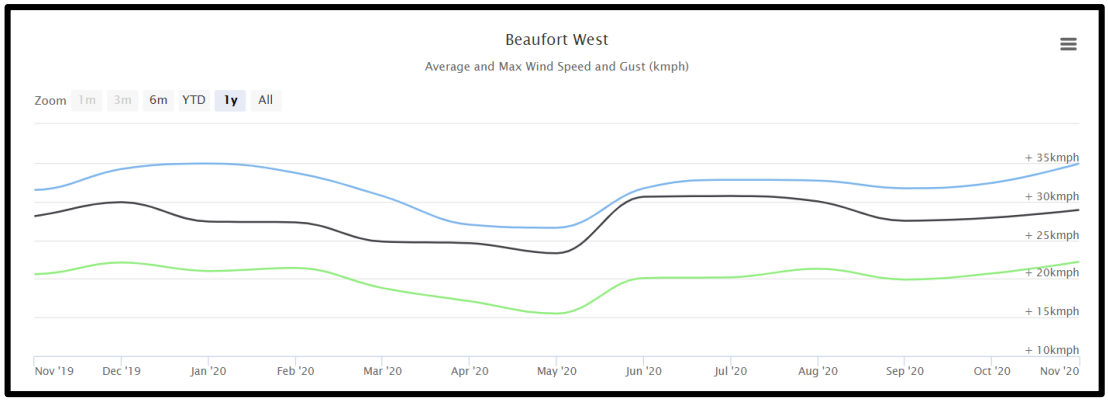


Figure 11: Statistical representation of the wind speed for the Beaufort West region (Chart obtained from http://www.worldweatheronline.com).

According to the wind statistics as presented on Windfinder.com the prevalent wind direction distribution of Beaufort West is in a eastern direction (western wind), with the average wind speed being between 1 -7 knots (±1.8 – 12.9 km/h) as shown in the figure below (measured at the Beaufort West weather station).

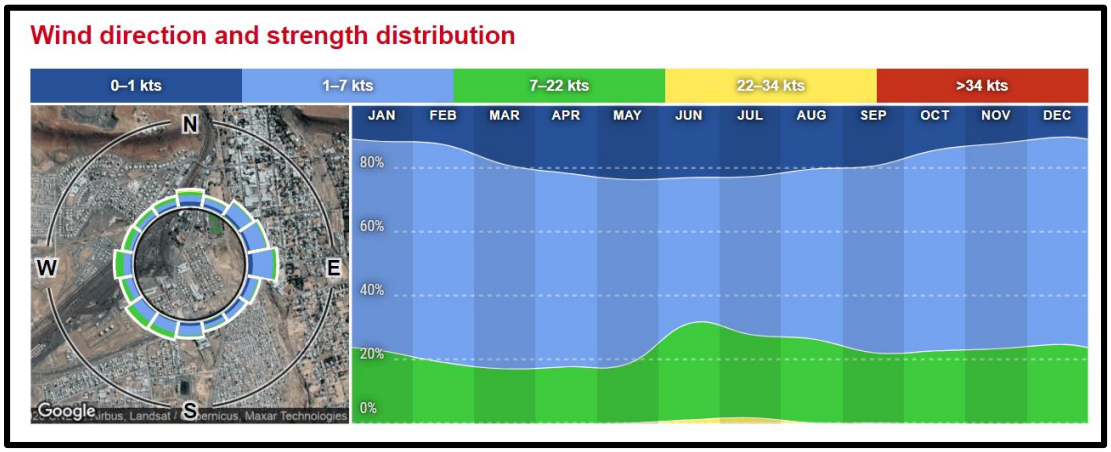


Figure 12: Image showing the dominant wind direction (first panel) and average wind speed over a 12 month period for the Beaufort West area (image obtained from http://www.windfinder.com/windstatistics/beaufortwest).

TOPOGRAPHY

Extremely irregular to slightly undulating plains covered with dwarf spiny shrubland dominated by Karoo dwarf shrubs (e.g. Chrysocoma ciliata, Eriocephalus ericoides) with rare low trees (e.g. Euclea undu-Jata). Dense stands of drought-resistant grasses (Stipagrostis, Aristida) cover (especially after abundant rains) broad sandy bottom lands. The figure below shows the elevation loss from the proposed mining footprint to the town of Beaufort West to be 182 m over 29.4 km.

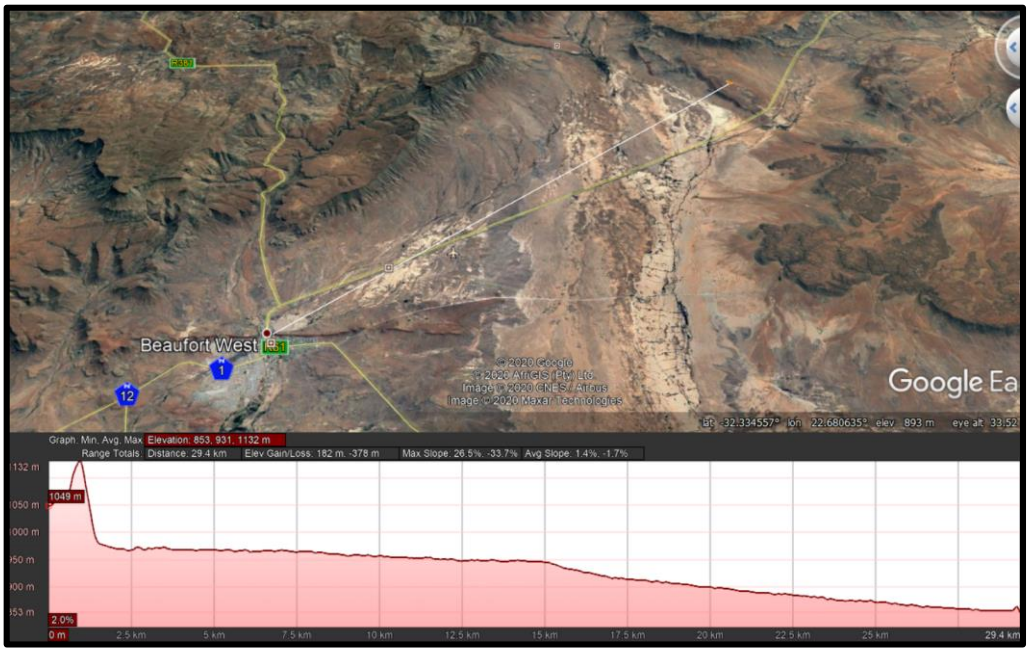


Figure 13: Elevation profile showing the topography between the proposed mining footprint (white line) and the town of Beaufort West. (Image obtained from Google Earth).

VISUAL CHARACTERISTICS

The visual character of the surrounding areas mainly comprises of a dormant agricultural setting, previously mined area adjacent to the site (aggregate / gravel). The aesthetic ambiance of the area is that of a rural area.

AIR AND NOISE QUALITY

The wind patterns in Beaufort West are somewhat influenced by seasonal variations. According to the wind statistics as presented on Windfinder.com the prevalent wind direction distribution of Beaufort West is in a north/north-eastern direction from December to March. From April the wind changes direction from east-north-east to

east until September when it gradually returns to the north-eastern trend. The ambient noise levels of the surrounding area are low with the noise levels of the greater surrounding area are low representing that of a rural area, with the noise levels of the study area (immediate surroundings) impacted by farming operations and the N1.

GEOLOGY AND SOIL

The geology of the study area comprises mostly rimitive, skeletal soils in rocky areas devel-oping over sedimentary rocks such as mudstones and arenites of the Adelaide Subgroup of the Karoo Supergroup and to a lesser extent also the Ecca Group (Waterford and Volksrust Formations) as well as Jurassic dolerite sills and dykes and subsummit positions of mesas and butts with dolerite boulder slopes. Almost entirely lb land type.

Mudstones and sandstones of the Beaufort Group (Adelaide Subgroup) with some Ecca (Fort Brown Formation) shales supporting very shallow and stony soils of the Glenrosa and/or Mispah forms, typical of Fe land type.

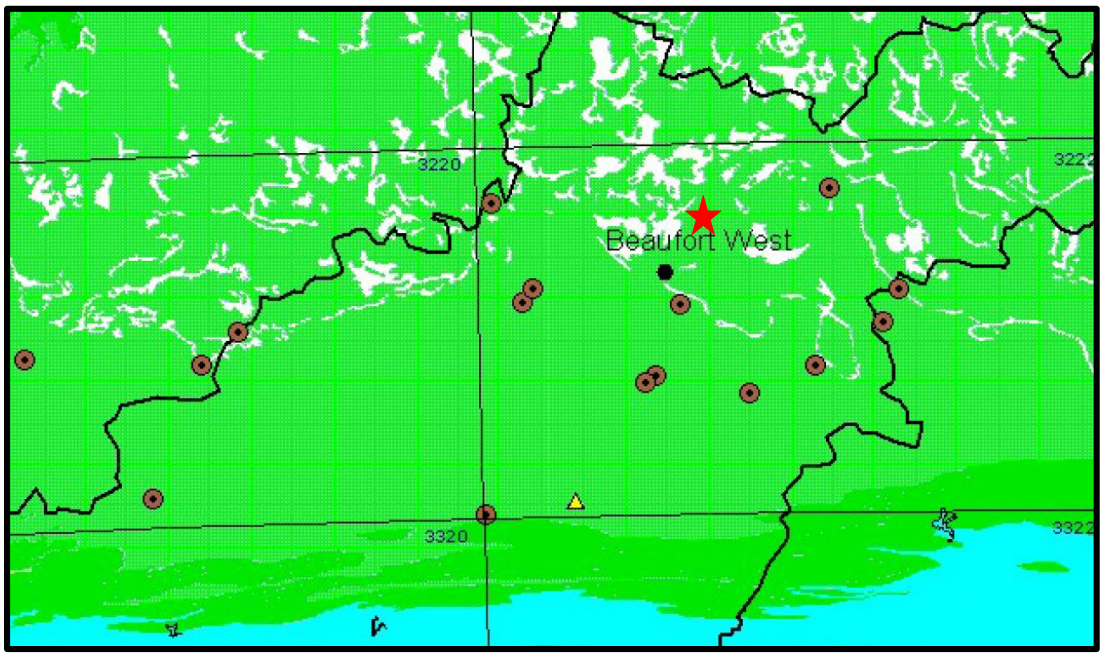


Figure 14: Indication of the simplified geology of the study area, where green represents the Beaufort Group. The proposed mining area is indicated by the red star. (Image obtained from the Council for Geoscience)

HYDROLOGY

The proposed project does not require a Water Use Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No 36 of 1998). As mentioned earlier, no activity will take place in or within 500 m radius of any water bodies. Any water required for the implementation of the project will be bought from a registered source and

transported to on site. The use of potable water for dust suppression should be avoided.

Table 12: Aquatic characteristics of the greater study area

Water Management Area	Fish to Tsitsikamma WMA 16
Sub Water Management Area	Gamtoos Sub-WMA
Quaternary Catchment	L11F
FEPA Status	No fresh water priority area status

According to the Cape Farm Mapper, a non-perennial center line occurs within 534m from the proposed site as well as site alternative 2.

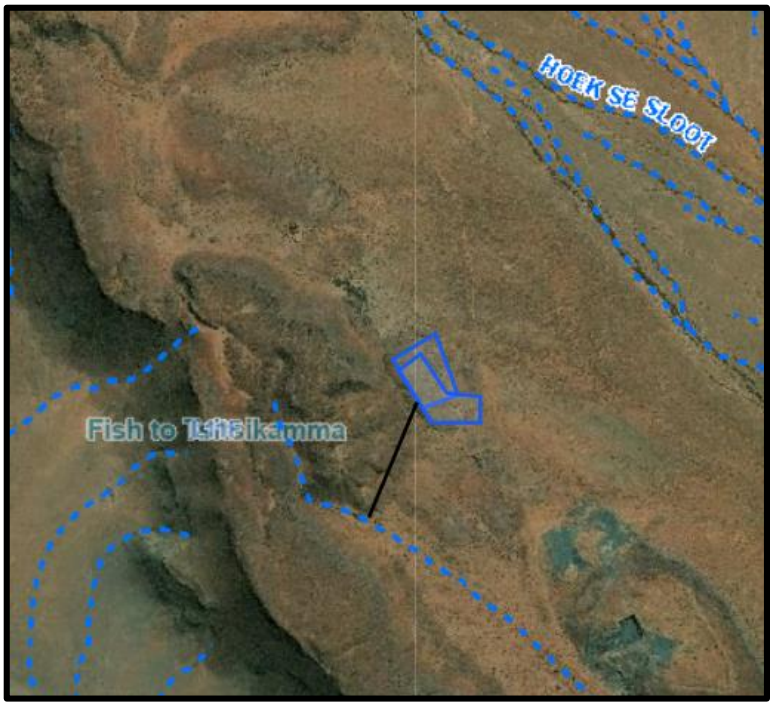


Figure 15: Map showing the proposed mining footprint (blue L- shaped polygon) and site alternative 2 blue rectangular shape polygon. (Image obtained from the Cape Farm Mapper)

According to the National Freshwater Ecosystem Priority Areas (NFEPA) map as presented by SANBI, no rivers NFEPA of conservation importance extends over the proposed footprint (see figure below).

Figure 16: Map showing the proposed mining footprint (pink polygon) and site alternative 2 purple polygon. (Image obtained from the BGIS Map Viewer – National Wetlands and NFEPA)

BIOLOGICAL ENVIRONMENT

MINING AND BIODIVERSITY

(Information extracted from the Mining and Biodiversity Guideline: Mainstreaming Biodiversity into the Mining Sector, Department of Environmental Affairs, Department of Mineral Resources, Chamber of Mines, 2013)

The Mining and Biodiversity Guideline, compiled by the South African Mining and Biodiversity Forum (SAMBF) provides the mining sector with a practical, user-friendly manual for integrating biodiversity considerations into planning processes and managing biodiversity during the developmental and operational phases of a mine, from exploration through to closure.

When the mining footprint is layered over the Mining and Biodiversity Map, as shown in the figure below, it does not fall over and area of any specified for risk of mining therefore the risk is seen to be insignificant. The Mining and Biodiversity Guideline's describes areas of moderate risk biodiversity importance as: "*These areas are of moderate biodiversity value."* The guideline notes that environmental screening, the EIA and specialists should focus on confirming the presence and significance of biodiversity features, and provide a site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision-making.

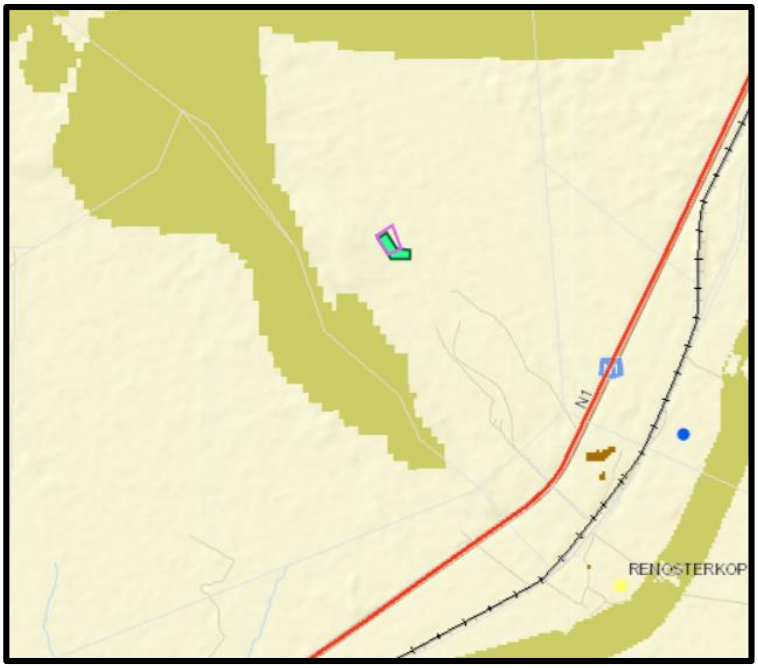


Figure 17: The Mining and Biodiversity importance map with the proposed mining footprint site alternative 1 indicated by the green polygon and site alternative 2 indicated by the purple polygon. Light brown – moderate biodiversity importance, moderate risk for mining, light brown – moderate biodiversity Importance, moderate risk for mining (image obtained from the BGIS Map Viewer – Mining Guidelines).

BIODIVERSITY CONSERVATION AREAS

The Western Cape Biodiversity Plan (WCBP) shows that the proposed mining footprint falls within an Other Natural Area. The category is described to be Natural to Near-Natural – Minimise habitat and species loss and ensure ecosystem functionality through strategic landscape planning. Offers flexibility in permissible land uses, but some authorisation may still be required for high impact land uses as per the Biodiversity Spatial Plan Land Use Guidelines and Compliance Requirements.

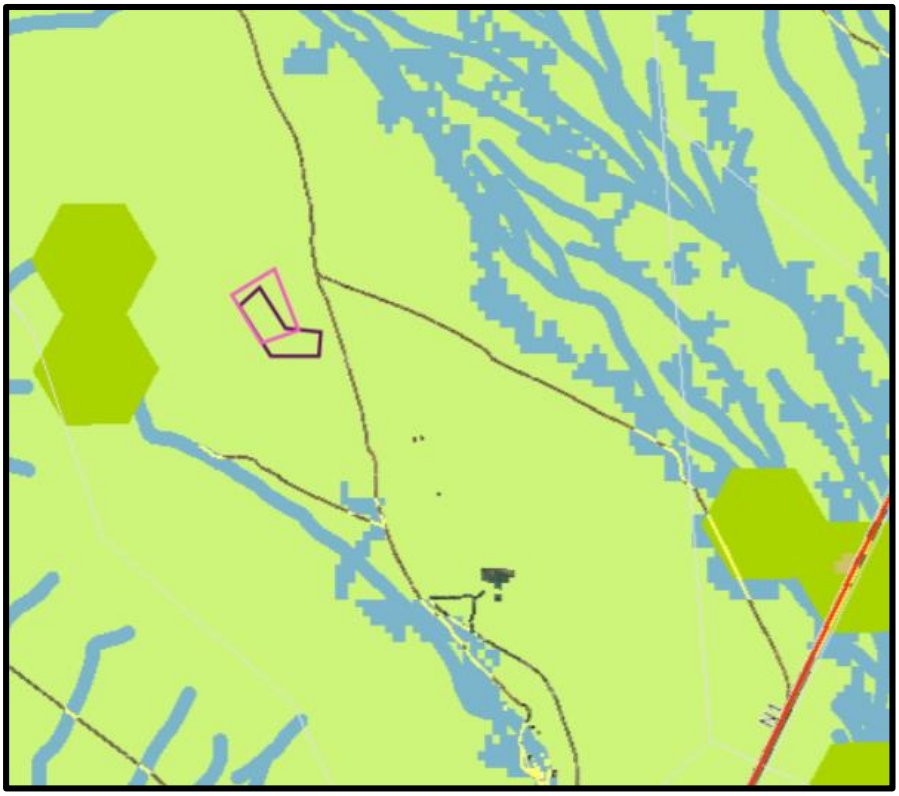


Figure 18: Western Cape Biodiversity Conservation Plan showing the mining area (purple polygon) and site alternative 2 (pink polygon) in relation to the degraded areas (purple). (Image obtained from BGIS Map Viewer – Western Cape Conservation Plan).

GROUNDCOVER

According to Mucina and Rutherford (2012) the vegetation type of the surrounding natural areas are known as the Beaufort West Dry Grassland (GH5) that is slightly undulating bottomland landscape covered with tall, dense grassland alternating with patches of karroid scrub occurring especially over calcrete.

Some of the important taxa found in this vegetation type include *Graminoids: Anthephora pubescens (d), Aristida congesta (d), A. diffusa (d), Cynodon dactylon (d), Digitaria argyrograpta (d), Elionurus muticus (d), Eragrostis chloromelas (d), E. lehmanniana (d), E. obtusa (d), E. plana (d), E. superba (d), E. trichophora (d), Heteropogon contortus (d), Panicum stapfianum (d), Setaria sphacelata (d), Themeda triandra (d), Tragus koelerioides (d), Aristida stipitata subsp. graciliflora, Chloris virgata, Cymbopogon pospischilii, Pogonarthria squarrosa, Sporobolus fimbriatus, Trichoneura grandiglumis, Triraphis andropogonoides. Herbs: Selago densiflora (d), Berkheya onopordifolia var. onopordifolia, Blepharis integrifolia var. clarkei, Chamaesyce inaequilatera, Commelina africana, Dicoma macrocephala, Gazania krebsiana subsp. krebsiana, Geigeria ornativa, Harpagophytum procumbens, Helichrysum caespititium, Heliotropium ciliatum, Hermannia comosa, H. tomentosa, Indigofera alternans, Lactuca dregeana, Lotononis listii, Monsonia burkeana, Nolletia ciliaris, Pollichia campestris. Geophytic Herbs: Oxalis depressa (d), Haemanthus*

humilis subsp. humilis. Succulent Herb: Tripteris aghillana var. integrifolia. Low Shrubs: Chrysocoma ciliata (d), Felicia filifolia subsp. filifolia (d), Pentzia globosa (d), P. incana (d), Amphiglossa triflora, Anthospermum rigidum subsp. pumilum, Asparagus striatus, Felicia muricata, Gnidia polycephala, Helichrysum dregeanum, Nenax microphylla, Osteospermum leptolobum, Polygala hottentotta, Selago saxatilis. Succulent Shrub: Hertia pallen.

The vegetation type is classified as endangered. According to Mucina and Rutherford (2012) only a small portion is statutorily conserved in the Soetdoring Nature Reserve. More than 40% already transformed, e.g. for crop production (mainly Ae and Ca land types) as well as by urban (and related) development (the largest part of this vegetation unit on the Ae land type is situated in the Genl De Wet military training area, west of Beaufort West). Especially those grasslands on shallow gravelly soils as well as the low-lying areas on clayey soils are prone to karoo-bush encroachment when overgrazed. Erosion low (50%), very low (37%) or moderate (13%). A conservation target of 24% was set for the vegetation type.

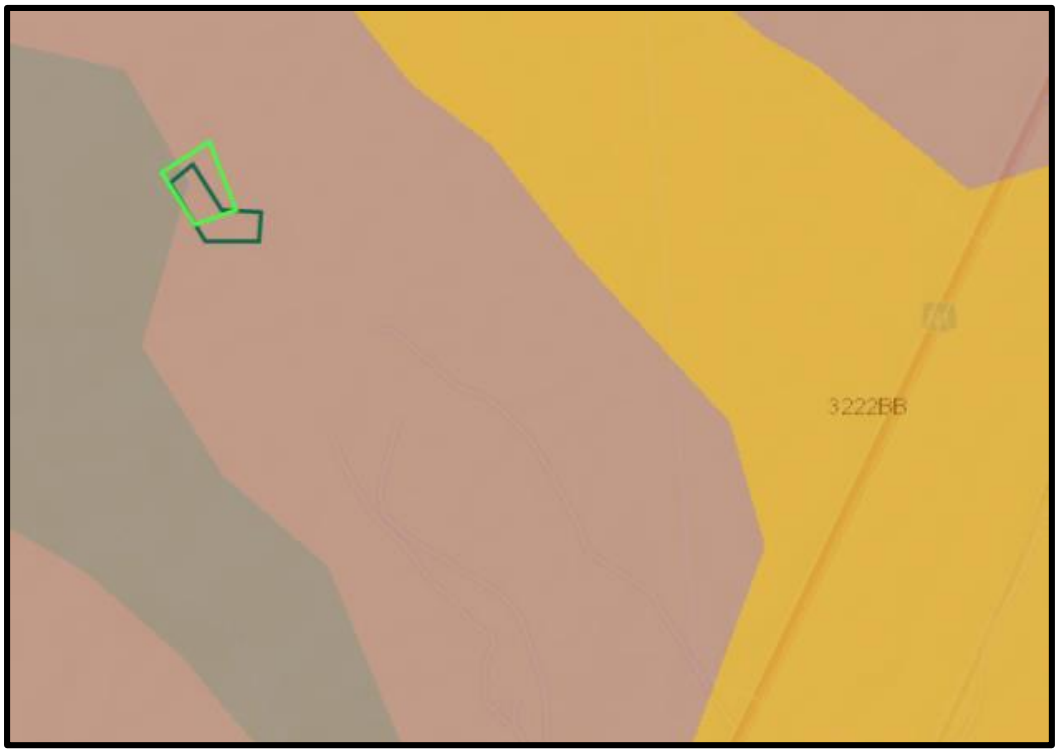


Figure 19: National vegetation cover map showing the mining area site alternative 1 indicated by the green polygon and site alternative 2 (light green polygon) within the Beaufort West Gamka Karoo (NKI 1) (light purple) Upper Karoo Hardeveld (NKu 2) (Grey). (Image obtained from BGIS Map Viewer – National Vegetation Map).

FAUNA

Various small mammals and reptiles occur are likely to on the property. The fauna at the site will not be impacted by the proposed mining activities as they will be able to move away or through the site, without being harmed. Workers should be educated and managed to ensure that no fauna at the site is harmed. At this stage no resident protected or red data faunal species could be identified within the earmarked footprint. The study area falls over a property that is noted to be operational game farms, should this mining permit be granted farm owner will be consulted prior to commencement of any activities to ensure that safety of animals and workers. Workers will be informed and managed to ensure that no fauna at the site is harmed. No poaching or hunting of animals will be allowed. All construction vehicles must adhere to a low speed limit (<40km/h) to avoid collisions with susceptible species such as snakes and tortoises. Trenches and deep excavations should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench.

HUMAN ENVIRONMENT:

CULTURAL AND HERITAGE ENVIRONMENT

The proposed quarry is located on a spur of hills that extend out from the eastern Nieuweveldsberge of the Great Southern Escarpment. The site overlooks the drainages of the Hoek se Sloot and Renosterspruit Rivers to the east, while the Platdoring River drainage lies immediately to the west (as per notification of intent to develop Section 38 (1) and Section 38 (8) of the National Heritage Resources Act (completed by John Gibble).

Heritage resources located within the footprint of the proposed mining area will be affected by quarrying activities, except if expressly excluded from quarrying activities.

The stripping for stockpiling of the topsoil from the site will result in the disturbance of any archaeological material (both pre-colonial and historical) present, and the destruction of any stratified sites. This includes the stone-walled kraal on the site and any associated artefacts.

The quarrying of the area will result in the loss and destruction of fossil material within the shales and mudstones that underly the site and which are the target resource of the proposed quarry.

No archaeological or other heritage studies have been identified from available literature in the immediate vicinity of the site, but a handful studies from the wider region provide general information about the history of the area.

While the desktop archaeological review indicated that pre-colonial archaeological material is relatively common in the Beaufort West area of the Karoo and that some such material must be expected on the site, the walkover survey identified only a handful of Later Stone Age lithics within the proposed quarry area. These were graded as Not Conservation Worthy A likely colonial period stone-walled kraal was also identified on the site which was given a grading of 3C. No other built structures are present on the site and no graves or cemeteries were identified. The proposed quarrying will result in the loss and destruction of this archaeological material and the kraal, although the significance of these impact was assessed to be low.

The palaeontological assessment indicates that Tierkloof Formation bedrock which underlies a substantial portion of the proposed quarry is fossiliferous and of potentially high significance. The quarrying of the area will result in the loss and destruction of fossil material within the shales and mudstones that underly the site and which are the target resource of the proposed quarry.

The cultural landscape of the proposed quarry can be best described as an organically evolved landscape which probably contains both relict (the pre-colonial use of and interaction with the land) and continuing (the modern, largely agricultural influences on the Karoo landscape) landscape elements (stock farming, as evidenced by the kraal). The establishment of the proposed quarry on Waai Kraal will introduce an industrial element into this overwhelmingly natural landscape where the human imprint is relatively light.

The proposed quarry is likely to be visible from the N1 although at distances varying between 2,8 km and 5 km and is unlikely to materially alter the character or sense of place of the wider cultural landscape in which it will operate. The change in landscape character the quarry will occasion is be partially offset by the presence of an existing quarry approximately 500 m south-east of the proposed development area on the same farm.

This assessment has found that the area identified for proposed quarry in Portion 4 of the farm Waai Kraal (120) is a moderately-low sensitive heritage environment and that impacts on heritage resources arising from quarrying operations can be expected.

Provided the mitigation measures set out above are implemented, the overall impact of the proposed quarry on Waai Kraal will be of low heritage significance and the proposed activity is acceptable.

The following pre-quarrying archaeological mitigation measures are recommended as per the Heritage Impact Assessment (Appendix N):

Archaeology:

- No pre-quarrying archaeological mitigation of the proposed quarry site is recommended. Although unlikely, should any human remains be encountered at any stage during the works associated with the project, work must in the vicinity must cease immediately, the remains must be left in situ but made secure and the project archaeologist and HWC must be notified immediately.
- Should any human remains be encountered at any stage during the works associated with the project, work must in the vicinity must cease immediately, the remains must be left in situ but made secure and the project archaeologist and HWC must be notified immediately in order to make a decision about how to deal with the remains.

Built Environment:

- Provided the kraal structure is photographically recorded and its position accurately mapped, this assessment suggests that it need not be retained once quarrying commences on the site.

The Palaeontological Impact Assessment conducted by Prof Marion Bamford indicates that, based on the geological record and fossil collecting map maintained by the Evolutionary Studies Institute, there is a chance that vertebrate fossils could occur on the site but none have been recorded to date. If dolerite is the material to be mined than there will be no fossils, but if mudstones and shales are to be mined there is a moderate chance that fossils will be present.

The following mitigation measures are, therefore, recommended:

- A site visit by a suitably qualified palaeontologist must take place prior to the commencement of quarrying to establish whether fossils are exposed on the site;
- A Fossil Chance Finds Protocol must be implemented once quarrying commences to ensure the reporting, safeguarding and recovery of any discoveries of fossils;
- The requirement to implement a Fossil Chance Finds Protocol, an example of which is attached as Appendix D of the Palaeontological Impact Assessment Report (Appendix N), must be included in the EMPr for the project; and

- If fossils are found during quarrying, they must be excavated and collected by a professional palaeontologist, working under a HWC permit and then housed in a recognised repository.

Figure 20: Information as per notification of intent to develop Section 38 (1) and Section 38 (8) of the National Heritage Resources Act (completed by John Gibble) Plate 1: Stone-walled kraal located within the proposed mining area (Photo: Gerhard Botha).

Figure 21: Information as per notification of intent to develop Section 38 (1) and Section 38 (8) of the National Heritage Resources Act (completed by John Gibble) Satellite image showing the location of the kraal (red arrow) within the proposed

mining area (white polygon). The kraal is visible in the most recent Google Earth image, but the image dated 19 September 2009 was chosen for its clarity (Source: Google Earth).

Description of impact on heritage resource:

The quarrying of the proposed mining area is likely to result in the destruction of the kraal structure and any potential associated artefactual material.

The South African Heritage Resources Agency (SAHRA) compiled the Palaeontological (fossil) Sensitivity Map (PSM) to guide developers, heritage officers and practitioners in screening paleontologically sensitive areas at the onset of a project. When the footprint of the earmarked mining area is placed on the PSM, the SAHRIS palaeo-sensitivity map (see https://sahris.sahra.org.za/map/palaeo) indicates that the bulk of the footprint of the proposed quarry is located in an area of high palaeontological sensitivity (as presented in the figure below). The sensitivity of the southern portion of the site is rated by SAHRIS as insignificant. as presented in the figure below.

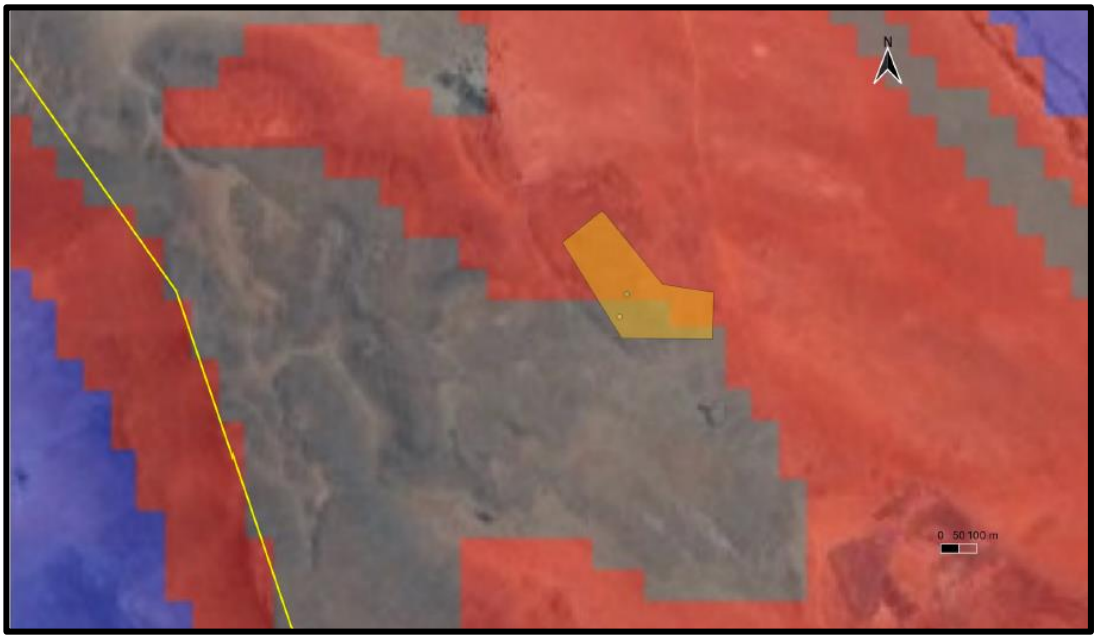


Figure 22: Screengrab from the SAHRIS palaeo-sensitivity map showing the location of the proposed mining area (orange polygon) straddling an area of high (red) and insignificant/zero (grey) palaeontological sensitivity (Source: https://sahris.sahra.org.za/map/palaeo).

SOCIO-ECONOMIC ENVIRONMENT

(Information extracted from the Beaufort West Municipality Integrated Development Plan – 2020/21)

The proposed mining area is located within ward 2 of the Beaufort West Local Municipality. Beaufort West Municipality is one of the three (3) local municipalities that comprise Central Karoo District. Beaufort West is the economic, political and

administrative heart of the Central Karoo. Located 32°21′S 22°35′E, about 460 km North East of Cape Town, the town was founded on the farm Hooyvlakte in 1818. The municipal area covers 16 330.10 km^2 and is structured into 7 Wards.

According to the Community Survey (2016), the municipality is home to an estimated population of 51 080 people.

According to Census 2011, the Afrikaans language is spoken by more than 40 000 people, i.e. 80% plus, of the people residing in the municipal area, with IsiXhosa spoken by about 5000 residents. In 2001, the number of Afrikaans speaking residents were 37 000 which is about 85% of the total population. The languages most spoken in the household are; Afrikaans (83.0%), IsiXhosa (13.1%) and English (1.9%). Afrikaans has remained the predominant language spoken by households since census 2001

Gender Profile

The female population over time has consistently been greater than that of the male population. The sex ratio indicates the number of males to every 100 females within the municipality has only increased in 2011 but declined back to its 2001 figure in 2016. Within 2001, 2011 and 2016, those aged 0-4, 5-9 and 15-19 have consistently had a higher male to female ratio. In 2016 however there was also subsequently and increase in the male to female ratio of persons aged 20-24 and 45-49.

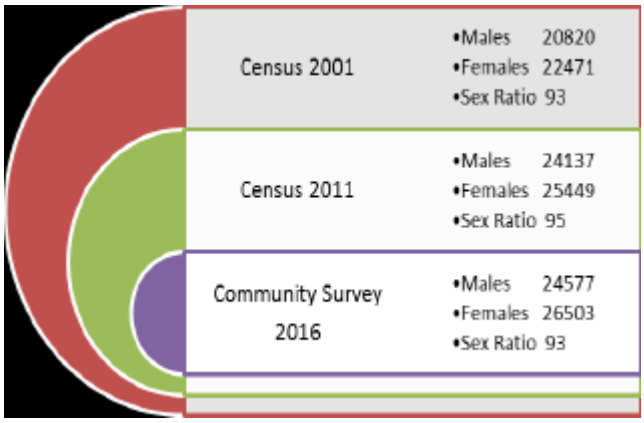


Figure 23: Gender distribution (Information extracted from the Beaufort West Municipality Integrated Development Plan – 2020/21) - Source: Statistics South Africa: Community Survey, 2016.

Economic Profile

Beaufort West Municipality, like any other municipality in the country, has a huge service backlog. The municipality does try to deliver relevant services to the communities through effective utilization of funds and human resources, but there is still much work to be done. Its economic base depends largely on Wholesale and reatail trade, catering and accommodation at 24.4%, with Agriculture and forestry and fishing at 19.7% and General Government at 18.3% of the municipality's GDP.

Population Profile

It is estimated that about 70% of the District population resides in Beaufort West, Beaufort West population in 2011 being 49 586. In 2011 of the people living in the Central Karoo District — the total population was 71 011. The Community Survey (CS) 2016, conducted by Stats SA, indicates that 69% of the population within the Central Karoo district resides in the Beaufort West municipal area. The increase in the number of people residing in the municipal area is because of the merging of administrative areas, i.e. the Beaufort West municipal area and the former District Management Area (DMA) and in-migration from other provinces. The population increased at an annual growth rate of 1.4% in the ten-year period between census 2001 and 2011. The

municipality experienced a growth rate of 0.59% per annum between census 2011 and 2016.

Although population growth is expected to slow down somewhat, it will still have a significant impact on the demand and the level of service delivery (especially in Beaufort West). Population density of the area in 2011 was 2.07 persons per km² and in 2016 marginally increased to 2.13 persons per km².

Education Levels

The number of schools across the CKD remain mostly unchanged in recent years, the exception being the closure of one school in the Beaufort West municipal area between 2017 and 2018. The closure of the school in Beaufort West can impact negatively on education outcomes given the gradual increase in learner enrolment.

The matric pass rate for the CKD improved notably between 2016 (76.8 per cent) and 2017 (79.5 per cent) before decreasing slightly in 2018 (78.5 per cent). The 2018 pass rate in the Beaufort West municipal area (79.2 per cent) is higher than the District average and has been steadily increasing since 2016.

Employment Profile

The unemployment rate in Beaufort West municipality has decreased by 12.9% in the 10 years between censuses. Although there has been a significant drop in the unemployment rate and the number of persons employed has increased, the municipality's 2011 unemployment rate is still higher than the district and provincial unemployment rates of 23, 1% and 21, 4% respectively.

Figure 24: Income levels (Information extracted from the Beaufort West Municipality Integrated Development Plan – 2020/21) - Source: Statistics South Africa: Census 2001 - 2011.

The above graph demonstrates an increase in monthly household income in the census 2011. While those earning a monthly income of R1600 and below has shown

a decline since 2001, we see an increase in those households earning R1601 to R102400 per month. This indicates that more households have members who are employed thus not solely dependent on social grants as compared to households in 2001.

(b) Description of the current land uses

Portion 4 of the farm Waai Kraal 120, Registration Division of Beaufort West, Western Cape province is situated in a rural setting. The N1 forms the south western boundary of the farm. The land use of the property mainly comprises of dormant agricultural land. The land use was also extended to include small scale mining.

The main land use of the surrounding properties is agricultural. The following table provides a description of the land uses and/or prominent features that currently occur within a 500 m radius of the proposed site:

Table 13: Land uses and/or prominent features that occur within 500 m radius of S1 and S2.

LAND USE CHARACTER	YES	NO	DESCRIPTION
Natural area	**YES**	-	The study area is surrounded by natural areas used for agricultural (small holding) purposes.
Low density residential	-	**NO**	
Medium density residential	-	**NO**	
High density residential	-	**NO**	
Informal residential	-	**NO**	
Retail commercial & warehousing	-	**NO**	
Light industrial	-	**NO**	
Medium industrial	-	**NO**	
Heavy industrial	-	**NO**	
Power station	-	**NO**	
High voltage power line	-	**NO**	
Office/consulting room	-	**NO**	
Military or police base / station / compound	-	**NO**	
Spoil heap or slimes dam	-	**NO**	
Quarry, gravel or borrow pit	**YES**	-	The footprint of the proposed mining area extends over an area previously used for gravel mining purposes.
Dam or reservoir		**NO**	A farm reservoir lays ±160 m north of the proposed mining area. The mining activities will not impact on the reservoir.
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	-	**NO**	The nearest railway line is located ±3.4 km from the earmarked area.
Major road (4 lanes or more)	**YES**		The N1 passes the site on the south eastern side
Airport	-	**NO**	.
Harbour	-	**NO**	
Sport facilities	-	**NO**	
Golf course	-	**NO**	
Polo fields	-	**NO**	
Filling station	-	**NO**	

LAND USE CHARACTER	YES	NO	DESCRIPTION
Landfill or waste treatment site	-	**NO**	
Plantation	-	**NO**	
Agriculture	**YES**	-	The proposed footprint forms part of an agricultural active farm.
River, stream or wetland		**NO**	
Nature conservation area	-	**NO**	
Mountain, hill or ridge	**YES**	-	The mining area is located on a low hill (koppie).
Museum	-	**NO**	
Historical building	-	**NO**	
Protected Area	-	**NO**	
Graveyard	**-**	**NO**	
Archaeological site	-	**NO**	
Other land uses (describe)	-	**NO**	

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

SPECIFIC ENVIRONMENTAL FEATURES

SITE SPECIFIC TOPOGRAPHY

Extremely irregular to slightly undulating plains covered with dwarf spiny shrubland dominated by Karoo dwarf shrubs (e.g. Chrysocoma ciliata, Eriocephalus ericoides) with rare low trees (e.g. Euclea undu-Jata). Dense stands of drought-resistant grasses (Stipagrostis, Aristida) cover (especially after abundant rains) broad sandy bottom lands. The figure below shows the elevation loss from the proposed mining footprint to the town of Beaufort West to be 182 m over 29.4 km.

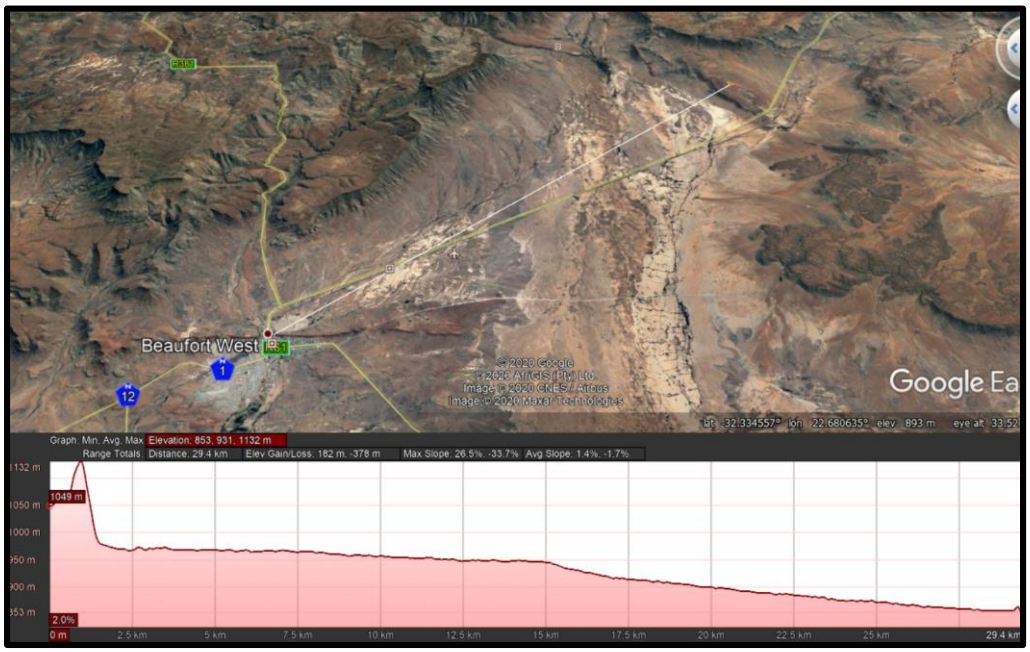


Figure 25: Elevation profile of the proposed mining footprint (Image obtained from Google Earth).

SITE SPECIFIC VISUAL CHARACTERISTICS

The proposed mining activities will be visible within close proximity (±1 km radius) of the footprint. However, as one moves away the visibility of the area greatly lessens. The figure below shows the viewshed analysis for the footprint within a ±10 km radius. The green shaded areas show the positions from where the mining area will be visible. From this analysis it is proposed that the visual impact of the proposed gravel mining operation will be of low significance, especially as no permanent structures will be constructed. The small scale of the proposed operation, and the mining area will be located between two hills in order to minimize the visual impact. Should the Applicant successfully rehabilitate the mining area (upon closure), no residual visual impact is expected upon closure of the mine.

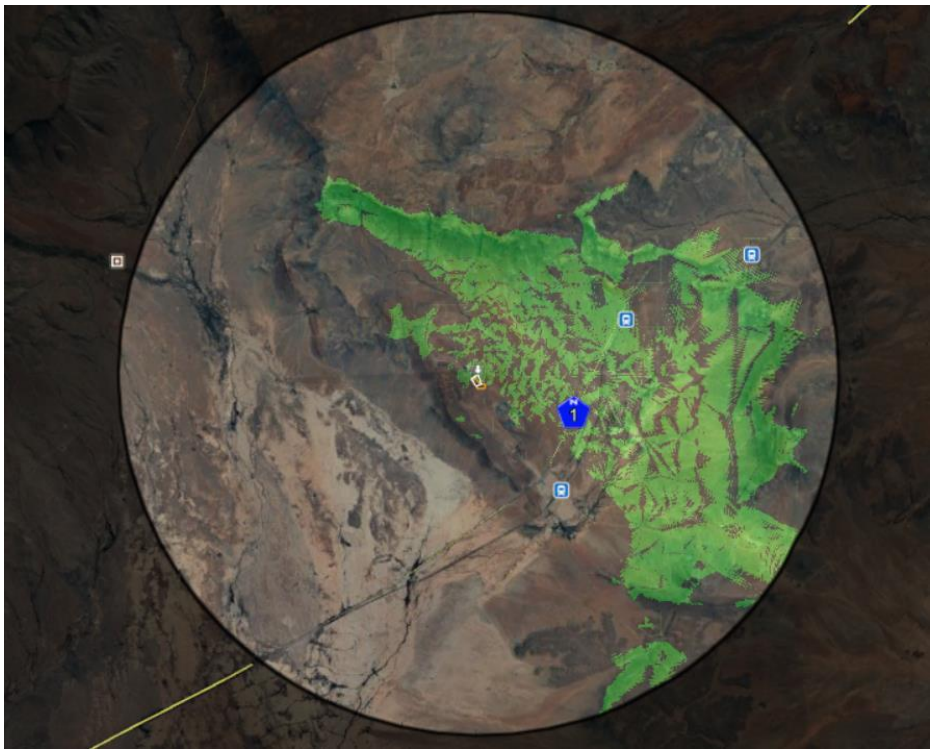


Figure 26: Viewshed of the proposed mining footprint as well as site alternative 2 where the green shaded areas shows the positions from where the mining area (Proposed mining area) will be visible. (Image obtained from Google Earth).

SITE SPECIFIC AIR AND NOISE QUALITY

The residential dwellings nearest to the proposed footprint is approximately 2 km away (south). Currently the air quality of the study area is mainly impacted on by the surrounding traffic on the N1 passing the site.

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. The proposed activity will contribute the emissions

mechanical mining equipment to the receiving environment for the duration of the operational phase. Should the permit holder 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 significance and compatible with the current land use.

The potential impact on the noise ambiance of the receiving environment is expected to be of low significance and representative of the traffic of the surrounding area. The distance of the proposed mining area from residential infrastructure further lessens the potential noise impact.

SITE SPECIFIC GEOLOGY AND SOIL

The site specific geology is representative of the regional geology and soil as described earlier in this report. The geology of the study area comprises mostly rimitive, skeletal soils in rocky areas devel-oping over sedimentary rocks such as mudstones and arenites of the Adelaide Subgroup of the Karoo Supergroup and to a lesser extent also the Ecca Group (Waterford and Volksrust Formations) as well as Jurassic dolerite sills and dykes and subsummit positions of mesas and butts with dolerite boulder slopes. Almost entirely lb land type.

Mudstones and sandstones of the Beaufort Group (Adelaide Subgroup) with some Ecca (Fort Brown Formation) shales supporting very shallow and stony soils of the Glenrosa and/or Mispah forms, typical of Fe land type.

The aggregate / gravel of the study area is aggregate highly suitable for construction purposes. The mining method will make use of blasting in order to loosen the hard rock; upon which the loosened material will be transported to a processing area (inside mining boundary) where it will be crushed and screened to various sized stockpiles, before being sold and transported from site to clients.

SITE SPECIFIC HYDROLOGY

The proposed project does not require a Water Use Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No 36 of 1998). As mentioned earlier, the proposed mining footprint extends into an undisturbed area of the farm occasionally used for grazing, and no activity will take place in or within 1km radius of any water bodies. Any water required for the implementation of the project will be bought from a registered source and transported to on site. The use of potable water for dust suppression should be avoided.

Figure 27: Satellite view showing 1km radius from the position of mining footprint as well as site alternative 2. (Image obtained from Google Earth)

SITE SPECIFIC MINING AND BIODIVERSITY CONSERVATION AREAS

As mentioned earlier, when the mining footprint is layered over the Mining and Biodiversity Map, it falls over and area of moderate biodiversity importance with a corresponding rating of moderate risk for mining. The Mining and Biodiversity Guideline's describes areas of moderate risk biodiversity importance as: "*These areas are of moderate biodiversity value."* The guideline notes that environmental screening, the EIA and specialists should focus on confirming the presence and significance of biodiversity features, and provide a site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision-making.

SITE SPECIFIC GROUNDCOVER

The site specific groundcover of the mining area consists of low shrub land (purple area) as per the figure below the surrounding groundcover varies between bare none vegetated (white area) and woodland / open bush (green area)

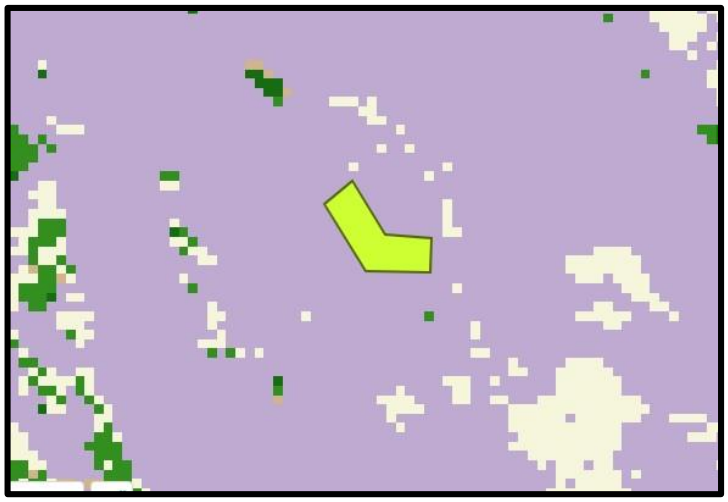


Figure 28: National land cover map showing the mining area (Image obtained from BGIS Map Viewer – National land cover Map 2014)

As per the botanical assessment report conducted by Nkurenkuru Ecology and Biodiversity dated November 2020 attached as appendix M - A total of 33 non-indigenous vegetation has been recorded within the region and includes nine listed Alien Invasive Plants (AIPs) according to the updated 2019 list in accordance with the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) Alien and Invasive Species List (2016). Seven of the nine recorded AIPs were listed as Category 1b plants, whilst one species (Tephrocactus articulatus) was listed as a Category 1a plant and one species (Atriplex nummularia) as a Category 2 plant. The Category 1b plants recorded within the region are; *Prosopis glandulosa*, *P. velutina, Opuntia ficus-indica, Opuntia spp., Pennisetum setaceum, Salsola kali and*

Cylindropuntia imbricata. A total of 82 plant species were recorded within the mining area with 76 species associated with the dolerite outcrop whilst 24 species were recorded within the plain habitat. All of species recorded were indigenous with no alien plants recorded within the mining area. The mining area can be characterized as a relative short, dwarf karroid shrubland dominated by dwarf shrubs (20 species) and forbs (21 species) and wiry white grass species (17 species). Even though succulence, within the mining area, is not well represented in terms of species diversity, succulent dwarf shrubs are a common coverage within the area. As mentioned, taller shrubs and small trees are associated with areas with a slightly higher moisture content along the footslopes and sandy pockets of the dolerite ridge. These taller shrub patches mostly comprise of *Searsia burchellii, Carissa bispinosa, Diospyros lyciodes and Grewia occidentalis*, with *Asparagus retrofractus* straggling into the branches of these taller shrubs. Plant families well represented within the mining area include; *Asteraceae* (19 species), *Poaceae* (17 species) and (8 species). The Applicant will implement an invasive plant species management plan and constantly monitor the mining area for problem species. Only one provincially protected species has been recorded within the proposed mining area namely *Babianna hypogeae*. This species is however not regarded as rare and the loss of the affected individuals from the development footprint would not be of wider significance or compromise the viability of the local populations of these species. In light of this, there should be a preconstruction walk-through of the development footprint/project site in order to locate individual plant species of conservation concern. Any trans locatable protected species must be relocated to a suitable and similar habitat where these plants can grow without any disturbance.

SITE SPECIFIC FAUNA

Various small mammals and reptiles occur are likely to on the property. The fauna at the site will not be impacted by the proposed mining activities as they will be able to move away or through the site, without being harmed. Workers should be educated and managed to ensure that no fauna at the site is harmed. At this stage no resident protected or red data faunal species could be identified within the earmarked footprint. The study area falls over a property that is noted to be operational game farms, should this mining permit be granted farm owner will be consulted prior to commencement of any activities to ensure that safety of animals and workers. Workers will be informed and managed to ensure that no fauna at the site is harmed. No poaching or hunting of animals will be allowed. All construction vehicles must adhere to a low speed limit (<40km/h) to avoid collisions with susceptible species such as snakes and tortoises. Trenches and deep excavations should not be left open for extended periods of time

as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench.

SITE SPECIFIC CULTURAL AND HERITAGE ENVIRONMENT

The proposed quarry is located on a spur of hills that extend out from the eastern Nieuweveldsberge of the Great Southern Escarpment. The site overlooks the drainages of the Hoek se Sloot and Renosterspruit Rivers to the east, while the Platdoring River drainage lies immediately to the west (as per notification of intent to develop Section 38 (1) and Section 38 (8) of the National Heritage Resources Act (completed by John Gibble).

Heritage resources located within the footprint of the proposed mining area will be affected by quarrying activities, except if expressly excluded from quarrying activities.

The stripping for stockpiling of the topsoil from the site will result in the disturbance of any archaeological material (both pre-colonial and historical) present, and the destruction of any stratified sites. This includes the stone-walled kraal on the site and any associated artefacts.

The quarrying of the area will result in the loss and destruction of fossil material within the shales and mudstones that underly the site and which are the target resource of the proposed quarry.

No archaeological or other heritage studies have been identified from available literature in the immediate vicinity of the site, but a handful studies from the wider region provide general information about the history of the area.

While the desktop archaeological review indicated that pre-colonial archaeological material is relatively common in the Beaufort West area of the Karoo and that some such material must be expected on the site, the walkover survey identified only a handful of Later Stone Age lithics within the proposed quarry area. These were graded as Not Conservation Worthy A likely colonial period stone-walled kraal was also identified on the site which was given a grading of 3C. No other built structures are present on the site and no graves or cemeteries were identified. The proposed quarrying will result in the loss and destruction of this archaeological material and the kraal, although the significance of these impact was assessed to be low.

The palaeontological assessment indicates that Tierkloof Formation bedrock which underlies a substantial portion of the proposed quarry is fossiliferous and of potentially high significance. The quarrying of the area will result in the loss and destruction of

fossil material within the shales and mudstones that underly the site and which are the target resource of the proposed quarry.

The cultural landscape of the proposed quarry can be best described as an organically evolved landscape which probably contains both relict (the pre-colonial use of and interaction with the land) and continuing (the modern, largely agricultural influences on the Karoo landscape) landscape elements (stock farming, as evidenced by the kraal). The establishment of the proposed quarry on Waai Kraal will introduce an industrial element into this overwhelmingly natural landscape where the human imprint is relatively light.

The proposed quarry is likely to be visible from the N1 although at distances varying between 2,8 km and 5 km and is unlikely to materially alter the character or sense of place of the wider cultural landscape in which it will operate. The change in landscape character the quarry will occasion is be partially offset by the presence of an existing quarry approximately 500 m south-east of the proposed development area on the same farm.

This assessment has found that the area identified for proposed quarry in Portion 4 of the farm Waai Kraal (120) is a moderately-low sensitive heritage environment and that impacts on heritage resources arising from quarrying operations can be expected.

Provided the mitigation measures set out above are implemented, the overall impact of the proposed quarry on Waai Kraal will be of low heritage significance and the proposed activity is acceptable.

The following pre-quarrying archaeological mitigation measures are recommended as per the Heritage Impact Assessment (Appendix N):

<u>Archaeology:</u>

- No pre-quarrying archaeological mitigation of the proposed quarry site is recommended. Although unlikely, should any human remains be encountered at any stage during the works associated with the project, work must in the vicinity must cease immediately, the remains must be left in situ but made secure and the project archaeologist and HWC must be notified immediately.

- Should any human remains be encountered at any stage during the works associated with the project, work must in the vicinity must cease immediately, the remains must be left in situ but made secure and the project archaeologist and HWC must be notified immediately in order to make a decision about how to deal with the remains.

Built Environment:

- Provided the kraal structure is photographically recorded and its position accurately mapped, this assessment suggests that it need not be retained once quarrying commences on the site.

The Palaeontological Impact Assessment conducted by Prof Marion Bamford indicates that, based on the geological record and fossil collecting map maintained by the Evolutionary Studies Institute, there is a chance that vertebrate fossils could occur on the site but none have been recorded to date. If dolerite is the material to be mined than there will be no fossils, but if mudstones and shales are to be mined there is a moderate chance that fossils will be present.

The following mitigation measures are, therefore, recommended:

- A site visit by a suitably qualified palaeontologist must take place prior to the commencement of quarrying to establish whether fossils are exposed on the site;
- A Fossil Chance Finds Protocol must be implemented once quarrying commences to ensure the reporting, safeguarding and recovery of any discoveries of fossils;
- The requirement to implement a Fossil Chance Finds Protocol, an example of which is attached as Appendix D of the Palaeontological Impact Assessment Report (Appendix N), must be included in the EMPr for the project; and
- If fossils are found during quarrying, they must be excavated and collected by a professional palaeontologist, working under a HWC permit and then housed in a recognised repository.

SITE SPECIFIC INFRASTRUCTURE

There is no existing infrastructure located within 500 m of the proposed mining area includes. The following is located within close proximity:

- An existing SANRAL quarry is located 900m south east of the site.
- Guest lodge on the farm is located 2km south of the site
- The N1 – 2.5km towards the south of the site.

None of the existing infrastructure falls within the site area and will therefore not be affected.

(d) 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.

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 of the proposed project. 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.

SITE ESTABLISHMENT & INFRASTRUCTURE DEVELOPMENT:

Alteration of the agricultural sense of place

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: None**		
2	2	1	1.6	4	5	4.5	**7.5**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: None**		
2	2	1	1.6	4	5	4.5	**7.5**

Loss of agricultural land for duration of mining

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: None**		
2	4	1	2.3	5	5	5	**11.5**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: None**		
2	4	1	2.3	5	5	5	**11.5**

Visual intrusion as a result of site establishment

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: None**		
2	2	2	2	5	5	5	**10**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: None**		

3	2	2	2.3	5	5	5	**11.5**

Potential impact on fauna within the footprint area

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	2	1	1.6	4	3	3.5	**5.6**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	2	1	1.6	4	3	3.5	**5.6**

Potential impact on archaeological artefacts

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	5	5	4	1	1	1	**4**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	5	5	4	1	1	1	**4**

Potential impact on destruction of the kraal structure

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	5	5	4	1	1	1	**4**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	5	5	4	1	1	1	**4**

New job opportunities as a result of the mining operation (Positive Impact)

			Consequence			Likelihood	**Significance (+)**
Severity (+)	Duration	Extent		Probability	Frequency		
Rating: High (+)			**Site Alternative 1**		**Degree of Mitigation: N/A**		
4	4	5	4.6	5	5	5	**23**
			Consequence			Likelihood	**Significance (+)**
Severity (+)	Duration	Extent		Probability	Frequency		
Rating: High (+)			**Site Alternative 2**		**Degree of Mitigation: N/A**		
4	4	5	4.6	5	5	5	**23**

STRIPPING AND STOCKPILING OF TOPSOIL AND/OR OVERBURDEN:

Visual intrusion caused by mining activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: None**		
2	4	4	3.3	5	5	5	**16.5**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: None**		
3	4	4	3.6	5	5	5	**18.3**

Loss of stockpiled topsoil during mining and stockpiling

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	4	1	2.6	4	3	3.5	**9.1**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	4	1	2.6	4	3	3.5	**9.1**

Dust nuisance as a result of the disturbance of soil

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	3	2	2.3	4	4	4	**9.2**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	3	2	2.3	4	4	4	**9.2**

Noise nuisance generated by earthmoving machinery

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Partial**		
2	3	2	2.3	3	5	4	**9.2**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 2**		**Degree of Mitigation: Partial**		
2	3	2	2.3	3	5	4	**9.2**

Infestation of the topsoil heaps and mining area with weeds or invader plant species

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		

Rating: Medium			Site Alternative 1				Degree of Mitigation: Full
3	4	2	3	5	2	3.5	**10.5**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**				**Degree of Mitigation: Full**
3	4	2	3	5	2	3.5	**10.5**

Potential impact on local fauna due to disturbance and loss of available habitat

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**				**Degree of Mitigation: Full**
2	4	1	2.3	4	4	4	**9.2**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 2**				**Degree of Mitigation: Full**
2	4	1	2.3	4	4	4	**9.2**

Potential erosion of denuded areas

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**				**Degree of Mitigation: Full**
3	3	1	2.3	4	2	3	**6.9**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 2**				**Degree of Mitigation: Full**
3	3	1	2.3	4	2	3	**6.9**

Potential contamination of footprint area and surface runoff as a result of hydrocarbon spillages

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
3	3	1	2.3	4	4	4	**9.2**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	3	1	2.3	4	4	4	**9.2**

DRILLING AND BLASTING:

Health and safety risk posed by blasting activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
4	4	1	3	4	3	3.5	**10.5**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
4	4	1	3	4	3	3.5	**10.5**

Dust nuisance caused by blasting activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: None**	
3	4	2	3	4	3	3.5	**10.5**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: None**	
3	4	2	3	4	3	3.5	**10.5**

Noise nuisance as a result of blasting

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Partial**	
3	4	2	3	4	3	3.5	**10.5**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Partial**	
3	4	2	3	4	3	3.5	**10.5**

EXCAVATION, LOADING AND HAULING TO THE PROCESSING PLANT

Visual intrusion as a result of excavation and from loading and vehicles transporting the material

			Consequence			Likelihood	**Significance**

Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: None**	
2	2	2	2	5	5	5	**10**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: None**	
3	2	2	2.3	5	5	5	**11.5**

Dust nuisance due to excavation and from loading and vehicles transporting the material

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
2	4	2	2.6	4	5	4.5	**11.7**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
2	4	2	2.6	4	5	4.5	**11.7**

Noise nuisance as a result of the mining activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Partial**	
2	4	2	2.6	4	5	4.5	**11.7**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Partial**	
2	4	2	2.6	4	5	4.5	**11.7**

Unsafe working environment for employees

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
4	4	1	3	4	5	4.5	**13.5**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
4	4	1	3	4	5	4.5	**13.5**

Soil contamination from hydrocarbon spills and/or littering

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	4	1	2.6	4	5	4.5	**11.7**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	4	1	2.6	4	5	4.5	**11.7**

Potential impact on areas of palaeontological concern

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
4	4	5	4.3	2	1	1.5	**6.5**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
4	4	5	4.3	2	1	1.5	**6.5**

Facilitation of erosion due to mining activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	4	1	2.6	4	3	3.5	**9.1**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	4	1	2.6	4	3	3.5	**9.1**

PROCESSING, STOCKPILING AND TRANSPORTING OF MATERIAL:

Dust nuisance generated at the processing plant

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	4	2	2.6	5	5	5	**13**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	4	2	2.6	5	5	5	**13**

Noise nuisance stemming from operation of the processing plant

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Partial**		
2	4	2	2.6	4	5	4.5	**11.7**

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Partial**		
2	4	2	2.6	4	5	4.5	**11.7**

Visual intrusion as a result of operation of the processing plant

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: None**		
2	2	2	2	5	5	5	**10**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: None**		
3	2	2	2.3	5	5	5	**11.5**

Potential contamination of environment due to improper waste management

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	4	1	2.6	4	4	4	**10.4**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	4	1	2.6	4	4	4	**10.4**

Overloading of trucks impacting road infrastructure

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium-High			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	4	5	4	4	5	4.5	**18**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium-High			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	4	5	4	4	5	4.5	**18**

Degradation of the access road

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
3	4	2	3	4	5	4.5	**13.5**
			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	4	2	3	4	5	4.5	**13.5**

CUMULATIVE IMPACTS:

Impact the broad-scale ecological processes - The loss of unprotected vegetation types on a cumulative basis from the broad area may impact the country's ability to meet its conservation targets.

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Partial**	
4	4	4	4	3	1	2	**8**
			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Partial**	
4	4	4	4	3	1	2	**8**

Transformation of intact habitat would contribute to the fragmentation of the landscape and would potentially disrupt the connectivity of the landscape for fauna, avifauna, and flora and impair their ability to respond to environmental fluctuations.

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Partial**	
4	4	4	4	3	1	2	**8**
			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Partial**	
4	4	4	4	3	1	2	**8**

Impact on existing infrastructure as a direct result of the mining operation

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
4	4	5	4.3	3	3	3	**12.9**
			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
4	4	5	4.3	3	3	3	**12.9**

SLOPING AND LANDSCAPING DURING REHABILITATION:

Safety risk posed by un-sloped areas

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	5	1	3	4	5	4.5	**13.5**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	5	1	3	4	5	4.5	**13.5**

Erosion of returned topsoil after rehabilitation

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	5	1	3	4	3	3.5	**10.5**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	5	1	3	4	3	3.5	**10.5**

Infestation of the reinstated areas by weeds and invader plant species

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium-High			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	5	3	3.6	5	5	5	**18**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium-High			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	5	3	3.6	5	5	5	**18**

Potential impact associated with litter/waste left at the mining area

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	5	1	3	4	5	4.5	**10.5**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	5	1	3	4	5	4.5	**10.5**

Return of the mining area to agricultural use upon closure (Positive Impact)

			Consequence			Likelihood	**Significance (+)**
Severity (+)	Duration	Extent		Probability	Frequency		
Rating: Medium-High			**Site Alternative 1**		**Degree of Mitigation: N/A**		

3	5	1	3	5	5	5	**15**
Severity (+)	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance (+)**
Rating: Medium-High			**Site Alternative 2**		**Degree of Mitigation: N/A**		
3	5	1	3	5	5	5	**15**

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.

The table below will be used to obtain an overall rating for severity, taking into consideration the various criteria.

Table 14: Table to be used to obtain an overall rating of severity, taking into consideration the various criteria.

Type of criteria	Rating				
	1	2	3	4	5
Quantitative	0-20%	21-40%	41-60%	61-80%	81-100%

Qualitative	Insignificant / 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 15: 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 16: 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/neighbouring 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 17: Example of calculating 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 6 and 7.

Determination of Frequency

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

Table 18: 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 19: 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 20: 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 21: 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 22: 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 environmental impact assessment process assessed the feasibility of the proposed site alternative to identify fatal flaws that are deemed as severe as to prevent the activity continuing, or warrant another 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). The aggregate / gravel mining area can be moved to various alternative sites within close proximity of the proposed mining area but will

entail disturbing a greenfield area. However, the proposed mining area was identified as the preferred and only viable site alternative as it entails the mining of an area previously used for aggregate / gravel mining purposes. In light of this, S1 was identified during the assessment phase of the environmental impact assessment, by the Applicant and project team due to the following:

- The proposed area is over an undisturbed area of the farm occasionally used for grazing but with very low agricultural potential due to the rocky surface, after consultation with the land owner the application footprint extends into an area with low agricultural potential. The proposed project will not necessitate the loss of agricultural field with high potential to the land owner. This was deemed the only site alternative as this is the only area that will be viable for the land owner due to the low agricultural potential,
- Access to the proposed mining area is possible via the existing access road with a formal (existing) entrance onto the N1.
- The quality of the aggregate / gravel, in the earmarked area, complies with the requirements of the Applicant's clients and/or contracts.

PROJECT ASSOCIATED POSITIVE IMPACTS:

- Possible work opportunities to local residents;
- Return of the mining area to agricultural use upon closure of the project; and
- Diversification of the land use of the property.

POTENTIAL NEGATIVE IMPACTS:

Site establishment & infrastructure development

- Alteration of the agricultural sense of place;
- Loss of agricultural land for duration of mining;
- Visual intrusion as a result of site establishment;
- Potential impact on fauna within the footprint area;
- Potential impact on archaeological artefacts;

Stripping and stockpiling of topsoil and/or overburden:

- Visual intrusion caused by mining activities;
- Loss of stockpiled topsoil during mining and stockpiling;
- Dust nuisance as a result of the disturbance of soil;
- Noise nuisance generated by earthmoving machinery;
- Infestation of the topsoil heaps and mining area with weeds or invader plant species;
- Potential impact on local fauna due to disturbance and loss of available habitat;
- Potential erosion of denuded areas;
- Potential contamination of footprint area and surface runoff as a result of hydrocarbon spillages;

Drilling and blasting:

- Health and safety risk posed by blasting activities;
- Dust nuisance caused by blasting activities;
- Noise nuisance as a result of blasting;

Excavation, loading and hauling to the processing plant:

- Dust nuisance due to excavation and from loading and vehicles transporting the material;
- Noise nuisance as a result of the mining activities;
- Unsafe working environment for employees;
- Soil contamination from hydrocarbon spills and/or littering;
- Potential impact on areas of palaeontological concern;
- Facilitation of erosion due to mining activities;

Processing, stockpiling and transporting of material:

- Dust nuisance generated at the processing plant;
- Noise nuisance stemming from operation of the processing plant;
- Potential contamination of environment due to improper waste management;
- Overloading of trucks impacting road infrastructure;
- Degradation of the access road;

Cumulative impacts:

- Impact the broad-scale ecological processes;
- Impact on existing infrastructure as a direct result of the mining operation;

Sloping and landscaping during rehabilitation:

- Safety risk posed by un-sloped areas;
- Erosion of returned topsoil after rehabilitation;
- Infestation of the reinstated areas by weeds and invader plant species;
- Potential impact associated with litter/waste left at the mining area.

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/minimize the impact of the proposed activity on the surrounding environment:

TOPOGRAPHY

Rehabilitating/Landscaping of Mining 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.
- Coarse natural material used for the construction of ramps must be removed and dumped into the excavations.
- Stockpiles must be removed during the decommissioning phase, the area ripped and the topsoil returned to its original depth to provide a growth medium.
- 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 six 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.
- 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).
- On completion of mining operations, the surface of all plant-, stockpiling-, and/or office areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 200mm and graded to an even surface condition. Where applicable/possible topsoil needs to be returned to its original depth over the area.

VISUAL CHARACTERISTICS

Visual Mitigation:

- The site must 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 must be rehabilitated to ensure that the visual impact on the aesthetic value of the area is reduced to the minimum.

AIR AND NOISE QUALITY

Fugitive Dust Emission Mitigation Measures:

- The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, straw, water spraying and/or environmentally friendly 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 and 40 km/h on the access road to prevent the generation of excess dust.
- 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 crusher plant must have operational water sprayers to alleviate dust generation from the conveyor belts.
- Fines, blowing from the drop end of the crusher plant, can be minimized by attaching strips of used conveyor belts to the conveyor's end.
- Compacted dust must weekly be removed from the crusher plant to eliminate the dust source.
- Loads must be flattened to prevent spillage during transportation on public roads.
- Weather conditions must be taken into consideration upon commencement of daily operations. Limiting operations during very windy periods would reduce airborne dust and resulting impacts.
- 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 permit holder 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.
- 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.

- Site management must strive to minimise the noise caused by generators. All generators must be maintained and equipped with sound mufflers. If possible the generators must be positioned towards the western part of the mining area (S1) as this will point it away from the neighbouring land users. Further to this, all generators must be placed on a level area/footing to minimise vibration noise.
- Best practice measures shall be implemented in order to minimize potential noise impacts.

GEOLOGY AND SOIL

Topsoil Management:

- The upper 300 mm of the soil must be stripped and stockpiled before mining.
- Topsoil is a valuable and essential resource for rehabilitation and it must therefore be managed carefully to conserve and maintain it throughout the stockpiling and rehabilitation processes.
- Topsoil stripping, stockpiling and re-spreading must be done in a systematic way. The mining plan have to be such that topsoil is stockpiled for the minimum possible time.
- The topsoil must be placed on a levelled area, within the mining footprint. No topsoil may be stockpiled in undisturbed areas.
- Topsoil stockpiles must be protected against losses by water- and wind erosion. Stockpiles must be positioned so as not to be vulnerable to erosion by wind and water. The establishment of plants (weeds or a cover crop) on the stockpiles will help to prevent erosion.
- Topsoil heaps may 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.
- The temporary topsoil stockpiles must be kept free of invasive plant species.
- Topsoil heaps to be stored longer than a period of 6 months needs to be vegetated with an indigenous grass seed mix if vegetation does not naturally germinate within the first growth season.
- Storm- and runoff water must be diverted around the stockpile area to prevent erosion.
- The stockpiled topsoil must be evenly spread, to a depth of 300 mm, 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 biomass 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 berms, where necessary, on the slopes to ensure that accumulation of run-off does not cause down-slope erosion.
- Silt/sediment traps/barriers should be used where there is a danger of topsoil or material stockpiles eroding and entering downstream drainage lines and other sensitive areas.
- These sediment/silt barriers should be regularly maintained and cleared so as to ensure effective drainage of the areas
- The rehabilitated area must be monitored for erosion, and appropriately stabilized if any erosion occurs for at least 12 months after reinstatement.

HYDROLOGY

Erosion Control and Storm Water Management:

- Clearing of vegetation must be limited to the proposed mining footprint and associated infrastructure. No clearing outside of the minimum required footprint to take place.
- Stormwater must be diverted around the topsoil heaps and mining areas to prevent erosion.
- Stockpiles must be protected from erosion, stored on flat areas where possible, and be surrounded by appropriate berms.
- When mining within steep slopes, it must be ensured that adequate slope protection is provided.
- During mining, the outflow of run-off water from the mining excavation must be controlled to prevent down-slope erosion. This must be done by way of the construction of temporary banks and ditches that will direct run-off water (if needed). These must be in place at any points where overflow out of the excavation might occur.
- Roads and other disturbed areas within the project area must be regularly monitored for erosion and problem areas must receive follow-up monitoring to assess the success of the remediation.
- Any erosion problems within the mining area as a result of the mining activities observed must be rectified immediately (within 48 hours) and monitored thereafter to ensure that it does not re-occur.
- Silt/sediment traps/barriers must be used where there is a danger of topsoil or material stockpiles eroding and entering downstream drainage lines and other sensitive areas. These sediment/silt barriers must regularly be maintained and cleared so as to ensure effective drainage of the areas.

- 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 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).
  - The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into a storm water management plan.
- Polluting activities including storage of mining fleet, equipment wash down facilities and vehicle maintenance yards must be restricted to the workshop areas and must be undertaken on impermeable hard standing surfaces, which are formally drained to a dirty water drainage system at the site.
- Vehicle maintenance or refueling should be undertaken within the workshop and service area proposed within the mining area. Alternatively, if emergency repairs or refueling are required, it must be undertaken on an impermeable surface to prevent contamination of soil and groundwater. Vehicles and equipment must be parked and stored on impermeable surfaces or make use of uPVC lining and drip trays when stationary
- All fuels and chemicals stored or used on site must be contained within fit for purpose containers and stored within designated storage areas. In order to prevent pollution of the surrounding environment during an accidental spillage, the designated storage areas must be situated on an impermeable surface and must feature a perimeter bund and a drainage sump. The volume of the bund and sump must be sized to contain at least 110% of the total volume of the fuel and chemicals being stored within the designated storage area. The storage areas must feature a roof to prevent inflow of rainwater, which would require the sump to be emptied more frequently.

TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS AND GROUNDCOVER

Management of Vegetation Removal:

- The mining boundaries must be clearly demarcated and all operations must be contained to the approved mining area. The area outside the mining boundaries must be declared a no-go area, and all staff must be educated accordingly.

- A pre-commencement walk-through of the final mining footprint, must be done by a suitably qualified botanist to identify species of conservation concern that need to be removed/relocated prior to bush clearance.
- Permits for the removal of protected plant species (if required) must be obtained and kept on-site in the possession (at all times) of the flora search and rescue team.
- A pre-commencement environmental induction for all site staff must be provided to ensure that basic environmental principles are adhered to. This includes awareness of no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, remaining within demarcated construction areas, etc.
- Bush-clearance may only commence once the recommendations of the specialist (pre-commencement walkthrough) have been implemented.
- Cleared vegetation to be retained at any time may not be burned, but can be mulched and stockpiled. Ideally the heaps can be covered with stockpiled topsoil and the material be retained for future site rehabilitation purposes.
- The on-site ECO must provide supervision and oversight of vegetation clearing activities and other activities which may cause damage to the environment, especially during the site establishment phase, when the majority of vegetation clearing is taking place.
- All vehicles must remain on demarcated roads and no unnecessary driving in the veld outside these areas may be allowed.
- No plants may be translocated or otherwise uprooted or disturbed for rehabilitation or other purposes without express permission from the ECO and without the relevant permits.
- No fires must be allowed on-site.
- If deemed necessary by the ECO, a firebreak must be made around the periphery of the site in autumn every year. Vegetated areas inside the break should be burned (upon recommendation of the ECO) on a biennial basis if deemed necessary. The relevant veld burning legislation must be adhered to.

Management of Invasive Plant Species:

- An invasive plant species management plan (Appendix K) must be implemented at the site to ensure the management and control of all 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). Weed/alien clearing must be done on an ongoing basis throughout the life of the mining activities.
- No planting or importing of any alien species to the site for landscaping, rehabilitation or any other purpose may be allowed.
- All stockpiles (topsoil & overburden) must be kept free of invasive plant species.
- 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 chemically by a registered pest control officer (PCO) through the use of an herbicide recommended for use by the PCO in accordance with the directions for the use of such an herbicide.

FAUNA

Protection of Fauna:

- The site manager must ensure no fauna is caught, killed, harmed, sold or played with.
- Any fauna directly threatened by the operational activities must be removed to a safe location by the ECO or other suitably qualified person.
- All personnel must undergo environmental induction regarding fauna management and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition. 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.
- All vehicles must adhere to a low speed limit (40 km/h is recommended) to avoid collisions with susceptible species such as snakes and tortoises.
- No litter, food or other foreign material may be thrown or left around the site. Such items must be kept in the site vehicles and daily removed to the site camp.

CULTURAL AND HERITAGE ENVIRONMENT

Archaeological, Heritage and Palaeontological Aspects:

The following pre-quarrying archaeological mitigation measures are recommended as per the Heritage Impact Assessment (Appendix N):

Archaeology:

- No pre-quarrying archaeological mitigation of the proposed quarry site is recommended. Although unlikely, should any human remains be encountered at any stage during the works associated with the project, work must in the vicinity must cease immediately, the remains must be left in situ but made secure and the project archaeologist and HWC must be notified immediately.;

- Should any human remains be encountered at any stage during the works associated with the project, work must in the vicinity must cease immediately, the remains must be left in situ but made secure and the project archaeologist and HWC must be notified immediately in order to make a decision about how to deal with the remains.

- 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.

Built Environment:

- Provided the kraal structure is photographically recorded and its position accurately mapped, this assessment suggests that it need not be retained once quarrying commences on the site.

As per the Palaeontological Impact Assessment the following mitigation measures are recommended:

- A site visit by a suitably qualified palaeontologist must take place prior to the commencement of quarrying to establish whether fossils are exposed on the site;
- A Fossil Chance Finds Protocol must be implemented once quarrying commences to ensure the reporting, safeguarding and recovery of any discoveries of fossils;
- The requirement to implement a Fossil Chance Finds Protocol, an example of which is attached as Appendix D of the Palaeontological Impact Assessment, (Appendix N) must be included in the EMPr for the project; and
- If fossils are found during quarrying, they must be excavated and collected by a professional palaeontologist, working under a HWC permit and then housed in a recognised repository.

LAND USE

Loss of agricultural land for duration of mining:

- The Applicant signed a lease agreement with the landowner to compensate for the loss of agricultural land for the duration of the mining period. If needed, mined-out/rehabilitated areas could revert back to agricultural use once the cover crop stabilised.

- Restrict the proposed development to the smallest footprint possible and do not disturb/alter areas outside the development;
- Ensure that the mining activities and associated infrastructure is adequately fenced to prevent livestock from gaining access to the base station; and,
- Ensure that access roads are kept clear and that construction and operational activities do not interfere with agricultural activities.

Management of the Access Road:

- Storm water must be diverted around the access road to prevent erosion.
- Vehicular movement must be restricted to the existing access road and crisscrossing of tracks through undisturbed areas must be prohibited.
- Rutting and erosion of the access road caused as a direct result of the mining activities must be repaired by the permit holder.
- Overloading of the trucks must be prevented and proof of load weights must be filed and be available for auditing by relevant officials.
- The speed of all mining equipment/vehicles must be restricted to 40 km/h on the access roads.

GENERAL

Waste Management:

- Regular vehicle maintenance, repairs and services may only take place at the workshop and service area. 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 closed container/bin to be removed from the emergency service area (same day) to the workshop in order to ensure proper disposal. This waste must be treated as hazardous waste and must be disposed of at a registered hazardous waste handling facility, alternatively collected by a registered hazardous waste handling contractor. The safe disposal certificates must be filed for auditing purposes.
- Vehicle maintenance or refueling should be undertaken within the workshop and service area proposed within the mining area. Alternatively, if emergency repairs or refueling are required, it must be undertaken on an impermeable surface to prevent contamination of soil and groundwater. Vehicles and equipment must be parked and stored on impermeable surfaces or make use of uPVC lining and drip trays when stationary
- 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.
- Site management must ensure drip trays are cleaned after each use. No dirty drip trays may be used on site. The dirty rags used to clean the drip trays must be disposed as

hazardous waste into a designated bin at the workshop, where it is incorporated into the hazardous waste removal system.

- 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. Proof of safe disposal must be filed for auditing purposes.
- An oil spill kit must be obtained, and the employees must be trained in the emergency procedures to follow when a spill occurs as well as the application of the spill kit.
- Spills must be cleaned up immediately, within two hours of occurrence, to the satisfaction of the Regional Manager (DMRE) by removing the spillage together with the polluted soil and containing it in a designated hazardous waste bin until it is disposed of at a recognised facility. Proof must be filed.
- Suitable covered receptacles must be available at all times and conveniently placed for the disposal of general 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 to be collected at least once a month and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or in the vicinity of the mine area. Proof of disposal must be available for auditing purposes.
- Biodegradable refuse must be handled as indicated above.
- Re-use or recycling of waste products must be encouraged on site.
- No waste may be buried or burned on the site.
- Ablution facilities must be provided in the form of a chemical toilet/s. The chemical toilet must be anchored (to prevent blowing/falling over) and shall be serviced at least once a week for the duration of the mining activities by a registered liquid waste handling contractor. The safe disposal certificates must be filed for auditing purposes.
- 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 to all relevant authorities, including Departement Environmental Affairs and Development Planning – Directorate - Pollution and Chemicals Management, in accordance with section 30 of the National

Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA") pertaining to the *control of incidents*. In the event of a significant accidental spill or leak of hazardous substances (e.g. petrol, diesel, etc.) during any phase of the proposed activities, such an incident(s) must be reported.

- Site management must implement the use of waste registers to keep record of the waste generated and removed from the mining area.

Storage/Handling of Hazardous Substances/Chemicals:

- Chemical storage areas must be placed on level ground to prevent offsite migration of any spilled product.
- The floor of the storage area must be impermeable to prevent seepage of spilled products into the ground or ground water.
- Access to the chemicals/substances must be controlled and require prior notification of an appropriate staff member.
- A Hazardous Substances Register must be maintained, and Safety Data Sheets (SDS) must be kept current for all chemicals used on site.
- Any fuel/used oil tanks must have secondary containment in the form of an impermeable bund wall and base within which the tanks sits, raised above the floor, on plinths. The bund capacity must 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 must also be taken into consideration to ensure that any spillage does not result in hydrocarbons/other substances spouting beyond the confines of the bund.
- The site manager must 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 must be inspected at least weekly and any accumulated rainwater removed and handled as contaminated water. All valves and outlets must be checked to ensure that its intact and closed securely.
- The bund base must slope towards an oil sump of sufficient size. Contaminated water may not be allowed to mix with clean water, and must be contained until it is collected by a registered hazardous waste handling contractor or disposed of at a registered hazardous waste handling facility.
- Drip trays must be used underneath all stationary equipment or vehicles. Used drip trays must be placed within a bunded area and are not be stored on bare soil. The waste water originating from the cleaning of drip trays must be discarded into the oil sump.

Management of health and safety risks:

- Workers must have access to the correct personal protection equipment (PPE) as required by law.

- Sanitary facilities must be located within 100 m from any point of work.
- 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 must be informed in writing ahead of each blasting event.
- The compliance of ground vibration and airblast levels must be monitored to USBM standards with each blasting event.
- A vibro recorder must be used to record all blasts.
- Audible warning of a pending blast must be given at least 3 minutes in advance of the blast.
- 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.

ix) Motivation where no alternative sites were considered.

As mentioned previously, the proposed mining area was identified as the preferred and only viable site alternative as it entails the mining of an area with low agricultural potential, the aggregate (dolerite) / gravel mining area can be moved to various alternative sites within close proximity of the proposed mining area but will still entail disturbing a greenfield area. However, the proposed mining area, as indicated on the Regulation 2.2 Mine Plan (attached as Appendix A), was identified as the preferred and only viable site alternative as the proposed area falls over an undisturbed area of the farm occasionally used for grazing but with very low agricultural potential due to the rocky surface, after consultation with the land owner the application footprint extends into an area with low agricultural potential. The proposed project will not necessitate the loss of agricultural field with high potential to the land owner. This was deemed the only site alternative as this is the only area that will be viable for the land owner due to the low agricultural potential.

Site Alternative 2:

Site Alternative 2 (S2) was assessed for the proposed mining but found not environmentally and practically suitable. The earmarked area is also a greenfield site that will have a higher visual impact to be disturbed for the quarry to be established. Site alternative 1, was deemed the only site alternative as this is the only area that will be viable for the land owner due to the low agricultural potential.

This alternative site was not deemed to be the preferred option as the face of the quarry will directly face the N1 therefor the area will have very high visual impact on the surrounding area,

and the use of the existing access road and entrance to the site. In light of this, no alternative sites were considered during this assessment.

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

Site Alternative 1 was identified during the assessment phase of the environmental impact assessment as the preferred and only site alternative. The following matters contributed to the identification of the preferred development footprint:

1. **Topography** –The natural topography of the area surrounding the proposed aggregate / gravel mine is best described as extremely irregular to slightly undulating plains covered with dwarf spiny shrubland dominated by Karoo dwarf shrubs (e.g. Chrysocoma ciliata, Eriocephalus ericoides) with rare low trees (e.g. Euclea undu-Jata). Dense stands of drought-resistant grasses (Stipagrostis, Aristida) cover (especially after abundant rains) broad sandy bottom lands. The elevation loss from the proposed mining footprint to the town of Beaufort West to be 182 m over 29.4 km.

2. **Visual Characteristics** – The viewshed analysis showed that the visual impact of the proposed aggregate / gravel mining operation will be of low significance. The small scale of the proposed operation, and the mining area will be located between two hills in order to minimize the visual impact. Should the Applicant successfully rehabilitate the mining area (upon closure), no residual visual impact is expected upon closure of the mine.

3. **Air and Noise Quality** – The proposed activity will contribute the emissions mechanical mining equipment to the receiving environment for the duration of the operational phase. Should the permit holder 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 significance and compatible with the current land use. The potential impact on the noise ambiance of the receiving environment is expected to be of low significance and representative of the traffic of the surrounding area.

4. **Geology and Soil –** The site specific geology is representative of the regional geology and soil as described earlier in this report. The geology of the study area comprises mostly rimitive, skeletal soils in rocky areas devel-oping over sedimentary rocks such as mudstones and arenites of the Adelaide Subgroup of the Karoo Supergroup and to a lesser extent also the Ecca Group (Waterford and Volksrust Formations) as well as Jurassic dolerite sills and dykes and subsummit positions of mesas and butts with dolerite boulder slopes. Almost entirely lb land type.

Mudstones and sandstones of the Beaufort Group (Adelaide Subgroup) with some Ecca (Fort Brown Formation) shales supporting very shallow and stony soils of the Glenrosa and/or Mispah forms, typical of Fe land type.

5. **Mining, Biodiversity and Groundcover –** Ground-truthhing by the specialists showed that in terms of local-level biodiversity, the site is not exceptional and the site is not highly sensitive in this regard, as there are no Species of Conservation Concern or unique and range restricted species present within the proposed mining as well as no unique habitats which are not widely available in the wider landscape. As a result, the majority of impacts associated with the development of the site are likely to be local in nature and not of wider significance. Only one provincially protected species has been recorded within the proposed mining area namely *Babianna hypogeae*. This species is however not regarded as rare and the loss of the affected individuals from the development footprint would not be of wider significance or compromise the viability of the local populations of these species.

   In terms of the likely botanical impacts associated with the mine, impacts on vegetation during the operation phase are likely to be relatively moderate (rated mostly as medium significance prior to mitigation) and are difficult to mitigate as little can be done to avoid the large amounts of disturbance associated with this phase of the development. As the affected vegetation type is relatively widespread and the footprint area is regarded as limited, the impact on vegetation, as already mentioned, is likely to be of locally high intensity but is not considered to be of broader significance. Potential cumulative impacts are also furthermore regarded limited and of low significance.

   Subsequently the proposed development area is largely well located in terms of avoiding sensitive receptors and the development will not compromise the survival of any specific flora or terrestrial vertebrate species on the study area or beyond if mitigation measures are fully implemented. and concluded that the earmarked footprint (S1) is not of high conservation priority. The botanist deduced that the impacts on the vegetation do not constitute a fatal flaw to the proposed mining operation and so there is no reason to block the project in that regard. The Applicant will make use of the existing access point to the mining area. It is proposed that should the Applicant implement the mitigation measures proposed in the EMPr the impact of the proposed activity on the vegetation and groundcover in general is deemed to be of low significance.

6. **Fauna -** No protected or red data species were identified to be resident within the proposed footprint area. Various small mammals and reptiles occur on the property. Larger herbivore species are very scares or absent due to the conflicting land use. The fauna at the site will not be impacted by the proposed mining activity as they will be able to move away or through the site, without being harmed. Workers will be informed and managed to ensure

that no fauna at the site is harmed. No poaching or hunting of animals will be allowed. All construction vehicles must adhere to a low speed limit (<20km/h) to avoid collisions with susceptible species such as snakes and tortoises. Trenches and deep excavations must not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed must contain soil ramps allowing fauna to escape the trench.

7. **Cultural and Heritage Environment** - The proposed quarry is located on a spur of hills that extend out from the eastern Nieuweveldsberge of the Great Southern Escarpment. The site overlooks the drainages of the Hoek se Sloot and Renosterspruit Rivers to the east, while the Platdoring River drainage lies immediately to the west (as per notification of intent to develop Section 38 (1) and Section 38 (8) of the National Heritage Resources Act (completed by John Gibble).

   Heritage resources located within the footprint of the proposed mining area will be affected by quarrying activities, except if expressly excluded from quarrying activities.

   The stripping for stockpiling of the topsoil from the site will result in the disturbance of any archaeological material (both pre-colonial and historical) present, and the destruction of any stratified sites. This includes the stone-walled kraal on the site and any associated artefacts.

   The quarrying of the area will result in the loss and destruction of fossil material within the shales and mudstones that underly the site and which are the target resource of the proposed quarry.

   No archaeological or other heritage studies have been identified from available literature in the immediate vicinity of the site, but a handful studies from the wider region provide general information about the history of the area.

   While the desktop archaeological review indicated that pre-colonial archaeological material is relatively common in the Beaufort West area of the Karoo and that some such material must be expected on the site, the walkover survey identified only a handful of Later Stone Age lithics within the proposed quarry area. These were graded as Not Conservation Worthy A likely colonial period stone-walled kraal was also identified on the site which was given a grading of 3C. No other built structures are present on the site and no graves or cemeteries were identified. The proposed quarrying will result in the loss and destruction of this archaeological material and the kraal, although the significance of these impact was assessed to be low.

   The palaeontological assessment indicates that Tierkloof Formation bedrock which underlies a substantial portion of the proposed quarry is fossiliferous and of potentially

high significance. The quarrying of the area will result in the loss and destruction of fossil material within the shales and mudstones that underly the site and which are the target resource of the proposed quarry.

The cultural landscape of the proposed quarry can be best described as an organically evolved landscape which probably contains both relict (the pre-colonial use of and interaction with the land) and continuing (the modern, largely agricultural influences on the Karoo landscape) landscape elements (stock farming, as evidenced by the kraal). The establishment of the proposed quarry on Waai Kraal will introduce an industrial element into this overwhelmingly natural landscape where the human imprint is relatively light.

The proposed quarry is likely to be visible from the N1 although at distances varying between 2,8 km and 5 km and is unlikely to materially alter the character or sense of place of the wider cultural landscape in which it will operate. The change in landscape character the quarry will occasion is be partially offset by the presence of an existing quarry approximately 500 m south-east of the proposed development area on the same farm.

This assessment has found that the area identified for proposed quarry in Portion 4 of the farm Waai Kraal (120) is a moderately-low sensitive heritage environment and that impacts on heritage resources arising from quarrying operations can be expected.

Provided the mitigation measures set out above are implemented, the overall impact of the proposed quarry on Waai Kraal will be of low heritage significance and the proposed activity is acceptable.

The following pre-quarrying archaeological mitigation measures are recommended as per the Heritage Impact Assessment (Appendix N):

<u>Archaeology:</u>

- No pre-quarrying archaeological mitigation of the proposed quarry site is recommended. Although unlikely, should any human remains be encountered at any stage during the works associated with the project, work must in the vicinity must cease immediately, the remains must be left in situ but made secure and the project archaeologist and HWC must be notified immediately.

- Should any human remains be encountered at any stage during the works associated with the project, work must in the vicinity must cease immediately, the remains must be left in situ but made secure and the project archaeologist and

HWC must be notified immediately in order to make a decision about how to deal with the remains.

Built Environment:

- Provided the kraal structure is photographically recorded and its position accurately mapped, this assessment suggests that it need not be retained once quarrying commences on the site.

The Palaeontological Impact Assessment conducted by Prof Marion Bamford indicates that, based on the geological record and fossil collecting map maintained by the Evolutionary Studies Institute, there is a chance that vertebrate fossils could occur on the site but none have been recorded to date. If dolerite is the material to be mined than there will be no fossils, but if mudstones and shales are to be mined there is a moderate chance that fossils will be present.

The following mitigation measures are, therefore, recommended:

- A site visit by a suitably qualified palaeontologist must take place prior to the commencement of quarrying to establish whether fossils are exposed on the site;
- A Fossil Chance Finds Protocol must be implemented once quarrying commences to ensure the reporting, safeguarding and recovery of any discoveries of fossils;
- The requirement to implement a Fossil Chance Finds Protocol, an example of which is attached as Appendix D of the Palaeontological Impact Assessment Report (Appendix N), must be included in the EMPr for the project; and
- If fossils are found during quarrying, they must be excavated and collected by a professional palaeontologist, working under a HWC permit and then housed in a recognised repository.

8. **Site Specific Infrastructure** – There is no existing infrastructure located within 500 m of the proposed mining area includes. The following is located within close proximity:

    - An existing SANRAL quarry is located 900m south east of the site.
    - Guest lodge on the farm is located 2km south of the site
    - The N1 – 2.5km towards the south of the site.

    None of the existing infrastructure falls within the site area and will therefore not be affected.

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.

SITE ESTABLISHMENT & INFRASTRUCTURE DEVELOPMENT:

Alteration of the agricultural sense of place

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: None**		
2	2	1	1.6	4	5	4.5	**7.5**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: None**		
2	2	1	1.6	4	5	4.5	**7.5**

Loss of agricultural land for duration of mining

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: None**		
2	4	1	2.3	5	5	5	**11.5**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: None**		
2	4	1	2.3	5	5	5	**11.5**

Visual intrusion as a result of site establishment

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Partial**		
2	1	2	1.6	5	5	5	**8**
			Consequence			Likelihood	**Significance**

Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Partial**		
3	1	2	2	5	5	5	**10**

Potential impact on fauna within the footprint area

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
1	2	1	1.3	2	2	2	**2.6**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
1	2	1	1.3	2	2	2	**2.6**

Potential impact on archaeological artefacts

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
1	5	1	2.3	1	1	1	**2.3**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Full**		
1	5	1	2.3	1	1	1	**2.3**

Potential impact on destruction of the kraal

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
1	5	1	2.3	1	1	1	**2.3**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Full**		
1	5	1	2.3	1	1	1	**2.3**

New job opportunities as a result of the mining operation (Positive Impact)

			Consequence			Likelihood	**Significance (+)**
Severity (+)	Duration	Extent		Probability	Frequency		
Rating: High (+)			**Site Alternative 1**		**Degree of Mitigation: N/A**		
4	4	5	4.6	5	5	5	**23**
			Consequence			Likelihood	**Significance (+)**
Severity (+)	Duration	Extent		Probability	Frequency		
Rating: High (+)			**Site Alternative 2**		**Degree of Mitigation: N/A**		
4	4	5	4.6	5	5	5	**23**

STRIPPING AND STOCKPILING OF TOPSOIL AND/OR OVERBURDEN:

Visual intrusion caused by mining activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: None**		
2	4	4	3.3	5	5	5	**16.5**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: None**		
3	4	4	3.6	5	5	5	**18**

Loss of stockpiled topsoil during mining and stockpiling

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	4	1	2.6	2	2	2	**5.2**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	4	1	2.6	2	2	2	**5.2**

Dust nuisance as a result of the disturbance of soil

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	3	2	2.3	3	4	3.5	**8**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	3	2	2.3	3	4	3.5	**8**

Noise nuisance generated by earthmoving machinery

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Partial**		

2	3	2	2.3	3	4	3.5	**8**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Partial**	
2	3	2	2.3	3	4	3.5	**8**

Infestation of the topsoil heaps and mining area with weeds or invader plant species

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
3	4	2	3	4	2	3	**9**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	4	2	3	4	2	3	**9**

Potential impact on local fauna due to disturbance and loss of available habitat

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
2	4	1	2.3	2	2	2	**4.6**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
2	4	1	2.3	2	2	2	**4.6**

Potential erosion of denuded areas

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	3	1	2.3	2	2	2	**4.6**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	4	1	2.3	2	2	2	**4.6**

Potential contamination of footprint area and surface runoff as a result of hydrocarbon spillages

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	3	1	2.3	2	2	2	**4.6**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	3	1	2.3	2	2	2	**4.6**

DRILLING AND BLASTING:

Health and safety risk posed by blasting activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
4	4	1	3	2	2	2	**6**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
4	4	1	3	2	2	2	**6**

Dust nuisance caused by blasting activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: None**		
3	4	2	3	2	2	2	**6**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: None**		
3	4	2	3	2	2	2	**6**

Noise nuisance as a result of blasting

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Partial**		
3	4	2	3	2	3	2.5	**7.5**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Partial**		
3	4	2	3	2	3	2.5	**7.5**

EXCAVATION, LOADING AND HAULING TO THE PROCESSING PLANT

Dust nuisance due to excavation and from loading and vehicles transporting the material

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	4	2	2.6	3	4	3.5	**9.1**
			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	4	2	2.6	3	4	3.5	**9.1**

Noise nuisance as a result of the mining activities

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Partial**		
2	4	2	2.6	3	4	3.5	**9.1**
			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Partial**		
2	4	2	2.6	3	4	3.5	**9.1**

Visual intrusion as a result of the mining activities

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Partial**		
2	1	2	1.6	5	5	5	**8**
			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Partial**		
3	1	2	2	5	5	5	**10**

Unsafe working environment for employees

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
4	4	1	3	2	2	2	**6**
			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
4	4	1	3	2	2	2	**6**

Soil contamination from hydrocarbon spills and/or littering

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
3	4	1	2.6	2	2	2	**5.2**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	4	1	2.6	2	2	2	**5.2**

Potential impact on areas of palaeontological concern

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
4	4	5	4.3	2	1	1.5	**6.5**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
4	4	5	4.3	2	1	1.5	**6.5**

Facilitation of erosion due to mining activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
3	4	1	2.6	1	1	1	**2.6**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	4	1	2.6	1	1	1	**2.6**

PROCESSING, STOCKPILING AND TRANSPORTING OF MATERIAL:

Dust nuisance generated at the processing plant

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
2	4	2	2.6	4	3	3.5	**9.1**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
2	4	2	2.6	4	3	3.5	**9.1**

Noise nuisance stemming from operation of the processing plant

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Partial**	
2	4	2	2.6	4	3	3.5	**9.1**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Partial**		
2	4	2	2.6	4	3	3.5	**9.1**

Visual intrusion as a result of operation of the processing plant

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Partial**		
2	1	2	1.6	5	5	5	**8**
			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Partial**		
3	1	2	2	5	5	5	**10**

Potential contamination of environment due to improper waste management

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	4	1	2.6	2	2	2.5	**6.5**
			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	4	1	2.6	2	2	2.5	**6.5**

Overloading of trucks impacting road infrastructure

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium-High			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	4	5	4	2	2	2	**8**
			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium-High			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	4	5	4	2	2	2	**8**

Degradation of the access road

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: Full**		
3	4	2	3	2	2	2	**6**
			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: Full**		
3	4	2	3	2	2	2	**6**

CUMULATIVE IMPACTS:

Impact the broad-scale ecological processes - The loss of unprotected vegetation types on a cumulative basis from the broad area may impact the country's ability to meet its conservation targets.

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Partial**	
4	4	4	4	2	1	1.5	**6**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	4	2	3	2	2	2	**6**

Impact on existing infrastructure as a direct result of the mining operation

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
4	4	5	4.3	1	1	1	**4.3**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
4	4	5	4.3	1	1	1	**4.3**

SLOPING AND LANDSCAPING DURING REHABILITATION:

Safety risk posed by un-sloped areas

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
3	5	1	3	2	1	1.5	**4.5**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	5	1	3	2	1	1.5	**4.5**

Erosion of returned topsoil after rehabilitation

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
3	5	1	3	3	3	3	**9**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	5	1	3	3	3	3	**9**

Infestation of the reinstated areas by weeds and invader plant species

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		

Rating: Medium-High			Site Alternative 1				Degree of Mitigation: Full
3	5	3	3.6	3	3	3	**10.8**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium-High			**Site Alternative 2**				**Degree of Mitigation: Full**
3	5	3	3.6	3	3	3	**10.8**

Potential impact associated with litter/waste left at the mining area

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 1**				**Degree of Mitigation: Full**
3	5	1	3	1	1	1	**3**
			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium			**Site Alternative 2**				**Degree of Mitigation: Full**
3	5	1	3	1	1	1	**3**

Return of the mining area to agricultural use upon closure (Positive Impact)

			Consequence			Likelihood	**Significance (+)**
Severity (+)	Duration	Extent		Probability	Frequency		
Rating: Medium-High			**Site Alternative 1**				**Degree of Mitigation: N/A**
3	5	1	3	5	5	5	**15**
			Consequence			Likelihood	**Significance (+)**
Severity (+)	Duration	Extent		Probability	Frequency		
Rating: Medium-High			**Site Alternative 1**				**Degree of Mitigation: N/A**
3	5	1	3	5	5	5	**15**

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

ACTIVITY Whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	POTENTIAL IMPACT (E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, air pollution, etc…etc…etc.)	ASPECTS AFFECTED	PHASE In which impact is anticipated. (E.g. Construction, commissioning, operational Decommissioning closure, post closure.)	SIGNIFICANCE If not mitigated.	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc etc) E.g. Modify through alternative method Control through noise control Control through management and monitoring through rehabilitation.	SIGNIFICANCE If mitigated.
• Demarcation of site with visible beacons.	• No impact could be identified other than the beacons being outside the boundaries of the approved mining area.	N/A	Site Establishment & Operational Phase	• Low-Medium (S1&S2)	<u>Control:</u> Implementing proper housekeeping.	• Low-Medium(S1& S2)
• Site establishment and infrastructure development**.**	• Alteration of the agricultural sense of place.	The impact may affect the agricultural opportunities of the property.	Site Establishment- and Decommissioning phase	• Low-Medium • (S1&S2)	<u>Control & Remedy:</u> Proper housekeeping and storm water management.	• Low-Medium(S1& S2)
• Site establishment and infrastructure development**.**	• Loss of agricultural land for duration of mining.	The impact may affect the agricultural opportunities of the property.	Site Establishment-, Operational- and Decommissioning phase	• Medium (S1&S2) • Medium (S1&S2)	<u>Control:</u> Implementing soil- and storm water management.	• Medium(S1& S2) • Medium (S1&S2)

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
				• Medium(S1& S2)		• Low(S1&S2)
• Site establishment and infrastructure development. • Stripping and stockpiling of topsoil and overburden.	• Visual intrusion as a result of site establishment. • Visual intrusion caused by mining activities.	The visual impact may affect the aesthetics of the landscape.	Site Establishment- and Operational phase	• Medium(S1& S2) • Medium-High(S1&S2)	Control & Stop: Implementing good management practices.	• Low - Medium(S1) & Medium (S2) • Medium - High (S1&S2)
• Site establishment and infrastructure development.	• Potential impact on vegetation and listed and/or protected plant species.	This will impact on the biodiversity of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	• Low-Medium(S1& S2) • Low (S1&S2)	Control: Noise suppression methods and proper housekeeping.	• Low (S1&S2) • Low (S1&S2)
• Site establishment and infrastructure development. • Stripping and stockpiling of topsoil and overburden.	• Potential impact on fauna within the footprint area. • Potential impact on local fauna due to distrubance and loss of available habitat.	This will impact on the biodiversity of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	• Low-Medium (S1&S2) • Low-Medium (S1&S2) • Low – Medium (S1&S2)	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan.	• Low (S1&S2) • Low (S1&S2) • Low (S1&S2)
• Site establishment and infrastructure development • Stripping and stockpiling of topsoil and overburden.	• Dust nuisance due to excavation and from loading and vehicles transporting the material	This will impact on the biodiversity of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	• Low – Medium (S1&S2) • Medium (S1&S2) • Medium (S1&S2)	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan.	• Low – medium (S1&S2) • Low - medium(S1& S2) • Low - medium

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
• Excavation, Loading and Hauling to the processing plant	• Noise nuisance as a result of the mining activities	This will impact on the biodiversity of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	• Low – Medium (S1&S2) • Medium (S1&S2) • Medium (S1&S2)	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan.	• Low – medium (S1&S2) • Low – medium (S1&S2) • Low – medium (S1&S2)
	• Unsafe working environment for employees	This will impact on the biodiversity of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	• Medium (S1&S2) • Medium (S1&S2) • Medium (S1&S2)	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan.	• Low – medium (S1&S2) • Low – medium (S1&S2) • Low – medium (S1&S2)
	• Soil contamination from hydrocarbon spills and/or littering	This will impact on the biodiversity of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	• Low – Medium (S1&S2) • Low – Medium (S1&S2) • Low – Medium (S1&S2)	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan.	• Low – medium (S1&S2) • Low – medium (S1&S2) • Low – medium (S1&S2)

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
• Site establishment and infrastructure development. • Excavation, loading and hauling to the processing plant.	• Potential impact on archaeological artefacts. • Potential impact on areas of palaeontological concerns.	This could impact on the cultural and heritage legacy of the receiving environment.	Operational Phase	• Low (S1&S2)	Control & Stop: Implementing good management practices, as well as the chance-find protocol.	• Low (S1&S2)
• Drilling and Blasting	• Health and safety risk posed by blasting activities	This will impact on the biodiversity of the receiving environment	Operational Phase	• Medium (S1&S2)	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan.	• Low – Medium (S1&S2)
	• Dust nuisance caused by blasting activities	This will impact on the biodiversity of the receiving environment	Operational Phase	• Medium (S1&S2)	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan.	• Low – Medium (S1&S2)
	• Noise nuisance as a result of blasting	This will impact on the biodiversity of the receiving environment	Operational Phase	• Medium(S1& S2)	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan.	• Low – Medium (S1&S2)
• Site establishment and infrastructure development.	• New job opportunities as a result of the mining operation (+)	Contribution to the socio-economic status of the area.	Operational Phase	• Medium-High (S1&S2)	Control: Proper site management.	• Medium-High (S1&S2)
• Processing, Stockpiling and transporting of material	• Dust nuisance generated at the processing plant	This will impact on the biodiversity of the receiving environment	Operational Phase	• Medium (S1&S2)	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan and Proper site management.	• Low-Medium (S1&S2)
	• Noise nuisance stemming from operation of the processing plant	This will impact on the biodiversity of the receiving environment	Operational Phase	• Medium (S1&S2)	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and	• Low-Medium (S1&S2)

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
					waste management plan and Proper site management.	
	Potential contamination of environment due to improper waste management	This will impact on the biodiversity of the receiving environment	Operational Phase	Medium (S1&S2)	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan and Proper site management.	Low-Medium (S1&S2)
	Overloading of trucks impacting road infrastructure	This will impact on the biodiversity of the receiving environment	Operational Phase	Medium – High (S1&S2)	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan and Proper site management.	Low-Medium (S1&S2)
	Degradation of the access road	This will impact on the biodiversity of the receiving environment	Operational Phase	Medium (S1&S2)	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan and Proper site management.	Low-Medium (S1&S2)
Sloping and landscaping during rehabilitaition	Safety risk posed by un-sloped areas	This will impact on the biodiversity of the receiving environment	Decommissioning Phase	Medium (S1&S2)	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan and Proper site management.	Low (S1&S2)
	Erosion of returned topsoil after rehabilitation	This will impact on the biodiversity of the receiving environment	Decommissioning Phase	Medium (S1&S2)	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan and Proper site management	Low (S1&S2)
	Infestation of the reinstated areas by weeds and invader plant species	This will impact on the biodiversity of the receiving environment	Decommissioning Phase	Medium – High (S1&S2)	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and	Medium (S1&S2)

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
					waste management plan and Proper site management	
	• Potential impact associated with litter/waste left at the mining area	This will impact on the biodiversity of the receiving environment	Decommissioning Phase	• Medium (S1&S2)	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan and Proper site management	• Low (S1&S2)

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 X if applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
The screening report for an environmental authorisation, as required in terms of the 2014 NEMA EIA Regulations of a portion of Portion 4 of the farm Waai Kraal No 120 situated in the Beaufort West magisterial district of the Western Cape Province identified the following list of specialist assessment for inclusion in the assessment report: • Agricultural Impact Assessment; • Archaeological and Cultural Heritage Impact Assessment; • Paleontology Impact Assessment; • Terrestrial Biodiversity Impact Assessment; • Aquatic Biodiversity Impact Assessment;			

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with X if applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED

- Hydrology Assessment;
- Noise Impact Assessment;
- Radioactivity Impact Assessment;
- Traffic Impact Assessment;
- Geotechnical Assessment;
- Socio-economic Assessment;
- Plant Species Assessment;
- Animal Species Assessment.

Lombardskraal Doleriet (Pty) Ltd (hereafter referred to as the applicant) appointed Greenmined Environmental (Pty) Ltd as the environmental impact assessment practitioner (EAP) to undertake the EIA associated with the mining permit application. In light of this Greenmined would like to respond as follows to the list of required specialist studies:

- Agricultural Impact Assessment (AIA):

The portion of Portion 4 of the farm Waai Kraal No 120 situated in the Beaufort West magisterial district of the Western Cape Province is over an undisturbed area of the farm occasionally used for grazing but with very low agricultural potential due to the rocky surface. The agricultural potential of the farm will be assessed as part of the EIA, however, after consultation with the land owner Greenmined is of the opinion that a specialist AIA is not needed as the application footprint extends into an area with low agricultural potential. The proposed project will not necessitate the loss of any agricultural field, center pivot or similarly operated agricultural area.

The desktop agricultural compliance statement done by Dr Darren Bouwer (PhD Soil Science Pri Nat Sci 400081/16) confirmed that the proposed development site is of a “low” Agricultural sensitivity, as classified by the DEA Screening Tool. The landtypes of the area predict shallow rocky soils. This is further substantiated by satellite images of the survey area. These soils will have a low water holding capacity which will limit crop production and are not deemed suitable for irrigation. The grazing potential of 28 ha/LSU is very low and typical of the area. This is further substantiated by the low rainfall. It is the specialist’s opinion that the proposed development site is of a low agricultural sensitivity and that the development at the proposed site

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with X if applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED

will not significantly impact agricultural activities. In terms of agricultural sensitivity, the proposed development should thus be allowed to proceed at the identified site subject to recommendations provided.

- Archaeological and Cultural Heritage Impact Assessment (HIA) & Paleontology Impact Assessment (PIA):

The Beaufort West region is known as a palaeontological sensitive area, and therefore a palaeontological impact assessment with heritage impact assessment will form part of the EIA process. A Notice of Intent to Develop will also be submitted to Heritage Western Cape for their perusal and commenting.

The following pre-quarrying archaeological mitigation measures are recommended as per the Heritage Impact Assessment (Appendix N):

- An archaeological walkover survey of the site must be conducted by a suitably qualified professional archaeologist to identify any archaeological sites and/or materials and to assess the stone-walled structure;
- If any significant archaeological remains are located during this survey which cannot be avoided by, or excluded from the quarrying, they will require mitigation prior to any quarry-related activities on the site. A Workplan application will need to be made to HWC to conduct this work;
- Should any human remains be encountered at any stage during the works associated with the project, work must in the vicinity must cease immediately, the remains must be left in situ but made secure and the project archaeologist and HWC must be notified immediately in order to make a decision about how to deal with the remains.
- 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.

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with X if applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED

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

As per the Palaeontological Impact Assessment the following mitigation measures are recommended:

- A site visit by a suitably qualified palaeontologist must take place prior to the commencement of quarrying to establish whether fossils are exposed on the site;
- A Fossil Chance Finds Protocol must be implemented once quarrying commences to ensure the reporting, safeguarding and recovery of any discoveries of fossils;
- The requirement to implement a Fossil Chance Finds Protocol, an example of which is attached as Appendix D of the Palaeontological Impact Assessment, (Appendix N) must be included in the EMPr for the project; and
- If fossils are found during quarrying, they must be excavated and collected by a professional palaeontologist, working under a HWC permit and then housed in a recognised repository.

- Terrestrial Biodiversity Impact Assessment (TBIA) & Animal Species Assessment (ASA):

An ecologist was appointed to conduct a study of the proposed footprint area. These findings are included under Plant Species Assessment (PSA).

- Aquatic Biodiversity Impact Assessment (ABIA) & Hydrology Assessment (HA):

The proposed project does not require a Water Use Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No 36 of 1998). No activity will take place in or in close proximity to any water bodies. Any water required for the implementation of the project will be bought and transported to site. Therefore, in light of the consultation on this stage there is no need for a ABIA & HA.

- Noise Impact Assessment (NIA):

The potential impact on the noise ambiance of the receiving environment is expected to be of low significance and representative of the machinery already operational at the property. Due to the small scale of the operation a NIA is not deemed applicable.

- Radioactivity Impact Assessment

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with X if applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED

A radioactivity impact assessment is not deemed necessary for the proposed mining operation that will not store any chemicals on site, perform activities of radioactive nature or generate hazardous waste of radioactive nature.

- Traffic Impact Assessment (TIA):

The Applicant will use the existing road to access the mining area and transport material from the mining area. The existing road has a formal entrance and was also used by the SANRAL to transport material. No upgrading of the road is needed prior to commencement. In light of the small scale of the proposed operation a TIA is not deemed necessary, should the Applicant implement the mitigation measures to be proposed in the EMPR.

- Geotechnical Assessment:

No reason for a geotechnical assessment could be identified as no permanent infrastructure will be established at the proposed mining area.

- Socio-economic Assessment (SEA):

The material to be sourced from the mining area will be used for the upgrading of the road infrastructure in the vicinity of the site. The proposed mine will be operated on an area with very low agricultural potential. Should any additional workers to be required on this mining activity they will be sourced from the local community. Workers will daily be transported to the site. The establishment of the mining area on the farm will also assist the property owner in the diversification of their income. In light of this a SEA is not deemed applicable to this project.

- Plant Species Assessment:

According to Mucina and Rutherford (2012) the expansion area extends over two vegetation types known as the NKI 1 Gamka Karoo and the NKu 2 Upper Karoo Hardeveld. Both is classified as Least Threatened. According to the Western Cape Biodiversity Conservation Plan (WCBCP) – the area is classified as other National Area Area (ONA). An ecologist was appointed to conduct a vegetation study of the proposed footprint area. The findings from the botanical assessment were as follows:

The proposed mining footprint will be approximately 4.9 ha in extent and will be located on a portion of Portion 4 of the farm Waai Kraal No 120 situated in the Beaufort West magisterial district of the Western Cape Province.

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with X if applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
The study area is situated in the Nama Karoo biome. The majority of the proposed site is located within the Gamka Karoo Vegetation Type whilst a small portion of the north-western corner of the site falls within the Upper Karoo Hardeveld Vegetation Type. Both of these vegetation types are listed as Least Concern by Mucina and Rutherford (2018) and is furthermore not listed within the Threatened Ecosystem List (NEM:BA). Furthermore, the study site itself is located outside of any CBAs and / ESAs according to the Western Cape CBA Spatial Data. It is highly unlikely that this development will have an impact on the status of the Ecosystem and Vegetation Types due to the limited extent of the mine as well as the extent of natural vegetation surrounding the mining area. Furthermore, this mine will not have a significant impact on the services and functions provided by the surrounding natural habitats and development within this area is regarded as acceptable. In terms of local-level biodiversity, the site is not exceptional and the site is not highly sensitive in this regard, as there are no Species of Conservation Concern or unique and range restricted species present within the proposed mining as well as no unique habitats which are not widely available in the wider landscape. As a result, the majority of impacts associated with the development of the site are likely to be local in nature and not of wider significance. Only one provincially protected species has been recorded within the proposed mining area namely *Babianna hypogeae*. This species is however not regarded as rare and the loss of the affected individuals from the development footprint would not be of wider significance or compromise the viability of the local populations of these species. In terms of the likely botanical impacts associated with the mine, impacts on vegetation during the operation phase are likely to be relatively moderate (rated mostly as medium significance prior to mitigation) and are difficult to mitigate as little can be done to avoid the large amounts of disturbance associated with this phase of the development. As the affected vegetation type is relatively widespread and the footprint area is regarded as limited, the impact on vegetation, as already mentioned, is likely to be of locally high intensity but is not considered to be of broader significance. Potential cumulative impacts are also furthermore regarded limited and of low significance. Subsequently the proposed development area is largely well located in terms of avoiding sensitive receptors and the development will not compromise the survival of any specific flora or terrestrial vertebrate species on the study area or beyond if mitigation measures are fully implemented. **From a botanical perspective, no objective or motives (identification of impacts of high significance, etc.) were identified which would hinder the establishment of the proposed mine. Activities and Impacts are regarded as acceptable from a botanical perspective and will not cause detrimental impacts to the local flora, located within the affected area and surroundings. Therefore, it is the opinion of the specialist that the development may be authorised, subject to the implementation of the recommended mitigation measures.**			

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with X if applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
In light of the above mentioned, we propose that the no specialist studies are currently deemed applicable to the proposed mining operation.			

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:

Project Proposal

Lombardskraal Doleriet (Pty) Ltd applied for authorisation to mine aggregate (dolerite)/ gravel from a 4.9 ha area over an undisturbed area of the farm occasionally used for grazing. The mining method will make use of blasting in order to loosen the hard rock; the material will then be loaded and hauled to the crushing plant where it will be screened to various sized stockpiles. The aggregate will be stockpiled until it is transported from site using tipper trucks. All mining related activities will be contained within the approved mining permit boundaries. The proposed area is over an undisturbed area of the farm occasionally used for grazing but with very low agricultural potential due to the rocky surface, after consultation with the land owner the application footprint extends into an area with low agricultural potential. The proposed project will not necessitate the loss of agricultural field with high potential to the land owner.

Topography

The natural topography of the area surrounding the proposed aggregate / gravel mine is best described as extremely irregular to slightly undulating plains covered with dwarf spiny shrubland dominated by Karoo dwarf shrubs (e.g. Chrysocoma ciliata, Eriocephalus ericoides) with rare low trees (e.g. Euclea undu-Jata). Dense stands of drought-resistant grasses (Stipagrostis, Aristida) cover (especially after abundant rains) broad sandy bottom lands. The elevation loss from the proposed mining footprint to the town of Beaufort West to be 182 m over 29.4 km.

Visual Characteristics

The viewshed analysis showed that the visual impact of the proposed aggregate / gravel mining operation will be of low significance. The small scale of the proposed operation, and the mining area will be located between two hills in order to minimize the visual impact. Should the Applicant successfully rehabilitate the mining area (upon closure), no residual visual impact is expected upon closure of the mine.

Air and Noise Quality

The proposed activity will contribute the emissions mechanical mining equipment to the receiving environment for the duration of the operational phase. Should the permit holder 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 significance and compatible with the current land use. The potential impact on the noise ambiance of the receiving environment is expected to be of low significance and representative of the traffic of the surrounding area.

Geology and Soil

The site specific geology is representative of the regional geology and soil as described earlier in this report. The geology of the study area comprises mostly rimitive, skeletal soils in rocky areas devel-oping over sedimentary rocks such as mudstones and arenites of the Adelaide Subgroup of the Karoo Supergroup and to a lesser extent also the Ecca Group (Waterford and Volksrust Formations) as well as Jurassic dolerite sills and dykes and subsummit positions of mesas and butts with dolerite boulder slopes. Almost entirely lb land type.

Mudstones and sandstones of the Beaufort Group (Adelaide Subgroup) with some Ecca (Fort Brown Formation) shales supporting very shallow and stony soils of the Glenrosa and/or Mispah forms, typical of Fe land type.

The aggregate / gravel of the study area is aggregate highly suitable for construction purposes. The mining method will make use of blasting in order to loosen the hard rock; upon which the loosened material will be transported to a processing area (inside mining boundary) where it will be crushed and screened to various sized stockpiles, before being sold and transported from site to clients.

Mining, Biodiversity and Groundcover

Ground-truth showed that the proposed footprint of the mining area is highly disturbed. The Applicant will make use of the existing access point to the mining area. It is proposed that should the Applicant implement the mitigation measures proposed in the EMPr the impact of the proposed activity on the vegetation and groundcover in general is deemed to be of low significance.

Fauna

Various small mammals and reptiles occur are likely to on the property. The fauna at the site will not be impacted by the proposed mining activities as they will be able to

move away or through the site, without being harmed. Workers should be educated and managed to ensure that no fauna at the site is harmed. At this stage no resident protected or red data faunal species could be identified within the earmarked footprint. The study area falls over a property that is noted to be operational game farms, should this mining permit be granted farm owner will be consulted prior to commencement of any activities to ensure that safety of animals and workers. Workers will be informed and managed to ensure that no fauna at the site is harmed. No poaching or hunting of animals will be allowed. All construction vehicles must adhere to a low speed limit (<20km/h) to avoid collisions with susceptible species such as snakes and tortoises. Trenches and deep excavations should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench.

Cultural and Heritage Environment

The proposed quarry is located on a spur of hills that extend out from the eastern Nieuweveldsberge of the Great Southern Escarpment. The site overlooks the drainages of the Hoek se Sloot and Renosterspruit Rivers to the east, while the Platdoring River drainage lies immediately to the west (as per notification of intent to develop Section 38 (1) and Section 38 (8) of the National Heritage Resources Act (completed by John Gibble).

Heritage resources located within the footprint of the proposed mining area will be affected by quarrying activities, except if expressly excluded from quarrying activities.

The stripping for stockpiling of the topsoil from the site will result in the disturbance of any archaeological material (both pre-colonial and historical) present, and the destruction of any stratified sites. This includes the stone-walled kraal on the site and any associated artefacts.

The quarrying of the area will result in the loss and destruction of fossil material within the shales and mudstones that underly the site and which are the target resource of the proposed quarry.

No archaeological or other heritage studies have been identified from available literature in the immediate vicinity of the site, but a handful studies from the wider region provide general information about the history of the area.

While the desktop archaeological review indicated that pre-colonial archaeological material is relatively common in the Beaufort West area of the Karoo and that some such material must be expected on the site, the walkover survey identified only a handful of Later Stone Age lithics within the proposed quarry area. These were graded as Not Conservation Worthy A likely colonial period stone-walled kraal was also identified on the site which was given a grading of 3C. No other built structures are present on the site and no graves or cemeteries were identified. The proposed quarrying will result in the loss and destruction of this archaeological material and the kraal, although the significance of these impact was assessed to be low.

The palaeontological assessment indicates that Tierkloof Formation bedrock which underlies a substantial portion of the proposed quarry is fossiliferous and of potentially high significance. The quarrying of the area will result in the loss and destruction of fossil material within the shales and mudstones that underly the site and which are the target resource of the proposed quarry.

The cultural landscape of the proposed quarry can be best described as an organically evolved landscape which probably contains both relict (the pre-colonial use of and interaction with the land) and continuing (the modern, largely agricultural influences on the Karoo landscape) landscape elements (stock farming, as evidenced by the kraal). The establishment of the proposed quarry on Waai Kraal will introduce an industrial element into this overwhelmingly natural landscape where the human imprint is relatively light.

The proposed quarry is likely to be visible from the N1 although at distances varying between 2,8 km and 5 km and is unlikely to materially alter the character or sense of place of the wider cultural landscape in which it will operate. The change in landscape character the quarry will occasion is be partially offset by the presence of an existing quarry approximately 500 m south-east of the proposed development area on the same farm.

This assessment has found that the area identified for proposed quarry in Portion 4 of the farm Waai Kraal (120) is a moderately-low sensitive heritage environment and that impacts on heritage resources arising from quarrying operations can be expected.

Provided the mitigation measures set out above are implemented, the overall impact of the proposed quarry on Waai Kraal will be of low heritage significance and the proposed activity is acceptable.

Site Specific Infrastructure

There is no existing infrastructure located within 500 m of the proposed mining area includes. The following is located within close proximity:

- An existing SANRAL quarry is located 900m south east of the site.
- Guest lodge on the farm is located 2km south of the site
- The N1 – 2.5km towards the south of the site.

None of the existing infrastructure falls within the site area and will therefore not be affected.

ii) 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.

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

The positive impacts associated with the project include:

- Possible work opportunities to local residents;
- Return of the mining area to agricultural use upon closure of the project; and
- Diversification of the land use of the property.

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

- Visual intrusion as a result of site establishment **Low-Medium (S1) Medium (S2)**
- Visual intrusion as a result of stockpiling **Low-Medium (S1) Medium (S2)**
- Visual intrusion as a result of operation of the processing plant **Low-Medium (S1) Medium (S2)**
- Overloading of trucks having an impact on the public roads **Low-Medium**

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

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

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

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
TOPOGRAPHY Landscaping of Mining Area	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	• Use the excavated area for the final depositing of overburden. • Dump rocks and coarse material removed from the excavation into the excavation. • Remove coarse natural material used for the construction of ramps and dump it into the excavations. • Remove stockpiles during the decommissioning phase, rip the area and return the topsoil to its original depth to provide a growth medium. • Do not permit any waste to be deposited into the excavations. • Return the previously stored topsoil to its original depth, once overburden, rocks and coarse natural materials 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 in order to propagate the locally or regionally occurring flora, should natural vegetation not re-establish within six months from closure of the site. • If required by the Regional Manager (DMRE) the soil must be analysed and any deleterious effects on the	• Effectively restoring the mined area to allow the return of land use to agricultural purposes.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		soil arising from the mining operation must be corrected and the area be seeded with a vegetation seed mix to his/her specification. • On completion of operations, deal with all structures or objects in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002). On completion of mining operations, scarify the surface of all plant-, stockpiling-, and/or office areas, if compacted due to hauling and dumping operations, to a depth of at least 200mm and graded it to an even surface condition. Where applicable/possible return topsoil to its original depth over the area.	
VISUAL CHARACTERISTICS Visual mitigation	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, and only strip topsoil immediately prior to the mining/use of a specific area. Contain excavations to the approved footprint of the permitted area. Upon closure, rehabilitate the site to ensure that the visual impact on the aesthetic value of the area is reduced to the minimum.	Minimise the impact of the mining operations on the visual characteristics of the receiving environment during the operational phase, and minimise the residual impact after closure.
AIR AND NOISE QUALITY Dust Mitigation	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.	• Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. • Ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression.	Dust prevention measures are applied to minimise the impact.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
	Compliance to be monitored by the Environmental Control Officer.	• Limit speed on the haul roads to 20 km/h and 40 km/h on the access road to prevent the generation of excess dust. • Minimise areas devoid of vegetation, and only remove vegetation immediately prior to mining. • Install water sprayers at the crusher plant to alleviate dust generation from the conveyor belts. • Minimise fines, blowing from the drop end of the crusher plant by attaching strips of used conveyor belts to the conveyor's end. • Weekly remove compacted dust from the crusher plant to eliminate the dust source. • Flatten loads to prevent spillage during transportation on public roads. • Consider weather conditions upon commencement of daily operations. Limit operations during very windy periods to reduce airborne dust and resulting impacts. • 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.	
AIR AND NOISE QUALITY Noise Mitigation	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.	• 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 project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996.	• Prevent unnecessary noise to the environment by ensuring that noise from development activity is mitigated.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
	Compliance to be monitored by the Environmental Control Officer.	• 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. • 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. • Implement best practice measures to minimise potential noise impacts.	
GEOLOGY AND SOIL Topsoil Handling	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. • Place the topsoil on a levelled area, within the mining footprint. Do not stockpile topsoil in undisturbed areas. • Protect topsoil stockpiles against losses by water- and wind erosion. Position stockpiles so it is not vulnerable to erosion by wind and water. The establishment of plants (weeds or a cover crop) on the stockpiles will help to prevent erosion. • 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.	• Adequate fertile topsoil is available to rehabilitate the mined area.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		• Keep temporary topsoil stockpiles free of invasive plant species. • 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. • Divert storm- and runoff water around the stockpile area to prevent erosion. • Spread the topsoil evenly, to a depth of 300 mm, 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. • 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.	
HYDROLOGY Erosion Control and Storm Water Management	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.	• Limit clearing of vegetation to the proposed mining footprint and associated infrastructure. Ensure no clearing takes place outside the minimum required footprint. • Divert stormwater around the topsoil heaps and mining areas to prevent erosion.	• Impact on the environment caused by stormwater discharge is avoided and erosion is managed.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
	Compliance to be monitored by the Environmental Control Officer.	• Protect stockpiles from erosion, and store it on flat areas surrounded by appropriate berms where possible. • Ensure that adequate slope protection is provided when mining within steep slopes. • Control the outflow of run-off water from the mining excavation to prevent down-slope erosion, by constructing temporary banks and ditches that will direct run-off water (if needed). These must be in place at any points where overflow out of the excavation might occur. • Regularly monitor roads and other disturbed areas within the project for erosion, and ensure problem areas receive follow-up monitoring to assess the success of the remediation. • Rectify erosion problems within the mining area as a result of the mining activities immediately (within 48 hours) and monitored thereafter to ensure that it does not re-occur. • Use silt/sediment traps/barriers where there is a danger of topsoil or material stockpiles eroding and entering downstream drainage lines and other sensitive areas. Regularly maintain and clear the sediment/silt barriers to ensure effective drainage of the areas. • Conduct activity in terms of the Best Practice Guidelines for small-scale mining as developed by DWS. • Restrict polluting activities including storage of mining fleet, equipment wash down facilities and vehicle maintenance yards to the workshop areas and ensure it takes place on impermeable hard standing surfaces,	

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		which formally drain to a dirty water drainage system at the site. • vehicle maintenance or refuelling must be undertaken within the workshop and service area proposed within the mining area. Alternatively, if emergency repairs or refuelling are required, it must be undertaken on an impermeable surface to prevent contamination of soil and groundwater. Vehicles and equipment must be parked and stored on impermeable surfaces or make use of uPVC lining and drip trays when stationary • Contain all fuels and chemicals stored or used on site in fit for purpose containers and store within designated storage areas. Ensure the designated storage areas are situated on an impermeable surface with a perimeter bund and a drainage sump. Size the volume of the bund and sump to contain at least 110% of the total volume of the fuel and chemicals being stored within the designated storage area. Ensure that the storage areas have a roof to prevent inflow of rainwater, which would require the sump to be emptied more frequently.	
TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS AND GROUNDCOVER Management of vegetation removal.	Permit holder to apply for a destruction/removal plant permit from DEADP Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.	• Clearly demarcate the mining boundaries and contain all operations to the approved mining area. Declare the area outside the mining boundaries a no-go area, and educate all staff accordingly. • Arrange a pre-commencement walk-through of the final mining footprint by a suitably qualified botanist for species of conservation concern that need to be removed/relocated prior to bush clearance.	• Vegetation clearing is restricted to the authorised development footprint of the mine.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
	Compliance to be monitored by the Environmental Control Officer.	• Obtain permits for the removal of protected plant species (if required) and keep it on-site in the possession (at all times) of the flora search and rescue team. • Arrange a pre-commencement environmental induction for all staff on site to ensure that basic environmental principles are adhered to. This must include awareness of no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, remaining within demarcated construction areas, etc. • Only commence with bush-clearance once the recommendations of the specialist (pre-commencement walkthrough) have been implemented. • Do not burn cleared vegetation to be retained at any time, but rather mulch and stockpiled it. Ideally cover the heaps with stockpiled topsoil and retain the material for future site rehabilitation. • The on-site ECO must provide supervision and oversight of vegetation clearing activities and other activities which may cause damage to the environment, especially during the site establishment phase, when the majority of vegetation clearing is taking place. • Ensure all vehicles remain on demarcated roads and prevent unnecessary driving in the veld outside these areas. • Do not translocated, uprooted or disturbed plants for rehabilitation or other purposes without express permission from the ECO and without the relevant permits.	

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		• Do not allow fires on-site. • Provide spoil heaps and topsoil stockpiles with a vegetation cover of indigenous grasses. • If deemed necessary by the ECO, make a firebreak around the periphery of the site in autumn every year. Upon recommendation of the ECO, burn the vegetated areas inside the break on a biennial basis if deemed necessary. Adhere to the relevant veld burning legislation.	
TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS AND GROUNDCOVER Management of invasive plant species.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	• Implement an invasive plant species management plan to control all invasive plant species on site in terms of NEM:BA, 2004 and CARA, 1983. Do weed/alien ongoing clearing on throughout the life of the mining activities. • Do not allow planting or importing of any alien species to the site for landscaping, rehabilitation or any other purpose. • Keep all stockpiles (topsoil & overburden) free of invasive plant species. • Control declared invader or exotic species on the rehabilitated areas.	• Mining area is kept free of invasive plant species.
FAUNA Protection of fauna	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. • The ECO or other suitably qualified person must remove any fauna directly threatened by the operational activities to a safe location. • Arrange that all personnel undergo environmental induction regarding fauna management and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are	• Disturbance to fauna is minimised.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		often persecuted out of superstition. 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. • Ensure all vehicles adhere to a low speed limit (20 km/h is recommended) to avoid collisions with susceptible species such as snakes and tortoises. • Prevent litter, food or other foreign material thrown or left around the site. Keep such items in the site vehicles and daily removed it to the site camp.	
CULTURAL AND HERITAGE ENVIRONMENT Archaeological, heritage and palaeontological aspects.	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: • The following pre-quarrying archaeological mitigation measures are recommended as per the Heritage Impact Assessment (Appendix N): ▪ No pre-quarrying archaeological mitigation of the proposed quarry site is recommended. Although unlikely, should any human remains be encountered at any stage during the works associated with the project, work must in the vicinity must cease immediately, the remains must be left in situ but made secure and the project archaeologist and HWC must be notified immediately.; ▪ Should any human remains be encountered at any stage during the works associated with the project, work must in the vicinity must cease immediately, the remains must be left in situ but made secure and the project archaeologist and HWC must be	• Impact to cultural/heritage resources is avoided or at least minimised.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		notified immediately in order to make a decision about how to deal with the remains. The Palaeontological Impact Assessment conducted by Prof Marion Bamford indicates that, based on the geological record and fossil collecting map maintained by the Evolutionary Studies Institute, there is a chance that vertebrate fossils could occur on the site but none have been recorded to date. If dolerite is the material to be mined than there will be no fossils, but if mudstones and shales are to be mined there is a moderate chance that fossils will be present. The following mitigation measures are, therefore, recommended: ▪ A site visit by a suitably qualified palaeontologist must take place prior to the commencement of quarrying to establish whether fossils are exposed on the site; ▪ A Fossil Chance Finds Protocol must be implemented once quarrying commences to ensure the reporting, safeguarding and recovery of any discoveries of fossils; ▪ The requirement to implement a Fossil Chance Finds Protocol, an example of which is attached as Appendix D of the Palaeontological Impact Assessment Report (Appendix N), must be included in the EMPr for the project; and ▪ If fossils are found during quarrying, they must be excavated and collected by a professional palaeontologist, working under a HWC permit and then housed in a recognised repository. ▪ If during the pre-construction phase, construction, operations or closure phases of this project, any	

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		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. Work may only continue once the go-ahead was issued by SAHRA.	
LAND USE Loss of agricultural land for duration of mining.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	If needed, sign mined-out/rehabilitated areas back to agricultural use once the cover crop stabilised.	Mining has the least possible impact on the operation of the property.
EXISTING INFRASTRUCTURE Management of the access road.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.	• Divert storm water around the access road to prevent erosion. • Restrict vehicular movement to the existing access road to prevent crisscrossing of tracks through undisturbed areas.	The access road remains accessible to the landowner and lawful occupiers during the operational phase, and upon closure, the road is returned in a better, or at least the

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
	Compliance to be monitored by the Environmental Control Officer.	• Repair rutting and erosion of the access road caused as a direct result of the mining activities. • Prevent the overloading of the trucks and file proof of load weights for auditing by relevant officials. • Restrict the speed of all mining equipment/vehicles to 40 km/h on the access roads.	same state as received by the permit holder.
GENERAL 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 regular vehicle maintenance, repairs and services only take place at the workshop and service area. Ensure drip trays are present if emergency repairs are needed on equipment not able to move to the workshop. Dispose all waste products in a closed container/bin to be removed from the emergency service area (same day) to the workshop in order to ensure proper disposal. Treat this as hazardous waste and dispose of it at a registered hazardous waste handling facility, alternatively arrange collection by a registered hazardous waste handling contractor. File safe disposal certificates for auditing purposes. • If a diesel bowser is used on site, equip it with a drip tray at all times. Use drip trays during each and every refuelling event. The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling. • Ensure drip trays are cleaned after each use. Do not allow dirty drip trays to be used on site. Dispose of dirty rags used to clean the drip trays as hazardous waste into a designated bin at the workshop, where it is incorporated into the hazardous waste removal system. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and	• Wastes are appropriately handled and safely disposed of at recognised waste facilities.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		remove it from the site, either for resale or for appropriate disposal at a recognized facility. File proof. • Obtain an oil spill kit, and train the employees in the emergency procedures to follow when a spill occurs as well as the application of the spill kit. • Clean spills immediately, within two hours of occurrence, to the satisfaction of the Regional Manager (DMRE) by removing the spillage together with the polluted soil and containing it in a designated hazardous waste bin until it is disposed of at a recognised facility. File proof. • Ensure suitable covered receptacles are available at all times and conveniently placed for the disposal of general 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 to be collected at least once a month and disposed of at a recognized landfill site. Take specific precautions to prevent refuse from being dumped on or in the vicinity of the mine area. File proof of disposal. • Handle biodegradable refuse as indicated above. • Encourage re-use or recycling of waste products. • Do not bury or burn waste on the site. • Provide ablution facilities in the form of a chemical toilet/s. Anchor the chemical toilet (to prevent blowing/falling over) and arrange that it is serviced at least once a week for the duration of the mining activities by a registered liquid waste handling contractor. File the safe disposal certificates.	

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		• Ensure that the use of any temporary, chemical toilet facilities do not cause any pollution to water sources or pose a health hazard. In addition, ensure that no form of secondary pollution arise from the disposal of refuse or sewage from the temporary, chemical toilets. Address any pollution problems arising from the above immediately. • Do not discharge water containing waste into the natural environment. • Implement measures to contain the waste water and safely dispose thereof. • Report any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities to the to all relevant authorities, including Department Environmental Affairs and Development Planning – Directorate - Pollution and Chemicals Management, in accordance with section 30 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA") pertaining to the *control of incidents*. In the event of a significant accidental spill or leak of hazardous substances (e.g. petrol, diesel, etc.) during any phase of the proposed activities, such an incident(s) must be reported. Implement the use of waste registers to keep record of the waste generated and removed from the mining area. The storage of hazardous and/or general waste in excess of 80m^3 and 100m^3 respectively, excluding the storage of waste in lagoons or the temporary storage of such waste, would require the applicant to comply with the National Norms and Standards for	

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		the Storage of Waste, published in GN No. 926 of 29 November 2013. Although the storage of general and hazardous waste below these mentioned thresholds is not regulated, section 28 of the NEMA, 1998 would apply to ensure that any waste storage does not impact negatively on the environment.	
GENERAL Storage/handling of hazardous substances/chemicals.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	• Place chemical storage areas on level ground to prevent offsite migration of any spilled product. • Ensure that the floor of the storage area is impermeable to prevent seepage of spilled products into the ground or ground water. • Control access to the chemicals/substances and implement a notification system of an appropriate staff member. • Ensure that the storage area is out of the 1:100 year floodline or further than 100 m from the edge of a watercourse, whichever is greatest. • Maintain a Hazardous Substances Register, and keep Safety Data Sheets (SDS) current for all chemicals used on site. • Ensure any fuel/used oil tanks have secondary containment in the form of an impermeable bund wall and base within which the tanks sits, raised above the floor, on plinths. Check that the bund capacity is sufficient to contain 110% of the tank's maximum capacity. Ensure that the distance and height of the bund wall relative to that of the tank is taken into consideration to ensure that any spillage does not result in hydrocarbons/other substances spouting beyond the confines of the bund.	The chemical/hazardous substances used on site are stored according to specifications without contaminating the receiving environment.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		• Establish a formal inspection routine to check all equipment in the bund area, as well as the bund area itself for malfunctions or leakages. Inspect the bund area at least weekly and remove any accumulated rainwater and hand it as contaminated water. Check all valves and outlets to ensure that its intact and closed securely. • Ensure that the bund base slope towards an oil sump of sufficient size. Do not allow contaminated water to mix with clean water, and contain it until it is collected by a registered hazardous waste handling contractor or disposed of at a registered hazardous waste handling facility. • Use drip trays under all stationary equipment or vehicles. Place used drip trays within a bunded area and do not store on the bare soil. Discard the waste water originating from the cleaning of drip trays into the oil sump.	
GENERAL Management of health and safety risks	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	• Ensure that workers have access to the correct PPE as required by law. • Locate sanitary facilities within 100 m from any point of work. • 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. • Inform the surrounding landowners and communities in writing ahead of any blasting event.	• Employees work in a healthy and safe environment.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		• Monitor the compliance of ground vibration and airblast levels to USBM standards with each blasting event. • Record all blasts with a vibro recorder. • Give audible warning of a pending blast at least 3 minutes in advance of the blast. • Limit fly rock, and collect and remove flyrock and rock spill that falls beyond the working area.	

n) 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 *Part A(1)(m) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPR* above should be considered for inclusion in the environmental authorisation.

o) 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 site inspections, desktop studies as well as the specialist study. No uncertainty regarding the proposed project or the receiving environment could be identified.

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

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

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.

ii) Conditions that must be included in the authorisation

The management objectives listed in this report under *Part A(1)(m) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPR* should be considered for inclusion in the environmental authorisation.

q) Period for which the Environmental Authorisation is required.

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

r) Undertaking

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

The undertaking 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.

s) Financial Provision

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

i) Explain how the aforesaid amount was derived

The annual amount required to manage and rehabilitate the environment was estimated to be R 537500. Please see the explanation as to how this amount was derived at attached as Appendix H – Financial and Technical Competence Report.

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 Prospecting Work Programme as the case may be).

Lombardskraal Doleriet (Pty) Ltd will be responsible for the financial and technical aspects of the proposed mining project. The operating expenditure is provided for as such in the Financial and Technical Competence Report attached as Appendix H to this report.

t) Specific Information required by the competent Authority

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

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

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

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

- **Visual intrusion associated with the proposed mining activities:**

  The viewshed analysis showed that the visual impact of the proposed aggregate / gravel mining operation will be of low significance, especially as no permanent structures will be constructed. The small scale of the proposed operation, and the mining area will be located between two hills in order to minimize the visual impact. Should the Applicant successfully rehabilitate the mining area (upon closure), no residual visual impact is expected upon closure of the mine.

- **Dust nuisance caused as a result of the proposed mining activities:**

  The proposed activity will contribute the emissions mechanical mining equipment to the receiving environment for the duration of the operational phase. Should the permit holder 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 significance and compatible with the current land use.

- **Noise nuisance as a result of mining activities:**

  The potential impact on the noise ambiance of the receiving environment is expected to be of low significance and representative of the traffic of the surrounding area. The distance of the proposed mining area from residential infrastructure further lessens the potential noise impact.

- **Employment opportunities and socio-economic impact:**

  The proposed labour component of the activity will be four employees. The operation will contribute to the local economy in the area, both directly and through the multiplier effect that its continued presence will create.

  Equipment and supplies will be purchased locally, and wages are spent at local businesses, generating both jobs and income in the area. Although the employees are not resident on the site, they will be from the surrounding community.

(2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act.

(Provide the results of investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of 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).

Heritage resources located within the footprint of the proposed mining area will be affected by quarrying activities, except if expressly excluded from quarrying activities.

The stripping for stockpiling of the topsoil from the site will result in the disturbance of any archaeological material (both pre-colonial and historical) present, and the

destruction of any stratified sites. This includes the stone-walled kraal on the site and any associated artefacts as mentioned above.

Provided the kraal structure is photographically recorded and its position accurately mapped, this assessment suggests that it need not be retained once quarrying commences on the site.

The quarrying of the area will result in the loss and destruction of fossil material within the shales and mudstones that underly the site and which are the target resource of the proposed quarry.

u) 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)

Site Alternative 1, as discussed earlier, was identified during the assessment phase of the environmental impact assessment by the Applicant and project team, as the preferred and only viable site alternative. The Applicant will recover the aggregate / gravel by means of mechanical excavation with earthmoving equipment, crush, screen, and store it at the proposed mining area.

The no-go alternative entails no change to the status quo and is therefore a real alternative that must be considered. The aggregate / gravel to be mined at the site will be used in the building and construction industries, if however, the no-go alternative is implemented the Applicant will not be able to utilise the mineral present in the area.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1. FINAL 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 Sonette Smit of Greenmined Environmental that acts as EAP on this project has been included in Part A Section 1(a) as well as Appendix L 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)

As mentioned under Part A, section (1)(l)(ii) 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 in 2.4 herein)

The primary objective, at the end of the mine's life, is to obtain a closure certificate 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 (Act No. 28 of 2002) [MPRDA]. To realise this, the following main objectives must be achieved:

- Remove all temporary infrastructure and waste from the mine as per the requirements of this EMPR and of the Provincial Department of Minerals and Resources.
- Shape and contour disturbed areas in compliance with the EMPR.

- Ensure that permanent changes in topography (due to mining) are sustainable and do not cause erosion or the uncontrolled damming of surface water.
- Make all excavations safe.
- Use the topsoil effectively to promote the re-establishment of vegetation.
- Ensure that all rehabilitated areas are stable and self-sustaining in terms of vegetation cover.
- Eradicate all weeds/invader plant species by intensive management of the mining area.

The site-specific closure objectives are discussed in the attached Closure Plan (Appendix J), however, a summary of the closure objectives for the proposed mine were included below.

The decommissioning phase will entail the reinstatement of the processing area by removing the stockpiled material, and site infrastructure/equipment and landscaping the disturbed footprints. 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 scree slopes on the benches below, thereby reducing the overall face angle. The benches will be 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.

The decommissioning activities will therefore consist of the following:

- Sloping and landscaping the quarry pit;
- Removing all stockpiled material;
- Removing all mining machinery and equipment from site;
- Landscaping all disturbed areas and replacing the topsoil;
- Vegetating the reinstated area; and
- Controlling/monitoring the invasive plant species.

The future land use of the proposed area will be agriculture. Upon replacement of the topsoil, the area around the excavation will once again be available for grazing purposes, and the planting of the cover crop (to protect the topsoil) will tie in with the proposed land use.

The applicant will comply with the minimum closure objectives as prescribed by the DMRE 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.

- 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 must 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 10 cm 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 camp 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 DMRE Regional Manager.

On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 200mm and graded to an even surface condition. Where applicable/possible topsoil needs to be returned to its original depth over the area.

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 DMRE 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 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 and Energy 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 (as amended).

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

As no washing is proposed for this project, the applicant will exclusively use water for dust suppression purposes on the access road when needed. Approximately 5 000 litre water/day will be needed during the dry months. The water will be bought and transported to the mining area in a water truck that will moisten the problem area. The use of potable water for dust suppression should be avoided.

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

As no washing is proposed for this project, the Applicant will exclusively use water for dust suppression purposes on the access road when needed. Approximately 5 000 litre water/day will be needed during the dry months. The water will be bought and transported to the mining area in a water truck that will moisten the problem area and therefore the proposed project does not trigger the NWA, 1998 and no additional water use licence is needed. The use of potable water for dust suppression should be avoided.

iv) Impacts to be mitigated in their respective phases

Table 26: Impact to be mitigated in their respective phases

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
(as listed in 2.11.1)	of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	(volumes, tonnages and hectares or m^2)	(describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Demarcation of site with visible beacons.	Site Establishment phase	4.9 ha	Demarcation of the site will ensure that all employees are aware of the boundaries of the mining area, and that work stay within the approved area.	Mining of aggregate / gravel 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.
Site establishment and infrastructure development**.**	Site Establishment & Operational Phase	4.9 ha	**<u>Loss of agricultural land for duration of mining:</u>** The Applicant signed a lease agreement with the landowner to compensate for the loss of agricultural land for the duration of the mining period. If needed,	Use of agricultural land must be managed in accordance with the: • CARA, 1983 Closure Plan (Appendix J)	Throughout the site establishment-, and operational phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			mined-out/rehabilitated areas could revert back to agricultural use once the cover crop stabilised.		
• Site establishment	Site Establishment & Operational Phase	4.9 ha	**Visual Mitigation** • Mining must be contained to the boundaries of the permitted area. • The site must 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 (if applicable), and stripping of topsoil may only be done immediately prior to the use of a specific area. • Upon closure the mining area must be rehabilitated and levelled to remove the visual impact on the aesthetic value of the area.	Management of the mining area must be in accordance with the: • MPRDA, 2008 • NEMA, 1998	Throughout the site establishment-, and operational phase.
• Site establishment and infrastructure development. • Cumulative Impacts	Site Establishment phase	±4.9 ha	**Management of vegetation removal:** • The mining boundaries must be clearly demarcated and all operations must be contained to the approved mining area. The area outside the mining boundaries must be declared a no-go area, and all staff must be educated accordingly. • Permits for the removal of protected plant species (if required) must be obtained and kept on-site in the possession (at all times) of the flora search and rescue team. • Cleared vegetation to be retained at any time may not be burned, but can be mulched and	Natural vegetated areas must be managed in accordance with the: • NEM:BA 2004 • Western Cape Biodiversity Plan	Throughout the site establishment phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			stockpiled. Ideally the heaps can be covered with stockpiled topsoil and the material be retained for future site rehabilitation purposes. • The on-site ECO must provide supervision and oversight of vegetation clearing activities and other activities which may cause damage to the environment, especially during the site establishment phase, when the majority of vegetation clearing is taking place. • All vehicles must remain on demarcated roads and no unnecessary driving in the veld outside these areas may be allowed. • No plants may be translocated or otherwise uprooted or disturbed for rehabilitation or other purposes without express permission from the ECO and without the relevant permits. • No fires must be allowed on-site.		
• Site establishment. • Sloping and landscaping upon closure of the mining area.	Site Establishment- and Decommissioning phase	±4.9 ha	**<u>Topsoil Management:</u>** • The upper 300 mm of the soil must be stripped and stockpiled. • Topsoil is a valuable and essential resource for rehabilitation and it must therefore be managed carefully to conserve and maintain it throughout the stockpiling and rehabilitation processes. • Topsoil stripping, stockpiling and re-spreading must be done in a systematic way. The mining plan have to be such that topsoil is stockpiled for the minimum possible time. • The topsoil must be placed on a levelled area, within the mining footprint. No topsoil may be stockpiled in undisturbed areas. • Topsoil stockpiles must be protected against losses by water and wind erosion. Stockpiles must be positioned so as not to be vulnerable to	Topsoil must be managed in accordance with the: • CARA, 1983 • NEM:BA, 2004 • MPRDA, 2008	Throughout the site establishment-, operational, and decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			erosion by wind and water. The establishment of plants (weeds or a cover crop) on the stockpiles will help to prevent erosion. • Topsoil heaps may 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. • The temporary topsoil stockpiles must be kept free of invasive plant species. • Storm- and runoff water must be diverted around the mining area to prevent erosion. • The stockpiled topsoil must be evenly spread, to a depth of 300 mm, 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, irrigated and established immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. The cover crop must be fertilized for optimum biomass 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. • The rehabilitated area must be monitored for erosion, and appropriately stabilized if any erosion occurs for at least 12 months after reinstatement.		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
• Site establishment. • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area.	Site Establishment-, Operational- and Decommissioning phase	±1 ha	**Management of Invader Plant Species:** • An invasive plant species management plan (Appendix I) must be implemented at the site to ensure the management and control of all 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). Weed/alien clearing must be done on an ongoing basis throughout the life of the mining activities. • All stockpiles (topsoil) must be kept free of invasive plant species. • 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 chemically by a registered pest control officer (PCO) through the use of an herbicide recommended for use by the PCO in accordance with the directions for the use of such an herbicide.	Invader plants must be managed in accordance with the: • CARA, 1983 • NEM:BA 2004 • Invasive Plant Species Management Plan (Appendix I)	Throughout the site establishment-, operational, and decommissioning phase.
• Site establishment. • Mining of aggregate / gravel .	Site Establishment- and Operational phase	4.9 ha	**Protection of Fauna:** • The site manager must ensure no fauna is caught, killed, harmed, sold or played with. • Any fauna directly threatened by the operational activities must be removed to a safe location by the ECO or other suitably qualified person. • All personnel must undergo environmental induction regarding fauna management and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of	Fauna must be managed in accordance with the: • NEM:BA 2004	Throughout the site establishment-, and operational phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			superstition. 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. • All vehicles must adhere to a low speed limit (20 km/h is recommended) to avoid collisions with susceptible species such as snakes and tortoises. • No litter, food or other foreign material may be thrown or left around the site. Such items must be kept in the site vehicles and daily removed to the site camp..		
• Site establishment and infrastructure development. • Excavation, loading and hauling to the processing plant.	Site Establishment, & Operational Phase.	4.9 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	Cultural/heritage aspects on site must be managed in accordance with the: NHRA, 1999	Throughout the site establishment-, and operational phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			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.		
• Stripping and stockpiling of topsoil and/or overburden. • Drilling and blasting. • Excavation, loading and hauling to the processing plant. • Processing, stockpiling and transporting of material.	Site Establishment-, Operational Phase	±1 ha	**<u>Fugitive Dust Emission Mitigation:</u>** • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, straw, water spraying and/or environmentally friendly 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 and 40 km/h on the access road to prevent the generation of excess dust. • 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 crusher plant must have operational water sprayers to alleviate dust generation from the conveyor belts. • Fines, blowing from the drop end of the crusher plant, can be minimized by attaching strips of used conveyor belts to the conveyor's end. • Compacted dust must weekly be removed from the crusher plant to eliminate the dust source. • Loads must be flattened to prevent spillage during transportation on public roads.	Dust generation 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 the site establishment-, operational, and decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Weather conditions must be taken into consideration upon commencement of daily operations. Limiting operations during very windy periods would reduce airborne dust and resulting impacts. • 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.		
• Site establishment. • Mining of aggregate / gravel . • Crushing, screening, stockpiling and transporting material from site. • Sloping and landscaping upon closure of the mining area.	Site Establishment-, Operational-, and Decommissioning Phase	4.9 ha	**Noise Handling:** • The permit holder 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). • 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. • All noise levels of machinery and work activities within the mining area must be monitored and controlled and noise generated from blasting,	Noise generation must be managed in accordance with the: • NEM:AQA. 2004 Regulation 6(1) • NRTA, 1996 • Western Cape Noise Control Regulations (Provincial Notice 200/2013) of 20 June 2013	Throughout the site establishment-, operational-, and decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			excavations, crushing, stockpiling activities, loading of material, and the decommissioning/rehabilitation of the mining area must comply with the Western Cape Noise Control Regulations (Provincial Notice 200/2013) of 20 June 2013.		
• Stripping and stockpiling of topsoil and/or overburden. • Excavation, loading and hauling to the processing plant. • Processing, stockpiling and transporting of material. • Sloping and landscaping during rehabilitation phase.	Site Establishment-, Operational-, and Decommissioning Phase	4.9 ha	**Waste Management:** • Regular vehicle maintenance, repairs and services may only take place in a demarcated service area of the permit holder. If emergency repairs are needed on equipment not able to move to the workshop / service area, 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. • Vehicle maintenance or refueling must be undertaken within the workshop and service area proposed within the mining area. Alternatively, if emergency repairs or refueling are required, it must be undertaken on an impermeable surface to prevent contamination of soil and groundwater. Vehicles and equipment must be parked and stored on impermeable surfaces or make use of uPVC lining and drip trays when stationary • Ablution facilities must be provided in the form of a chemical toilet. The chemical toilet must be placed outside the 1:100 year floodline of any open water resource, and must be serviced at least once every two weeks for the duration of the mining activities. • The use of any temporary, chemical toilet facilities may not cause any pollution to water sources or pose a health hazard. In addition, no	Mining related waste must be managed in accordance with the: • NWA, 1998 • NEM:WA, 2008 • NEM:WA, 2008: National norms and standards for the storage of waste (GN 926) • NEMA, 1998 (Section 30)	Throughout the site establishment-, operational-, and decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			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. • 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. • Site management must ensure drip trays are cleaned after each use. No dirty drip trays may be used on site. • A spill kit must be available on-site which can be operated by trained employees for the adhoc remediation of minor chemical and hydrocarbon spillages. • 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. • Should spillage occur, such as oil or diesel leaking from a burst pipe, the contaminated soil must, within the first hour of occurrence, be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. Proof must be filed. • A waste management plan must be compiled by site management and implemented on site. The plan must focus on the waste hierarchy of the NEM:WA. • General waste must be contained in marked, sealable, refuse bins placed at a designated		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			area, to be removed when filled to capacity to a recognised general waste landfill site. • No waste may be buried or burned on the site. • No chemicals or hazardous materials may be stored at the mining area. • Report any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities to the to all relevant authorities, including Department Environmental Affairs and Development Planning – Directorate - Pollution and Chemicals Management, in accordance with section 30 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA") pertaining to the control of incidents. In the event of a significant accidental spill or leak of hazardous substances (e.g. petrol, diesel, etc.) during any phase of the proposed activities, such an incident(s) must be reported.		
• Stripping and stockpiling of topsoil and overburden. • Excavation, loading and hauling to the processing plant. • Sloping and landscaping during rehabilitation.	Operational Phase	4.9 ha	**<u>Erosion Control and Storm Water Management:</u>** • Clearing of vegetation must be limited to the proposed mining footprint and associated infrastructure. No clearing outside of the minimum required footprint to take place. • Stormwater must be diverted around the topsoil heaps and mining areas to prevent erosion. • Stockpiles must be protected from erosion, stored on flat areas where possible, and be surrounded by appropriate berms. • When mining within steep slopes, it must be ensured that adequate slope protection is provided. • During mining, the outflow of run-off water from the mining excavation must be controlled to prevent down-slope erosion. This must be done	Storm water must be managed in accordance with the: • CARA, 1983 • NEMA, 1998 • NWA, 1998	Throughout the operational phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			by way of the construction of temporary banks and ditches that will direct run-off water (if needed). These must be in place at any points where overflow out of the excavation might occur. • Roads and other disturbed areas within the project area must be regularly monitored for erosion and problem areas must receive follow-up monitoring to assess the success of the remediation. • Any erosion problems within the mining area as a result of the mining activities observed must be rectified immediately (within 48 hours) and monitored thereafter to ensure that it does not re-occur. • 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 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).		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	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. • Polluting activities including storage of mining fleet, equipment wash down facilities and vehicle maintenance yards must be restricted to the workshop areas and must be undertaken on impermeable hard standing surfaces, which are formally drained to a dirty water drainage system at the site. • Vehicle maintenance or refueling must be undertaken within the workshop and service area proposed within the mining area. Alternatively, if emergency repairs or refueling are required, it must be undertaken on an impermeable surface to prevent contamination of soil and groundwater. Vehicles and equipment must be parked and stored on impermeable surfaces or make use of uPVC lining and drip trays when stationary ▪ All fuels and chemicals stored or used on site must be contained within fit for purpose containers and stored within designated storage areas. In order to prevent pollution of the surrounding environment during an accidental spillage, the designated storage areas must be situated on an impermeable surface and must feature a perimeter bund and a drainage sump. The volume of the bund and sump must be sized to contain at least 110% of the total volume of the fuel and chemicals being stored within the designated storage area. The storage areas must feature a roof to prevent inflow of		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			rainwater, which would require the sump to be emptied more frequently.		
• Crushing, screening, stockpiling and transporting material from site.	Operational Phase	±1 ha	**Access Road Mitigation:** • Storm water must be diverted around the access road to prevent erosion. • Vehicular movement must be restricted to the existing access road to prevent crisscrossing of tracks through undisturbed areas. • Rutting and erosion of the access road caused as a direct result of the mining activities must be repaired by the permit holder. • Overloading of the truck must be prevented, and proof of load weights must be filed for auditing purposes.	The access road must be managed in accordance with the: • NRTA, 1996	Throughout the operational phase.
• Drilling and blasting. • Excavation, loading and hauling to the processing plant. • Sloping and landscaping during rehabilitation phase.	Site Establishment-, Operational-, and Decommissioning phase	4.9 ha	**Management of health and safety risks:** • Workers must have access to the correct personal protection equipment (PPE) as required by law. • Sanitary facilities must be located within 100 m from any point of work. • 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 must be informed in writing ahead of each blasting event.	Health and safety aspects must be managed in accordance with the: • MHSA, 1996 • OHSA, 1993 • OHSAS, 18001	Throughout the site establishment-, operational and decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• The compliance of ground vibration and airblast levels must be monitored to USBM standards with each blasting event. • A vibro recorder must be used to record all blasts. • Audible warning of a pending blast must be given at least 3 minutes in advance of the blast. • 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.		
• Site establishment and infrastructure development.	Site Establishment, & Operational Phase.	±500 m²	**Storage/Handling of Hazardous Substances/Chemicals:** • Chemical storage areas must be placed on level ground to prevent offsite migration of any spilled product. • The floor of the storage area must be impermeable to prevent seepage of spilled products into the ground or ground water. • Access to the chemicals/substances must be controlled and require prior notification of an appropriate staff member. • A Hazardous Substances Register must be maintained, and Safety Data Sheets (SDS) must be kept current for all chemicals used on site. • Any fuel/used oil tanks must have secondary containment in the form of an impermeable bund wall and base within which the tanks sits, raised above the floor, on plinths. The bund capacity must 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 must also be taken into consideration to ensure that any spillage does not result in hydrocarbons/other substances spouting beyond the confines of the bund.	Chemicals/hazardous substances must be stored in accordance with the: • HSA,1973 • NWA, 1998 • NEM:WA, 2008	Throughout the site establishment-, and operational phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• The site manager must 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 must be inspected at least weekly and any accumulated rainwater removed and handled as contaminated water. All valves and outlets must be checked to ensure that its intact and closed securely. • The bund base must slope towards an oil sump of sufficient size. Contaminated water may not be allowed to mix with clean water, and must be contained until it is collected by a registered hazardous waste handling contractor or disposed of at a registered hazardous waste handling facility. • Drip trays must be used underneath all stationary equipment or vehicles. Used drip trays must be placed within a bunded area and are not be stored on bare soil. The waste water originating from the cleaning of drip trays must be discarded into the oil sump.		
• Sloping and landscaping during rehabilitation phase.	Decommissioning Phase	4.9 ha	**<u>Rehabilitation/landscaping of mining area:</u>** • 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. • Coarse natural material used for the construction of ramps must be removed and dumped into the excavations. • Stockpiles must be removed during the decommissioning phase, the area ripped and the topsoil returned to its original depth to provide a growth medium.	Rehabilitation of the mining area must be in accordance with the: ❖ CARA, 1983 ❖ NEM:BA, 2004 ❖ MPRDA, 2002 Closure Plan (Appendix J)	Throughout the decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• 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 six 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. • 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). • On completion of mining operations, the surface of all plant-, stockpiling-, and/or office areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 200mm and graded to an even surface condition. Where applicable/possible topsoil needs to be returned to its original depth over the area.		

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

ACTIVITY whether listed or not listed (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..) E.g. • Modify through alternative method. • Control through noise control • Control through management and monitoring Remedy through rehabilitation.	STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
• Demarcation of site with visible beacons.	• No impact could be identified other than the beacons being outside the boundaries of the approved mining area.	N/A	Site Establishment phase	Control through management and monitoring.	Mining of aggregate / gravel is only allowed within the boundaries of the approved area. • MPRDA, 2008 • NEMA, 1998
• Site establishment and infrastructure development. • Stripping and stockpiling of topsoil and overburden.	• Visual intrusion as a result of site establishment.	The visual impact may affect the aesthetics of the landscape.	Site Establishment & Operational Phase	<u>Control:</u> Implementing proper housekeeping.	Management of the mining area must be in accordance with the: • MPRDA, 2008 • NEMA, 1998
• Site establishment and infrastructure development**.**	• Loss of agricultural land for duration of mining.	The impact may affect the agricultural	Site Establishment & Operational Phase	Should the proposed project be approved, the operation will temporarily interrupt the agricultural activities of the footprint area, only to be reversed upon the closure of the mine.	Use of agricultural land must be managed in accordance with the: • CARA, 1983

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
		opportunities of the property.		The impact could be controlled through progressive rehabilitation.	Closure Plan (Appendix J)
• Stripping and stockpiling of topsoil and overburden. • Excavation, loading and hauling to the processing plant. • Sloping and landscaping during rehabilitation.	• Loss of stockpiled topsoil during mining and stockpiling. • Potential erosion of denuded areas. • Facilitation of erosion due to mining activities. • Erosion of returned topsoil after rehabilitation.	Loss of topsoil will affect the rehabilitation success upon closure of the mine.	Site Establishment-, Operational and Decommissioning Phase	Control & Remedy: Proper housekeeping and storm water management.	Topsoil must be managed in accordance with the: • CARA, 1983 • NEM:BA, 2004 • MPRDA, 2008
• Site establishment • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area.	• Infestation of the topsoil heaps and mining area with invader plant species. • Infestation of denuded areas with invader plant species • Infestation of the reinstated area with invader plant species.	This will impact on the biodiversity of the receiving environment.	Site Establishment-, Operational- and Decommissioning phase	Control: Implementing soil- and storm water management.	Invader plants must be managed in accordance with the: • CARA, 1983 • NEM:BA 2004 • Invasive Plant Species Management Plan (Appendix I)
• Site establishment and infrastructure development. • Stripping and stockpiling of topsoil and overburden.	• Potential impact on fauna within the footprint area. • Disturbance to aquatic fauna within the footprint area	This will impact on the biodiversity of the receiving environment.	Site Establishment- and Operational phase	Control & Stop: Implementing good management practices.	Fauna must be managed in accordance with the: • NEM:BA 2004

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
• Stripping and stockpiling of topsoil and/or overburden. • Drilling and blasting. • Excavation, loading and hauling to the processing plant. • Processing, stockpiling and transporting of material.	• Dust nuisance as a result of the mining activities. • Dust nuisance as a result of the mining activities.	Increased dust generation will impact on the air quality of the receiving environment.	Site Establishment- and Operational Phase	<u>Control:</u> Dust suppression methods and proper housekeeping.	Dust generation 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)
• Stripping and stockpiling of topsoil and/or overburden. • Drilling and blasting. • Excavation, loading and hauling to the processing plant. • Processing, stockpiling and transporting of material.	• Noise nuisance generated by earthmoving machinery. • Noise nuisance as a result of blasting. • Noise nuisance as a result of the mining activities. • Noise nuisance stemming from operation of the processing plant.	Should noise levels become excessive it may have an impact on the noise ambiance of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	<u>Control:</u> Noise suppression methods and proper housekeeping.	Noise generation on site must be managed in accordance with the: • NEM:AQA, 2004 Regulation 6(1) • NRTA, 1996
• Mining of aggregate / gravel . • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area.	• Soil contamination from hydrocarbon spills. • Potential impact assocaited with littering and hydrocarbon spills. • Potential impact associated with litter	Contamination of the footprint area will negatively impact the soil, surface runoff and potentially the groundwater. It will also incur additional costs to the permit holder.	Site Establishment-, Operational-, and Decommissioning Phase	<u>Control & Remedy:</u> Proper housekeeping and implementation of an emergency response plan and waste management plan.	Mining related waste must be managed in accordance with the: • NWA, 1998 • NEM:WA, 2008 • NEM:WA, 2008: National norms and standards for the storage of waste (GN 926) • NEMA, 1998 (Section 30)

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
	left at the mining area.				
• Site establishment and infrastructure development. • Excavation, loading and hauling to the processing plant.	• Potential impact on area/infrastructure of heritage or cultural concern.	This could impact on the cultural and heritage legacy of the receiving environment.	Operational Phase	Control & Stop: Implementing good management practices, as well as the chance-find protocol.	Cultural/heritage aspects must be managed in accordance with the: • NHRA, 1999
• Screening, stockpile, and transporting material from site.	• Deterioration of the access road to the mining area.	Collapse of the road infrastructure will affect the landowner.	Operational Phase	Control & Remedy: Maintaining the access road for the duration of the operational phase, as well as leaving it in a representative or better condition than prior to mining.	The access road must be managed in accordance with the: • NRTA, 1996
• Drilling and blasting. • Excavation, loading and hauling to the processing plant. • Sloping and landscaping during rehabilitation phase.	• Health and safety risk posed by blasting activities. • Unsafe working environment for employees. • Safety risk posed by un-sloped areas.	An unsafe working environment affects the labour force, as well as pose a threat to animals and humans that may enter the mining footprint.	Operational-, and Decommissioning Phase	Stop & Control: Adherance to the blasting rules and regulations, demarcation of the mining area and proper housekeeping.	Health and safety aspects on site must be managed in accordance with the: • MHSA, 1996 • OHSA, 1993 • OHSAS 18001 USBM standards
• Screening, stockpile, and transporting material from site.	• Overloading of trucks having an impact on the public roads.	Overloading will negatively affect the roads in the vicinity of the mining area.	Operational Phase	Control: Proper site management.	Load weights must be managed in accordance with the: • NRTA, 1996

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 Actions

ACTIVITY whether listed or not listed (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)	**POTENTIAL IMPACT** (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)	**MITIGATION TYPE** (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc... etc.) E.g. • Modify through alternative method. • Control through noise control • Control through management and monitoring Remedy through rehabilitation.	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: Upon cessation of the individual activity Or. Upon the cessation of mining bulk sampling or alluvial diamond prospecting as the case may be.	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
▪ Demarcation of site with visible beacons.	▪ No impact could be identified other than the beacons being outside the boundaries of the approved mining area.	Demarcation of the site will ensure that all employees are aware of the boundaries of the mining area, and that work stay within the approved area.	Beacons need to be in place throughout the life of the activity.	Mining of aggregate / gravel is only allowed within the boundaries of the approved area. ▪ MPRDA, 2008 ▪ NEMA, 1998
▪ Site establishment	▪ Visual intrusion as a result of site establishment.	**<u>Visual Mitigation</u>** ▪ Mining must be contained to the boundaries of the permitted area.	Throughout the site establishment-, and operational phase.	Management of the mining area must be in accordance with the: ▪ MPRDA, 2008

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• The site must have a neat appearance and be kept in good condition at all times. • The permit holder must limit vegetation removal (if applicable), and stripping of topsoil may only be done immediately prior to the use of a specific area. • Upon closure the mining area must be rehabilitated and levelled to remove the visual impact on the aesthetic value of the area.		• NEMA, 1998
• Site establishment • Crushing, screening, stockpiling and transporting material from site. • Sloping and landscaping upon closure of the mining area.	• Loss of topsoil and fertility during mining and stockpiling • Loss of stockpiled material due to ineffective storm water control. • Erosion of returned topsoil after rehabilitation	**<u>Topsoil Management:</u>** • The upper 300 mm of the soil must be stripped and stockpiled. • Topsoil is a valuable and essential resource for rehabilitation and it must therefore be managed carefully to conserve and maintain it throughout the stockpiling and rehabilitation processes. • Topsoil stripping, stockpiling and re-spreading must be done in a systematic way. The mining plan have to be such that topsoil is stockpiled for the minimum possible time. • The topsoil must be placed on a levelled area, within the mining footprint. No topsoil may be stockpiled in undisturbed areas. • Topsoil stockpiles must be protected against losses by water and wind erosion. Stockpiles must be positioned so as not to be vulnerable to erosion by wind and water. The establishment of plants (weeds or a cover crop) on the stockpiles will help to prevent erosion.	Throughout the site establishment-, operational, and decommissioning phase.	Topsoil must be managed in accordance with the: • CARA, 1983 • NEM:BA, 2004 • MPRDA, 2008

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• Topsoil heaps may 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. • The temporary topsoil stockpiles must be kept free of invasive plant species. • Storm- and runoff water must be diverted around the mining area to prevent erosion. • The stockpiled topsoil must be evenly spread, to a depth of 300 mm, 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, irrigated and established immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. The cover crop must be fertilized for optimum biomass 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. • The rehabilitated area must be monitored for erosion, and appropriately stabilized if any erosion occurs for at least 12 months after reinstatement.		

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
• Site establishment • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area.	• Infestation of the topsoil heaps and mining area with invader plant species. • Infestation of denuded areas with invader plant species • Infestation of the reinstated area with invader plant species.	**Management of Invader Plant Species:** • An invasive plant species management plan (Appendix I) must be implemented at the site to ensure the management and control of all 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). Weed/alien clearing must be done on an ongoing basis throughout the life of the mining activities. • All stockpiles (topsoil) must be kept free of invasive plant species. • 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 chemically by a registered pest control officer (PCO) through the use of an herbicide recommended for use by the PCO in accordance with the directions for the use of such an herbicide.	Throughout the site establishment-, operational, and decommissioning phase.	Invader plants must be managed in accordance with the: • CARA, 1983 • NEM:BA 2004 • Invasive Plant Species Management Plan (Appendix I)
• Site establishment. • Mining of aggregate / gravel .	• Potential impact on fauna within the footprint area.	**Protection of Fauna:** • The site manager must ensure 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.	Throughout the site establishment-, and operational phase.	Fauna must be managed in accordance with the: • NEM:BA 2004

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
• Site establishment • Screening, stockpile, and transporting material from site.	• Dust nuisance as a result of the mining activities. • Dust nuisance as a result of the mining activities.	**Fugitive Dust Emission Mitigation:** • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, straw, water spraying and/or environmentally friendly 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 access road must be limited to 40 km/h to prevent the generation of excess dust. • 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. • Loads must be flattened and covered to ensure that minimal spillage of material takes place during transportation, also preventing windblown dust. • Weather conditions must be taken into consideration upon commencement of daily operations. Limiting operations during very windy periods would reduce airborne dust and resulting impacts. • 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, loading, and transporting of the aggregate /	Throughout the site establishment-, operational, and decommissioning phase.	Dust generation 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)

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		gravel from site to minimize potential dust impacts.		
• Site establishment • Mining of aggregate / gravel • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area.	• Noise nuisance as a result of the mining activities. • Noise nuisance as a result of the decomissiononig activities.	**Noise Handling:** • The permit holder 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). • 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.	Throughout the site establishment-, operational-, and decommissioning phase.	Noise generation must be managed in accordance with the: • NEM:AQA. 2004 Regulation 6(1) • NRTA, 1996
• Mining of aggregate / gravel . • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area.	• Soil contamination from hydrocarbon spills. • Potential impact assocaited with littering and hydrocarbon spills. • Potential impact associated with litter left at the mining area.	**Waste Management:** • Regular vehicle maintenance, repairs and services may only take place in a demarcated service area of the permit holder. If emergency repairs are needed on equipment not able to move to the workshop / service area, 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.	Throughout the site establishment-, operational-, and decommissioning phase.	Mining related waste must be managed in accordance with the: • NWA, 1998 • NEM:WA, 2008 • NEM:WA, 2008: National norms and standards for the storage of waste (GN 926) • NEMA, 1998 (Section 30) • Regulation 8(1) of the Waste Classification and Management

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• All safe disposal certificates, including hazardous waste and waste from the chemical ablution facilities, should be retained for a minimum period of five years. This requirement is stipulated in regulation 8(1) of the Waste Classification and Management Regulations published in GN No. R. 634 of 23 August 2013: "*All waste generators, transporters and managers subjected to the requirements of subregulations (1), (2), (4), (5), (6) and (7) must retain copies, or be able to access copies/records, of the waste manifest documentation for a period of at least five (5) years."* Waste registers, as described in this document must be made available for review upon request by any relevant authority. • Vehicle maintenance or refueling must be undertaken within the workshop and service area proposed within the mining area. Alternatively, if emergency repairs or refueling are required, it must be undertaken on an impermeable surface to prevent contamination of soil and groundwater. Vehicles and equipment must be parked and stored on impermeable surfaces or make use of uPVC lining and drip trays when stationary • Ablution facilities must be provided in the form of a chemical toilet. The chemical toilet must be placed outside the 1:100 year floodline of any open water resource, and must be serviced at least once every two weeks for the duration of the mining activities. • The use of any temporary, chemical toilet facilities may not cause any pollution to		Regulations published in GN No. R. 634 of 23 August 2013

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		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. • 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. • Site management must ensure drip trays are cleaned after each use. No dirty drip trays may be used on site. • A spill kit must be available on-site which can be operated by trained employees for the adhoc remediation of minor chemical and hydrocarbon spillages. • 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. • Should spillage occur, such as oil or diesel leaking from a burst pipe, the contaminated soil must, within the first hour of occurrence, be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. Proof must be filed. • A waste management plan must be compiled by site management and implemented on site. The plan must focus on the waste hierarchy of the NEM:WA.		

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• The storage of hazardous and/or general waste in excess of 80m^3 and 100m^3 respectively, excluding the storage of waste in lagoons or the temporary storage of such waste, would require the applicant to comply with the National Norms and Standards for the Storage of Waste, published in GN No. 926 of 29 November 2013. Although the storage of general and hazardous waste below these mentioned thresholds is not regulated, section 28 of the NEMA, 1998 would apply to ensure that any waste storage does not impact negatively on the environment. • General waste must be contained in marked, sealable, refuse bins placed at a designated area, to be removed when filled to capacity to a recognised general waste landfill site. • No waste may be buried or burned on the site. • No chemicals or hazardous materials may be stored at the mining area. • Report any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities to the to all relevant authorities, including Department Environmental Affairs and Development Planning – Directorate - Pollution and Chemicals Management, in accordance with section 30 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA") pertaining to the *control of incidents*. In the event of a significant accidental spill or leak of hazardous substances (e.g. petrol, diesel, etc.) during any phase of the proposed activities, such an incident(s) must be reported.		

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
• Mining of aggregate / gravel .	• Potential impact on area/infrastructure of heritage or cultural concern.	**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 SAHRA. • Work may only continue once the go-ahead was issued by SAHRA.	Throughout the operational phase.	Cultural/heritage aspects must be managed in accordance with the: • NHRA, 1999
• Crushing, screening, stockpiling and transporting material from site. • Mining of aggregate / gravel .	• Loss of stockpiled material due to ineffective storm water control.	**Storm Water Mitigation:** • Storm water must be diverted around the topsoil heaps and mining area to prevent erosion. • Mining must be conducted only in accordance with the Best Practice Guideline for small scale mining that relates to storm	Throughout the operational phase.	Storm water must be managed in accordance with the: • CARA, 1983 • NEMA, 1998 • NWA, 1998

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		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 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.		
◣ Screening, stockpile, and transporting material from site.	◣ Deterioration of the access road to the mining area. ◣ Overloading of trucks having an impact on the public roads.	**<u>Access Road Mitigation:</u>** ◣ Storm water must be diverted around the access road to prevent erosion. ◣ Vehicular movement must be restricted to the existing access road to prevent crisscrossing of tracks through undisturbed areas. ◣ Rutting and erosion of the access road caused as a direct result of the mining activities must be repaired by the permit holder. ◣ Overloading of the truck must be prevented, and proof of load weights must be filed for auditing purposes.	Throughout the operational phase.	The access road must be managed in accordance with the: ◣ NRTA, 1996

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
• Site establishment. • Mining of aggregate / gravel . • Crushing, screening, stockpiling and transporting material from site. • Sloping and landscaping upon closure of the mining area.	• Potential health and safety risk to employees.	**Management of Health and Safety Risks:** • Adequate ablution facilities and water for human consumption must daily be available on site. • 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).	Throughout the site establishment-, operational and decommissioning phase.	Health and safety aspects must be managed in accordance with the: • MHSA, 1996 • OHSA, 1993 • OHSAS, 18001

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 closure objectives entail removing the mining machinery from the site. Removal of the crushing and screening plant, containers, weighbridge and chemical toilet from the mining area, removal/levelling of all stockpiled material and the landscaping of the mining area to allow the replacement of stockpiled topsoil. The reinstated area will be vegetated and invasive plant species will be controlled during a 12 months' aftercare period to address germination of problem plants in the area. The Applicant will comply with the minimum closure objectives as prescribed by DMRE.

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

This report, the Final Basic Assessment Report, includes all the environmental objectives in relation to closure and will be made available for perusal by the landowner, registered I&AP's and stakeholders over a 30-days commenting period.

(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 as Appendix E.

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

The decommissioning phase will entail the final rehabilitation of the mining site. Final landscaping, levelling and top dressing will be done. 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 DMRE and detailed below, and therefore is deemed to be compatible:

- 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. Seeds should be harvested prior to commencement of the mining activities and indigenous vegetation or a suitable crop should be reintroduced during the rehabilitation process;
  - Where re-vegetation work will be done on the disturbed areas, only suitable crops, or locally indigenous, endemic vegetation must be used, and no “alien Plant” species are allowed.
  - 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 the Mining area:

  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.
- 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:

Final rehabilitation of the surface area shall entail landscaping, levelling, maintenance, and clearing of invasive plant species. All equipment, plant and other items used during the mining period will be removed from site (section 44 of the MPRDA, 2002). Waste material of any description 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. The management of invasive plant species will 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.

(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 / 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)	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	Low

Level of information

According to Step 4.2:

Level of information available	Limited

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)	-	NO
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	-	NO
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	-	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.

Component No.	Main description	Master rate	Multiplication factor
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	-	-
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	253 019	0.5-
7	Sealing of shafts, adits and inclines	-	-
8(A)	Rehabilitation of overburden and spoils	168 679	-
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	126 059	1.00
11	River diversions	-	-

Component No.	Main description	Master rate	Multiplication factor
12	Fencing	-	-
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	16 776	1.00

Determine weighting factors

According to Tables B.7 and B.8

Weighting factor 1: Nature of terrain/accessibility	1.1 (Undulating)
Weighting factor 2: Proximity to urban area where goods and services are to be supplied	1.05

Calculation of closure costs

Table B.10 Template for Level 2: "Rules-based" assessment of the quantum for financial provision

Table 29: Calculation of closure cost

CALCULATION OF THE QUANTUM							
Mine:	Lombardskraal Doleriet (Pty) Ltd			**Location:**	Beaufort West		
Evaluators:	S Smit			**Date:**	30 November 2020		
No	**Description**	**Unit**	**A Quantity**	**B Master rate**	**C Multiplication factor**	**D Weighting factor 1**	**E=A *B*C*D Amount (Rand)**
			Step 4.5	**Step 4.3**	**Step 4.3**	**Step 4.4**	
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	m^2	0	16	1.00	1.1	R 0.00
2(A)	Demolition of steel buildings and structures	m^2	0	228	1.00	1.1	R 0.00
2(B)	Demolition of reinforced concrete buildings and structures	m^2	0	336	1.00	1.1	R 0.00
3	Rehabilitation of access roads	m^2	0	41	1.00	1.1	R 0.00
4(A)	Demolition and rehabilitation of electrified railway lines	m	0	395	1.00	1.1	R 0.00
4(B)	Demolition and rehabilitations of non-electrified railway lines	m	0	216	1.00	1.1	R 0.00
5	Demolition of housing and/or administration facilities	m^2	0	455	1.00	1.1	R 0.00
6	Opencast rehabilitation including final voids and ramps	ha	4	238 697	0.04	1.1	R 44531.34
7	Sealing of shaft, audits and inclines	m^3	0	122	1.00	1.1	R 0.00
8(A)	Rehabilitation of overburden and spoils	ha	0	159 131	1.00	1.1	R 0.00
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	ha	0	198 195	1.00	1.1	R 0.00
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	ha	0	575 653	0.51	1.1	R 0.00
9	Rehabilitation of subsided areas	ha	0	133 249	1.00	1.1	R 0.00
10	General surface rehabilitation	ha	0.9	126 059	1.00	1.1	R 132 285.78
11	River diversions	ha	0	126 059	1.00	1.1	R 0.00

12	Fencing	m	0	144	1.00	1.1	R 0.00
13	Water Management	ha	0	50 807	0.17	1.1	R 0.00
14	2 to 3 years of maintenance and aftercare	ha	4.9	16 776	1.00	1.1	R 95 844.98
15(A)	Specialists study	Sum	0				R 0.00
15(B)	Specialists study	Sum	0				R 0.00
Sum of items 1 to 15 above							R 272 662.1
Multiply Sum of 1-15 by Weighting factor 2 (Step 4.4)		1.05		R 142 835.00		**Sub Total 1**	R 286 295.21

1	Preliminary and General	6% of Subtotal 1 if Subtotal 1 <R100 000 000.00	R 17 177.71
		12% of Subtotal 1 if Subtotal 1 >R100 000 000.00	-
2	Contingency	10.0% of Subtotal 1	R 28 629.52
		Sub Total 2 (Subtotal 1 plus management and contingency)	R 332 102.44
		Vat (15%)	R 49 815.37
		GRAND TOTAL (Subtotal 3 plus VAT)	**R 381 917.81**

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 381 917.81**.

(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.

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

g) Monitoring of Impact Management Actions

h) Monitoring and reporting frequency

i) Responsible persons

j) Time period for implementing impact management actions

k) Mechanisms for monitoring compliance

Table 30: Mechanisms for monitoring compliance with and performance assessment against the EMPR and reporting thereon.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
▪ Demarcation of site with visible beacons	Maintenance of beacons	▪ Visible beacons need to be placed at the corners of the mining area.	Role: ▪ 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. Responsibility: ▪ Ensure beacons are in place throughout the life of the mine.	Applicable throughout site establishment-, operational-, and decommissioning phases. ▪ Daily compliance monitoring by site management. ▪ Annual compliance monitoring of site by an Environmental Control Officer.
▪ Site establishment	**Visual Characteristics:** ▪ Visual intrusion as a result of site establishment.	▪ Minimize the visual impact of the activity on the surrounding environment through proper site management and implementing good housekeeping practices.	Role: ▪ 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.	Applicable throughout site establishment-, operational-, and decommissioning phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			Responsibility: • Contain mining to the boundaries of the permitted area. • Ensure that the site have a neat appearance and is kept in good condition at all times. • Limit vegetation removal, and only strip topsoil immediately prior to the use of a specific area. • Rehabilitate and level the site upon closure to ensure that the visual impact on the aesthetic value of the area is kept to a minimum.	
• Site establishment • Crushing, screening, stockpiling and transporting material from site. • Sloping and landscaping upon closure of the mining area.	**Geology and Soil:** • Loss of topsoil and fertility during mining and stockpiling • Loss of stockpiled material due to ineffective storm water control. • Erosion of returned topsoil after rehabilitation .	• Earthmoving equipment to reinstate mined-out areas. • Cover crop to be established on reinstated areas. • Erosion control infrastructure (if necessary)	Role: • 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. Responsibility: • Strip and stockpile the upper 300 mm of the soil. • 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. • Place topsoil heaps on a levelled area within the mining footprint area. Do not stockpile topsoil in undisturbed areas. • Protect topsoil stockpiles against losses by water and wind erosion. Position stockpiles so as not to be vulnerable to erosion by wind and water. Establishment of plants on the stockpiles will help prevent erosion.	Applicable throughout site establishment-, operational-, and decommissioning phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			• 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. • Keep temporary stockpiles free of invasive plant species. • Divert storm- and runoff water around the mining area to prevent erosion. • Spread the topsoil evenly over the rehabilitated area, to a depth of 300 mm, 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 and irrigate a cover crop immediately after spreading topsoil to stabilise the soil and protect it from erosion. Fertilise the cover crop for optimum biomass production. Rehabilitation extends until the first cover crop is well established. • Monitor the rehabilitated area for erosion, and appropriately stabilize if erosion do occur, for at least 12 months after reinstatement.	
• Site establishment • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area.	**<u>Groundcover:</u>** • Infestation of the topsoil heaps and mining area with invader plant species. • Infestateion of denuded areas with invader plant species.	• Designated team to cut or pull out invasive plant species that germinated on site. • Herbicide application equipment.	<u>Role:</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. <u>Responsibility:</u>	Applicable throughout site establishment-, operational-, and decommissioning phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	• Infestation of the reinstated area with invader plant species.		• Implement an invasive plant species management plan to control all invasive plant species on site in terms of NEM:BA, 2004 and CARA, 1983. • Keep all stockpiles (topsoil) free of invasive plant species. • Control declared invader or exotic species on the rehabilitated areas.	
• Site establishment. • Mining of aggregate / gravel .	**Fauna:** • Potential impact on fauna within the footprint area. • Disturbance to fauna within the footprint area.	• Toolbox talks to educate employees how to handle fauna that enter the work areas.	Role: • 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. Responsibility: • 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 site establishment-, and operational phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.
• Site establishment • Screening, stockpile, and transporting material from site.	**Air Quality:** • Dust nuisance as a result of the mining activities.	• Dust suppression equipment such as a water car. • Signage that clearly reduce the speed on the access roads.	Role: • 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. Responsibility: • Control the liberation of dust into the surrounding environment by the use of; inter alia, straw, water spraying and/or	Applicable throughout site establishment-, operational-, and decommissioning phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			environmentally friendly dust-allaying agents that contains no PCB's (e.g. DAS products). • Ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Limit speed on the haul roads to 40 km/h to prevent the generation of excess dust. • Minimise areas devoid of vegetation. • Flatten and cover loads to prevent spillage and windblown dust during transportation. • Take weather conditions into consideration upon commencement of daily operations. Limit operations during very windy periods to reduce airborne dust and resulting impacts. • 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, loading, and transporting of material from site to minimize potential dust impacts.	
• Site establishment • Mining of aggregate / gravel • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area.	**<u>Noise Ambiance:</u>** • Noise nuisance as a result of the mining activities. • Noise nuisance as a result of the decomissiononig activities.	• Silencers fitted to all project related vehicles, and the use of vehicles that are in road worthy condition in terms of the National Road Traffic Act, 1996.	<u>Role:</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. <u>Responsibility:</u> • Ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the mining area.	Applicable throughout site establishment-, operational-, and decommissioning phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			• Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996. • 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.	
• Mining of aggregate (dolerite) / gravel . • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area.	**Waste Management:** • Soil contamination from hydrocarbon spills. • Potential impact assocaited with littering and hydrocarbon spills. • Potential impact associated with litter left at the mining area.	• Oil spill kit. • Sealed drip trays. • Formal waste disposal system with waste registers.	Role: • 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. Responsibility: • Ensure regular vehicle maintenance, repairs and services take place in a demarcated service area of the permit holder. If emergency repairs are needed on equipment not able to move to the workshop / service area, 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. • Vehicle maintenance or refueling must be undertaken within the workshop and service area proposed within the mining area. Alternatively, if emergency repairs or refueling are required, it must be undertaken on an	Applicable throughout site establishment-, operational-, and decommissioning phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			impermeable surface to prevent contamination of soil and groundwater. Vehicles and equipment must be parked and stored on impermeable surfaces or make use of uPVC lining and drip trays when stationaryProvide ablution facilities in the form of a chemical toilet that is placed outside the 1:100 year floodline of any open water resource. Ensure the toilet is serviced at least once every two weeks for the duration of the mining activities. • Ensure that the use of any temporary, chemical toilet facilities does not cause any pollution to water sources or pose a health hazard. In addition, ensure that no form of secondary pollution arise from the disposal of refuse or sewage from the temporary, chemical toilets. Address any pollution problems arising from the above immediately. • 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. • Keep a spill kit 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 recognized facility. • Collect the contaminated soil from spillage that occurred, such as oil or diesel leaking from a burst pipe, within the first hour of occurrence, in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. File proof.	

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			• Compile a waste management plan and implement it on site. The plan must focus on the waste hierarchy of the NEM:WA. • Contain general waste in marked, sealable, refuse bins placed at a designated area and remove waste from the mining area to a recognised general waste landfill site. • Prevent the burning or burying of waste on site. • Report any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities to the to all relevant authorities, including Department Environmental Affairs and Development Planning – Directorate - Pollution and Chemicals Management, in accordance with section 30 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA") pertaining to the *control of incidents*. In the event of a significant accidental spill or leak of hazardous substances (e.g. petrol, diesel, etc.) during any phase of the proposed activities, such an incident(s) must be reported. • Park the machinery at the mining area with drip trays placed underneath stationary vehicles.	
• Mining of aggregate (dolerite) / gravel .	• Potential impact on areas/infrastructure of heritage or cultural concern.	• Contact number of an archaeologist that can be contacted when a discovery is made on site.	<u>Role:</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. <u>Responsibility:</u> • Confine all mining to the development footprint area. • Implement the following change find procedure when discoveries are made on site:	Applicable throughout site establishment-, operational-, and decommissioning phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			▪ 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 SAHRA. ▪ Work may only continue once the go-ahead was issued by SAHRA.	
▪ Crushing, screening, stockpiling and transporting material from site. ▪ Mining of aggregate / gravel .	**<u>Hydrology:</u>** ▪ Storm water management	▪ Storm water management structures such as berms to direct storm- and runoff water around the stockpiled topsoil area (when needed).	<u>Role:</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. <u>Responsibility:</u> ▪ Divert storm water around the topsoil heaps to prevent erosion. ▪ Conduct activity in terms of the Best Practice Guidelines for small-scale mining as developed by DWS.	Applicable throughout site establishment-, operational-, and decommissioning phases. ▪ Daily compliance monitoring by site management. ▪ Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
• Screening, stockpile, and transporting material from site.	**Existing Infrastructure:** • Deterioration of the access road to the mining area. • Overloading of trucks having an impact on the public roads.	• Grader to restore the road surface when needed.	Role: • 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. Responsibility: • Divert storm water around the access road to prevent erosion. • Restrict vehicular movement to the existing access road to prevent crisscrossing of tracks through undisturbed areas. • Repair rutting and erosion of the access road caused as a direct result of the mining activities. • Prevent the overloading of the truck, and file proof of load weights for auditing purposes.	Applicable throughout operational phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.
• Site establishment. • Mining of aggregate / gravel . • Crushing, screening, stockpiling and transporting material from site. • Sloping and landscaping upon closure of the mining area.	• Potential health and safety risks to employees.	• Stocked first aid box. • Level 1 certified first aider. • All appointments in terms of the Mine Health and Safety Act, 1996.	Role: • 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. Responsibility: • Ensure adequate ablution facilities and water for human consumption is daily available on site. • Ensure that workers have access to the correct PPE as required by law. • Manage all operations in compliance with the Mine Health and Safety Act, 1996 (Act No 29 of 1996).	Applicable throughout operational-, and decommissioning phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.

l) 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 Regulations, 2014 (as amended) will annually be submitted to DMRE for compliance monitoring purposes or in accordance with the time period stipulated by the Environmental Authorisation.

m) 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.

Once the Applicant received the mining permit and may commence with the proposed activity, a copy of the Environmental Management Programme will be handed to the site manager for his perusal. Issues such as the mining boundaries, fire principals and 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.

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.

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.
  - 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.

- **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.
  - Pick-up any litter laying around.

- **Hazardous Waste Management (Petrol, Oil, Diesel, Grease)**
  - 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.
    - ✓ Label containers and move to approved storage area.

- **Discoveries:**
  - Stop work immediately.
  - Notify site manager/supervisor.
  - 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:
    - ✓ Water all roads and work areas.

- ✓ Minimize handling of material.
- ✓ 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.
  - Report or repair noisy vehicles.

- **Vegetation and Animal life:**

  - 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.
  - Do not set snares or raid nests for eggs or young.

- **Fire Management:**

  - 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.
  - Don't burn waste or vegetation.

- ***Duty of care towards the environment*:**

  - General "duty of care towards the environment" as prescribed in section 28 of the NEMA, 1998 which states that "Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment."

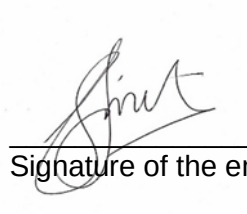
n) Specific information required by the Competent Authority
(Among others, confirm that the financial provision will be reviewed annually)

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

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 (Pty) Ltd

Name of Company:

12 February 2021

Date:

-END-

APPENDIX A

REGULATION 2(2) MINE MAP

APPENDIX B

LOCALITY MAP

APPENDIX C
SITE ACTIVITIES PLAN

APPENDIX D

LAND USE MAP

APPENDIX E
REHABILITATION MAP

APPENDIX F1 & F2

COMMENTS AND RESPONSE REPORT

&

PROOF OF PUBLIC PARTICIPATION

APPENDIX G

SUPPORTING IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, herewith please receive an environmental impact statement that summarises the impact that the proposed activity may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

ENVIRONMENTAL IMPACT STATEMENT			
SITE ALTERNATIVE 1			
TYPE OF IMPACT	**DURATION**	**LIKELIHOOD**	**SIGNIFICANCE**
Site Establishment:			
• Alteration of the agricultural sense of place	**Duration of site establishment phase (<1 month)**	**Possible**	**Low Concern**
• Loss of agricultural land for duration of mining		**Possible**	**Low Medium Concern**
• Visual intrusion as a result of site establishment.		**Possible**	**Low-Medium Concern**
• Loss of topsoil and fertility during mining and stockpiling		**Low Possibility**	**Low Concern**
• Infestation of the topsoil heaps and mining area with invader plant species.		**Low Possibility**	**Low Concern**
• Potential impact on archaeological artefacts		**Low Possibility**	**Low Possibility**
• Potential impact on destruction of the kraal structure		**Low Possibility**	**Low Concern**
• Potential impact on fauna within the footprint area.		**Low Possibility**	**Low Concern**
• Dust nuisance as a result of the mining activities.		**Low Possibility**	**Low Concern**
• Noise nuisance as a result of the mining activities.		**Low Possibility**	**Low Concern**
• Work opportunities to 4 local residents **(Positive Impact)**		**Definite**	**Medium-High (+)**
TYPE OF IMPACT	**DURATION**	**LIKELIHOOD**	**SIGNIFICANCE**
Site Establishment:			
• Visual intrusion as a result of site establishment.	**Duration of site establishment phase (<1 month)**	**Possible**	**Low-Medium Concern**
• Loss of topsoil and fertility during mining and stockpiling		**Low Possibility**	**Low Concern**
• Infestation of the topsoil heaps and mining area with invader plant species.		**Low Possibility**	**Low Concern**

• Potential impact on fauna within the footprint area. • Dust nuisance as a result of the mining activities. • Noise nuisance as a result of the mining activities. Work opportunities to 4 local residents **(Positive Impact)**		**Low Possibility** **Low Possibility** **Low Possibility** **Definite**	**Low Concern** **Low Concern** **Low Concern** **Medium-High (+)**
Mining of aggregate / gravel • Soil contamination from hydrocarbon spills. • Disturbance to fauna within the footprint area. • Noise nuisance as a result of the mining activities. • Potential impact on areas/infrastructure of heritage or cultural concern.	**Duration of operational phase (5 years maximum)**	**LIKELIHOOD** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility**	**SIGNIFICANCE** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Low Concern**
Crushing, screening, stockpiling and transporting material from site: • Loss of stockpiled material due to ineffective storm water control • Dust nuisance as a result of the mining activities. • Noise nuisance as a result of the mining activities. • Potential impact associated with littering and hydrocarbon spills. • Infestation of denuded areas with invader plant species. • Deterioration of the access road to the mining area. • Overloading of trucks having an impact on the public roads.	**Duration of operational phase (5 years maximum)**	**LIKELIHOOD** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Possible**	**SIGNIFICANCE** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Low-Medium Concern**
Sloping and landscaping upon closure of the mining area: • Erosion of returned topsoil after rehabilitation. • Infestation of the reinstated area with invader plant species. • Noise nuisance as a result of the decommissioning activities • Potential impact associated with litter/hydrocarbon spills left at the mining area.	**Duration of decommissioning phase (±2 months)**	**LIKELIHOOD** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility**	**SIGNIFICANCE** **Low Concern** **Low Concern** **Low Concern** **Low Concern**

• Return of the mining area to agricultural use by the landowner **(Positive Impact)**.		**Definite**	**Medium-High (+)**

ENVIRONMENTAL IMPACT STATEMENT			
SITE ALTERNATIVE 2			
TYPE OF IMPACT	**DURATION**	**LIKELIHOOD**	**SIGNIFICANCE**
Site Establishment:			
• Alteration of the agricultural sense of place	**Duration of site establishment phase (<1 month)**	**Possible**	**Low Concern**
• Loss of agricultural land for duration of mining		**Possible**	**Low Medium Concern**
• Visual intrusion as a result of site establishment.		**Possible**	**Medium Concern**
• Loss of topsoil and fertility during mining and stockpiling		**Low Possibility**	**Low Concern**
• Infestation of the topsoil heaps and mining area with invader plant species.		**Low Possibility**	**Low Concern**
• Potential impact on archaeological artefacts		**Low Possibility**	**Low Possibility**
• Potential impact on destruction of the kraal structure		**Low Possibility**	**Low Concern**
• Potential impact on fauna within the footprint area.		**Low Possibility**	**Low Concern**
• Dust nuisance as a result of the mining activities.		**Low Possibility**	**Low Concern**
• Noise nuisance as a result of the mining activities.		**Low Possibility**	**Low Concern**
• Work opportunities to 4 local residents **(Positive Impact)**		**Definite**	**Medium-High (+)**
TYPE OF IMPACT	**DURATION**	**LIKELIHOOD**	**SIGNIFICANCE**
Site Establishment:			
• Visual intrusion as a result of site establishment.	**Duration of site establishment phase (<1 month)**	**Possible**	**Medium Concern**
• Loss of topsoil and fertility during mining and stockpiling		**Low Possibility**	**Low Concern**
• Infestation of the topsoil heaps and mining area with invader plant species.		**Low Possibility**	**Low Concern**
• Potential impact on fauna within the footprint area.		**Low Possibility**	**Low Concern**
• Dust nuisance as a result of the mining activities.		**Low Possibility**	**Low Concern**
• Noise nuisance as a result of the mining activities.		**Low Possibility**	**Low Concern**
		Definite	**Medium-High (+)**

Work opportunities to 4 local residents **(Positive Impact)**			
<u>Mining of aggregate / gravel</u> • Soil contamination from hydrocarbon spills. • Disturbance to fauna within the footprint area. • Noise nuisance as a result of the mining activities. • Visual intrusion as a result of mining of aggregate • Potential impact on areas/infrastructure of heritage or cultural concern.	**Duration of operational phase (5 years maximum)**	**<u>LIKELIHOOD</u>** **Low Possibility** **Low Possibility** **Low Possibility** **Possibility** **Low Possibility**	**<u>SIGNIFICANCE</u>** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Medium Concern** **Low Concern**
<u>Crushing, screening, stockpiling and transporting material from site:</u> • Loss of stockpiled material due to ineffective storm water control • Dust nuisance as a result of the mining activities. • Noise nuisance as a result of the mining activities. • Potential impact associated with littering and hydrocarbon spills. • Visual intrusion as a result of crushing and screening • Infestation of denuded areas with invader plant species. • Deterioration of the access road to the mining area. • Overloading of trucks having an impact on the public roads.	**Duration of operational phase (5 years maximum)**	**<u>LIKELIHOOD</u>** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Possibility** **Low Possibility** **Possible**	**<u>SIGNIFICANCE</u>** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Medium Concern** **Low Concern** **Low-Medium Concern**
<u>Sloping and landscaping upon closure of the mining area:</u> • Erosion of returned topsoil after rehabilitation. • Infestation of the reinstated area with invader plant species. • Noise nuisance as a result of the decommissioning activities • Potential impact associated with litter/hydrocarbon spills left at the mining area. • Return of the mining area to agricultural use by the landowner **(Positive Impact)**.	**Duration of decommissioning phase (±2 months)**	**<u>LIKELIHOOD</u>** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Definite**	**<u>SIGNIFICANCE</u>** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Medium-High (+)**

APPENDIX H
FINANCIAL AND TECHNICAL ABILITY

APPENDIX I

INVASIVE PLANT SPECIES MANAGEMENT PLAN

APPENDIX J

PHOTOGRAPHS OF THE PROPOSED SITE

APPENDIX K

CV AND PROOF OF EXPERIENCE OF THE EAP

APPENDIX L
CLOSURE / REHABILITATION PLAN

APPENDIX M
BOTANICAL ASSESSMENT REPORT

APPENDIX N
HERITAGE IMPACT ASSESSMENT REPORT
PALAEONTOLOGICAL IMPACT ASSESSMENT REPORT

APPENDIX O
SITE ALTERNATIVES MAP

APPENDIX P
SCREENING REPORT

APPENDIX Q
PUBLIC PARTICIPATION REPORT

APPENDIX R
SITE SENSITIVITY REPORT

APPENDIX S
AGRICULTURAL COMPLIANCE STATEMENT