

**PROPOSED SAND MINE ON A PORTION OF THE
REMAINING PORTION OF THE FARM RHENOSTERKOP
NO 155, REGISTRATION DIVISION OF BEAUFORT
WEST,
WESTERN CAPE PROVINCE**

DRAFT BASIC ASSESSMENT REPORT



MAY 2025

REFERENCE NUMBER: WC30/5/1/3/2/10361MP

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EXECUTIVE SUMMARY

The Applicant, CZ Sand Mine (Pty) Ltd, applied for environmental authorisation (EA) and a mining permit to mine sand on a portion of the remaining portion of the Farm Rhenosterkop no 155, Registration Division of Beaufort West, Western Cape province.

The proposed mining area is approximately 5 ha in extent and will be developed over an undisturbed and inactive area of the farm. The applicant, intends to obtain material from the area for at least 2 years with a possible 3-year extension. The proposed sand mine will appoint ± 6 employees, and due to the small scale of the operation no infrastructure, other than a chemical toilet, must be established within the mining footprint. The proposed mining area will be reached via an existing farm road that will be upgraded and maintained for the duration of the operational phase. This same access road will also be used for the adjacent dolerite mine permit (14/2023).

The sand extracted from the sand mine will be used for the construction industry in the surrounding area. The proposed sand mine will contribute to the upgrading / maintenance of road infrastructure, renewable energy projects and building contracts in and around the Beaufort West area.

The proposed operation is representative of the small-scale mining industry where the mineral (sand) is loaded with a Front-End-Loader (FEL) directly from the mining footprint area to the stockpile area, following standard practices in the small-scale mining sector. If necessary, the sand will be screened before being stockpiled. Once ready for distribution, a front-end loader will load the sand onto trucks for delivery to customers. No washing of sand will be required. All mining related activities will be contained within the limits of the authorized mining permit.

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.

Site Alternative 1 (Preferred and Only Site Alternative):

Site Alternative 1 is considered the most practical and feasible option. The proposed area is adjacent to an existing quarry, allowing for the use of the same access route, which reduces additional infrastructure requirements. Furthermore, rehabilitation efforts are simplified due to the site's location and characteristics. Based on the preliminary assessments, the anticipated environmental impacts are deemed acceptable.

The Applicant, applied for a 5 ha mining permit to mine sand on a portion of the remaining portion of the Farm Rhenosterkop no 155, Registration Division of Beaufort West in the Western Cape Province. The proposed mining area is over an undisturbed and inactive area of the farm.

The proposed area was deemed as the preferred area due to the location of the sand reserve which is situated over an undisturbed and inactive area of the farm. The site has a medium agricultural production potential. The mining area is situated between the koppies on a flat sandy area with low visual impact and is approximately 5km from the N1, the site is situated to avoid interfering with nearby drainage lines.

An alternative layout for the sand mine, has been assessed in the pre application phase – Site Alternative 2 but not found viable as explained below.

Site Alternative 2:

Site alternative 1, was deemed the only viable site alternative as this is the only area that will be viable for the applicant due to the presence of the sand ridge. Although the position of Site Alternative 2 will still allow the development of the sand mine on the property, it is believed that the 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 sand 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 relevant stakeholders and I&AP's will be informed of the project by means of an advertisement in Oudtshoorn Courant on 16 May 2025, and two on-site

notices will be placed at visible locations, one on the farm boundary fence at the entrance, and another at the at the Beaufort West Public Library.

A 30-day commenting period will be allowed which expires on 17 June 2025. In accordance with the timeframes stipulated in the EIA Regulations, as amended, the Draft Basic Assessment Report was compiled and distributed for comment and perusal to the I&AP's and stakeholders. The comments received on the DBAR will be incorporated into the Final Basic Assessment Report (FBAR) to be submitted 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 of the proposed excavated area can be described as steep slopes of koppies, butts, mesas and parts of the Great Escarpment covered with large boulders and stones supporting sparse dwarf Karoo scrub with drought-tolerant grasses of genera such as *Aristida*, *Eragrostis* and *Stipagrostis*. 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 sand mining operation will be of low significance. The small scale of the proposed operation, and the mining area is located beyond the hills / koppies on a flat sandy area that is not visible from the national road, approximate distance of +/-5km from the (N1). Should the Applicant successfully rehabilitate the mining area 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 primitive, skeletal soils in rocky areas developing over sedimentary rocks such as mudstones and arenites of the Adelaide Subgroup of the Karoo Supergroup and to a lesser extent also the Eccu Group (Waterford and Volksrust Formations) as well as Jurassic sand sills and dykes and subsummit positions of mesas and butts with sand boulder slopes. Almost entirely lb land type.
- According to the Agriculture Assessment Report (Appendix M), the proposed mining will not have an unacceptable negative impact on the agricultural production capability of the site. This is because the site naturally has extremely low agricultural production potential and very little potential is therefore lost due to mining.

The mining area will not cause unacceptable fragmentation and disturbance of agricultural activities.

The conclusion of this assessment on the acceptability of the proposed development and the recommendation for its approval is subject to the following conditions:

Mine management must be held accountable for well managed and effective implementation of all the recommended rehabilitation steps above. The specific, measurable rehabilitation outcomes against which the effectiveness of completed rehabilitation must be measured are:

- that the topography and surface has been sufficiently smoothed without steep excavation edges;
- that topsoil has been spread on the surface;
- that there is a potential rooting depth of at least 30 cm of soil that is suitable for root growth above any existing depth limitation, across the entire mining area;
- that there is no visible erosion across the area, or down-slope of it as a result of mining, and that no part of the area has been left unacceptably vulnerable to erosion;
- that soil conditions are suitable for natural revegetation to take place.
- that there is no invasive alien vegetation within the mining area.

Hydrology:

- The proposed access road intersects with more than 2 drainage lines which necessitates a water use application in terms of Section 21 of the NWA, 1998. This was confirmed by the Risk Matrix

Assessment conducted by the Biodiversity Company (Pty) Ltd (please see Appendix M1). A General Authorisation was obtained in 2024 for the adjacent dolerite mine.

- Based on desktop and survey findings in Appendix M1, the specialist disputes the “Low” rating for the mining area and agrees with the “Very High” aquatic theme sensitivity as per the National Web based Environmental Screening Tool. The specialist revised the ratings to a maximum of ‘High’ aquatic sensitivity. This is attributed to:
 - The project area is not located within a SWSA for surface water;
 - The project footprint overlaps only with a Western Cape ESA1 and Other Natural Areas;
 - The project area (proposed sand mine and access road) is in proximity of an NFEPA river (Platdoring River) as well as several drainage lines which are tributaries of same;
 - The project area is located along a Least Threatened and Poorly Protected watercourse (Platdoring River); and
 - No protected areas detected within the project area or immediate downstream reaches. The Steenbokkie Private Nature Reserve is approximately 15 km downstream of the project area.
- The proposed activities pose low to moderate pre-mitigation risks during the construction, operational and decommissioning phases. Moderate risks are associated with the activities proximate to the watercourse, including the drainage patterns change due to road extent and crossings, clearing of riparian (and terrestrial) vegetation, stormwater management, excavation of riparian area, bed and/or banks, operation of heavy machinery adjacent/within the watercourse, alien vegetation encroachment, conducting road and crossings maintenance, sedimentation and erosion, and hydrocarbon contamination. Due to the presence of existing roads and crossings, the implementation of mitigation measures as well as the avoidance of watercourse areas for any mining activities will reduce the risks/impacts of Moderate-risk activities to Low if done effectively. If not done effectively, the activities will not reduce the risks of aspects/activities such as clearing riparian areas, deep excavation when mining, drilling and crushing, excavations, the drainage patterns change due to road extent and crossings, dust precipitation (from backfilling), change in topography (from backfilling), dust precipitation (from shaping/contouring), change in topography (from shaping/contouring) and surface structures as well as stormwater, as these activities will result in direct loss of riparian vegetation, channel-, bed- and bank modification, and have a direct impact on the rivers and riparian areas. Water required for the implementation of the project will be bought and transported to the site.
- It is the opinion of the specialist that the project may be considered for authorisation. This is on condition that all prescribed mitigation measures and recommendations are implemented. This includes the avoidance of sensitive freshwater habitats and their buffer zones (as far as is feasible),

methods that prevent the introduction of contaminants into watercourses, rehabilitation of disturbed watercourses, as well as the minimisation of development/disturbances within these areas

Mining, Biodiversity and Groundcover:

- Ground-truthing showed that the proposed footprint of the mining area is an undisturbed and inactive area of the farm with very low agricultural potential due to the sandy surface. The Applicant will make use of the existing farm road which will be upgraded and extended as the open cast mining progress and will be rehabilitated as part of the final reinstatement of the area. Trucks will transfer the materials to the places along the N1 national road. The number of trucks will depend on the contract demand any may vary from time to time. 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. If the mining permission is approved, the farm owner will be contacted before the start of any activities to ensure the safety of the workers and the animals on the site. 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.

Cultural and Heritage Environment:

According to the Notice of Intent to Develop conducted by Beyond Heritage (Pty) Ltd, a few CRM surveys have occurred close by with the most relevant being for a sand mine access road immediately over the N1 from Renosterkop and the widening of the N1 through Courlandskloof just to the northeast (Orton 2010; the sand mine itself has apparently been surveyed and permitted but no documentation of this is known and none could be sourced from the developer at the time of the road application), and a second sand mine just further north (Gribble 2020).

These projects showed that scatters of LSA and MSA stone artefacts occur in places and rock engravings including both animals and scratching/rubbing occur in the area. Some engravings of high significance occur very close to the Renosterkop Sand mine but do not seem to be under threat yet. A stone-walled kraal is also on record north of the N1. Historical structures, artefacts scatters and aspects of the historical nineteenth century Cape Town to Kimberley railway (which broadly follows the N1) were also recorded. The latter include cast iron and stone bridge and an Anglo-Boer War blockhouse built at the bridge to guard it during the war. Around Nelspoort, to the northeast of the study area, there are several rock engravings and some rock gongs that are quite well-known (Parkington et al. 2008).

More broadly, most Karoo farms include historical structures and graves, and the kinds of archaeology noted above are expected to be widespread. Rock paintings are also known from the Karoo, but not from anywhere close to the study area. The only impact anticipated is to LSA scratched engravings on the sand rocks of the study area. While these “motifs” are poorly understood and might have once had significance beyond that which we might understand, they are also very common. A photographic

record has been made of those in the study area and further work on this small sample is unlikely to accomplish anything further.

Survey diagrams indicate that Rhenosterkop was first granted on 18 November 1890 to Adolph Siegfried Grimbeek. Portions referred to as Lucerne Lodge and Annex Lucerne Lodge were subdivided off on the northwest side of the railway line during the early 20th century. Various other subdivisions have also occurred for the railway on the land to its northwest. The rest of the farm to the south of the railway line, however, has remained intact.

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 significance. In light of this, a Heritage Impact Assessment was not deemed necessary by the heritage specialist.

The Notification of Intent to Develop (NID) was submitted to the Department of Heritage Western Cape on 29 April 2025.

Site Specific Infrastructure:

Apart from the Eskom power line approximately $\pm 350\text{m}$ from the mining permit area. No other infrastructure has been established on the property that can be affected by the proposed development.

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 of R686 571.15.

LIST OF ABBREVIATIONS

BGIS	Biodiversity GIS
ABSA	Aquatic Biodiversity Specialist Assessment
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
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
WLA	Wayleave approval

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Appendix R	Proof of Municipality agreement for treated water (dust suppression)



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT
And
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

NAME OF APPLICANT:	CZ Sand Mine (Pty) Ltd
TEL NO:	021 872 0090
POSTAL ADDRESS:	Fish Eagle Street Lady Blake Estate, Wellington, Western Cape
PHYSICAL ADDRESS:	Fish Eagle Street Lady Blake Estate, Wellington, Western Cape
FILE REFERENCE NUMBER SAMRAD:	WC30/5/1/3/2/10361MP

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 Act. CZ Sand Mine (Pty) Ltd appointed Greenmined Environmental to undertake the study needed. Greenmined Environmental has no vested interest in CZ Sand Mine (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 Murchellin Saal (Senior Environmental Consultant)
Tel No.:	021 851 2673
Fax No.:	086 546 0579
E-mail address:	murchellin.s@greenmined.co.za
EAP Registration No:	2021/4203

ii) Expertise of the EAP.

(1) The qualifications of the EAP

(with evidence).

Mrs. M Saal has fifteen years of experience in the environmental sector. She specialized in the last 12 years in the mining sector where she conducted legal compliance audits, (GIS) geographic information system, mining right and permit applications and applications for environmental authorisations & Water use applications. Full curriculum vitae with evidence is attached as Appendix K.

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

(In carrying out the Environmental Impact Assessment Procedure)

Mrs. Murchellin Saal has fifteen years of experience in the environmental sector, including twelve years specifically focused on conducting Water Use License Applications, Environmental Impact Assessments, and Mining Applications within South Africa. She is a registered Environmental Assessment Practitioner

(Registration No. 2021/4203) with the Environmental Assessment Practitioners Association of South Africa (EAPASA) since 2021. A list of relevant past projects is provided in Appendix K.

b) Location of the overall Activity.

Table 1: Location of the proposed project.

Farm Name:	A portion of the remaining portion of the Farm Rhenosterkop no 155, Beaufort West District, Western Cape Province.
Application area (Ha)	5 ha
Magisterial district:	Beaufort West
Distance and direction from the nearest town	±30 km North of Beaufort West. Using the N1, head north for approximately 30km. The entrance to the proposed mining area is found on the right side of the road.
21 digit Surveyor General Code for each farm portion	C00900000000015500000

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 sand mining permit area (white polygon) by Sand Mine (Pty) (image obtained from Google Earth).



Figure 2: Satellite view of the proposed sand mining permit area (white polygon) by Sand Mine (Pty) Ltd in relation to the approved dolerite mine (14/2023) (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

The Applicant, CZ Sand Mine (Pty) Ltd, applied for environmental authorisation (EA) and a mining permit to mine sand on a portion of the remaining portion of the Farm Rhenosterkop no 155, Registration Division of Beaufort West, Western Cape province.

The proposed mining footprint will be 5 ha and will be developed over an undisturbed and inactive area of the farm. The proposed mining method will implement strip mining and be representative of the small-scale mining industry where the mineral (sand) is loaded with a front-end-loader (FEL) directly from the mining footprint area to the stockpile area, following standard practices in the small-scale mining sector. If necessary, the sand will be screened before being stockpiled. Once ready for distribution, a front-end loader will load the sand onto trucks for delivery to customers. No washing of sand will be required. Trucks will transfer the materials to the places along the N1 national road. All mining related activities will be contained within the limits of the authorized mining permit.

The applicant, intends to win material from the area for at least 2 years with a possible extension of another 3 years. The sand to be removed from the sand mine will be used for construction industry in the vicinity. The proposed sand mine will contribute to the upgrading / maintenance of road infrastructure, renewable energy projects and building contracts in and around the Beaufort West area.

The mining activities will consist out of the following:

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

The mining site will contain the following:

- Excavating equipment;
- Screening Plant
- Earth-moving equipment;
- Access Roads;
- Site office (Containers);
- Site vehicles;
- Parking area for visitors and site vehicles;

- Weighbridge
- Ablution facilities (Chemical toilet).

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 m²	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.	5ha	N/A	Not listed
Stripping and stockpiling of topsoil.	±1 ha at a time	X	GNR 983 Listing Notice 1 Activity 21 (as amended)
Loading and hauling of the sand from the mining footprint.	±1 ha at a time	X	
Sloping and landscaping upon closure of the mining area.	±1 ha (last disturbed area)	X	
Replacing the topsoil and vegetating the disturbed area.	±1 ha (last disturbed area)	X	
GNR 983 Listing Notice 1 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, as well as any other applicable activity as contained in this Listing Notice or in Listing Notice 3 of 2014, required to exercise the mining permit.			

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)

Background:

The 5-hectare proposed mining location is located over an undeveloped, inactive portion of the property. The portion of the remaining portion of the Farm Rhenosterkop

no 155, is located approximately ± 30 km North of Beaufort West, Western Cape Province

Table 3: GPS Coordinates of the proposed mining footprint.

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	32°14'17.563"S;	22°52'28.945"E	-32.238205°	22.874720°
B	32°14'14,708"S	22°52'33,071"E	-32.237420°	22.875877°
C	32°14'22,834"S	22°52'42,679"E	-32.239678°	22.878519°
D	32°14'25,93"S	22°52'38,568"E	-32.240529°	22.877416°

Project Proposal:

Considering the above, the Applicant identified the need to apply for environmental authorisation (EA) and a sand mining permit (MP) on an undisturbed and inactive area on a portion of the remaining portion of the Farm Rhenosterkop no 155, Registration Division of Beaufort West, Western Cape province. The proposed mining footprint will be 5 ha and will be developed over an undisturbed and inactive area of the farm. The proposed mining method will implement strip mining and be representative of the small-scale mining industry where the mineral (sand) is loaded with a front-end-loader (FEL) directly from the mining footprint area to the stockpile area, following standard practices in the small-scale mining sector. If necessary, the sand will be screened before being stockpiled. Once ready for distribution, a front-end loader will load the sand onto trucks for delivery to customers. No washing of sand will be required. Trucks will transfer the materials to the places along the N1 national road. All mining related activities will be contained within the limits of the authorized mining permit.

The applicant, intends to win material from the area for at least 2 years with a possible extension of another 3 years. The sand to be removed from the sand mine will be used for construction industry in the vicinity. The proposed sand mine will contribute to the upgrading / maintenance of road infrastructure, renewable energy projects and building contracts in and around the Beaufort West area.

The mining activities will consist out of the following:

- Stripping and stockpiling of topsoil;
- Screening, Stockpiling and transporting;
- Sloping and landscaping upon closure of the site; and

- Replacing the topsoil and vegetation of the disturbed area.

The proposed mining activities will entail the following:

- The Applicant will make use of the existing farm road which will be upgraded and extended and will be rehabilitated as part of the final reinstatement of the area. An alternative road along the dam will be used in the event that the dam is full.
- The 5-hectare proposed mining location is located over an undeveloped, inactive portion of the property.
- The mining method will implement strip mining and be representative of the small-scale mining industry where the mineral (sand) is loaded with a front-end-loader (FEL) directly from the mining footprint area to the stockpile area, the sand will be screened before being stockpiled. Once ready for distribution, a front-end loader will load the sand onto trucks for delivery to customers. No washing of sand will be required. The sand will be stockpiled and transported to clients via trucks and trailers.
- All mining related activities will be contained within the approved mining permit boundaries.

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 and the identification of the first 1 ha strip to be mined. Site establishment may necessitate the clearing of vegetation (that established through succession), the stripping and stockpiling of topsoil, and the introduction of the mining machinery.

Operational phase that will entail the strip mining of sand from the approved footprint area through direct excavation. The Applicant will make use of a front-end-loader directly from the mining footprint area to the stockpile area, following standard practices in the small-scale mining sector. If necessary, the sand will be screened before being stockpiled. Once ready for distribution, a front-end loader will load the sand onto trucks for delivery to customers, via the via the existing road. The transport of sand from the mining area will be done by site management as no clients will be allowed to collect sand directly from the mine. It is proposed that the truck will visit the mining area approximately twenty times a week.

(2) 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). 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).

- The permit holder will further be responsible for the seeding (only if needed) of all rehabilitated areas.
- 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.
- Weeds and invasive plants present on the land concerned need to be controlled and removed annually through continuous monitoring and maintenance programs as they can cause damage to the surrounding natural vegetation in accordance with the Conservation of Agricultural Resources Act, (Act 43 of 1983), Regulation 15E methods of controlling weeds and alien plants.
- 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 Applicant will make use of an existing farm road that will be upgraded and maintained for the duration of the operational phase. This same access road will also be used for the adjacent approved dolerite mine permit (14/2023).

The access road will be upgraded and extended and will be rehabilitated as part of the final reinstatement of the area. (The access farm road turns right from the N1)

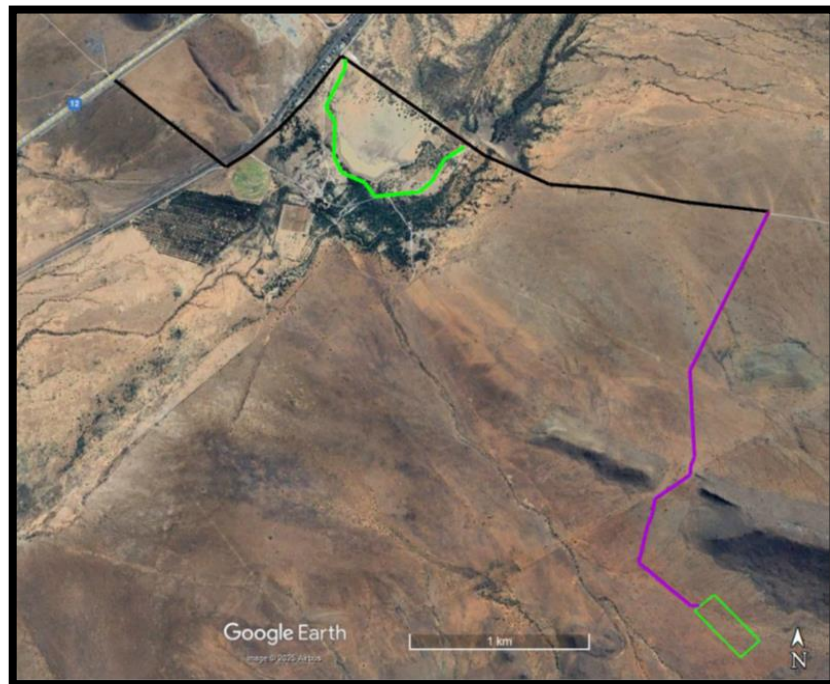


Figure 3: Satellite view showing the access road (black line) existing road, (purple line) is the proposed access road the (green line) is an existing farm road to be used as an alternative access when the dam is full and the (green polygon) is the proposed mining permit area.

- **Clearing of Vegetation:**

According to Mucina and Rutherford (2012) the expansion area extends over two vegetation types known as the NKL 1 Gamka Karoo and the NKL 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 (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:**

Upon removal of the vegetation, the topsoil will be stripped of the areas to be affected by the proposed activities. Topsoil stripping will be restricted to the areas needed during the operational phase of the activity. The complete A-horizon (topsoil – the top 100 – 200 mm of soil which is generally darker coloured due to high organic matter content) will be removed. If it is unclear where the topsoil layer ends the top 300 mm of soil will be stripped. The topsoil will be stockpiled in the form of a berm alongside the boundary of the mining area where it cannot be driven over, contaminated, flooded, or moved during the operational phase. The topsoil berm will measure a maximum of 1.5 m high and must be planted with an indigenous grass seed mix if it does not naturally vegetate within 6 months. The grass will bind the soil and thus serve to control both wind and water erosion of the stockpiles, as well as assist in keeping the soil viable for rehabilitation purposes.

- **Introduction of Mining Machinery:**

The mining site will contain the following:

- Excavating equipment;
- Earth moving equipment;
- Site vehicles;

The Applicant will not construct/establish any permanent infrastructure (such as a workshop or storage facilities) within the permitted mining area.

2. Operational Phase:

The operational phase will involve the removal of topsoil off a strip of approximately 1 ha. The topsoil will be stockpiled at the edge of the strip to be replaced during the rehabilitation of the area. The sand will be removed from the stripped area with a front-end-loader directly from the mining footprint area to the stockpile area, following standard practices in the small-scale mining sector. If necessary, the sand will be screened before being stockpiled. Once ready for distribution, a front-end loader will load the sand onto trucks for delivery to customers, via the existing road. The transport of sand from the mining area will be done by site management as no clients will be allowed to collect sand directly from the mine. It is proposed that the truck will visit the mining area approximately twenty times a week.

As mentioned in the Agricultural Impact Assessment (AIA) (full copy attached as Appendix M), it will be important to control the mining depth at a maximum of 3metres across the entire mine.

It is proposed that the mining footprint is apportioned into 5 strips of 1 hectare each. The Applicant could access each strip to be mined without the need of driving over rehabilitated areas. Strip mining the earmarked area in this manner, allows for mined-out areas to be rehabilitated / signed back to the landowner for continued cultivation without the need of mining equipment re-entering rehabilitated areas.

The mining activities will consist out of the following:

- Stripping and stockpiling of topsoil;1 ha
- Screening, Stockpiling and transporting;
- Sloping and landscaping upon closure of the site; and
- Replacing the topsoil and vegetation the disturbed area.
- Water Use:

There is no need for sand washing for the proposed project. Dust generated on the access road will as far as possible be managed through alternative dust suppression methods to prevent the use of water for dust suppression.

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 that instance, water will be sought from the municipality for which the applicant holds an agreement with the municipality to use water from treated sewers. The water truck driver will receive the necessary training to prevent water wastage. Should additional water be required at any stage of the process, water will be bought and transported to site.

- Electricity:

The proposed project will make use of generators for power supply.

- Waste Handling:

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:**

No workshop or servicing area will be established within the boundaries of the permitted area. Any maintenance/services will be performed at the applicants temporary workshop established in the adjacent mining permit area on the Rhenosterkop Farm.

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.

Decommissioning Phase:

The end objective is for the entire mining area to return to agricultural use (as agreed with the landowner). No buildings/infrastructure need to be demolished, and the access road will remain intact to be used by the landowner.

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

The closure specific objectives entail progressive rehabilitation of each 1 ha strip as mining continues, (see Appendix L for the Closure Plan).

The decommissioning activities will therefore consist of the following:

- Sloping and landscaping the mining area;
- Replacing the topsoil;
- Removing all mining machinery and equipment from site.
- Vegetating the reinstated area; and
- Controlling the invasive plant species.

The future land use of the proposed area will revert back to its previous state. The current state of the area is undisturbed and inactive area, with low agriculture potential. Upon replacement of the topsoil, the area around the excavation will once again return to the previous state, and the planting of the cover crop (to protect the topsoil) will tie in with the rehabilitation. The application site falls partly on fairly level Karoo veld, but the sand mine area is entirely on a steep, sand koppie dominated by rock outcrop and with almost no soil cover. The reference to a grazing capacity in the agricultural assessment of 24 hectares per large stock unit is the general long-term grazing capacity for the surrounding veld, but does not apply specifically to the rocky, dolertie koppie, which, in itself, obviously has almost no grazing capacity.

A very important factor affecting the success of rehabilitation, and consequently the significance of all direct impacts, is the level of care that is taken to rehabilitate effectively. This is dependent on the level of environmental management of all mining activities that can impact on rehabilitation, both during the mining process and during the rehabilitation phase.

The following is the sequence of recommended rehabilitation steps:

- The upper 30 cm of soil must first be stripped and stockpiled before mining.
- Topsoil is a valuable and essential resource for rehabilitation, and it should therefore be managed carefully to conserve and maintain it throughout the stockpiling and rehabilitation processes.
- Topsoil stockpiles should be protected against losses by water and wind erosion. Stockpiles should be positioned so as not to be vulnerable to erosion by wind and water. The establishment of plants on the stockpiles will help to prevent erosion. Stockpiles should be no more than 2 metres high.
- After mining, any steep slopes must be reduced to a minimum and profiled to blend with the surrounding topography.
- The stockpiled topsoil must then be evenly spread across the entire mining area. The depth should be monitored during spreading to ensure that coverage is adequate and even. A slope must be maintained so that ponding of water does not occur on the surface.
- The rehabilitated area must be monitored for erosion, and appropriately stabilised if any erosion occurs.

Mine management must be held accountable for well managed and effective implementation of all the recommended rehabilitation steps above. The specific, measurable rehabilitation outcomes against which the effectiveness of completed rehabilitation must be measured are:

- that the topography and surface has been sufficiently smoothed without steep excavation edges;
- that topsoil has been spread on the surface;
- that there is a potential rooting depth of at least 30 cm of soil that is suitable for root growth above any existing depth limitation, across the entire mining area;
- that there is no visible erosion across the area, or down-slope of it as a result of mining, and that no part of the area has been left unacceptably vulnerable to erosion;
- that soil conditions are suitable for natural revegetation to take place.

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

- Rehabilitation of the excavated area:

The mine plan will ensure that 30cm topsoil is stockpiled for the minimum possible time through rehabilitating each mining block as mining continues.

Topsoil is a valuable and essential resource for rehabilitation, and it should therefore be managed carefully to conserve and maintain it throughout the stockpiling and rehabilitation processes. Topsoil stockpiles should be protected against losses by water and wind erosion. Stockpiles should be positioned so as not to be vulnerable to erosion by wind and water. The establishment of plants on the stockpiles will help to prevent erosion. Stockpiles should be no more than 2 metres high.

The stockpiled topsoil must then be evenly spread across the entire mining area. The depth should be monitored during spreading to ensure that coverage is adequate and even. A slope must be maintained so that ponding of water does not occur on the surface.

The rehabilitated area must be monitored for erosion, and appropriately stabilised if any erosion occurs.

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

The stockpiled topsoil will then be evenly spread over the disturbed mining area, so that there is a depth of 300 mm of sandy topsoil above the underlying layer.

The depth will be monitored during spreading to ensure that coverage is adequate and even.

The Applicant will strive to (when possible) spread topsoil at a time of the year when vegetation cover can be established as quickly as possible afterwards, so that erosion of returned topsoil by both rain and wind, is minimized.

The 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 to propagate the locally or regionally occurring flora, should natural vegetation not re-establish within 6 months from closure of the site.

The Applicant will ensure monthly monitoring of weeds/invasive plants that may germinated within the rehabilitated area. The invasive plant species management plan (Appendix I) will continually be implemented on site.

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

- Final rehabilitation:

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

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

The mining depth will be limited to a maximum of 3 metres in line with the Agricultural Assessment (Appendix M).

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. SCC and protected plant species that are listed in schedules 3 and 4 of the Western Cape Nature Conservation Laws Amendment Act, 2000 (Act No. 3 of 2000) may not be picked or removed without the relevant permit from CapeNature. Moreover, it is highly recommended that such species be relocated, via suitable Search and Rescue Procedures, in order to avoid their destruction.

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 4: 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)
Beaufort West Municipality: By-Law on Municipal Land Use Planning	Part A(1)(h)(iv)(1)(b) Description of current land uses.	The proposed footprint area is currently zoned for agricultural use and a temporary departure application was submitted on 18 March 2025 for approval to the competent authority.
Beaufort West Municipality: Final IDP/PMS/Budget Progress Plan 2022/2027.	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity: Human Environment – Socio-Economic Environment.	The IDP was used in the assessment of the socio-economic profile of the community in which the project is situated.
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: <i>Physical Environment – Geology and Soil.</i> Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – <i>Management of invader plant species.</i>	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 – <i>Management of Health and Safety Risks.</i>	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. 3 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: WC30/5/1/3/2/10361MP
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)	Part A(1)(d)(i) Listed and specified activities.	Application for environmental authorisation submitted to DMRE-WC. Ref No: WC30/5/1/3/2/10361MP

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)
3 GNR 983 Listing Notice 1 Activity 21		
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 – <i>Air and Noise Quality</i> . Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – <i>Dust Handling</i> .	The mitigation measures proposed for the site to consider the NEM:AQA, 2004 and the National Dust Control Regulations.
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 - <i>Biological Environment</i> Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – <i>Management of invader plant species</i> .	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 to consider 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 – <i>Human Environment</i>	The mitigation measures proposed for the site includes specifications of the NHRA, 1999. NID application submitted on 29 April 2025. HWC confirmed no further studies is required.
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 – <i>Hydrology</i> .	The mitigation measures proposed for the site includes specifications of the NWA, 1998.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
(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)		(E.g. in terms of the National Water Act a Water Use License has/has not been applied for)
	Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk.	Application for the adjacent dolerite mine using the same access road was submitted in 2023 for which an authorisation was obtained. It is assumed the General Authorisation will be sufficient for the current application unless otherwise determined by the Department of Water and Sanitation (DWS). Please refer to Appendix Q.
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 and renewable energy projects in the vicinity of the property triggered the need of the Applicant to trade with the available sand from a permitted area. The proposed mining operation will entail the removal of sand, from an undisturbed/inactive area of the farm.

The extraction of the mineral was determined to be a workable commercial prospect that will help diversify the uses of the site, converting it from idle farmland to small-scale mining.

Approximately 6 people will be employed for the duration of the operational phase. The project will contribute to the local economy, both directly and indirectly through the multiplier effect that the project 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 sand mined from the earmarked area will be sold to the building, construction, road maintenance industry and renewable energy projects in the vicinity of the property. The public will benefit from the planned site's sand mining since as it will help improve the

region's road infrastructure, allowing drivers to pass through the district safely. Road improvement and upkeep are top priorities since they help South Africa's infrastructure network function better.

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 5: 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?	<p>The Aquatic Biodiversity Specialist Assessment (Appendix M1) concluded that the post-mitigation risk level for the mining related aspects was determined to be Low”, whilst “Very High” for the access route to the mining area. The proposed activities pose low to moderate risks during the construction, operational and decommissioning phases. Moderate risks are associated with the activities proximate to the watercourse, including the drainage patterns change due to road extent and crossings, clearing of riparian (and terrestrial) vegetation, stormwater management, excavation of riparian area, bed and/or banks, operation of heavy machinery adjacent/within the watercourse, alien vegetation encroachment, conducting road and crossings maintenance, sedimentation and erosion, and hydrocarbon contamination. Due to the presence of existing roads and crossings, the implementation of mitigation measures will reduce the risks/impacts of Moderate-risk activities to Low if done effectively.</p> <p>The proposed activities pose low to moderate risks during the construction, operational and decommissioning phases. However, all moderate risks can be reduced to low with the application of adequate mitigation measures and recommendations ascribed in this report. It is therefore the specialist’s opinion that the project may continue as proposed and as the proposed access road will cross the Platdoring River and several drainage lines, to which a General Authoristaion was obtained in 2024 for the adjacent dolerite mine using the same access road. (Please see Appendix M1).</p> <p>Also refer to:</p> <ul style="list-style-type: none"> ⌘ 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; 	Desirable
How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity?		

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
	<p>⌘ 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,</p> <p>⌘ Part A(1)(h)(viii) The possible mitigation measures that could be applied and the level of risk.</p> <p>As discussed under <i>Part A(1)(g)(iv)(1)(a)</i>. The Applicant will make use of the existing farm road which will be upgraded and extended and will be rehabilitated as part of the final reinstatement of the area. An alternative road along the dam will be used in the event that the dam is full. Should the Applicant implement the mitigation measures proposed in the EMP the impact of the proposed activity on the surrounding area in general is deemed to be of low significance thereby keeping the impact on the receiving environment as low as possible.</p>	
How will this development pollute and/or degrade the biophysical environment?	<p>Considering all the findings of this report, no fatal flaws are evident for the proposed project, and development in the study area is considered acceptable. It is the opinion of the specialist that the proposed activities may be favourably considered, on the condition that all prescribed mitigation measures and supporting recommendations are strictly implemented. (Please see Appendix M2).</p> <p>Also refer to:</p> <p>⌘ Part A(1)(h)(viii) The possible mitigation measures that could be applied and the level of risk.</p>	Highly Desirable
What waste will be generated by this development?	<p>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.</p>	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
	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.	
How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage?	<p>According to the Notice of Intent to Develop conducted by Beyond Heritage (Pty) Ltd, a few CRM surveys have occurred close by with the most relevant being for a sand mine access road immediately over the N1 from Rhenosterkop and the widening of the N1 through Courlandskloof just to the northeast (Orton 2010; the sand mine itself has apparently been surveyed and permitted but no documentation of this is known and none could be sourced from the developer at the time of the road application), and a second sand mine just further north (Gribble 2020).</p> <p>These projects showed that scatters of LSA and MSA stone artefacts occur in places and rock engravings including both animals and scratching/rubbing occur in the area. Some engravings of high significance occur very close to the Renosterkop Sand mine but do not seem to be under threat yet. A stone-walled kraal is also on record north of the N1. Historical structures, artefacts scatters and aspects of the historical nineteenth century Cape Town to Kimberley railway (which broadly follows the N1) were also recorded. The latter include cast iron and stone bridge and also an Anglo-Boer War blockhouse built at the bridge to guard it during the war.</p> <p>Around Nelspoort, to the northeast of the study area, there are a number of rock engravings and some rock gongs that are quite well-known (Parkington et al. 2008).</p>	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
	<p>More broadly, most Karoo farms include historical structures and graves and the kinds of archaeology noted above are expected to be widespread. Rock paintings are also known from the Karoo, but not from anywhere close to the study area. The only impact anticipated is to LSA scratched engravings on the sand rocks of the study area. While these “motifs” are poorly understood and might have once had significance beyond that which we might understand, they are also very common. A photographic record has been made of those in the study area and further work on this small sample is unlikely to accomplish anything further.</p> <p>Survey diagrams indicate that Rhenosterkop was first granted on 18 November 1890 to Adolph Siegfried Grimbeek. Portions referred to as Lucerne Lodge and Annex Lucerne Lodge were subdivided off on the northwest side of the railway line during the early 20th century. Various other subdivisions have also occurred for the railway on the land to its northwest. The rest of the farm to the south of the railway line, however, has remained intact.</p> <p>In light of this, a Heritage Impact Assessment was not deemed necessary by the heritage specialist. . (Please see Appendix M3).</p>	
How will this development use and/or impact on non-renewable natural resources?	If approved the Applicant will mine the resource identified within the 5hectare mining area, on the Farm Rhenosterkop, Beaufort West, Western Cape Province. Presently, it is believed that the mineable area is (5 ha). Because there is thick sandy layer.	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 30 000 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. Currently, an agreement with the municipality is in place to obtain treated wastewater for dust suppression purposes. The contractor will be encouraged to consider the use of non-	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
	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.	
How were a risk-averse and cautious approach applied in terms of ecological impacts?	<p>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.</p> <p>Refer to the following sections:</p> <ul style="list-style-type: none"> ✧ Part A(1)(d)(ii) Description of the activities to be undertaken; ✧ Part A(1)(h)(i) Details of the development footprint alternatives considered; ✧ Part A(1)(h)(iv) The environmental attributes associated with the alternatives; ✧ Part A(1)(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; ✧ Part A(1)(l) Environmental impact statement. 	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 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 it impact negatively on the socio-economic status of the area.	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
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
What is the socio-economic context of the area?	Please refer to Heading 2(h)(iv)(1)(a) Socio-economic Environment.	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
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?	<p>As mentioned earlier, should this mining permit be approved the applicant will be able to,</p> <ul style="list-style-type: none"> • Provide employment opportunities. • The people/businesses of Beaufort West will benefit from diversification of sand 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 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.	<p>As mentioned above the proposed area is over an undisturbed/inactive area of the farm with medium agricultural potential due to the sandy surface, after consultation with the landowner the application footprint extends into an area with medium-low agricultural potential. The proposed project will not necessitate the loss of agricultural field with high potential to the landowner. The flatter veld area at the base of the koppie, included in the 5 hectares, will be possible to restore as agricultural grazing land.</p> <p>The Applicant will make use of the existing farm road which will be upgraded and extended and will be rehabilitated as part of the final reinstatement of the area. An alternative road along the dam will be used in the event that the dam is full. Should the</p>	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
	Applicant implement the mitigation measures proposed in the EMP the impact of the proposed activity on the surrounding area in general is deemed to be of low significance thereby keeping the impact on the receiving environment as low as possible.	
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) <i>Impact on the socio-economic condition of any directly affected person</i> , 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 and how the development's socio-economic impacts will result in ecological impacts?	If 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
What measures were taken to pursue the selection of the "best practicable environmental		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
option" in terms of socio-economic considerations?	<p>If the mitigation measures proposed in this document is adhered to, the project entails the mining of a 5ha area. Should the permit application be approved, the project will directly contribute to the socio-economic status of the receiving environment through the employment, and support of the local economy.</p> <p>Please refer to:</p> <ul style="list-style-type: none"> 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. 	
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?		
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?	<p>The mining site will (if approved) operate in accordance with, amongst others, the following:</p> <ul style="list-style-type: none"> 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; NEM:WA, 2008 – to ensure waste related compliance; NEMA, 1998 (as amended) – to ensure environmental related compliance; 	Highly Desirable
What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has		

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
been addressed throughout the development's life cycle?		
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.	<p>As mentioned earlier, should this mining permit be approved the applicant will be able to,</p> <ul style="list-style-type: none"> • Provide employment opportunities; • The people/businesses of Beaufort West will benefit from diversification of sand 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 mine will operate in accordance with the specifications of the Mine Health and Safety Act, 1996 as well as the Occupational Health and Safety Act, 1993. Site management will arrange regular toolbox talks with the site personnel regarding the work to be performed and the environment in which the work will take place. Grievances/concerns can be lodged during the toolbox sessions and site meetings.	Highly Desirable
Describe how the development will impact on job creation in terms of, amongst other aspects?	<p>As mentioned earlier, should this mining permit be approved the applicant will be able to,</p> <ul style="list-style-type: none"> • Provide employment opportunities; 	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
	<ul style="list-style-type: none"> The people/businesses of Beaufort West will benefit from diversification of a sand sources which will result in competitive product costs. It will also diversify the income of the property as well as potential employees and clients. 	
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.	The proposed mine will operate under a valid environmental authorisation and mining permit to be issued by the DMRE-WC. Compliance of the site with the approved EMPR, EA- conditions will be reported on as per departmental specifications. Considering this, the proposed activity will take place in an environmentally sustainable manner with the least possible impact on the receiving environment.	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 effects and of preventing, controlling or minimising further pollution environmental damage or adverse health effects will be paid for	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
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	<p>Please refer to:</p> <ul style="list-style-type: none"> ∞ 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 are 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 adjacent to an existing quarry, allowing for the use of the same access route, which reduces additional infrastructure requirements.
- Furthermore, rehabilitation efforts are simplified due to the site's location and characteristics. Based on preliminary assessments, the anticipated environmental impacts are deemed acceptable.
- The applicant only identified one alternative site for the proposed mining as this area is the only viable area due to the position of the sand reserve.
- If the mining permission is approved, the farm owner will be contacted before any work begins to ensure the safety of the workers and the animals on the land. This was deemed the only site alternative as this is the only area that will be viable for the landowner due presence of the sand reserve and was positioned to avoid crossing nearby drainage lines.
- The Applicant will make use of the existing farm road which will be upgraded and extended as the open cast mining progress and will be rehabilitated as part of the final reinstatement of the area. The access farm road turns right from the N1)

±30 km North of Beaufort West, Using the N1, head north for approximately 30km. The entrance to the proposed mining area is found on the right side of the road. The access road intersects with more than 2 drainage lines which necessitates a water use license application in terms of Section 21 of the NWA, 1998. This was confirmed by the Risk Matrix Assessment conducted by the Biodiversity Company (Pty) Ltd (please see Appendix M1). A General Authorisation was obtained for the adjacent mine that uses the same road and will be used in support of this application, unless otherwise directed by the Department of Water and Sanitation (DWS). (please see Appendix Q)

Water required for the implementation of the project will be bought from a registered source and transported to site.

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. Considering 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.

Site Alternative 1 (S1) (Preferred and Only Site Alternative): Site Alternative 1 entails the mining of an area over an undisturbed area of the farm within the GPS coordinates as listed in the table below:

Table 6: GPS Coordinates of Site Alternative 1 (preferred and only site alternative)

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	32°14'17.563"S;	22°52'28.945"E	-32.238205°	22.874720°
B	32°14'14,708"S	22°52'33,071"E	-32.237420°	22.875877°
C	32°14'22,834"S	22°52'42,679"E	-32.239678°	22.878519°
D	32°14'25,93"S	22°52'38,568"E	-32.240529°	22.877416°

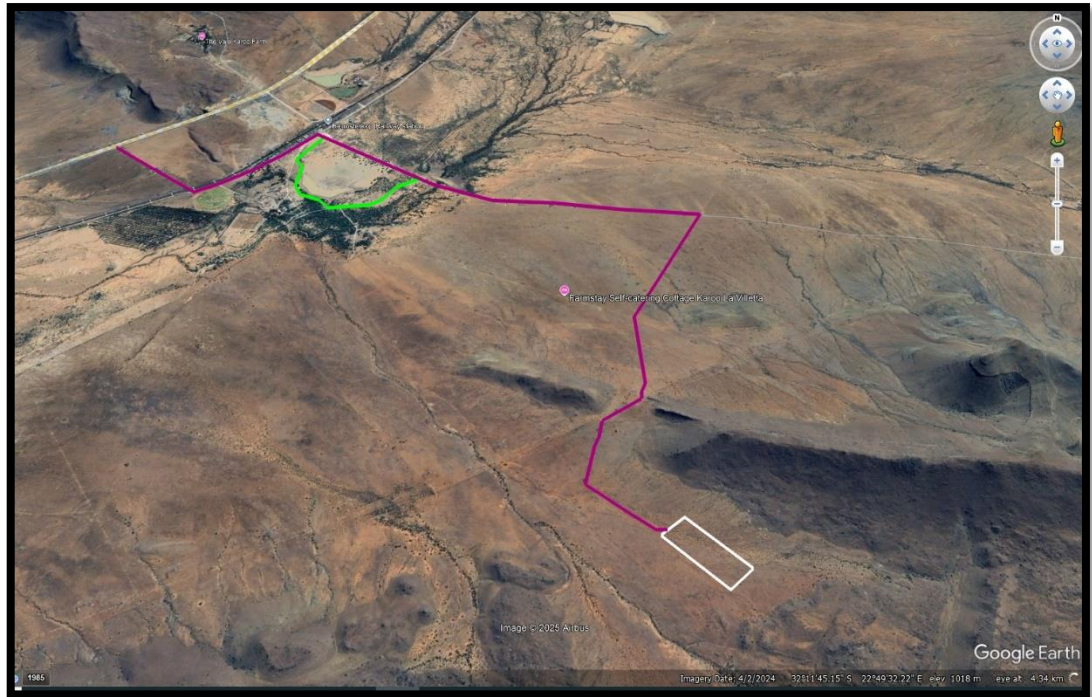


Figure 4: Satellite view showing the position of Site Alternative 1 (white polygon) with the viable access road (purple line) within the surrounding landscape.

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 site alternative** due to the following:

- The proposed area was chosen due to the presence of the sand reserve and was positioned to avoid crossing nearby drainage lines.
- Access to the proposed mining area is possible via the existing access road with a formal (existing) entrance onto the N1. ±30 km North of Beaufort West, Using the N1, head north for approximately 30km. The entrance to the proposed mining area is found on the right side of the road and is the same access that will be used for the adjacent approved dolerite quarry.

No-go Alternative: The no-go alternative entails no change to the *status quo* and is therefore a real alternative that needs to be considered. The sand to be mined from the existing sand mine will be sold to the building, road rehabilitation/maintenance and associated construction industry. If, however, the no-go alternative is implemented:

- the mineral resource on this land cannot be used by the applicant.
- the proposed employment opportunities will be lost;
- the diversification of sand sources, which would result in rising product costs, will not be advantageous to the residents or enterprises in Beaufort West.

- The mineral resource on this land cannot be used by the applicant.

The diversification of sand sources, which would result in rising product costs, will not be advantageous to the residents or enterprises in Beaufort West.

In light of this, the no-go alternative was not 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 this public participation process the relevant stakeholders and I&AP's will be informed of the project by means of an advertisement in Oudtshoorn Courant on 16 May 2025, and two on-site notices that will be placed at visible locations, one on the farm boundary fence, and another at the at the public library in Beaufort West.

A notification letter inviting comments on the DBAR over a 30-days commenting period (ending 17 June 2025) was sent to the landowner, neighbouring landowners, stakeholders and other I&AP that may be interested in the project. The comments received on the DBAR were incorporated into the Final Basic Assessment Report (FBAR) to be submitted to the DMRE for consideration. The following I&AP's and stakeholders will be informed of the project:

Table 7: List of the I&AP's and stakeholders that were notified of the proposed sand mine project.

SURROUNDING LANDOWNERS & INTERESTED AND AFFECTED PARTIES	STAKEHOLDERS
<ul style="list-style-type: none"> • <u>Surrounding landowners & lawful occupiers:</u> • Adriaan Johan Nigrini – Landowner – Rhenosterkop 155 of the remaining extent portion 0 • Adriaan Johan Nigrini – Rhenosterkop 155 Portion 9 • Adriaan Johan Nigrini – Rhenosterkop 155 Portion 5 (RE), • Adriaan Johan Nigrini – Rhenosterkop 155 Portion 6 • Sabre Trust– Riet Fontein 122 Portion 1 • Sabre Trust– Riet Fontein 122 Portion 11 	<ul style="list-style-type: none"> • 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 • Transnet

SURROUNDING LANDOWNERS & INTERESTED AND AFFECTED PARTIES	STAKEHOLDERS
<ul style="list-style-type: none"> • Sabre Trust – Klipkopjes leegte 122 Portion 2, • Sabre Trust– Elandsfontein 150 Portion 2 • Jean de Jager– Riet Fontein 122 Portion 10 • Johan Lund – Elandsfontein 150 Portion 7 • Johan Lund –Farm 410 Portion 0 • Andre Gerard Lautre Murray– Speelmans Kuil 154 Remaining Extent Portion 0 • Gideon Vivier Boerdery - Rhenosterkop 155 Portion 4 (RE) • Gideon Vivier Boerdery - Rhenosterkop 155 Portion 9 (RE) • SW Van Der Merwe 	<ul style="list-style-type: none"> • Department of Public Works and Infrastructure; • Department of Agriculture; • Department of Agriculture Forestry and Fisheries; • Department of Labour - Western Cape Provincial Office; • Department of Rural Development and Land Reform - Western Cape District Offices • Department of Water and Sanitation;Gqeberha • 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 • South African National Roads Agency
I&AP'S AND STAKEHOLDERS THAT REGISTERED/COMMENTED DURING THE INITIAL NOTIFICATION PERIOD	
<ul style="list-style-type: none"> • Any comments received on the draft BAR will be incorporated into the final BAR 	

An advertisement was placed in the Oudtshoorn Courant on 16 May 2025, and two on-site notices was placed on 16 May 2025, one on the farm boundary fence at the entrance, and another at the at the Beaufort West Public Library.

The application for environmental authorisation and mining permit was uploaded on SAMRAD on 19 March 2025. An acknowledgement of the application for environmental authorisation was received on the 31st of March 2025 and the project was assigned with WC30/5/1/3/2/10361MP as reference number.

A 30-days commenting period will be allowed which expires on 17 June 2025. 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 distributed for comment and perusal to the I&AP's and stakeholders. The comments received on the DBAR will be incorporated into the Final Basic (FBAR) that will be submitted 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 8: Summary of issues raised by IAPs

Interested and Affected Parties		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.
List the name of persons consulted in this column, and					
Mark with an X where those who must be consulted were in fact consulted					
AFFECTED PARTIES	X				
Landowner/s					
Adriaan Johan Nigrini – Landowner - a portion of the remaining portion of the farm Rhenosterkop 155	X	Mr. A De Waal Nigrini signed a landowner consent letter for the proposed sand mining permit on the property on 1 February 2025.			Comments and Response Report – Appendix F
Rhenosterkop 155 Portion 9					
Rhenosterkop 155 Portion 5 (remaining extent),					
Rhenosterkop 155 Portion 6					
Lawful occupier/s of the land					
N/A					
Landowners or lawful occupiers on adjacent properties	X				
Sabre Trust					
Sabre Trust – Riet Fontein 122 Portion 1	X				
Riet Fontein 122 Portion 2					
Riet Fontein 122 Portion 11					
Klipkopjes leegte 122 Portion 2					

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.
Jean de Jager– Riet Fontein 122 Portion 10	X				
Johan Lund – Elandsfontein 150 Portion 7 & Farm 410 Portion 0	X				
Andre Gerard Lautre Murray– Speelmans Kuil 154 Remaining Extent Portion 0	X				
Gideon Vivier Boerdery - Rhenosterkop 155 Portion 4 (remaining extent) Rhenosterkop 155 Portion 9 (remaining extent)	X				
Municipal councillor					
Cllr. D Welgemoed (Ward 2)	X				
Municipality					
Beaufort West Local Municipality	X				
Central Karoo District Municipality	X				
Organs of state (Responsible for infrastructure that may be					

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 Roads Department, Eskom, Telkom, DWA e					
Department of Infrastructure ,Transport and Public Works	X	Any comments received on the draft BAR will be incorporated into the final BAR.			
Department of Public Works and Infrastructure;	X	Any comments received on the draft BAR will be incorporated into the final BAR.			
Eskom	X	Any comments received on the draft BAR will be incorporated into the final BAR.			
Transnet Transnet LTD – Rhenosterkop 155 Portion 7 Rhenosterkop 155 Portion 1 (RE) Rhenosterkop 155 Portion 20 (RE	x	Any comments received on the draft BAR will be incorporated into the final BAR.			
South African National Roads Agency and adjacent landowner of: Rhenosterkop 155 Portion 0	X	Any comments received on the draft BAR will be incorporated into the final BAR.			
Communities	N/A	No community were identified within the study area.			
Dept. Land Affairs					

Interested and Affected Parties List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
Department of Agriculture;	X		Any comments received on the draft BAR will be incorporated into the final BAR.		
Department of Agriculture Forestry and Fisheries;	X		Any comments received on the draft BAR will be incorporated into the final BAR.		
Traditional Leaders	N/A		No Traditional leaders were identified within the study area.		
Dept. Environmental Affairs	X		Any comments received on the draft BAR will be incorporated into the final BAR.		
Department of Agriculture Forestry and Fisheries;	X		Any comments received on the draft BAR will be incorporated into the final BAR.		
Department of Environmental Affairs and Development Planning - George	X		Any comments received on the draft BAR will be incorporated into the final BAR.		
Other Competent Authorities affected					
Department of Labour - Western Cape Provincial Office;	X		Any comments received on the draft BAR will be incorporated into the final BAR.		
Department of Public Works and Infrastructure	X		Any comments received on the draft BAR will be incorporated into the final BAR.		

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 Agriculture, Land Reform & Rural Development - Western Cape District Offices	X	Any comments received on the draft BAR will be incorporated into the final BAR.			
Department of Water and Sanitation- Gqeberha	X	Any comments received on the draft BAR will be incorporated into the final BAR.			
South African Heritage Resources Agency	X	Any comments received on the draft BAR will be incorporated into the final BAR.			
Department of Social Development	X	Any comments received on the draft BAR will be incorporated into the final BAR.			
Department of Social Development – Beaufort West	X	Any comments received on the draft BAR will be incorporated into the final BAR.			
Department of Economic Development and Tourism;	X	Any comments received on the draft BAR will be incorporated into the final BAR.			
Heritage Western Cape	X	29 April 2025	Dear Applicant, I acknowledge receipt of your permit application received on 29 April 2025. Please note the application will be allocated to a case officer within 10 working days.	28 April 2025 Dear HWC Please find attached a NID application for a proposed sand mine on Rem of Rhenosterkop 155, Beaufort West.	Comments and Response Report – Appendix 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.
			<p>Once the application is assigned, the relevant Case Officer will confirm assignment of application and if there are any further requirements once tabled before a committee.</p> <p>Agendas for meetings are published weekly via www.hwc.org.za</p> <p>As of 5 May 2025, applicants will be able to submit their Section 38(1) Notification of Intent to Develop (NID) application via SAHRIS</p> <p>All other HWC applications and requests for reference numbers are still to be submitted to hwc.hwc@westerncape.gov.za while HWC prepares for the full migration to SAHRIS.</p> <p>HWC strongly encourages applicants to make use of SAHRIS during this trial period and inform us of your user experience.</p> <p>Please see the attached notices for further information related to the migration of SAHRIS and the application fee process for these applications.</p>		
Heritage Western Cape	X	07 May 2025	You are hereby notified that, since there is no reason to believe that the proposed mining permit for a sand mine on Farm Rhenosterkop No 155-RE, Beaufort West will have an impact on heritage resources, no further action under Section 38 of		Comments and Response Report – Appendix 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.
			the National Heritage Resources Act (Act 25 of 1999) is required. However, should any heritage resources, including evidence of graves and human burials, archaeological material and paleontological material be discovered during the execution of the activities above, all works must be stopped immediately, and Heritage Western Cape must be notified without delay.		
Cape Nature	X				
Cape Nature - George	X				
<u>OTHER AFFECTED PARTIES</u>					
N/A					
<u>INTERESTED PARTIES</u>					
N/A					
<u>INTERESTED PARTIES</u>					
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. It receives the lowest rainfall (0.2 mm) in August and the highest (21.8 mm) in March. The weather averages for the month of March, temperature averages around 26°C and at night it feels like 15°C. In March, Beaufort West gets on an average 31.53mm of rain and approximately 2 rainy days in the month. Humidity is close to 41%.

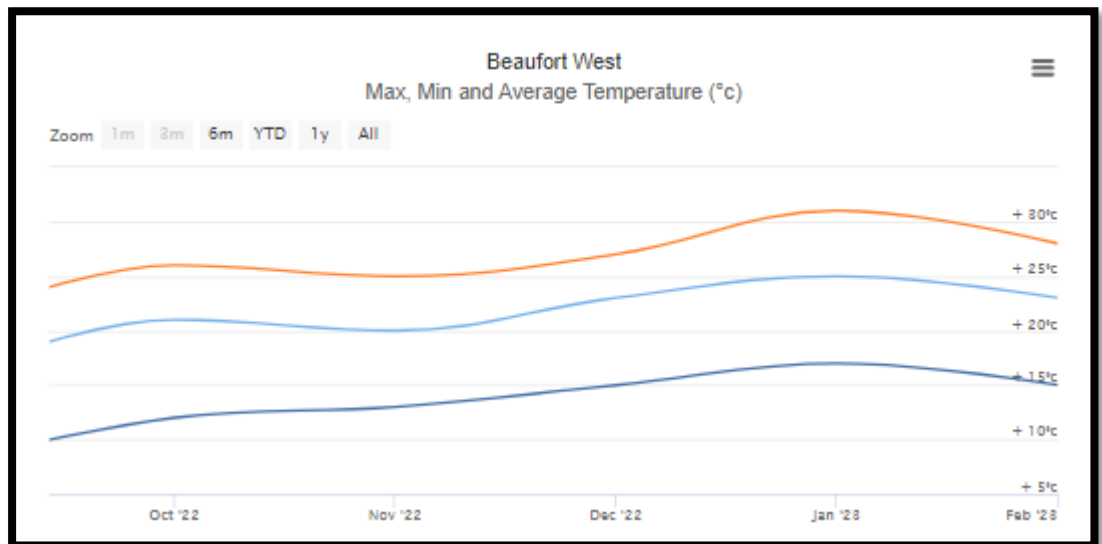


Figure 5: Statistical representation of the temperatures for the Beaufort West region (Chart obtained from <https://www.worldweatheronline.com/beaufort-west-weather-averages/western-cape/za.aspx>).

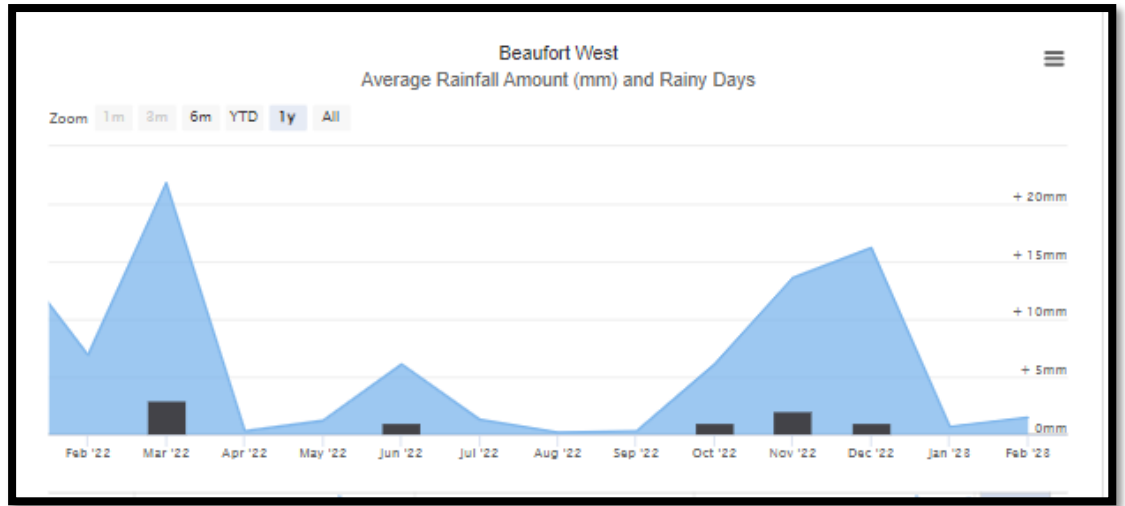


Figure 6: Statistical representation of the precipitation for the Beaufort West region (Chart obtained from <https://www.worldweatheronline.com/beaufort-west-weather-averages/western-cape/za.aspx>).

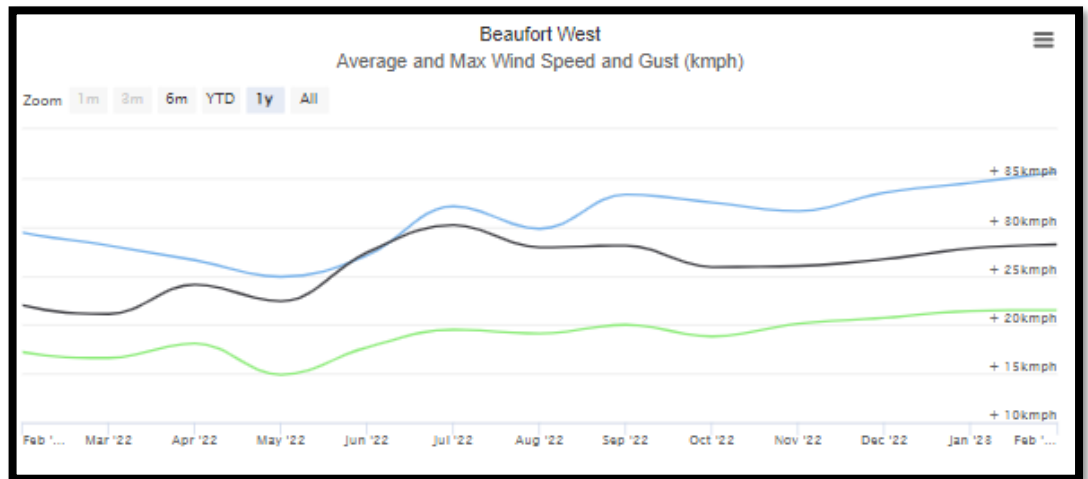


Figure 7: Statistical representation of the wind speed for the Beaufort West region (Chart obtained from <https://www.worldweatheronline.com/beaufort-west-weather-averages/western-cape/za.aspx>).

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 as shown in the figure below (measured at the Beaufort West weather station).

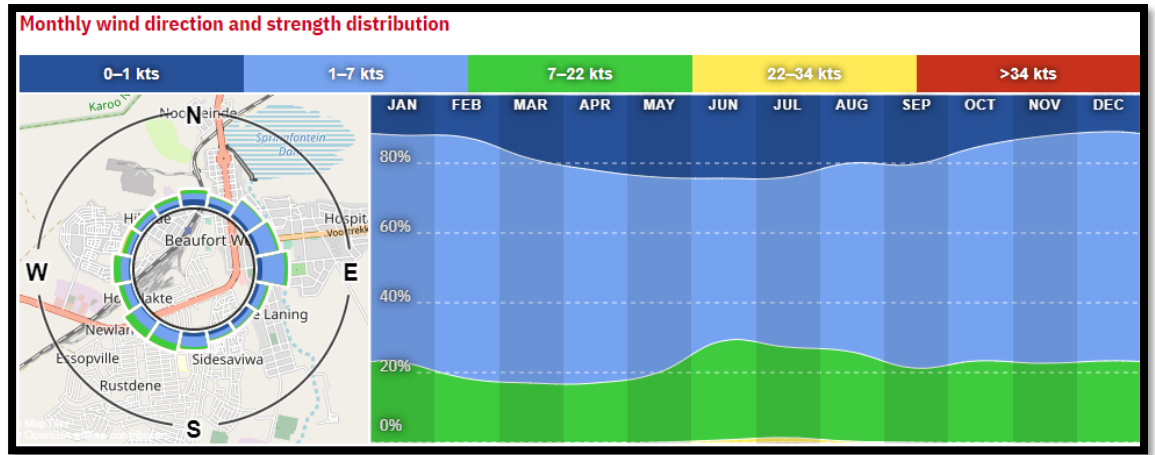


Figure 8: Image showing the dominant wind direction (first panel) and average wind speed over a 12 month period for the Beaufort West area (image obtained from https://www.windfinder.com/windstatistics/beaufort_west)

TOPOGRAPHY

The natural topography the proposed excavated area can be described as steep slopes of koppies, butts, mesas and parts of the Great Escarpment covered with large boulders and stones supporting sparse dwarf Karoo scrub with drought-tolerant grasses of genera such as *Aristida*, *Eragrostis* and *Stipagrostis*. The elevation loss from the proposed mining footprint to the town of Beaufort West to be 182 m over 29.4 km.



Figure 9: 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 an inactive agricultural setting with a few mining operations within the vicinity of the area. 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-northeast 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 sand sills and dykes and subsummit positions of mesas and butts with sand 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.

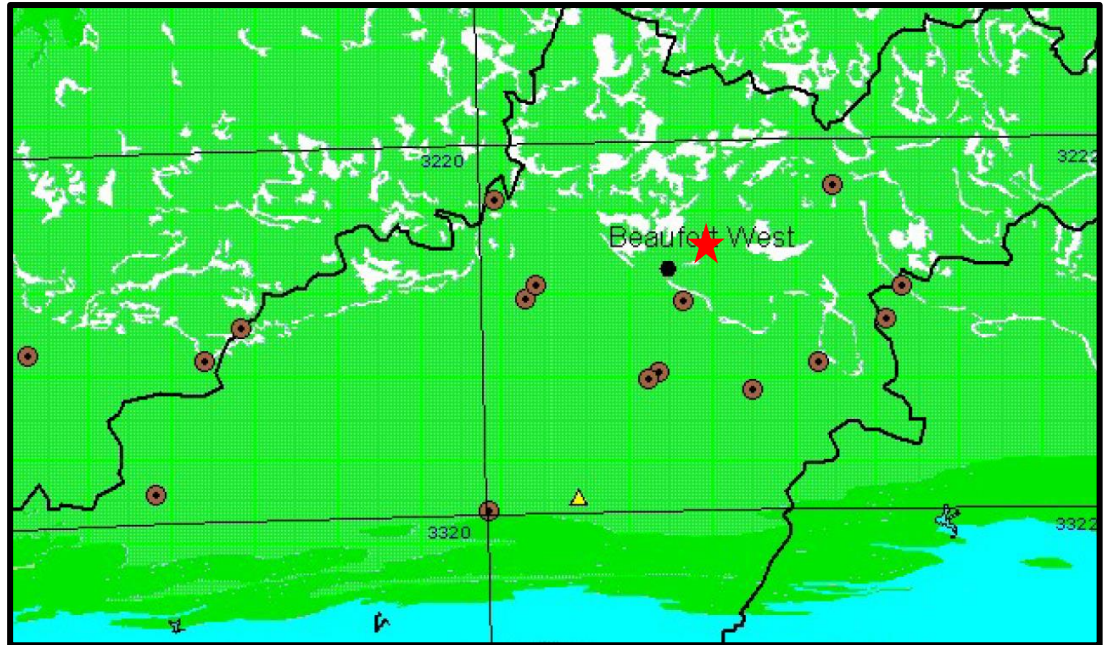


Figure 10: Indication of the simplified geology of the study area, where green represents the Beaufort Group. The proposed mining area is indicated by the red star. (Image obtained from the Council for Geoscience)

HYDROLOGY

The proposed mining area access road intersects with more than 2 drainage lines which necessitates a water use license application in terms of Section 21 of the NWA, 1998. This was confirmed by the Risk Matrix Assessment conducted by the Biodiversity Company (Pty) Ltd (please see Appendix M1). A General Authorisation was obtained for the adjacent mine that uses the same road and will be used in support of this application, unless otherwise directed by the Department of Water and Sanitation (DWS), (please see Appendix Q).

Water required for the implementation of the project will be bought from a registered source and transported to site.

Table 9: Aquatic characteristics of the greater study area

Water Management Area	Mzimvubu-Tsitsikama WMA 7
Sub Water Management Area	Platdoring Sub-
Quaternary Catchment	L11F
FEPA Status	no FEPA river or FEPA area within the project area

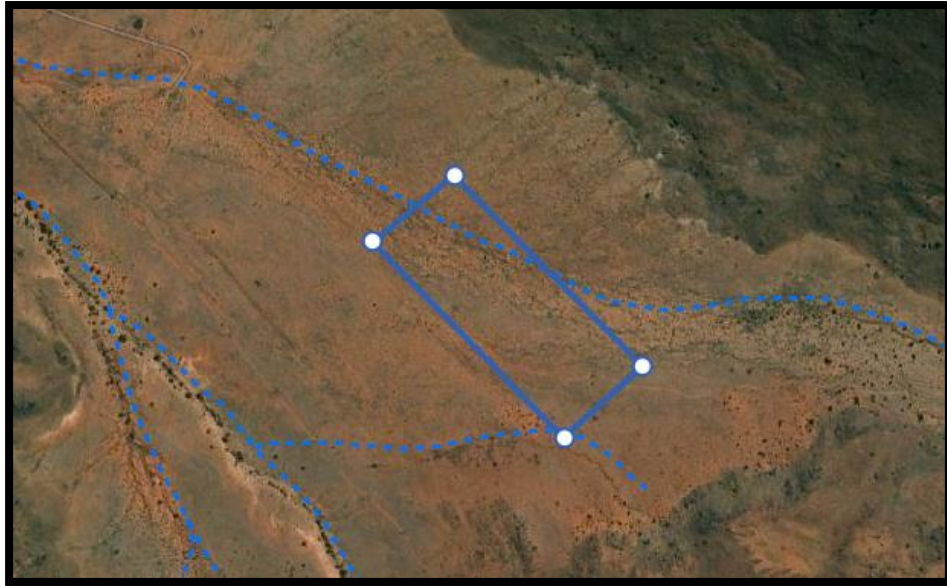


Figure 11: Map showing the proposed mining footprint (blue polygon) and drainage lines. (Image obtained from Cape Farm Mapper)

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 an 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.

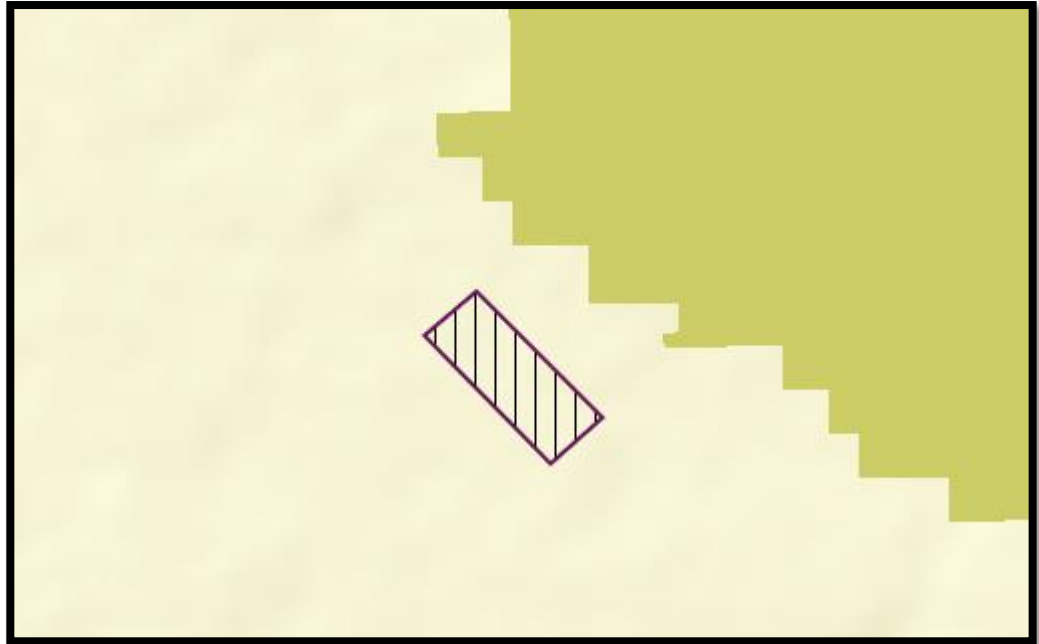


Figure 12: The Mining and Biodiversity importance map with the proposed mining footprint indicated by the purple polygon. Light brown – moderate biodiversity importance, moderate risk for mining, light brown – moderate biodiversity Importance, moderate risk for mining (image obtained from the BGIS Map 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.

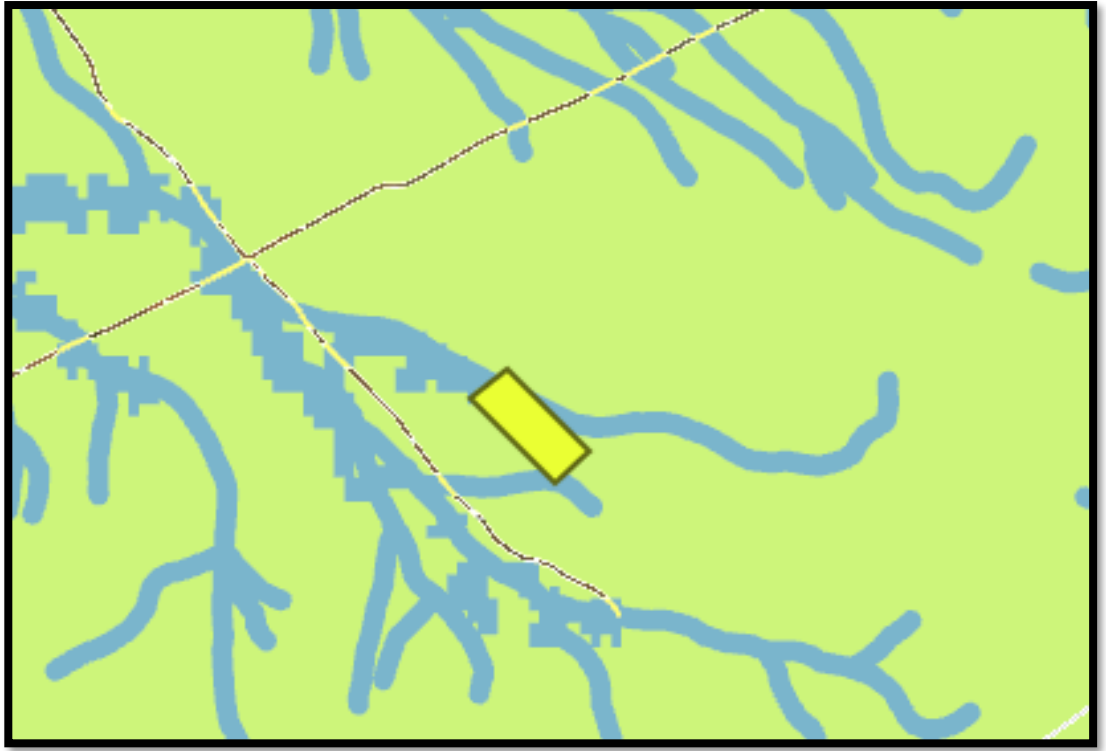


Figure 13: Western Cape Biodiversity Conservation Plan showing the mining area (green polygon) (Image obtained from BGIS Map Viewer – Western Cape Conservation Plan).

GROUND COVER

According to Mucina and Rutherford (2012) the vegetation type of the surrounding natural areas is 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*: *Antheophora 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 caespitium*, *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 pallens.

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.

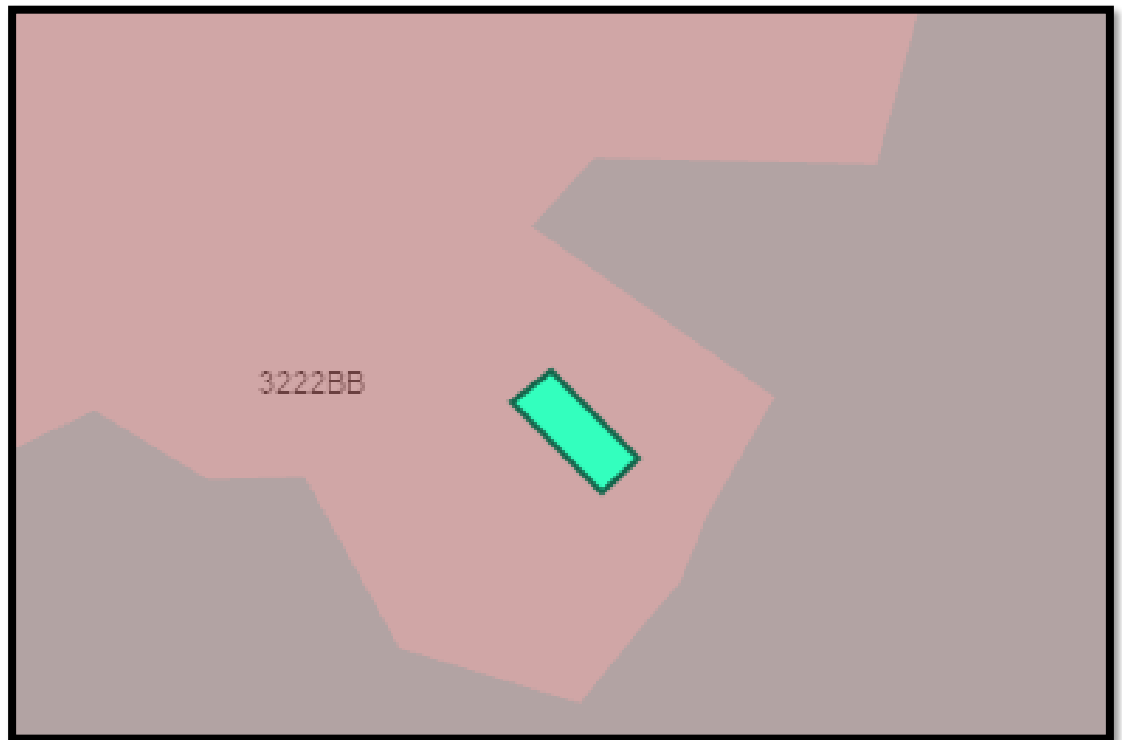


Figure 14: National vegetation cover map showing the mining area (green polygon) within the Beaufort West Gamka Karoo (NKI 1) (light pink) Upper Karoo Hardeveld (NKu 2) (Grey). (Image obtained from BGIS Map Viewer – National Vegetation Map).

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 is located on a property with diversified agricultural and game farming activities, comprising a partial game farm, olive farming, and sheep farming, should this mining permit be granted the 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. A 25 m buffer has been applied to the proposed access roads whereas a 100m buffer was placed on the proposed development area and is collectively referred to as the Project Area of Influence (PAOI) from hereon.

HUMAN ENVIRONMENT:

CULTURAL AND HERITAGE ENVIRONMENT

The proposed mining footprint was selected over an undisturbed and inactive area of the farm with sandy surface.

The proposed Sand mining area is located on 5 ha on a portion of the remaining extent of the Farm Rhenosterkop 155, approximately 30 km northeast of the Beaufort West Town within the Beaufort West District, Western Cape Province, South Africa. The project area is situated in the L11F quaternary catchment and is in proximity of the Platdoring River and its unnamed tributary. The Platdoring River flows in a southerly direction into the South River. The project area falls within the L11F-Platdoring Sub-Quaternary Reach (SQR) and the Great Karoo Level 1 Ecoregion. There are currently nine (9) Water Management Area (WMA) which were formed by joining the old nineteen WMAs, with the project area located within the Mzimvubu-Tsitsikama WMA. Several rivers drain the Mzimvubu-Tsitsikama WMA.

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 sand mine is located in an area of zero palaeontological sensitivity (as presented in the figure below).

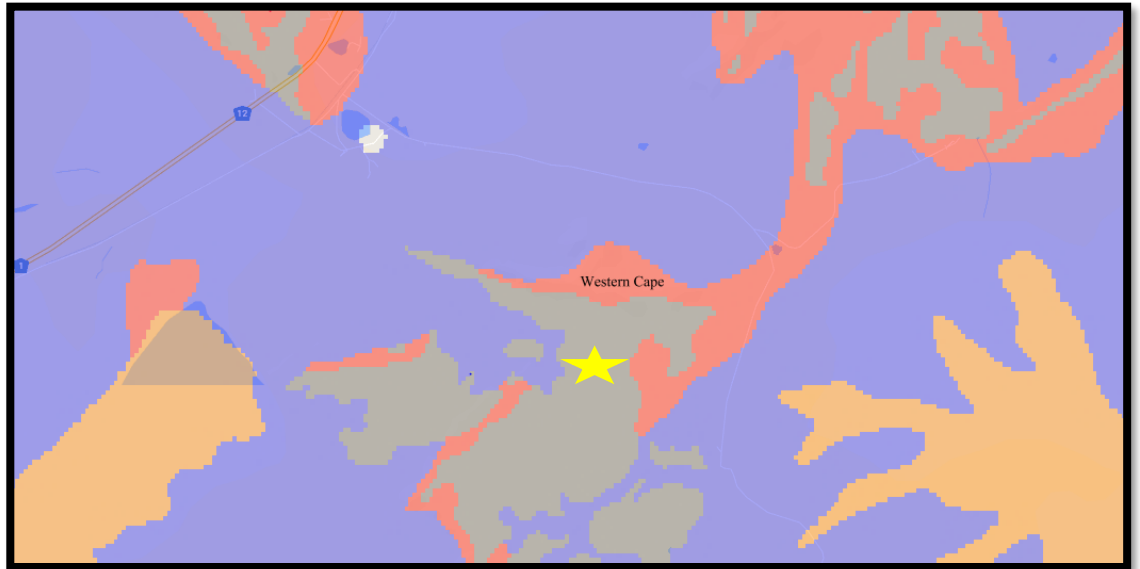


Figure 15: Screenshot from the SAHRIS palaeo-sensitivity map showing the location of the proposed mining area (yellow star) straddling an area of insignificant/zero (grey) palaeontological sensitivity (Source: <https://sahris.sahra.org.za/map/palaeo>).

SOCIO-ECONOMIC ENVIRONMENT

(Information extracted from the Beaufort West Municipality Integrated Development Plan – 2022-2027)

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 Hoogvlakte in 1818. The municipal area covers 16 330.10 km² and is structured into 7 Wards.

It's noteworthy to mention that the SEP-LG 2021 for Beaufort West Municipality indicates that the population has increased from 51 080 (2016 Community Survey) to 51 177 in 2021.

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.

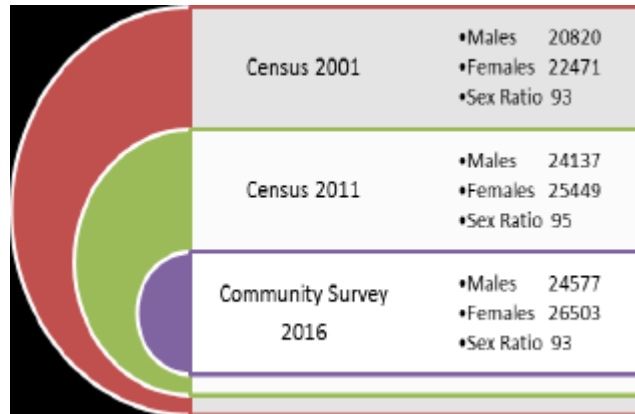


Figure 16: Gender distribution (Information extracted from the Beaufort West Municipality Integrated Development Plan – 2022/2027) - Source: Statistics South Africa: Community Survey, 2016.

Economic Profile

As per the SEP-LG 2021, it is reported that in 2019, the economy of Beaufort West municipal area was valued at R2.231 billion (current prices) and employed 12 552 people. Historical trends between 2015 and 2019 indicate that the municipal area realised an average annual growth rate of -0.1 per cent. While the primary sector and the secondary sector contracted between 2015 and 2019 at (-2.8 per cent) and (-0.3 per cent, the tertiary sectors grew at an average of 0.5 in the same period. The economy is overall estimated to have contracted by 4.8 per cent in 2020 and to have shed 725 jobs.

In terms of sectoral contribution, the general government (R500.3 million), transport, storage and communication (R382.2 million) and the wholesale and retail trade, catering and accommodation (R346.34 million) sectors were the main contributors to growth in the municipal area. The latter two sectors are however both expected to contract in 2019 (-1.2 and -0.2 per cent respectively) while the general government sector is expected to grow by 1.0 per cent. The wholesale and retail trade, catering and accommodation sector is the biggest contributor to overall employment in the municipal area (3 169) and is expected to shed 280 jobs in 2020. The general government sector, which is the third largest contributor to overall employment (2 319), is expected to create the 26 new jobs.

Although the agriculture, forestry and fishing sector contributed the second largest contributor to jobs 2 423 it is expected to shed 73 jobs in 2020. It is estimated that this sector had the largest GDP growth (10.8 per cent) in 2020.

Education Levels

Education remains one of the key avenues through which the state is involved in the economy. In preparing individuals for future engagement in the labour market, policy choices and decisions in the sphere of education play a critical role in determining the extent to which future economic and poverty reduction plans can be realised. Beaufort West's matric outcomes dropped from 79.2 per cent in 2018 to 70.9 per cent in 2020.

Beaufort West's matric outcomes increased significantly from 71, 71% percent in 2020 to 83, 65% percent in 2021.

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.

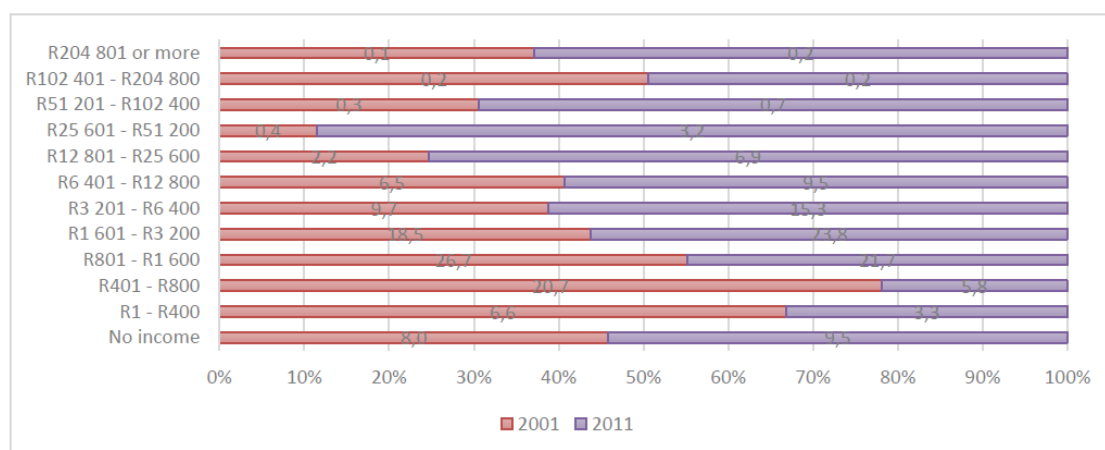


Figure 17: Income levels (Information extracted from the Beaufort West Municipality Integrated Development Plan – 2022/27) - Source: Statistics South Africa: Census 2001 - 2011.

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

A portion of the remaining portion of the Farm Rhenosterkop no 155, 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 proposed mining area on the property mainly comprises of inactive agricultural land.

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

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	
Sand mine, gravel or borrow pit	YES	-	Adjacent Dolerite mine using the same access road.
Dam or reservoir		NO	
Hospital/medical centre	-	NO	
School/ crèche	-	NO	
Tertiary education facility		NO	
Church	-	NO	
Old age home	-	NO	
Sewage treatment plant	-	NO	
Train station or shunting yard	-	NO	
Railway line	-	NO	The nearest railway line is located ± 3.4 km from the earmarked area.
Major road (4 lanes or more)	-	NO	The N1 passes the site on the north- eastern side
Airport	-	NO	.
Harbour	-	NO	
Sport facilities	-	NO	
Golf course	-	NO	
Polo fields	-	NO	
Filling station	-	NO	
Landfill or waste treatment site	-	NO	
Plantation	-	NO	
Agriculture	-	NO	The proposed footprint is inactive but still forms part of an agricultural active farm.
River, stream or wetland		NO	
Nature conservation area	-	NO	

LAND USE CHARACTER	YES	NO	DESCRIPTION
Mountain, hill or ridge	YES	-	The mining area is located on a flat sandy surface.
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

The natural topography the proposed excavated area can be described as steep slopes of koppies, butts, mesas and parts of the Great Escarpment covered with large boulders and stones supporting sparse dwarf Karoo scrub with drought-tolerant grasses of genera such as *Aristida*, *Eragrostis* and *Stipagrostis*. The figure below shows the elevation loss from the proposed mining footprint to the town of Beaufort West to be 865 m over 29.9 km.



Figure 18: 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 is located beyond the hills in an area that is not seen from the national road. Should the Applicant successfully rehabilitate the mining area (upon closure), no residual visual impact is expected upon closure of the mine.

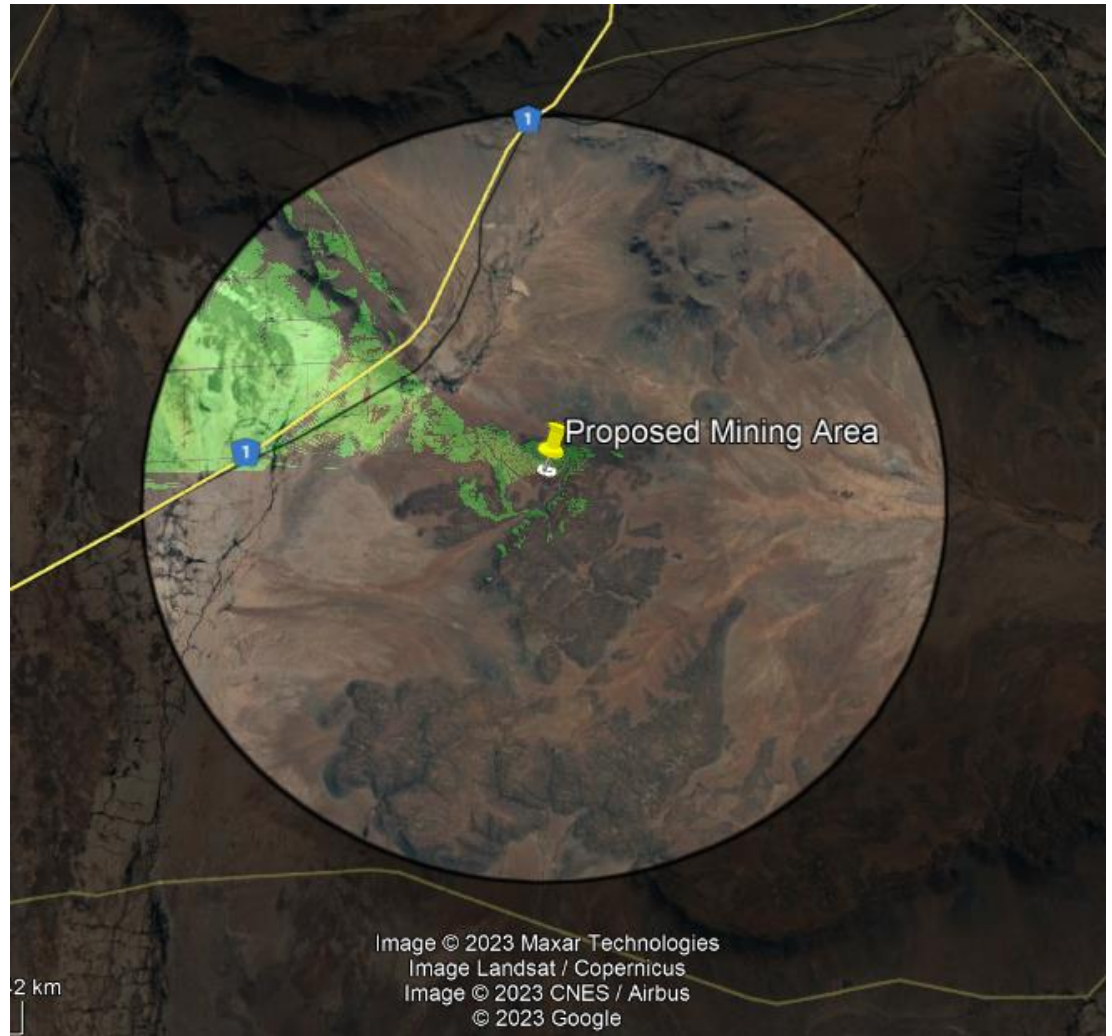


Figure 19: Viewshed of the proposed mining footprint where the green shaded areas show the positions from where the mining area (Proposed mining area) will be visible. (Image obtained from Google Earth).

SITE SPECIFIC AIR AND NOISE QUALITY

The residential dwellings nearest to the proposed footprint is approximately +/-3.5 km away (north). 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 geology of the study area comprises primitive, skeletal soils in rocky areas developing over sedimentary rocks such as mudstones and arenites of the Adelaide Subgroup of the Karoo Supergroup and to a lesser extent also the Eccu Group (Waterford and Volksrust Formations) as well as Jurassic sand sills and dykes and subsummit positions of mesas and butts with sand boulder slopes. Almost entirely lb land type.

According to the Agriculture Assessment Report (Appendix M), the proposed mining will not have an unacceptable negative impact on the agricultural production capability of the site. This is because the site has low pre-mining cropping potential anyway and retention of sufficient topsoil will retain the existing agricultural potential of the site. Mining with well managed and effectively implemented rehabilitation will therefore have an impact of low significance on agricultural resources.

The conclusion of this assessment on the acceptability of the proposed development and the recommendation for its approval is subject to the following conditions:

Mine management must be held accountable for well managed and effective implementation of all the recommended rehabilitation steps above. The specific,

measurable rehabilitation outcomes against which the effectiveness of completed rehabilitation must be measured are:

- that the topography and surface has been sufficiently smoothed without steep excavation edges;
- that topsoil has been spread on the surface;
- that there is a potential rooting depth of at least 30 cm of soil that is suitable for root growth above any existing depth limitation, across the entire mining area;
- that there is no visible erosion across the area, or down-slope of it as a result of mining, and that no part of the area has been left unacceptably vulnerable to erosion;
- that soil conditions are suitable for natural revegetation to take place.

Therefore, from an agricultural impact point of view, it is recommended that the development be approved.

SITE SPECIFIC HYDROLOGY

As per the Aquatic Biodiversity Specialist Assessment conducted by the Biodiversity Company (Pty) Ltd, a single wet season survey was conducted on the 7th of March 2023 for the proposed project. The drainage lines and Platdoring River was dry although this was a wet season survey. The project area is situated in the L11F quaternary catchment and is in proximity of the Platdoring River and its unnamed tributary. The Platdoring River flows in a southerly direction into the Sout River. The project area falls within the L11F-07164-Platdoring Sub-Quaternary Reach (SQR) and the Great Karoo Level 1 Ecoregion. The project area is located within the Mzimvubu-Tsitsikama WMA. Temperature for the region ranges from average lows of 4°C during winter periods (April – August) and average highs of 29°C during the summer periods (September-March). Rainfall patterns indicate a mean annual precipitation of 210 mm, with summer and winter rainfall, and peak rainfall periods occurring between December and March. The study area is situated within two biomes: Azonal Vegetation and Nama Karoo Biome and situated in both the Gamka Karoo and the Southern Karoo Riviere vegetation types. The L11F-07164 SQR is derived to be moderately modified, category C. The moderately modified state of the reach was due to small impacts on riparian and wetland zone continuity and modification, moderate impacts on instream habitat continuity, potential impacts on physico-chemical conditions (water quality), and flow modification. The results of the IHIA for the Platdoring River and its tributaries indicated moderately modified instream and riparian conditions. Instream habitat was considered largely intact; however, several impacts were observed on site and from aerial imagery.

The National Web-based Environmental Screening Tool has characterized the aquatic sensitivity of the project area (mining area) as “Low”, whilst “Very High” for the access route to the mining area. The desktop assessment and site visit agreed with both of these ratings. The reach (Platdoring River) is susceptible to further impacts, particularly on water quality and physical disturbances to instream and riparian habitat. The proposed activities pose low to moderate risks during the construction, operational and decommissioning phases. Moderate risks are associated with the activities proximate to the watercourse, including the drainage patterns change due to road extent and crossings, clearing of riparian (and terrestrial) vegetation, stormwater management, excavation of riparian area, bed and/or banks, operation of heavy machinery adjacent/within the watercourse, alien vegetation encroachment, conducting road and crossings maintenance, sedimentation and erosion, and hydrocarbon contamination.

Due to the presence of existing roads and crossings, the implementation of mitigation measures will reduce the risks/impacts of Moderate-risk activities to Low if done effectively. If not done effectively, the construction will not reduce the risks of aspects/activities such as clearing riparian areas, deep excavation when mining, drainage patterns change due to road extent and crossings, dust precipitation (from backfilling), change in topography (from backfilling), dust precipitation (from shaping/contouring), change in topography (from shaping/contouring) and surface structures as well as stormwater, as these activities will result in direct loss of riparian vegetation, channel-, bed- and bank modification, and have a direct impact on the rivers and riparian areas.

Impact Statement

An impact statement is required as per the NEMA regulations with regards to the proposed development.

Based on desktop and survey findings in this report the specialist agrees with the “Low” rating for the mining area and the “Very High” for the access route to the mining area aquatic theme sensitivity as per the National Web based Environmental Screening Tool. This is attributed to:

- The project area is not located within a SWSA for surface water.
- The project footprint overlaps only with Western Cape ESA1 and Other Natural Areas.
- There is no FEPA river and FEPA area within the project area. However, the project area (proposed access road) is in proximity to an unclassified NFEPA wetland.

- The project area is located along a Least Threatened and Poorly Protected watercourse (Platdoring River).
- No protected areas detected within the project area or immediate downstream reaches. The Steenbokkie Private Nature Reserve is approximately 15 km downstream of the project area.

The proposed activities pose low to moderate risks during the construction, operational and decommissioning phases. However, all moderate risks can be reduced to low with the application of adequate mitigation measures and recommendations ascribed in this report. It is therefore the specialist's opinion that the project may continue as proposed and as the proposed access road will cross the Platdoring River and several drainage lines, to which a General Authorisation was obtained in 2024 for the adjacent dolerite Mine that uses the same access road.

SITE SPECIFIC MINING AND BIODIVERSITY CONSERVATION AREAS

As was already indicated, the mining footprint falls over an area with a moderate relevance for biodiversity and a corresponding grade of moderate risk for mining when it is overlaid over the Mining and Biodiversity Map. Areas of intermediate risk biodiversity importance are listed as follows in the Mining and Biodiversity Guidelines: *“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.

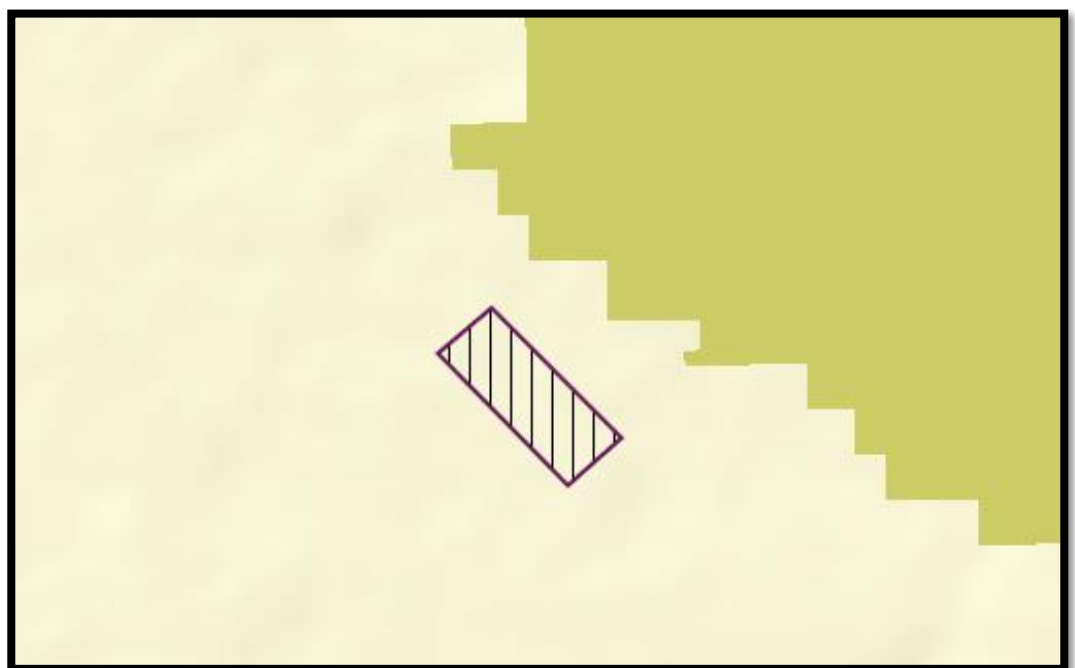


Figure 20: The Mining and Biodiversity importance map with the proposed mining footprint indicated by the blue dot. Light brown – moderate biodiversity importance, moderate risk for mining, light brown – moderate biodiversity Importance, moderate risk for mining (image obtained from the BGIS Map Viewer – Mining Guidelines).

SITE SPECIFIC GROUNDCOVER

According to the botanical assessment report conducted by Ecofloristix (Pty) Ltd, dated March 2023 attached as appendix M2, it is highly unlikely that this development will have an impact on ecosystem status or nationally listed vegetation types due to the limited extent of the mine, as well as the large 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, provided that the mitigation measures given that in the Biodiversity Assessment report (Appendix M2) is closely followed. In support of the report a motivation letter is also included in (Appendix M2)

In terms of local plant species levels, the site is not exceptional rich in species and therefore not highly sensitive in this regard. Moreover, no SCC or range restricted species are present within the study area. The extensive nature of the study area vegetation and plant community types within the wider landscape means that all species within the study area will highly likely also be found in the surrounding areas. Thus, given that the majority of impacts associated with the proposed activities are likely to be local in nature and not of wider significance, loss of particular species within the study area will not be problematic.

Five provincially protected species were found in the study area (but only in low numbers), as well in the surrounding areas. None of them are SCC and their loss from the study area will not be significant and will not 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 construction and operational phases are likely to be relatively high (medium after mitigation), and are somewhat difficult to mitigate given the destructive nature of the proposed activities. However, given the large extent of the affected vegetation and plant community types, and given the small footprint of the mining area, the impact on the vegetation is likely to be of locally high intensity but not broadly significant. Potential cumulative impacts are also furthermore regarded limited and of low to moderate significance.

The proposed study area is well positioned to mostly avoid highly sensitive receptors and the proposed activities will not severely compromise the survival and continued

persistence any specific plant or animal species within the study area and surrounds if mitigation measures are fully implemented.

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 is located on a property with diversified agricultural and game farming activities, comprising a partial game farm, olive farming, and sheep farming,, 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. A 25 m buffer has been applied to the proposed access roads whereas a 100m buffer was placed on the proposed development area and is collectively referred to as the Project Area of Influence (PAOI) from hereon.

The proposed development involves the construction of access roads and a sand mining area covering approximately 5 hectares. The access roads will utilize existing, already disturbed routes, resulting in minimal anticipated impact. The sand mining area overlaps with Medium SEI zones concerning the PAOI, due to the potential presence of SCC, although it is unlikely to serve as a significant habitat for these species. The impacts have been evaluated and mitigated.

The main anticipated impacts of the project include habitat loss and the migration of fauna. Based on the information provided, there are no apparent critical issues with the proposed project. The specialist believes the project can be approved, if all recommended mitigation measures are implemented, no significant negative impacts on the Faunal component are expected.

SITE SPECIFIC CULTURAL AND HERITAGE ENVIRONMENT

According to the Notice of Intent to Develop conducted by ASHA Consulting (Pty) Ltd, a few CRM surveys have occurred close by with the most relevant being for a sand

mine access road immediately over the N1 from Rhenosterkop and the widening of the N1 through Courlandskloof just to the northeast (Orton 2010; the sand mine itself has apparently been surveyed and permitted but no documentation of this is known and none could be sourced from the developer at the time of the road application), and a second sand mine just further north (Gribble 2020).

These projects showed that scatters of LSA and MSA stone artefacts occur in places and rock engravings including both animals and scratching/rubbing occur in the area. Some engravings of high significance occur very close to the Renosterkop Sand mine but do not seem to be under threat yet. A stone-walled kraal is also on record north of the N1. Historical structures, artefacts scatters and aspects of the historical nineteenth century Cape Town to Kimberley railway (which broadly follows the N1) were also recorded. The latter include cast iron and stone bridge and also an Anglo-Boer War blockhouse built at the bridge to guard it during the war.

Around Nelspoort, to the northeast of the study area, there are a number of rock engravings and some rock gongs that are quite well-known (Parkington et al. 2008).

More broadly, most Karoo farms include historical structures and graves and the kinds of archaeology noted above are expected to be widespread. Rock paintings are also known from the Karoo, but not from anywhere close to the study area. The only impact anticipated is to LSA scratched engravings on the sand rocks of the study area. While these “motifs” are poorly understood and might have once had significance beyond that which we might understand, they are also very common. A photographic record has been made of those in the study area and further work on this small sample is unlikely to accomplish anything further.

Should the Applicant implement the mitigation measures proposed in the EMP the impact of the proposed activity on the surrounding area in general is deemed to be of low significance. In light of this, a Heritage Impact Assessment was not deemed necessary by the heritage specialist.

An application for Notice of Intend to Develop (NID) was submitted to the Department of Heritage and Western Cape (HWC) on the 29th of April 2025.

SITE SPECIFIC INFRASTRUCTURE

Apart from the Eskom power line approximately $\pm 350\text{m}$ from the mining permit area, no other infrastructure has been established on the property that can be affected by the proposed development.

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.

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		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: None				
2	2	1	1.6	5	5	5	8				

Loss of agricultural land for duration of mining

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: None				
2	4	1	2.3	3	3	3	6.9				

Visual intrusion as a result of site establishment

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: None				
2	2	1	1.6	4	3	3.5	5.6				

Potential impact on fauna within the footprint area

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	4	1	2.3	2	2	2	4.6				

Potential impact on vegetation and listed and/or protected plant species

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	2	1	1.6	4	3	3.5	5.6				

Dust nuisance due to site establishment

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	4	1	2.6	4	3	3.5	9.1				

Potential impact on archaeological artefacts

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				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		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: N/A				
4	4	5	4.6	5	5	5	23				

CONSTRUCTION OF SITE ACCESS ROAD:

Visual intrusion caused by construction of site access road

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: None				
3	3	1	2.3	4	2	3	6.9				

Loss of stockpiled topsoil during construction of access road

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: None				
3	4	1	2.6	4	3	3.5	9.1				

Dust nuisance as a result of the construction of access road

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				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		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	3	2	2.3	4	4	4	9.2				

Destruction of drainage lines

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
4	5	2	3.6	5	5	5	18				

Potential erosion of denuded areas

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				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		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	3	1	2.3	4	4	4	9.2				

STRIPPING AND STOCKPILING OF TOPSOIL AND/OR OVERBURDEN:

Visual intrusion caused by mining activities.

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: None				
3	3	1	2.3	4	4	4	9.2				

Loss of stockpiled topsoil during mining and stockpiling

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				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		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				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		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	3	2	2.3	4	4	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		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	3	1	2.3	4	2	3	6.9				

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

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				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		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	3	1	2.3	4	2	3	6.9				

Loss of stockpiled material due to ineffective storm water control

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				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		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	3	1	2.3	4	4	4	9.2				

EXCAVATION LOADING AND HAULING TO THE SCREENING PLANT.

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

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: None				
3	3	1	2.3	4	2	3	6.9				

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

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	3	1	2.3	4	4	4	9.2				

Noise nuisance as a result of the mining activities

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	3	1	2.3	4	2	3	6.9				

Unsafe working environment for employees

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	3	1	2.3	4	4	4	9.2				

Soil contamination from hydrocarbon spills and/or littering

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				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		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	4	1	2.3	2	2	2	4.6				

Facilitation of erosion due to mining activities

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
3	3	1	2.3	4	2	3	1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	3	1	2.3	4	2	3	6.9				

PROCESSING, STOCKPILING AND TRANSPORTING OF MATERIAL:

Dust nuisance generated at the processing plant

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
3	3	1	2.3	4	2	3	1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	3	1	2.3	4	2	3	6.9				

Noise nuisance stemming from operation of the processing plant

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
3	3	1	2.3	4	2	3	1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	3	1	2.3	4	2	3	6.9				

Visual intrusion as a result of operation of the processing plant

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
3	3	1	2.3	4	2	3	1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	3	1	2.3	4	2	3	6.9				

Potential contamination of environment due to improper waste management

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
3	3	1	2.3	4	4	4	1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	3	1	2.3	4	4	4	9.2				

Overloading of trucks impacting road infrastructure

								Significance			
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			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	4	1	2.6	4	4	4	10.4				

Degradation of the access road

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				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		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Partial				
2	2	1	1.6	4	3	3.5	5.6				

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		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Partial				
3	3	1	2.3	4	4	4	9.2				

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

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: None				
3	4	1	2.6	4	4	4	10.4				

SLOPING AND LANDSCAPING DURING REHABILITATION:

Safety risk posed by un-sloped areas

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				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		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				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		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	4	1	2.6	4	4	4	10.4				

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

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	4	1	2.6	4	4	4	10.4				

Return of the mining area to landscape feature upon closure (Positive Impact)

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				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:

$$\text{Environmental Significance} = \text{Overall Consequence} \times \text{Overall Likelihood}$$

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 11: 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 12: 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 13: 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 14: 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 15: 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 16: 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 17: 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 18: 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 19: 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 or 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. Considering 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 sand mining area can be moved to various

alternative sites within 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 inactive area. Considering 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/inactive area of the farm with very low agricultural potential due to the rocky surface, after consultation with the landowner 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 landowner. This was deemed the only site alternative as this is the only area that will be viable for the applicant due the presence of the sand reserve and was positioned to avoid crossing nearby drainage lines.
- Access to the proposed mining area is possible via the existing farm road (turning right from the N1) to reach the mining area. ±30 km North of Beaufort West, Using the N1, head north for approximately 30km. The entrance to the proposed mining area is found on the right side of the road.
- The quality of the sand 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 its previous state 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 vegetation and listed and/or protected plant species
- Dust nuisance due to site establishment
- Potential impact on archaeological artefacts;

Construction of Site Access Road

- Visual intrusion caused by construction of site access road
- Loss of stockpiled topsoil during construction of access road;
- Dust nuisance as a result of the construction of access road;
- Noise nuisance generated by earthmoving machinery;

- Intersection/ destruction of drainage lines;
- Potential erosion of denuded areas;
- Potential contamination of footprint area and surface runoff as a result of hydrocarbon spillages;

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;
- Loss of stockpiled material due to ineffective storm water control;
- Potential contamination of footprint area and surface runoff as a result of hydrocarbon spillages;

Excavation, loading and hauling to the screening plant:

- Visual intrusion as a result of excavation and from loading and vehicles transporting the material
- 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;
- Visual intrusion because of 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;
- 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
- 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.
- 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, 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.
- If necessary, the area can be fertilized to hasten the establishment of flora. Should the site's natural vegetation not grow back within six months of its closure to spread the naturally existent flora in the area, the site could be seeded with a local or adapted indigenous seed mix. This area is seen to have low agricultural potential due to the rocky surface therefore the use of seed mixes should only be done after consultation with a qualified specialist with experience in the area as it might not apply.
- 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 always kept in good condition.
- 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 practise mitigation measures be implemented to ensure that particulate emissions, and their consequent impact on the receiving environment, is minimised and that off-site pollutant concentrations and dust fallout is compliant with the South African National Ambient Air Quality Standards (Gazette 32816, 24 December 2009) and the National Dust Control Regulations (Gazette 36974, 1 November 2013).
- A complaints register will be kept on-site and all interested and affected parties, including nearby residents but also personnel, may report any air quality related issued, no matter how trivial.
- 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).
- 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 at all possible, the generators must be placed as far away from the nearby land users as practicable, on the western portion of the mining area (S1). Also, to reduce vibration noise, all generators must be set up on a level surface or footing.
- Best practice measures shall be implemented 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 must be stripped and stockpiled separately during site preparation and replaced over disturbed areas on completion.
- Topsoil stripping, stockpiling, and re-spreading must be done in a systematic way. The mining plan must 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 and inactive 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.

- The rehabilitated area must be monitored for erosion, and appropriately stabilized if any erosion occurs for at least 12 months after reinstatement.
- Revegetation should occur naturally where topsoils were not severely altered.

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.
- Practical phased development and vegetation clearing should be practiced so that cleared areas are not left un-vegetated and vulnerable to erosion for extended periods of time.
- Construction of gabions and other stabilization features must be undertaken to prevent erosion, where deemed necessary.
- Soil should be stabilized in the period when it is disturbed until revegetation can take place. This can be done either temporarily or permanently, and can include methods such as using layers of either sterile mulch (that will not drastically alter soil conditions), blankets, wood binders, geo-textiles, artificial turf blankets, mats, or fiber rolls, depending on availability and how appropriate the measures are for the project.
- Runoff water on exposed areas should be controlled, for example with use of sediment traps, articulated concrete blocks, riprap, or geotextiles.
- Site entrances should be stabilized so that sediments are not carried away by the movement of construction vehicles to and from the site. Stabilized construction

entrances can be made, for example, by making use of crushed stone. Care should be taken to remove all foreign debris from the site upon termination of the activities.

- 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 area 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.
- All fuels and chemicals stored or used on site must be contained within fit for purpose containers and stored within designated storage areas. 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.
- The possibility of capturing, treating, and reusing the stormwater on-site should be considered where possible. Water can potentially be reused on-site, which will aid in minimising on-site water demand.
- Stormwater diversion infrastructure must be regularly inspected and suitably maintained.
- The following mitigation measures were provided by the Aquatic Biodiversity Impact Assessment:

- An Ecological Compliance Officer (ECO) that is a competent freshwater ecologist must be appointed to ensure compliance to the mitigation measures listed below;
- The ECO must clarify the sensitive areas with all operational staff, notwithstanding providing overall environmental awareness training of the catchment and general high importance of estuarine environments, as is particularly relevant to this project;
- Sand mining activities must be limited to the proposed sand mine amendment area, with the 12 bounding coordinates demarcated on the ground using wooden poles. The areas outside of the demarcated sand mine amendment area are to be treated as a no-go area for all aspects of the sand mine operation. The non-definitive list, comprises the operation of machinery, vehicles and equipment, construction camps/laydown yards and staff pedestrian movement to name some;
- Sand mining activities must avoid the riparian zones and instream stoney habitat (runs and riffles) as far as possible, considering these habitats provide the greatest refugia (support) to aquatic biota;
- Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation);
- All domestic and general waste that is produced daily must be contained and may not be buried or burned on site. Waste containers must be emptied regularly and removed from site to the nearest official waste disposal site to prevent littering on site;
- Access routes and other infrastructure areas must be rehabilitated
- Measures must be implemented where environmental alterations are made (including at existing structures or activities) to 1) prevent detrimental changes to the breeding, nesting or feeding patterns of aquatic biota, including migratory species (if present), 2) allow for the free up and downstream movement of aquatic biota, including migratory species (if present), and 3) prevent a decline in the composition and diversity of the indigenous and endemic aquatic biota;
- All link roads from the mining area to the main road must be continuously sprayed to suppress dust and prevent the potential smothering of aquatic vegetation in the form of wind-blown dust. Regular compaction and grading of the haul roads to clear accumulation of loose material will further assist to suppress dust.
- Operation of Vehicles, Heavy Machinery and Equipment
- Vehicles, heavy machinery and equipment are only permitted within the no-go areas when being actively operated and otherwise must be stored outside of the no-go areas on level impervious ground. The same applies to the servicing

thereof. This is best practice as it limits their duration within sensitive freshwater areas and thereby minimising impacts. Any activity within an unauthorised area must first seek the prior approval of the ECO, except under emergency procedures;

- The operation activities must be subjected to seasonal restrictions to support aquatic wildlife breeding periods;
- Existing access roads/jeep tracks/haul roads must be used as far as possible to prevent additional disturbance to the riparian zone and overall upgradient catchment. New routes must be carefully planned and advised by the ECO so as to avoid freshwater and generally sensitive habitats as far as feasibly possible. In the event of a new access route traversing a riparian zone, the proponent must investigate using machinery with low ground pressure to minimise soil compaction and damage to riparian vegetation. Tracked vehicles or specialised low-ground-pressure tyres can be used if feasible/available;
- Non mobile machinery must be equipped with attachments like swamp mats or bog mats to distribute weight and minimise disturbance to the watercourse areas;
- Vehicle and heavy machinery must be equipped with drip trays to prevent the spill of hydrocarbons and other contaminants into the environment. An emergency spill remediation response plan must be in place in the event of an unforeseen spill, as affected through the training of operational staff and the acquisition of spill contaminant materials that must be readily available on-site. It is the responsibility of the contractor to immediately action spill cleanups and remove hazardous material off site;
- Operators must be trained in operating machinery in wetland/sensitive environments and be aware of the sensitivity of the area;
- Sensitive areas must be demarcated so as to guide operators, labourers and contractors;
- Use machinery with low ground pressure to minimise soil compaction and damage to wetland/riparian vegetation. Tracked vehicles or specialised low-ground-pressure tyres can be used if feasible/available;
- Implement sediment and erosion control measures such as silt fences, erosion control blankets, or sediment traps to prevent soil runoff into water bodies associated with vehicular movements and disturbed/hardened surfaces;
- Servicing, washing and refuelling of vehicles may not take place within the no-go areas;
- All Hazardous Chemical Substances (HCS) should be stored within suitable secondary containment structure and may not be stored within the watercourses or their buffer zones;

- Develop spill prevention and response plans to address potential leaks or spills of fuels, oils, or other hazardous substances;
- Have spill containment materials readily available on-site and train personnel in proper spill response procedures;
- The contractor is responsible for cleaning up any spillages (e.g. concrete, oil, fuel), immediately;
- Leaking equipment shall be removed from site immediately to facilitate repair;
- Contaminated soils and waste materials must be removed and disposed of in accordance with local regulations and guidelines;
- Properly manage waste generated during operations, including fuel, lubricants, and construction debris, to prevent contamination of the wetland/riparian areas;
- Implement an Incident Register to report any incidents or deviations from the planned operations to the ECO;
- Tarpaulins must be used to cover the loaded material to prevent the spill and spread of sand during transport; and
- Develop a restoration and rehabilitation plan to mitigate any long-term impacts of operating heavy machinery in wetlands and/or riparian areas
- Water Quality Impairment
- All contractors and employees must undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good “housekeeping”;
- Vehicle washing and refuelling must take place outside of the no-go area to avoid the runoff of hydrocarbons and other contaminants into watercourses;
- All chemicals and toxicants must be stored in bunded areas; and
- The contractors used for the project should have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly.
- Erosion and Sedimentation
- All removed soil and material must not be stockpiled within the system. Stockpiling should take place outside of the water resources. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds;
- Install sandbags around soil stockpiles to prevent soils washing into the system;
- Document the soil profile on removal and ensure the soil is backfilled in the same horizon order in which it was removed;
- Ensure that topsoil is appropriately stored and re-applied; and
- Make sure that the soil is backfilled and compacted to appropriate geotechnical specifications for the project area.

- Signs of erosion must be addressed immediately to prevent further erosion of the infrastructure;
- Temporary and permanent erosion control methods may include silt fences, flotation silt curtains, retention basins, detention ponds, interceptor ditches, seeding and sodding, riprap of exposed embankments, erosion mats, and mulching;
- Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil; and
- Landscape and re-vegetate all cleared areas as soon as possible to limit erosion potential.
- Erosion control such as gabions must be established at the access point through the vegetation;
- Temporary storm water management systems must be in place and preferential runoff channels be filled with aggregate and/or logs (branches included) to dissipate flows, limiting erosion and sedimentation; and
- Silt traps and sediment trapping berms must be in place in drainage lines around the stockpile area.
- Vegetation
- An alien invasive plant management plan needs to be compiled and implemented by the ECO prior to the authorisation of the amended sand mine area to control and prevent the spread of invasive alien vegetation due to disturbance of the riparian zone;
- Vegetation must be removed sparingly and must be overseen by an ECO, who must prioritise the removal of alien invasive species over indigenous vegetation; and
- Alien vegetation must be removed to a registered facility as soon as possible and must not be stockpiled, burned or mulched on site, ultimately to prevent the spread of alien invasive vegetation.
- Construction of quarrying
- The following mitigation measures are aimed to conserve watercourses during the construction of the quarry:
 - The extent of the quarry should not differ from the extent of the shapefile shared with the consultants responsible for this assessment;
 - All infrastructure components (i.e., stockpiles, haul roads, buildings etc) associated with the quarry activities must be located within the extent of the quarry area shared with the consultant; and
 - Basic rock cladding must be applied to areas characterised by signs of erosion within and around the relevant watercourses and drainage lines.

- Decommissioning of Quarry
- To ensure that overland flow is not increased during the proposed decommissioning phase of the quarry, the following mitigation measures have been recommended:
- An annual monitoring must be completed for the first three years upon the completion of the decommissioning phase. This must be followed up by a thorough rehabilitation strategy as per the recommendations of these reports; and
- Water quality samples must be taken downstream of the relevant quarry, within the Platdoring River to the east of the quarry and its tributary south of the quarry, to determine potential salinity and heavy metal contamination. Contamination remediation strategies must be recommended if contamination is identified.
- The following recommendations are pertinent to ensure the adequate protection of the freshwater resource:
- A stormwater management plan must be incorporated for the quarry operation (including pollution control facilities, attenuation ponds, separation of clean and dirty water etc.);
- An infrastructure monitoring and service plan must be compiled and implemented during the operational phase. This will include the monitoring all stormwater discharge points, energy dissipation structures, and stability of watercourse banks in the project footprint which must include the river reach below any discharge points.
- It is critical that a competent ECO in the freshwater ecological discipline is appointed to ensure that the mitigation measures as listed in this report, including the sand mining operational conditions that are drafted by the authorities are adequately exercised on the ground;
- An alien invasive plant management plan must be drafted and implemented to prevent the establishment and spread of alien invasive vegetation as a result of site disturbance;
- A rehabilitation plan must be implemented in parallel with the operation of the sand mine, and look to rehabilitate areas in a phased approach as the mining operation moves along the riverbed;
- Water quality in terms of total suspended solids, turbidity, nutrient loading, temperature, dissolved oxygen and Electrical Conductivity must be monitored as part of a monitoring programme to ensure that water quality conditions do not deteriorate during the operation of the sand mine; and
- A sediment flow study must be undertaken to establish sustainable extraction rates that allow natural systems to replenish sand resources over time,

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-construction walk-through should be conducted in the flowering season by a suitably qualified botanist for SCC or protected plant species that will be affected (also to comply with provincial permit conditions), and to develop a more comprehensive plant species list of the area.
- SCC and protected plant species that are listed in schedules 3 and 4 of the Western Cape Nature Conservation Laws Amendment Act, 2000 (Act No. 3 of 2000) may not be picked or removed without the relevant permit from CapeNature. Moreover, it is highly recommended that such species be relocated, via suitable Search and Rescue Procedures, in order to avoid their destruction.
- For threatened species that may not be destroyed, it is recommended that professional search and rescue service providers be used to remove such plants and to use them either for later rehabilitation work or other conservation projects.
- Any individual of an SCC or protected plant species present on site requires a relocation or destruction permit (from CapeNature) to remove or destroy such an individual. High visibility flags must be placed near any threatened/protected plants in order to avoid any damage or destruction to them. If left undisturbed, the sensitivity and importance of these species must be part of the environmental awareness program. When infrastructure, development areas or routes intersect with protected plants, and which cannot be avoided, such plants should be removed from the soil and relocated/re-planted in similar habitats where they should be able to resprout and flourish again. All SCC and protected plant species should be relocated, and as many other geophytic species as possible.
- Permits must be kept on-site and in the possession of the flora search and rescue team at all times.
- A pre-construction environmental induction must be provided for all staff to ensure compliance with basic environmental principles. This includes awareness of no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, and remaining within demarcated construction areas. Bush-clearance may only commence once the recommendations of the specialist (pre-commencement walkthrough) have been implemented.
- Blanket clearing of vegetation must be limited to the proposed footprint and associated infrastructure. No clearing outside of the minimum required footprint to take place.

- 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.
- Clearing of vegetation should be minimized and avoided where possible.
- Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further.
- 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.
- As per the Terrestrial Biodiversity Impact Assessment by Dr. Jan-Hendrik Keet "The plant community type that will be the most affected is the *Ruschia intricata* - *Aristida diffusa* type since it is characterized by unique microhabitat conditions, specifically large sand sheets with very shallow overlying soils. While it might prove very difficult to replicate these exact microhabitat conditions, it is highly probable that this type might be successfully rehabilitated to its closely related counterpart, namely the *Aristida diffusa* - *Aristida congesta* type. This is because the *Ruschia intricata* - *Aristida diffusa* type can be regarded as a subtype of the former, and manifests in the areas where soils become much more shallow than usual. Thus, while the rehabilitation and restoration potential are low for the *Ruschia intricata* - *Aristida diffusa* type, it is indeed moderate to high for the *Aristida diffusa* - *Aristida congesta* type. In this sense, the loss of one plant community type can be mitigated by a gain in another type.
- As per the Terrestrial Biodiversity Report - The impacts on the *Aristida congesta* - *Asparagus burchellii* type are not as high as the aforementioned, since no actual mining will occur in it. Thus, it has a high rehabilitation potential.
- Advised relocation guidelines should be followed to ensure that the majority of the protected plant species found on site are relocated with a high success rate. Only one species, namely *Gomphocarpus tomentosus* subsp. *tomentosus*, may be difficult to relocate, but only if individuals have deep root systems that are difficult to remove without significant damage. Therefor the appropriate relocation measures must be implemented.
- No plant species, whether native or exotic, should be brought into, ore removed from, the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.
- 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.
- Areas that are denuded during construction must be re-vegetated with indigenous vegetation to prevent erosion. This will also reduce the likelihood of encroachment by IAPs.
- Livestock must always be kept out of the project area, especially in areas that have been recently re-vegetated.
- After the operation, rehabilitate an acceptable vegetation layer according to rehabilitation recommendations as provided within a site-specific Rehabilitation Plan compiled by a suitably qualified botanist.
- Revegetation should occur naturally where topsoils were not severely altered.
- A hydrocarbon spill management plan must be implemented. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No servicing of equipment on site unless necessary. Contaminated soils shall be treated in situ or removed and be placed in containers. Appropriately contain any spills in such a way as to prevent them leaking and entering the environment.

Management of Invasive 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.
- Weeds and invasive plants present on the land concerned need to be controlled and removed annually through continuous monitoring and maintenance programs as they can cause damage to the surrounding natural vegetation. According to the Conservation of Agricultural Resources Act, (Act 43 of 1983), Regulation 15E methods of controlling weeds and alien plants are as follows:
 - Uprooting; felling; cutting or burning
 - Treatment with a weed killer that is registered for use in connection with such plants per the directions for the use of such
 - Biological control is carried out per the stipulations of the Agricultural Pests Act, (Act no 36 of 1983)

- Combination of one or more methods mentioned above, and any action taken to control alien plants shall be executed with caution and in a manner that will cause the least possible damage to the environment.
- 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) using an herbicide recommended for use by the PCO in accordance with the directions for the use of such an herbicide.

FAUNA

Protection of Fauna:

- Site access should be controlled, and no unauthorised persons should be allowed onto the site.
- Any fauna directly threatened by the associated activities should be removed to a safe location by a site manager.
- The collection/trapping, hunting, or poisoning of any animals at the site is strictly forbidden. Signs must be put up to enforce this. Personnel should not be allowed to wander off demarcated areas.
- Fires must not be allowed on site.
- All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel, and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.
- All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. All vehicles should adhere to a low-speed limit (40 km/h) to avoid collisions with susceptible species.
- Construction vehicles must be limited to a minimal footprint on site (no movement outside of the earmarked footprint).
- 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.

- Schedule activities and operations during least sensitive periods, to avoid migration, nesting, and breeding seasons.
- Ensure that cables and connections are insulated successfully to reduce electrocution risk.
- Use environmentally friendly chemical products.
- No litter, food or other foreign material may be thrown or left around the site.
- As per Appendix M2, the following mitigation measures were provided:
- Clearly mark construction/mining zones to prevent impact on surrounding areas, using physical barriers like safety tape and signs instead of painted lines. This is especially true for the expected *Chersobius boulengeri* habitat in the surrounding dolerite ridges.
- Prior to vegetation clearing activities, the area to be cleared should be walked on foot by 1-2 individuals to create a disturbance in order for fauna to move off. Disturbance must occur as soon before vegetation clearing as possible and no unnecessary disturbance to the area is permitted
 - Any tortoises present should be removed from the affected areas before the start of site clearing/ construction and relocated them to safe areas with the PAOI.
 - Any fauna threatened by the construction activities should be removed safely by an appropriately qualified environmental officer or removal specialist.
- Schedule activities and operations during least sensitive periods;
 - Construction should take place during the dry season (May -July) as much is feasible, especially considering the fauna and their movement.
 - The known nesting time for *Afrotylus afra* is August-November and *Neotoma ludwigii* is September-February.
 - Driving on access roads at night should be restricted to maximum 20 km/h to reduce or prevent wildlife road mortalities which occur more frequently during this period.
- Roads and road edges should be designed to allow any fauna, especially tortoises to easily move from one side of the road to the other.
- Safely relocate any wildlife at risk from construction activities with the help of a qualified environmental officer or specialist.
- Limit construction vehicle speeds to 40 km/h to prevent accidents and install appropriate speed control measures and signage.

- Wildlife-permeable fencing with holes large enough for mongoose and other smaller mammals should be installed, the holes must not be placed in the fence where it is next to a major road as this will increase road killings in the area.
- Minimize the time between clearing an area and starting development to prevent wildlife from returning to disturbed sites.
- Focus work on one area at a time to reduce the extent of on-site activities, allowing wildlife to relocate as the project progresses. This helps smaller animals find refuge in nearby undisturbed areas.
- Implement noise and light mitigation measures for any nighttime construction activities to minimise disturbances to nocturnal species expected in the area.
- All project activities must be undertaken with appropriate noise mitigation measures to avoid disturbance to avifauna population in the region;
- Provide all personnel and contractors to undergo Environmental Awareness Training to all personnel and contractors. A signed register of attendance must be kept for proof. Discussions The training must include.
 - All personnel should undergo environmental induction with regards to avifauna and in particular awareness about not harming, collecting, or hunting terrestrial species, and owls, which are often persecuted out of superstition. Signs must be put up to enforce this.
- As far as possible power cables within the PAOI should be insulated and preferably buried. All trenching areas must be rehabilitated.
- All infrastructure must be removed if the facility is decommissioned.
- Where possible, instead of clearing the entire area at once, work on specific sections as needed. This approach involves focusing on one area at a time and following a systematic process. By doing so, the amount and scope of on-site activities are minimized, which allows wildlife to gradually relocate as the project advances. This method provides smaller birds, mammals, and reptiles the opportunity to cope with the disturbance by staying in nearby undisturbed areas that are close to their natural habitats.

CULTURAL AND HERITAGE ENVIRONMENT

Archaeological, Heritage and Palaeontological Aspects:

- If any significant archaeological remains are located during this survey which cannot be avoided by, or excluded from the sand mining, they will require mitigation prior to any sand mine-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 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 HWC.
- Work may only continue once the go-ahead was issued by SAHRA.

LAND USE

Loss of agricultural land for duration of mining:

- According to the landowner, the agricultural potential of the study area (S1) is of no significance and therefore he supports the proposed mining operation. The proposed mining area will revert back to its previous state upon closure. The mining area in its original state was deemed with low agricultural potential.

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 and inactive 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.
- A 25 m buffer has been applied to the proposed access roads whereas a 100m buffer was placed on the proposed development area and is collectively referred to as the Project Area of Influence (PAOI) from hereon.
- The following mitigation measures was recommended by the Aquatic Specialist (Appendix M1) for the construction of the access road:

- To minimise the impact on both surface water flow and interflow, portions of the road must include a coarse rock layer that has been specifically incorporated to increase the porosity and permeability of the sub-layers of the road;
- The footprint area of the road should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas;
- All construction activities and access must make use of the existing dirt road;
- Exposed road surfaces awaiting resurfacing must be stabilised to prevent the erosion of these surfaces. Signs of erosion must be addressed immediately to prevent further erosion of the road;
- Silt traps and fences must be placed in the preferential flow paths along the road to prevent sedimentation of the watercourse;
- Temporary storm water channels should be filled with aggregate and/or logs (branches included) to dissipate flows;
- The contractors used for the project should have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly; and
- The design of the road must make allowances for stormwater management.

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 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.
- If a diesel bowser is used on site, it must always be equipped with a drip tray. Drip trays must be used during each 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 always available 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 wastewater and safely dispose thereof must be implemented.
- It is important that any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities is reported to the Department of Water and Sanitation and other relevant authorities.
- 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.
- All tanks for fuel/used oil must have additional containment in the form of an impermeable bund wall and foundation, 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 stored on bare soil. The wastewater 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).

ix) Motivation where no alternative sites were considered.

Site Alternative 2 (S2) was considered for the proposed mining activities but was found to be neither environmentally nor practically suitable. The earmarked area is situated between two drainage lines, and mining in this location would result in the complete destruction of these watercourses. In addition, this site would require the use of an alternative access route, increasing the need for additional infrastructure and associated impacts.

Rehabilitation at this location would also be more complex due to the sites terrain and ecological sensitivity. Preliminary assessments indicate that, while Site Alternative 2 could technically accommodate sand mining the associated environmental impacts area of significantly higher concern. It is believed that the impact associated with this site alternative is of higher significance without the need or motivation justifying it.

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. **Access road** - The Applicant will make use of an existing farm road that will be upgraded and maintained for the duration of the operational phase. This same access road will also be used for the adjacent approved dolerite mine permit (14/2023).
2. **Topography** – The natural topography the proposed excavated area can be described as steep slopes of koppies, butts, mesas and parts of the Great Escarpment covered with large boulders and stones supporting sparse dwarf Karoo scrub with drought-tolerant grasses of genera such as *Aristida*, *Eragrostis* and *Stipagrostis*. The elevation loss from the proposed mining footprint to the town of Beaufort West to be 182 m over 29.4 km.
3. **Visual Characteristics** – The viewshed analysis showed that the visual impact of the proposed sand mining operation will be of low significance. The small scale of the

proposed operation, and the mining area will be beyond the hills / koppies which is not visible from the N1. Should the Applicant successfully rehabilitate the mining area (upon closure), no residual visual impact is expected upon closure of the mine.

4. **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 ambience of the receiving environment is expected to be of low significance and representative of the traffic of the surrounding area.
5. **Hydrology** - The proposed access road intersects with more than 2 drainage lines which necessitates a water use application in terms of Section 21 of the NWA, 1998. This was confirmed by the Risk Matrix Assessment conducted by the Biodiversity Company (Pty) Ltd (please see Appendix M1) . A General Authorisation (please see Appendix Q) was obtained for the adjacent dolerite mine, which is believed to support the current application unless otherwise determined by the Department of Water and Sanitation (DWS). Water required for the implementation of the proposed project will be purchased and transported to the site. An agreement (please see Appendix R) is currently in place with the local municipality for the use of treated sewage water.
6. **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 developing over sedimentary rocks such as mudstones and arenites of the Adelaide Subgroup of the Karoo Supergroup and to a lesser extent also the Eccu Group (Waterford and Volksrust Formations) as well as Jurassic sand sills and dykes and subsummit positions of mesas and butts with sand boulder slopes. Almost entirely lb land type.

According to the Agriculture Assessment Report (Appendix M), the proposed mining will not have an unacceptable negative impact on the agricultural production capability of the site. This is because the site naturally has extremely low agricultural production potential and very little potential is therefore lost due to mining. The conclusion of the assessment on the acceptability of the proposed development and the recommendation for its approval is not subject to any conditions. Therefore, from an agricultural impact point of view, it is recommended that the development be approved.

7. **Mining, Biodiversity and Groundcover** – According to the botanical assessment report conducted by Ecofloristix (Pty) Ltd, dated March 2023 attached as appendix M2, it is highly unlikely that this development will have an impact on ecosystem status or nationally listed

vegetation types due to the limited extent of the mine, as well as the large 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, provided that the mitigation measures given that in the Biodiversity Assessment report (Appendix M2) is closely followed.

In terms of local plant species levels, the site is not exceptional rich in species and therefore not highly sensitive in this regard. Moreover, no SCC or range restricted species are present within the study area. The extensive nature of the study area vegetation and plant community types within the wider landscape means that all species within the study area will highly likely also be found in the surrounding areas. Thus, given that the majority of impacts associated with the proposed activities are likely to be local in nature and not of wider significance, loss of particular species within the study area will not be problematic.

Five provincially protected species were found in the study area (but only in low numbers), as well in the surrounding areas. None of them are SCC and their loss from the study area will not be significant and will not 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 construction and operational phases are likely to be relatively high (medium after mitigation), and are somewhat difficult to mitigate given the destructive nature of the proposed activities. However, given the large extent of the affected vegetation and plant community types, and given the small footprint of the mining area, the impact on the vegetation is likely to be of locally high intensity but not broadly significant. Potential cumulative impacts are also furthermore regarded limited and of low to moderate significance.

The proposed study area is well positioned to mostly avoid highly sensitive receptors and the proposed activities will not severely compromise the survival and continued persistence any specific plant or animal species within the study area and surrounds if mitigation measures are fully implemented.

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 farm road to the mining area. It is proposed that should the Applicant implement the mitigation

measures proposed in the EMP the impact of the proposed activity on the vegetation and groundcover in general is deemed to be of low significance.

8. **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 scarce 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 (<40km/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.
9. **Cultural and Heritage Environment** - According to the Notice of Intent to Develop conducted by Beyond Heritage (Pty) Ltd, a few CRM surveys have occurred close by with the most relevant being for a sand mine access road immediately over the N1 from Renosterkop and the widening of the N1 through Courlandskloof just to the northeast (Orton 2010; the sand mine itself has apparently been surveyed and permitted but no documentation of this is known and none could be sourced from the developer at the time of the road application), and a second sand mine just further north (Gribble 2020).

These projects showed that scatters of LSA and MSA stone artefacts occur in places and rock engravings including both animals and scratching/rubbing occur in the area. Some engravings of high significance occur very close to the Renosterkop Sand mine but do not seem to be under threat yet. A stone-walled kraal is also on record north of the N1. Historical structures, artefacts scatters and aspects of the historical nineteenth century Cape Town to Kimberley railway (which broadly follows the N1) were also recorded. The latter include cast iron and stone bridge and also an Anglo-Boer War blockhouse built at the bridge to guard it during the war. Around Nelspoort, to the northeast of the study area, there are a number of rock engravings and some rock gongs that are quite well-known (Parkington et al. 2008).

More broadly, most Karoo farms include historical structures and graves, and the kinds of archaeology noted above are expected to be widespread. Rock paintings are also known from the Karoo, but not from anywhere close to the study area. The only impact anticipated is to LSA scratched engravings on the sand rocks of the study area. While these “motifs” are poorly understood and might have once had significance beyond that which we might understand, they are also very common. A photographic record has been made of those

in the study area and further work on this small sample is unlikely to accomplish anything further.

Should the Applicant implement the mitigation measures proposed in the EMP the impact of the proposed activity on the surrounding area in general is deemed to be of low significance. In light of this, a Heritage Impact Assessment was not deemed necessary by the heritage specialist.

10. Site Specific Infrastructure – Apart from the Eskom power line approximately $\pm 350\text{m}$ from the mining permit area. No other infrastructure has been established on the property that can be affected by the proposed development.

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.

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		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: None				
2	2	1	1.6	5	5	5	8				

Loss of agricultural land for duration of mining

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: None				
2	4	1	2.3	3	3	3	6.9				

Visual intrusion as a result of site establishment

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: None				
2	2	1	1.6	4	3	3.5	5.6				

Potential impact on fauna within the footprint area

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	4	1	2.3	2	2	2	4.6				

Potential impact on vegetation and listed and/or protected plant species

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	4	1	2.3	2	2	2	4.6				

Dust nuisance due to site establishment

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				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		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				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		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: N/A				
4	4	5	4.6	5	5	5	23				

CONSTRUCTION OF SITE ACCESS ROAD:

Visual intrusion caused by construction of site access road

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: None				
3	3	1	2.3	4	2	3	6.9				

Loss of stockpiled topsoil during construction of access road

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: None				
3	4	1	2.6	4	3	3.5	9.1				

Dust nuisance as a result of the construction of access road

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	4	1	2.3	2	2	2	4.6				

Noise nuisance generated by earthmoving machinery

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	4	1	2.3	2	2	2	4.6				

Destruction of drainage lines

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
4	4	2	3.3	4	5	4.5	14.8				

Potential erosion of denuded areas

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	5	5	4	1	1	1	4				

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

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	4	1	2.3	2	2	2	4.6				

STRIPPING AND STOCKPILING OF TOPSOIL AND/OR OVERBURDEN:

Visual intrusion caused by mining activities.

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: None				
2	2	1	1.6	4	3	3.5	5.6				

Loss of stockpiled topsoil during mining and stockpiling

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	2	1	1.6	4	3	3.5	5.6				

Dust nuisance as a result of the disturbance of soil

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	4	1	2.3	2	2	2	4.6				

Noise nuisance generated by earthmoving machinery

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	4	1	2.3	2	2	2	4.6				

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

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	2	2	2	2	2	2	4				

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

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	2	2	2	2	2	2	4				

Potential erosion of denuded areas

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	4	1	2.3	2	2	2	4.6				

Loss of stockpiled material due to ineffective storm water control

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				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		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	4	1	2.3	2	2	2	4.6				

EXCAVATION, LOADING AND HAULING TO THE SCREENING PLANT

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

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: None				
3	3	1	2.3	4	2	3	6.9				

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

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	4	1	2.3	2	2	2	4.6				

Noise nuisance as a result of the mining activities

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	4	1	2.3	2	2	2	4.6				

Unsafe working environment for employees

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	3	1	2.3	4	2	3	6.9				

Soil contamination from hydrocarbon spills and/or littering

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	2	1	1.6	3	3	3	5				

Potential impact on areas of palaeontological concern

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	4	1	2.3	2	2	2	4.6				

Facilitation of erosion due to mining activities

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
1 - 4.9							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	4	1	2.3	2	2	2	4.6				

PROCESSING, STOCKPILING AND TRANSPORTING OF MATERIAL:

Dust nuisance generated at the processing plant

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
1 - 4.9							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	2	1	1.6	2	2	2	3.2				

Noise nuisance stemming from operation of the processing plant

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
1 - 4.9							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	2	1	1.6	2	2	2	3.2				

Visual intrusion as a result of operation of the processing plant

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
1 - 4.9							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	3	1	2.3	4	2	3	6.9				

Potential contamination of environment due to improper waste management

			Consequence			Likelihood	Significance				
Severity	Duration	Extent		Probability	Frequency		Low	Low-Medium	Medium	Medium-High	High
1 - 4.9							1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
2	4	1	2.3	2	2	2	4.6				

Overloading of trucks impacting road infrastructure

			Consequence			Likelihood	Significance				
							Low	Low-Medium	Medium	Medium-High	High
Severity	Duration	Extent		Probability	Frequency		1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1			Degree of Mitigation: Full					
3	3	1	2.3	4	4	4	9.2				

Degradation of the access road

			Consequence			Likelihood	Significance				
							Low	Low-Medium	Medium	Medium-High	High
Severity	Duration	Extent		Probability	Frequency		1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1			Degree of Mitigation: Full					
3	3	1	2.3	4	4	4	9.2				

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				
							Low	Low-Medium	Medium	Medium-High	High
Severity	Duration	Extent		Probability	Frequency		1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1			Degree of Mitigation: Partial					
2	2	1	1.6	4	3	3.5	5.6				

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				
							Low	Low-Medium	Medium	Medium-High	High
Severity	Duration	Extent		Probability	Frequency		1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1			Degree of Mitigation: Partial					
3	3	1	2.3	4	4	4	9.2				

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

			Consequence			Likelihood	Significance				
							Low	Low-Medium	Medium	Medium-High	High
Severity	Duration	Extent		Probability	Frequency		1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1			Degree of Mitigation: None					

2	2	1	1.6	4	3	3.5	5.6
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SLOPING AND LANDSCAPING DURING REHABILITATION:

Safety risk posed by un-sloped areas

			Consequence			Likelihood	Significance				
Severity	Duration	Extent					Low	Low-Medium	Medium	Medium-High	High
				Probability	Frequency		1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	3	1	2.3	4	4	4	9.2				

Erosion of returned topsoil after rehabilitation

			Consequence			Likelihood	Significance				
Severity	Duration	Extent					Low	Low-Medium	Medium	Medium-High	High
				Probability	Frequency		1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	3	1	2.3	4	4	4	9.2				

Infestation of the reinstated areas by weeds and invader plant species

			Consequence			Likelihood	Significance				
Severity	Duration	Extent					Low	Low-Medium	Medium	Medium-High	High
				Probability	Frequency		1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	3	1	2.3	4	4	4	9.2				

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

			Consequence			Likelihood	Significance				
Severity	Duration	Extent					Low	Low-Medium	Medium	Medium-High	High
				Probability	Frequency		1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout Alternative 1				Degree of Mitigation: Full				
3	3	1	2.3	4	4	4	9.2				

Return of the mining area to landscape feature upon closure (Positive Impact)

			Consequence			Likelihood	Significance				
Severity	Duration	Extent					Low	Low-Medium	Medium	Medium-High	High
				Probability	Frequency		1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25
Rating: Medium			Site Layout 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 20: Assessment of each identified potentially significant impact and risk

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
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.)	(E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, air pollution, etc...etc...etc.)		In which impact is anticipated. (E.g. Construction, commissioning, operational Decommissioning closure, post closure.)	If not mitigated.	(modify, remedy, control, or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc etc) E.g. Modify through alternative method Control through noise control Control through management and monitoring through rehabilitation.	If mitigated.
<ul style="list-style-type: none"> Demarcation of site with visible beacons. 	<ul style="list-style-type: none"> No impact could be identified other than the beacons being outside the boundaries of the approved mining area. 	N/A	Site Establishment & Operational Phase	<ul style="list-style-type: none"> N/A 	Control through management and monitoring.	<ul style="list-style-type: none"> N/A
<ul style="list-style-type: none"> Site establishment and infrastructure development. 	<ul style="list-style-type: none"> Alteration of the agricultural sense of place. 	The impact may affect the agricultural opportunities of the property.	Site Establishment- and Decommissioning phase	<ul style="list-style-type: none"> Low-Medium 	<u>Control & Remedy:</u> Proper housekeeping and storm water management.	<ul style="list-style-type: none"> Low-Medium
<ul style="list-style-type: none"> Site establishment and infrastructure development. 	<ul style="list-style-type: none"> Loss of agricultural land for duration of mining. 	The impact may affect the agricultural	Site Establishment-, Operational- and	<ul style="list-style-type: none"> Low-Medium 	<u>Control:</u> Implementing soil- and storm water management.	<ul style="list-style-type: none"> Low-Medium

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
		opportunities of the property.	Decommissioning phase			
<ul style="list-style-type: none"> Site establishment and infrastructure development. Stripping and stockpiling of topsoil and overburden. 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Low-Medium 	<u>Control & Stop:</u> Implementing good management practices.	<ul style="list-style-type: none"> Low-Medium
<ul style="list-style-type: none"> Site establishment and infrastructure development. 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Low-Medium 	<u>Control:</u> Noise suppression methods and proper housekeeping.	<ul style="list-style-type: none"> Low
<ul style="list-style-type: none"> Site establishment and infrastructure development. Stripping and stockpiling of topsoil and overburden. 	<ul style="list-style-type: none"> Potential impact on fauna within the footprint area. Potential impact on local fauna due to disturbance and loss of available habitat. 	This will impact on the biodiversity of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	<ul style="list-style-type: none"> Low Low-Medium 	<u>Control & Remedy:</u> Proper housekeeping and implementation of an emergency response plan and waste management plan.	<ul style="list-style-type: none"> Low Low
<ul style="list-style-type: none"> Site establishment and infrastructure development Stripping and stockpiling of topsoil and overburden. 	<ul style="list-style-type: none"> Dust nuisance due to site establishment 	This will impact on the biodiversity of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	<ul style="list-style-type: none"> Low - Medium 	<u>Control & Remedy:</u> Proper housekeeping and implementation of an emergency response plan and waste management plan.	<ul style="list-style-type: none"> Low-Medium
	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Low - Medium 	<u>Control & Remedy:</u> Proper housekeeping and implementation of an emergency response plan and waste management plan.	<ul style="list-style-type: none"> Low-Medium

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
<ul style="list-style-type: none"> Excavation, Loading and Hauling to the screening plant 	<ul style="list-style-type: none"> Unsafe working environment for employees 	This will impact on the biodiversity of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	<ul style="list-style-type: none"> Low - Medium 	<u>Control & Remedy:</u> Proper housekeeping and implementation of an emergency response plan and waste management plan.	<ul style="list-style-type: none"> Low - medium
	<ul style="list-style-type: none"> Soil contamination from hydrocarbon spills and/or littering 	This will impact on the biodiversity of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	<ul style="list-style-type: none"> Medium 	<u>Control & Remedy:</u> Proper housekeeping and implementation of an emergency response plan and waste management plan.	<ul style="list-style-type: none"> Low - Medium
<ul style="list-style-type: none"> Site establishment and infrastructure development. Excavation, loading and hauling to the screening plant. 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Low Low 	<u>Control & Stop:</u> Implementing good management practices, as well as the chance-find protocol.	<ul style="list-style-type: none"> Low Low
<ul style="list-style-type: none"> Construction of Access Road 	<ul style="list-style-type: none"> Visual intrusion caused by construction of site access road 	The visual impact may affect the aesthetics of the landscape.	Site establishment phase	<ul style="list-style-type: none"> Low-Medium 	<u>Control & Stop:</u> Implementing good management practices, as well as the chance-find protocol	<ul style="list-style-type: none"> Low-Medium
	<ul style="list-style-type: none"> Destruction of drainage lines 	The visual impact may affect the aesthetics of the landscape.	Site establishment phase	<ul style="list-style-type: none"> High- Medium 	<u>Control & Stop:</u> Implementing good management practices, as well as the chance-find protocol	<ul style="list-style-type: none"> Medium
	<ul style="list-style-type: none"> Loss of stockpiled topsoil during construction of access road 	This will impact on the biodiversity of the receiving environment.	Site establishment phase	<ul style="list-style-type: none"> Low-Medium 	<u>Control & Stop:</u> Implementing good management practices, as well as the chance-find protocol	<ul style="list-style-type: none"> Low – Medium

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
	<ul style="list-style-type: none"> Dust nuisance as a result of the construction of access road 	This will impact on the biodiversity of the receiving environment.	Site establishment phase	<ul style="list-style-type: none"> Low-Medium 	<u>Control & Stop:</u> Implementing good management practices, as well as the chance-find protocol	<ul style="list-style-type: none"> Low
	<ul style="list-style-type: none"> Noise nuisance generated by earthmoving machinery 	This will impact on the biodiversity of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	<ul style="list-style-type: none"> Low-Medium 	<u>Control & Stop:</u> Implementing good management practices, as well as the chance-find protocol	<ul style="list-style-type: none"> Low
	<ul style="list-style-type: none"> Potential erosion of denuded areas 	This will impact on the biodiversity of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	<ul style="list-style-type: none"> Low-Medium 	<u>Control & Stop:</u> Implementing good management practices, as well as the chance-find protocol	<ul style="list-style-type: none"> Low
	<ul style="list-style-type: none"> Potential contamination of footprint area and surface runoff as a result of hydrocarbon spillages 	This will impact on the biodiversity of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	<ul style="list-style-type: none"> Low-Medium 	<u>Control & Stop:</u> Implementing good management practices, as well as the chance-find protocol	<ul style="list-style-type: none"> Low
<ul style="list-style-type: none"> Site establishment and infrastructure development. 	<ul style="list-style-type: none"> New job opportunities as a result of the mining operation (+) 	Contribution to the socio-economic status of the area.	Operational Phase	<ul style="list-style-type: none"> Medium-High 	<u>Control:</u> Proper site management.	<ul style="list-style-type: none"> Medium-High
<ul style="list-style-type: none"> Processing, Stockpiling and transporting of material 	<ul style="list-style-type: none"> Dust nuisance generated at the processing plant 	This will impact on the biodiversity of the receiving environment	Operational Phase	<ul style="list-style-type: none"> Low - Medium 	<u>Control & Remedy:</u> Proper housekeeping and implementation of an emergency response plan and waste management plan and Proper site management.	<ul style="list-style-type: none"> Low
	<ul style="list-style-type: none"> Noise nuisance stemming from operation of the processing plant 	This will impact on the biodiversity of the receiving environment	Operational Phase	<ul style="list-style-type: none"> Low - Medium 	<u>Control & Remedy:</u> Proper housekeeping and implementation of an emergency response plan and	<ul style="list-style-type: none"> Low

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
					waste management plan and Proper site management.	
	<ul style="list-style-type: none"> Potential contamination of environment due to improper waste management 	This will impact on the biodiversity of the receiving environment	Operational Phase	<ul style="list-style-type: none"> Low - Medium 	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan and Proper site management.	<ul style="list-style-type: none"> Low
	<ul style="list-style-type: none"> Overloading of trucks impacting road infrastructure 	This will impact on the biodiversity of the receiving environment	Operational Phase	<ul style="list-style-type: none"> Medium 	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan and Proper site management.	<ul style="list-style-type: none"> Low-Medium
	<ul style="list-style-type: none"> Degradation of the access road 	This will impact on the biodiversity of the receiving environment	Operational Phase	<ul style="list-style-type: none"> Medium 	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan and Proper site management.	<ul style="list-style-type: none"> Low-Medium
<ul style="list-style-type: none"> Sloping and during landscaping rehabilitation 	<ul style="list-style-type: none"> Safety risk posed by un-sloped areas 	This will impact on the biodiversity of the receiving environment	Decommissioning Phase	<ul style="list-style-type: none"> Low - Medium 	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan and Proper site management.	<ul style="list-style-type: none"> Low
	<ul style="list-style-type: none"> Erosion of returned topsoil after rehabilitation 	This will impact on the biodiversity of the receiving environment	Decommissioning Phase	<ul style="list-style-type: none"> Low - Medium 	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan and Proper site management	<ul style="list-style-type: none"> Low
	<ul style="list-style-type: none"> Infestation of the reinstated areas by weeds and invader plant species 	This will impact on the biodiversity of the receiving environment	Decommissioning Phase	<ul style="list-style-type: none"> Low - Medium 	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and	<ul style="list-style-type: none"> Low

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
					waste management plan and Proper site management	
	<ul style="list-style-type: none"> Potential impact associated with litter/waste left at the mining area 	This will impact on the biodiversity of the receiving environment	Decommissioning Phase	<ul style="list-style-type: none"> Low - Medium 	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan and Proper site management	<ul style="list-style-type: none"> Low
<ul style="list-style-type: none"> Cumulative Impacts 	<ul style="list-style-type: none"> 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. 	This will impact on the biodiversity of the receiving environment	Site Establishment-, Operational-, and Decommissioning Phase	<ul style="list-style-type: none"> Low - Medium 	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan and Proper site management	<ul style="list-style-type: none"> Low - Medium
	<ul style="list-style-type: none"> 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. 	This will impact on the biodiversity of the receiving environment	Site Establishment-, Operational-, and Decommissioning Phase	<ul style="list-style-type: none"> Low - Medium 	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan and Proper site management	<ul style="list-style-type: none"> Low - Medium
	<ul style="list-style-type: none"> Impact on existing infrastructure as a direct result of the mining operation 	This will impact on the biodiversity of the receiving environment	Site Establishment-, Operational-, and Decommissioning Phase	<ul style="list-style-type: none"> Medium 	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan and Proper site management	<ul style="list-style-type: none"> Low - Medium

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

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 21: 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
<p>The screening report for an environmental authorisation, as required in terms of the 2014 NEMA EIA Regulations on a portion of the remaining portion of the Farm Rhenosterkop no. 155, Registration Division of Beaufort West, Western Cape Province, identified the following list of specialist assessments for inclusion in the assessment report:</p> <ul style="list-style-type: none"> • Agricultural Impact Assessment; • Archaeological and Cultural Heritage Impact Assessment; • Paleontology Impact Assessment; • Terrestrial Biodiversity Impact Assessment; • Aquatic Biodiversity Impact Assessment; • Hydrology Assessment; • Noise Impact Assessment; • Radioactivity Impact Assessment; • Traffic Impact Assessment; • Geotechnical Assessment; • Socio-economic Assessment; 			

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<ul style="list-style-type: none"> Plant Species Assessment; Animal Species Assessment. Civil Aviation Assessment <p>CZ Sand Mine (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:</p> <ul style="list-style-type: none"> Agricultural Impact Assessment (AIA): <p>The portion of the remaining portion of the Farm Rhenosterkop no. 155, Beaufort West District, Western Cape Province is over an undisturbed and inactive and with medium agricultural potential area of the farm with medium agricultural potential due to the sandy surface. According to the AIA (Appendix M) the conclusion of this assessment is that the proposed is that there is unlikely to be a significant long-term reduction in the agricultural production potential of the site provided that effective rehabilitation is implemented. This is because the site has low pre-mining cropping potential anyway and retention of sufficient topsoil will retain the existing agricultural potential of the site.</p> <p>Mining with well managed and effectively implemented rehabilitation will therefore have an impact of low significance on agricultural resources. However, without effective mitigation, there may be some long-term reduction in soil and production potential and the impact on agricultural resources will therefore be higher.</p> <p>A very important factor affecting the success of rehabilitation, and consequently the significance of all direct impacts, is the level of care that is taken to rehabilitate effectively. This is dependent on the level of environmental management of all mining activities that can impact on rehabilitation, both during the mining process and during the rehabilitation phase.</p> <p>The following is the sequence of recommended rehabilitation steps:</p> <ol style="list-style-type: none"> The upper 30 cm of soil must first be stripped and stockpiled before mining. Topsoil is a valuable and essential resource for rehabilitation, and it should therefore be managed carefully to conserve and maintain it throughout the stockpiling and rehabilitation processes. 			

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	<ol style="list-style-type: none"> 3. Topsoil stockpiles should be protected against losses by water and wind erosion. Stockpiles should be positioned so as not to be vulnerable to erosion by wind and water. The establishment of plants on the stockpiles will help to prevent erosion. Stockpiles should be no more than 2 metres high. 4. Mining should be done to a maximum depth of 3 metres. 5. After mining, any steep slopes must be reduced to a minimum and profiled to blend with the surrounding topography. 6. The stockpiled topsoil must then be evenly spread across the entire mining area. The depth should be monitored during spreading to ensure that coverage is adequate and even. A slope must be maintained so that ponding of water does not occur on the surface. 7. The rehabilitated area must be monitored for erosion, and appropriately stabilised if any erosion occurs. <p>Therefore, from an agricultural impact point of view, it is recommended that the proposed mining will not significantly reduce the future agricultural production potential of the site, which is already low, if effective rehabilitation is implemented. The proposed mine is therefore acceptable, and, from an agricultural impact point of view, it is recommended that it be approved.</p>		
	<ul style="list-style-type: none"> • Archaeological and Cultural Heritage Impact Assessment (HIA) & Paleontology Impact Assessment (PIA): <p>According to the Notice of Intent to Develop conducted by Beyond Heritage (Pty) Ltd, (Appendix M3) a few CRM surveys have occurred close by with the most relevant being for a sand mine access road immediately over the N1 from Rhenosterkop and the widening of the N1 through Courlandskloof just to the northeast (Orton 2010; the sand mine itself has apparently been surveyed and permitted but no documentation of this is known and none could be sourced from the developer at the time of the road application), and a second sand mine just further north (Gribble 2020).</p> <p>These projects showed that scatters of LSA and MSA stone artefacts occur in places and rock engravings including both animals and scratching/rubbing occur in the area. Some engravings of high significance occur very close to the Renosterkop Sand mine but do not seem to be under threat yet. A stone-walled kraal is also on record north of the N1. Historical structures, artefacts scatters and aspects of the historical nineteenth century Cape Town to Kimberley railway (which broadly follows the N1) were also recorded. The latter include cast iron and stone bridge and also an Anglo-Boer War blockhouse built at the bridge to guard it during the war. Around Nelspoort, to the northeast of the study area, there are a number of rock engravings and some rock gongs that are quite well-known (Parkington et al. 2008).</p> <p>More broadly, most Karoo farms include historical structures and graves and the kinds of archaeology noted above are expected to be widespread. Rock paintings are also known from the Karoo, but not from anywhere close to the study area. The only impact anticipated is to LSA scratched engravings on the sand rocks of the study area. While these “motifs” are poorly</p>		

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			<p>understood and might have once had significance beyond that which we might understand, they are also very common. A photographic record has been made of those in the study area and further work on this small sample is unlikely to accomplish anything further.</p> <p>Survey diagrams indicate that Rhenosterkop was first granted on 18 November 1890 to Adolph Siegfried Grimbeek. Portions referred to as Lucerne Lodge and Annex Lucerne Lodge were subdivided off on the northwest side of the railway line during the early 20th century. Various other subdivisions have also occurred for the railway on the land to its northwest. The rest of the farm to the south of the railway line, however, has remained intact. In light of this, a Heritage Impact Assessment was not deemed necessary by the heritage specialist.</p>

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<ul style="list-style-type: none"> Terrestrial Biodiversity Impact Assessment (TBIA) & Plant Species Assessment (PSA): <p>A motivation letter included in support of the previous report prepared by EcoFloristix Specialist Botanical Surveys (report reference number: GM.OM.2.0; hereafter “the report”) for Greenmined Environmental (Pty) Ltd., is applicable and relevant to the proposed new sand mine as defined by Mrs Murchellin Saal (Environmental Consultant at Greenmined Environmental (Pty) Ltd). Although the report does not explicitly mention the proposed new sand mine but does contain information and data relevant to it. Specifically, the proposed new sand mine overlaps with vegetation types that were mapped and ground-truthed within the report. As such, the data and analysis contained within the report are relevant and valid for the proposed new sand mine.</p> <p>According to the botanical assessment report conducted by Ecofloristix (Pty) Ltd, dated March 2023 attached as appendix M2, it is highly unlikely that this development will have an impact on ecosystem status or nationally listed vegetation types due to the limited extent of the mine, as well as the large 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, provided that the mitigation measures given that in the Biodiversity Assessment report (Appendix M2) is closely followed.</p> <p>In terms of local plant species levels, the site is not exceptionally rich in species and therefore not highly sensitive in this regard. Moreover, no SCC or range restricted species are present within the study area. The extensive nature of the study area vegetation and plant community types within the wider landscape means that all species within the study area will highly likely also be found in the surrounding areas. Thus, given that the majority of impacts associated with the proposed activities are likely to be local in nature and not of wider significance, loss of particular species within the study area will not be problematic.</p> <p>Five provincially protected species were found in the study area (but only in low numbers), as well in the surrounding areas. None of them are SCC and their loss from the study area will not be significant and will not compromise the viability of the local populations of these species.</p>			

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<p>In terms of the likely botanical impacts associated with the mine, impacts on vegetation during the construction and operational phases are likely to be relatively high (medium after mitigation), and are somewhat difficult to mitigate given the destructive nature of the proposed activities. However, given the large extent of the affected vegetation and plant community types, and given the small footprint of the mining area, the impact on the vegetation is likely to be of locally high intensity but not broadly significant. Potential cumulative impacts are also furthermore regarded limited and of low to moderate significance.</p> <p>The proposed study area is well positioned to mostly avoid highly sensitive receptors, and the proposed activities will not severely compromise the survival and continued persistence any specific plant or animal species within the study area and surrounds if mitigation measures are fully implemented.</p> <p>Measures to minimize erosion:</p> <ul style="list-style-type: none"> Any signs of erosion resulting from the project activities must be rectified immediately and monitored thereafter to ensure that they do not re-occur. Roads and other disturbed areas within the study area should be regularly monitored for erosion problems, and problem areas should receive follow-up monitoring to assess remediation success. Any erosion points created during construction should be filled and stabilized immediately. Practical phased development and vegetation clearing should be practiced so that cleared areas are not left un-vegetated and vulnerable to erosion for extended periods of time Construction of gabions and other stabilization features must be undertaken to prevent erosion, where deemed necessary. Soil should be stabilized in the period when it is disturbed until revegetation can take place. This can be done either temporarily or permanently, and can include methods such as using layers of either sterile mulch (that will not drastically alter soil conditions), blankets, wood binders, geo-textiles, artificial turf blankets, mats, or fiber rolls, depending on availability and how appropriate the measures are for the project. Runoff water on exposed areas should be controlled, for example with use of sediment traps, articulated concrete blocks, riprap, or geotextiles. Site entrances should be stabilized so that sediments are not carried away by the movement of construction vehicles to and from the site. Stabilized construction entrances can be made, for example, by making use of crushed stone. Care should be taken to remove all foreign debris from the site upon termination of the activities. <ul style="list-style-type: none"> Animal Species Assessment (ASA) – Addendum M2 			

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	<p>As per Appendix M2, the proposed development involves the construction of access roads and a sand mining area covering approximately 5 hectares. The access roads will utilize existing, already disturbed routes, resulting in minimal anticipated impact. The sand mining area overlaps with Medium SEI zones concerning the PAOI, due to the potential presence of SCC, although it is unlikely to serve as a significant habitat for these species. The impacts have been evaluated and mitigated.</p> <p>The main anticipated impacts of the project include habitat loss and the migration of fauna. Based on the information provided, there are no apparent critical issues with the proposed project. The specialist believes the project can be approved, if all recommended mitigation measures are implemented, no significant negative impacts on the Faunal component are expected.</p>		
	<ul style="list-style-type: none"> • Aquatic Biodiversity Impact Assessment (ABIA) & Hydrology Assessment (HA): <p>The proposed mining area access road intersects with more than 2 drainage lines which necessitates a water use license application in terms of Section 21 of the NWA, 1998. This was confirmed by the Risk Matrix Assessment conducted by the Biodiversity Company (Pty) Ltd (please see Appendix M1). A General Authorisation (please see Appendix Q) was obtained for the adjacent mine that uses the same road and will be used in support of this application, unless otherwise directed by the Department of Water and Sanitation (DWS). An agreement is in place with the Municipality to secure treated water for dust suppression (see Appendix M1)</p> <p>Based on desktop and survey findings in Appendix M2, the specialist disputes the “Low” rating for the mining area and agrees with the “Very High” aquatic theme sensitivity as per the National Web based Environmental Screening Tool. The specialist revised the ratings to a maximum of ‘High’ aquatic sensitivity. This is attributed to:</p> <ul style="list-style-type: none"> • The project area is not located within a SWSA for surface water; • The project footprint overlaps only with a Western Cape ESA1 and Other Natural Areas; • The project area (proposed sand mine and access road) is in proximity of an NFEPA river (Platdoring River) as well as several drainage lines which are tributaries of same; • The project area is located along a Least Threatened and Poorly Protected watercourse (Platdoring River); and • No protected areas detected within the project area or immediate downstream reaches. The Steenbokkie Private Nature Reserve is approximately 15 km downstream of the project area. <p>The proposed activities pose low to moderate pre-mitigation risks during the construction, operational and decommissioning phases. Moderate risks are associated with the activities proximate to the watercourse, including the drainage patterns change due to road extent and crossings, clearing of riparian (and terrestrial) vegetation, stormwater management, excavation of riparian area, bed and/or banks, operation of heavy machinery adjacent/within the watercourse, alien vegetation encroachment, conducting road and crossings maintenance, sedimentation and erosion, and hydrocarbon contamination. Due to the presence of existing roads and crossings, the implementation of mitigation measures as well as the avoidance of watercourse areas</p>		

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	<p>for any mining activities will reduce the risks/impacts of Moderate-risk activities to Low if done effectively. If not done effectively, the activities will not reduce the risks of aspects/activities such as clearing riparian areas, deep excavation when mining, drilling and crushing, excavations, the drainage patterns change due to road extent and crossings, dust precipitation (from backfilling), change in topography (from backfilling), dust precipitation (from shaping/contouring), change in topography (from shaping/contouring) and surface structures as well as stormwater, as these activities will result in direct loss of riparian vegetation, channel-, bed- and bank modification, and have a direct impact on the rivers and riparian areas. Water required for the implementation of the project will be bought and transported to the site.</p> <p>It is the opinion of the specialist that the project may be considered for authorization. This is on condition that all prescribed mitigation measures and recommendations are implemented. This includes the avoidance of sensitive freshwater habitats and their buffer zones (as far as is feasible), methods that prevent the introduction of contaminants into watercourses, rehabilitation of disturbed watercourses, as well as the minimization of development/disturbances within these areas.</p>		
<ul style="list-style-type: none"> Noise Impact Assessment (NIA): 	<p>The potential impact on the noise ambiance of the receiving environment is expected to be of low significance due to the location of the proposed mining area being far away from residential dwellings. Due to the small scale of the operation an (NIA) is not deemed applicable.</p>		
<ul style="list-style-type: none"> Radioactivity Impact Assessment 	<p>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.</p>		
<ul style="list-style-type: none"> Traffic Impact Assessment (TIA): 	<p>Access to the proposed mining area will be via the N1, making use of the existing internal/haul roads to access the mining area. Haul roads will be extended as the open cast mining progress and will be rehabilitated as part of the final reinstatement of the area. Trucks delivering the materials to the destinations will take the N1 national route. 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.</p>		

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<ul style="list-style-type: none"> Geotechnical Assessment: 	<p>No reason for a geotechnical assessment could be identified as no permanent infrastructure will be established in the proposed mining area.</p>		
<ul style="list-style-type: none"> Socio-economic Assessment (SEA): 	<p>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 in an area with medium 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.</p>		
<ul style="list-style-type: none"> Civil Aviation Assessment 	<p>A civil aviation impact assessment is not deemed necessary for the proposed mining activities since the operations will have no effect on the air corridor that is situated above the area. The proposed operations will not consist of any high infrastructure or signal preventing equipment that will prevent airplanes from flying. The proposed mining activities is at 3400ft and has high ground surrounding the sand mine with hills at 4000ft North of the Sand mine and high ground at 3700ft south of the sand mine which makes the safe flying altitude much higher than the operating altitude of the proposed sand mine and will not infringe on air traffic operations even if aircraft do fly directly over the proposed mining area.</p>		

I) 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

The Applicant, CZ Sand Mine (Pty) Ltd, applied for environmental authorisation (EA) and a mining permit to mine sand on a portion of the remaining portion of the Farm Rhenosterkop no 155, Registration Division of Beaufort West, Western Cape province. The proposed mining method will implement strip mining and be representative of the small-scale mining industry where the mineral (sand) is loaded with a front-end-loader (FEL) directly from the mining footprint area to the stockpile area, following standard practices in the small-scale mining sector. If necessary, the sand will be screened before being stockpiled. Once ready for distribution, a front-end loader will load the sand onto trucks for delivery to customers. No washing of sand will be required. Trucks will transfer the materials to the places along the N1 national road. All mining related activities will be contained within the limits of the authorized mining permit.

The applicant, intends to win material from the area for at least 2 years with a possible extension of another 3 years. The sand to be removed from the sand mine will be used for construction industry in the vicinity. The proposed sand mine will contribute to the upgrading / maintenance of road infrastructure, renewable energy projects and building contracts in and around the Beaufort West area.

Topography

The natural topography of the area surrounding the proposed sand mine is best described as steep slopes of koppies, butts, mesas and parts of the Great Escarpment covered with large boulders and stones supporting sparse dwarf Karoo scrub with drought-tolerant grasses of genera such as *Aristida*, *Eragrostis* and *Stipagrostis*. 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 sand mining operation will be of low significance. The small scale of the proposed operation, and the mining area is located beyond the hills in an area that is not seen from the national

road. 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 primitive, skeletal soils in rocky areas developing over sedimentary rocks such as mudstones and arenites of the Adelaide Subgroup of the Karoo Supergroup and to a lesser extent also the Eccu Group (Waterford and Volksrust Formations) as well as Jurassic sand sills and dykes and subsummit positions of mesas and butts with sand boulder slopes. Almost entirely Ib land type.

According to the Agriculture Assessment Report (Appendix M), the proposed mining will not have an unacceptable negative impact on the agricultural production capability of the site. This is because the site naturally has extremely low agricultural production potential and very little potential is therefore lost due to mining. The conclusion of the assessment on the acceptability of the proposed development and the recommendation for its approval is not subject to any conditions. Therefore, from an agricultural impact point of view, it is recommended that the development be approved.

The sand of the study area is highly suitable for construction purposes. The mining method will make use of a *front-end-loader* directly from the mining footprint area to the stockpile area, following standard practices in the small-scale mining sector. If necessary, the sand will be screened before being stockpiled. Once ready for distribution, a front-end loader will load the sand onto trucks for delivery to customers, via the via the existing road. The transport of sand from the mining area will be done by site management as no clients will be allowed to collect sand directly from the mine.

It is proposed that the truck will visit the mining area approximately twenty times a week.

Mining, Biodiversity and Groundcover

As per the specialist report, the proposed footprint of the mining area is of low agricultural use. 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 EMP 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 is located on a property with diversified agricultural and game farming activities, comprising a partial game farm, olive farming, and sheep farming, 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.

Cultural and Heritage Environment

According to the Notice of Intent to Develop conducted by Beyond Heritage (Pty) Ltd, a few CRM surveys have occurred close by with the most relevant being for a sand mine access road immediately over the N1 from Rhenosterkop and the widening of the N1 through Courlandskloof just to the northeast (Orton 2010; the sand mine itself has apparently been surveyed and permitted but no documentation of this is known and none could be sourced from the developer at the time of the road application), and a second sand mine just further north (Gribble 2020).

These projects showed that scatters of LSA and MSA stone artefacts occur in places and rock engravings including both animals and scratching/rubbing occur in the area. Some engravings of high significance occur very close to the Renosterkop Sand mine but do not seem to be under threat yet. A stone-walled kraal is also on record north of the N1. Historical structures, artefacts scatters and aspects of the historical nineteenth century Cape Town to Kimberley railway (which broadly follows the N1) were also recorded. The latter include cast iron and stone bridge and also an Anglo-Boer War blockhouse built at the bridge to guard it during the war.

Around Nelspoort, to the northeast of the study area, there are a number of rock engravings and some rock gongs that are quite well-known (Parkington et al. 2008).

More broadly, most Karoo farms include historical structures and graves, and the kinds of archaeology noted above are expected to be widespread. Rock paintings are also known from the Karoo, but not from anywhere close to the study area. The only impact anticipated is to LSA scratched engravings on the sand rocks of the study area. While these “motifs” are poorly understood and might have once had significance beyond that which we might understand, they are also very common. A photographic record has been made of those in the study area and further work on this small sample is unlikely to accomplish anything further.

Should the Applicant implement the mitigation measures proposed in the EMP the impact of the proposed activity on the surrounding area in general is deemed to be of low significance. In light of this, a Heritage Impact Assessment was not deemed necessary by the heritage specialist.

Site Specific Infrastructure

Apart from the Eskom power line approximately $\pm 350\text{m}$ from the mining permit area. No other infrastructure has been established on the property that can be affected by the proposed development.

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.

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 its previous state upon closure of the project; and
- Diversification of the land use of the property.

Table 22: Potential negative impacts with a low-medium or higher significance/risk.

POTENTIAL IMPACT	SIGNIFICANCE (AFTER MITIGATION)
Visual intrusion because of site establishment.	• Low-Medium
Visual intrusion caused by mining activities	Visual intrusion Low-Medium
No impact could be identified other than the beacons being outside the boundaries of the approved mining area	Visual intrusion Low-Medium
Alteration of the agricultural sense of place	Visual intrusion Low – Medium
Loss of agricultural land for duration of mining	Visual intrusion Low – Medium
Visual intrusion as a result of site establishment.	Visual intrusion Low-Medium
Visual intrusion caused by mining activities.	Visual intrusion Low-Medium
Visual intrusion as a result of excavation and from loading and vehicles transporting the material	Visual intrusion Low-Medium

POTENTIAL IMPACT	SIGNIFICANCE (AFTER MITIGATION)
⌚ Unsafe working environment for employees	⌚ Low-Medium
⌚ Visual intrusion caused by construction of site access road	⌚ Low-Medium
⌚ Loss of stockpiled topsoil during construction of access road.	⌚ Low – Medium
⌚ Intersection//destruction of drainage lines	⌚ High
⌚ Health and safety risk posed by mining activities	⌚ Low-Medium
⌚ Dust nuisance caused by mining activities	⌚ Low-Medium
⌚ Noise nuisance as a result of mining	⌚ Low-Medium
⌚ Loss of stockpiled topsoil during mining and stockpiling	⌚ Low – Medium
⌚ Dust nuisance generated at the processing plant	⌚ Low-Medium
⌚ Visual intrusion as a result of operation of the processing plant	⌚ Low - Medium
⌚ Overloading of trucks impacting road infrastructure	⌚ Low – Medium
⌚ Degradation of the access road	⌚ Low – Medium
⌚ 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	⌚ Low – Medium

POTENTIAL IMPACT	SIGNIFICANCE (AFTER MITIGATION)
<p>3 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</p>	<p>3 Low – Medium</p>
<p>3 Impact on existing infrastructure as a direct result of the mining operation</p>	<p>3 Low – Medium</p>

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 23: 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.	<ul style="list-style-type: none"> Do not leave depressions in the mining floor. Maintain a surface slope (even if minimal) across the mining floor in the drainage direction, so that all excavations are free draining. Control mining depths on the down-slope side of the mine, so that the mining floor remains free-draining and above the low point for drainage out of the mining area. Control mining depths across the entire mine so that excavations result in a levelling of the lands rather than a hole with steep edges. Implement the closure plan upon decommissioning of the mining area. 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. If necessary, the area can be fertilized to hasten the establishment of flora. Should the site's natural vegetation not grow back within six months of its closure to spread the naturally existent flora in the area, the site could be 	<ul style="list-style-type: none"> Effectively restoring the mined area to allow the return of land use to agricultural purposes.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		<p>seeded with a local or adapted indigenous seed mix. This area is seen to have low agricultural potential due to the rocky surface therefore the use of seed mixes should only be done after consultation with a qualified specialist with experience in the area as it might not apply.</p> <ul style="list-style-type: none"> • If required by the Regional Manager (DMRE) the soil must be analysed and any deleterious effects on the 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. • Any signs of erosion resulting from the project activities must be rectified immediately and monitored thereafter to ensure that they do not re-occur. • Roads and other disturbed areas within the study area should be regularly monitored for erosion problems, and problem areas should receive follow-up monitoring to assess remediation success. 	

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		<ul style="list-style-type: none"> Any erosion points created during construction should be filled and stabilized immediately. Practical phased development and vegetation clearing should be practiced so that cleared areas are not left un-vegetated and vulnerable to erosion for extended periods of time Soil should be stabilized in the period when it is disturbed until revegetation can take place. This can be done either temporarily or permanently, and can include methods such as using layers of either sterile mulch (that will not drastically alter soil conditions), blankets, wood binders, geo-textiles, artificial turf blankets, mats, or fiber rolls, depending on availability and how appropriate the measures are for the project. Runoff water on exposed areas should be controlled, for example with use of sediment traps, articulated concrete blocks, riprap, or geotextiles. Site entrances should be stabilized so that sediments are not carried away by the movement of construction vehicles to and from the site. Stabilized construction entrances can be made, for example, by making use of crushed stone. Care should be taken to remove all foreign debris from the site upon termination of the activities. 	
VISUAL CHARACTERISTICS Visual mitigation	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
	Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> • 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. • Implement concurrent rehabilitation as strip mining progress to limit the visual impact on the aesthetic value of the area. • Limit vegetation removal, and only strip topsoil immediately prior to the mining/use of a specific area. • Upon closure, rehabilitate the site to ensure that the visual impact on the aesthetic value of the area is reduced to the minimum. 	
AIR AND NOISE QUALITY Dust Mitigation	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> • 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. • 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. • 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). 	<ul style="list-style-type: none"> • Dust prevention measures are applied to minimise the impact.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		<ul style="list-style-type: none"> 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. Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> 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. 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. 	<ul style="list-style-type: none"> Prevent unnecessary noise to the environment by ensuring that noise from development activity is mitigated.
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.	<ul style="list-style-type: none"> 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 and inactive 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. 	<ul style="list-style-type: none"> Adequate fertile topsoil is available to rehabilitate the mined area.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		<ul style="list-style-type: none"> • 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. Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> • 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. • 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 	<ul style="list-style-type: none"> • Impact on the environment caused by stormwater discharge is avoided and erosion is managed.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		<p>needed). These must be in place at any points where overflow out of the excavation might occur.</p> <ul style="list-style-type: none"> • 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 because 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, which formally drain to a dirty water drainage system at the site. • 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. • The possibility of capturing, treating, and reusing the stormwater on-site should be considered where possible. Water can potentially be reused on-site, which will aid in minimising on-site water demand. 	

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		<ul style="list-style-type: none"> • stormwater diversion infrastructure must be regularly inspected and suitably maintained • The following mitigation measures was recommended by the Aquatic Specialist (Appendix M1) for the construction of the access road: <ul style="list-style-type: none"> ▪ To minimise the impact on both surface water flow and interflow, portions of the road must include a coarse rock layer that has been specifically incorporated to increase the porosity and permeability of the sub-layers of the road; ▪ The footprint area of the road should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas; ▪ All construction activities and access must make use of the existing dirt road; ▪ Exposed road surfaces awaiting resurfacing must be stabilised to prevent the erosion of these surfaces. Signs of erosion must be addressed immediately to prevent further erosion of the road; ▪ Silt traps and fences must be placed in the preferential flow paths along the road to prevent sedimentation of the watercourse; ▪ Temporary storm water channels should be filled with aggregate and/or logs (branches included) to dissipate flows; ▪ The contractors used for the project should have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly; and ▪ The design of the road must make allowances for stormwater management. 	

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
<p>TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS AND GROUND COVER</p> <p>Management of vegetation removal.</p>	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<p>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.</p> <ul style="list-style-type: none"> • 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-construction walk-through should be conducted in the flowering season by a suitably qualified botanist for SCC or protected plant species that will be affected (also to comply with provincial permit conditions), and to develop a more comprehensive plant species list of the area. • For threatened species that may not be destroyed, it is recommended that professional search and rescue service providers be used to remove such plants and to use them either for later rehabilitation work or other conservation projects. • SCC and protected plant species that are listed in schedules 3 and 4 of the Western Cape Nature Conservation Laws Amendment Act, 2000 (Act No. 3 of 2000) may not be picked or removed without the relevant permit from CapeNature. Moreover, it is highly recommended that such species be relocated, via suitable Search and Rescue Procedures, in order to avoid their destruction. • Any individual of an SCC or protected plant species present on site requires a relocation or destruction permit (from CapeNature) to remove or destroy such an individual. High 	<ul style="list-style-type: none"> • Vegetation clearing is restricted to the authorised development footprint of the mine.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		<p>visibility flags must be placed near any threatened/protected plants in order to avoid any damage or destruction to them. If left undisturbed, the sensitivity and importance of these species must be part of the environmental awareness program. When infrastructure, development areas or routes intersect with protected plants, and which cannot be avoided, such plants should be removed from the soil and relocated/re-planted in similar habitats where they should be able to resprout and flourish again. All SCC and protected plant species should be relocated, and as many other geophytic species as possible.</p> <ul style="list-style-type: none"> • Permits must be kept on-site and in the possession of the flora search and rescue team at all times. • A pre-construction environmental induction must be provided for all staff to ensure compliance with basic environmental principles. This includes awareness of no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, and remaining within demarcated construction areas. Bush-clearance may only commence once the recommendations of the specialist (pre-commencement walkthrough) have been implemented. • Blanket clearing of vegetation must be limited to the proposed footprint and associated infrastructure. No clearing outside of the minimum required footprint to take place. • 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. 	

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		<ul style="list-style-type: none"> • Clearing of vegetation should be minimized and avoided where possible. • Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. • 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. • As per the Terrestrial Biodiversity Impact Assessment by Dr. Jan-Hendrik Keet "The plant community type that will be the most affected is the <i>Ruschia intricata</i> - <i>Aristida diffusa</i> type since it is characterized by unique microhabitat conditions, specifically large sand sheets with very shallow overlying soils. While it might prove very difficult to replicate these exact microhabitat conditions, it is highly probable that this type might be successfully rehabilitated to its closely related counterpart, namely the <i>Aristida diffusa</i> - <i>Aristida congesta</i> type. This is because the <i>Ruschia intricata</i> - <i>Aristida diffusa</i> type can be regarded as a subtype of the former, and manifests in the areas where soils become much more shallow than usual. Thus, while the rehabilitation and restoration potential are low for the <i>Ruschia intricata</i> - <i>Aristida diffusa</i> type, it is indeed moderate to high for the <i>Aristida diffusa</i> - <i>Aristida congesta</i> type. In this sense, the 	

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		<p>loss of one plant community type can be mitigated by a gain in another type.</p> <ul style="list-style-type: none"> As per the Terrestrial Biodiversity Report - The impacts on the <i>Aristida congesta</i> - <i>Asparagus burchellii</i> type are not as high as the aforementioned, since no actual mining will occur in it. Thus, it has a high rehabilitation potential. Advised relocation guidelines should be followed to ensure that the majority of the protected plant species found on site are relocated with a high success rate. Only one species, namely <i>Gomphocarpus tomentosus</i> subsp. <i>tomentosus</i>, may be difficult to relocate, but only if individuals have deep root systems that are difficult to remove without significant damage. Therefor the appropriate relocation measures must be implemented. No plant species, whether native or exotic, should be brought into, ore removed from, the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants. 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 OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		<ul style="list-style-type: none"> • Areas that are denuded during construction must be re-vegetated with indigenous vegetation to prevent erosion. This will also reduce the likelihood of encroachment by IAPs. • Livestock must always be kept out of the project area, especially in areas that have been recently re-vegetated. • After the operation, rehabilitate an acceptable vegetation layer according to rehabilitation recommendations as provided within a site-specific Rehabilitation Plan compiled by a suitably qualified botanist. • Revegetation should occur naturally where topsoils were not severely altered. • A hydrocarbon spill management plan must be implemented. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No servicing of equipment on site unless necessary. Contaminated soils shall be treated in situ or removed and be placed in containers. Appropriately contain any spills in such a way as to prevent them leaking and entering the environment. • A 25 m buffer has been applied to the proposed access roads whereas a 100m buffer was placed on the proposed development area and is collectively referred to as the Project Area of Influence (PAOI) from hereon. 	
TERRESTRIAL BIODIVERSITY,	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Mining area is kept free of invasive plant species.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
CONSERVATION AREAS AND GROUND COVER Management of invasive plant species.	Compliance to be monitored by the Environmental Control Officer.	<p>throughout the life of the mining activities. SCC and protected plant species that are listed in schedules 3 and 4 of the Western Cape Nature Conservation Laws Amendment Act, 2000 (Act No. 3 of 2000) may not be picked or removed without the relevant permit from CapeNature. Moreover, it is highly recommended that such species be relocated, via suitable Search and Rescue Procedures, in order to avoid their destruction.</p> <ul style="list-style-type: none"> • 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. 	
FAUNA Protection of fauna	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> • Site access should be controlled, and no unauthorised persons should be allowed onto the site. • Any fauna directly threatened by the associated activities should be removed to a safe location by a site manager. • The collection/trapping, hunting, or poisoning of any animals at the site is strictly forbidden. Signs must be put up to enforce this. Personnel should not be allowed to wander off demarcated areas. • Fires must not be allowed on site. • All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel, and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. • All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. All vehicles should adhere to a low-speed limit (40 km/h) to avoid collisions with susceptible species. 	<ul style="list-style-type: none"> • Disturbance to fauna is minimised.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		<ul style="list-style-type: none"> Construction vehicles must be limited to a minimal footprint on site (no movement outside of the earmarked footprint). 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. Schedule activities and operations during least sensitive periods, to avoid migration, nesting, and breeding seasons. Ensure that cables and connections are insulated successfully to reduce electrocution risk. Use environmentally friendly chemical products. No litter, food or other foreign material may be thrown or left around the site. 	
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.	<ul style="list-style-type: none"> Confine all mining to the development footprint area. Implement the following change find procedure when discoveries are made on site: If any significant archaeological remains are located during this survey which cannot be avoided by, or excluded from the sand mining, they will require mitigation prior to any sand mine-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 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 	<ul style="list-style-type: none"> Impact to cultural/heritage resources is avoided or at least minimised.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		<p>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.</p> <ul style="list-style-type: none"> • 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 HWC. • According to the Heritage Specialist, a Heritage Impact Assessment was not deemed necessary (please see Appendix M). 	
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.	<ul style="list-style-type: none"> • If needed, sign mined out/rehabilitated areas back to agricultural use once the cover crop stabilised. 	<ul style="list-style-type: none"> • 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. Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> • 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 and inactive areas. • 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. 	<ul style="list-style-type: none"> • 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 same state as received by the permit holder.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
<p>GENERAL</p> <p>Waste management</p>	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> • 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 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, always equip it with a drip tray. 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 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 always available and conveniently placed for the disposal of general waste. 	<ul style="list-style-type: none"> • Wastes are appropriately handled and safely disposed of at recognised waste facilities.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		<ul style="list-style-type: none"> • 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. • 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. • Do not discharge water containing waste into the natural environment. • Implement measures to contain the wastewater and safely dispose thereof. • Report any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities to the Department of Water and Sanitation and other relevant authorities. • Implement the use of waste registers to keep record of the waste generated and removed from the mining area. • The Municipality should be consulted for available options to deal with green waste in accordance with its organic waste diversion plan to divert organic waste from its landfills. 	

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
<p>GENERAL</p> <p>Storage/handling of hazardous substances/chemicals.</p>	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> 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 sit, 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. 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 	<ul style="list-style-type: none"> The chemical/hazardous substances used on site are stored according to specifications without contaminating the receiving environment.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		on the bare soil. Discard the wastewater 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.	<ul style="list-style-type: none"> • 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). 	<ul style="list-style-type: none"> • Employees work in a healthy and safe environment.

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 R200 000. 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).

CZ Sand Mine (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 sand 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 is located beyond the hills in an area that is not seen from the national road. 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 five or six 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.

- **Compliance Management:**

Should the MP application be approved, compliance with the mitigation measures and conditions approved as part of the EMPR and the Environmental Authorisation (EA) will be compulsory to the Permit Holder as both the EMPR and EA are legally binding documents. In terms of Section 34 of the NEMA EIA Regulations, 2014 (as amended 2017) the holder of an EA must: “(a) ensure that the compliance with the conditions of the environmental authorisation and the EMPR, and where applicable the closure plan, is audited; and (b) submit an environmental audit report to the relevant competent authority”. The regulations further stipulate that the environmental audit report (EAR) must be prepared by an independent person with the relevant environmental auditing expertise; provide verifiable findings on the level of performance against and compliance

with the provisions of the requisite EA, EMP and Closure Plan, and the ability of the measures contained in the EMPR and Closure Plan to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking. Within 7 days of the date of submission of an EAR to the competent authority (DMRE) the holder of the EA must notify all potential and registered I&AP's of the submission of that report and make such report immediately available to anyone on request, and on a publicly accessible website.

(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).

According to the Notice of Intent to Develop conducted by Beyond Heritage (Pty) Ltd, a few CRM surveys have occurred close by with the most relevant being for a sand mine access road immediately over the N1 from Rhenosterkop and the widening of the N1 through Courlandskloof just to the northeast (Orton 2010; the sand mine itself has apparently been surveyed and permitted but no documentation of this is known and none could be sourced from the developer at the time of the road application), and a second sand mine just further north (Gribble 2020).

These projects showed that scatters of LSA and MSA stone artefacts occur in places and rock engravings including both animals and scratching/rubbing occur in the area. Some engravings of high significance occur very close to the Renosterkop Sand mine but do not seem to be under threat yet. A stone-walled kraal is also on record north of the N1. Historical structures, artefacts scatters and aspects of the historical nineteenth century Cape Town to Kimberley railway (which broadly follows the N1) were also recorded. The latter include cast iron and stone bridge and also an Anglo-Boer War blockhouse built at the bridge to guard it during the war.

Around Nelspoort, to the northeast of the study area, there are a number of rock engravings and some rock gongs that are quite well-known (Parkington et al. 2008).

More broadly, most Karoo farms include historical structures and graves and the kinds of archaeology noted above are expected to be widespread. Rock paintings are also known from the Karoo, but not from anywhere close to the study area. The only impact anticipated is to LSA scratched engravings on the sand rocks of the study area. While these “motifs” are poorly understood and might have once had significance beyond that which we might understand, they are also very common. A photographic record has been made of those in the study area and further work on this small sample is unlikely to accomplish anything further.

In light of this, a Heritage Impact Assessment was not deemed necessary by the heritage specialist.

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 (S1) (Preferred Alternative and only site alternative): The Applicant, applied for a 5-ha mining permit to mine sand on a portion of the remaining portion of the Farm Rhenosterkop no 155, Registration Division of Beaufort West in the Western Cape Province. The proposed mining area is over an undisturbed and inactive area of the farm.

The proposed area was deemed as the preferred area due to the location of the sand reserve which is situated over an undisturbed and inactive area of the farm. The site has extremely poor agricultural production potential. The mining area was situated between the koppies on a flat area with low visual impact and is approximately 5km from the N1, the site is situated to avoid interfering with nearby drainage lines.

An alternative layout for the sand mine, has been assessed in the pre application phase – Site Alternative 2 but not found viable as explained below.

Site Alternative 2 (S2) was assessed for the proposed mining but found not environmentally and practically suitable. The earmarked area is situated between the two drainage lines this will result in the complete destruction of the drainage lines that is within the earmarked area. Site alternative 1, was deemed the only viable site alternative as this

is the only area that will be viable for the applicant due to the presence of the sand ridge. Although the position of Site Alternative 2 will still allow the development of the sand mine on the property, it is believed that the impact associated with this site alternative is of higher significance without the need or motivation justifying it.

The no-go alternative entails no change to the status quo and is therefore a real alternative that needs to be considered. The sand 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.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1. 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 Murchellin Saal of Greenmined Environmental that acts as EAP on this project has been included in Part A Section 1(a) as well as Appendix K 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:

The closure objectives entail progressive rehabilitation of each strip as mining progress.

The applicant proposes the following with regard to rehabilitation of the mined-out strips:

- The mine plan will be such that topsoil is stockpiled for the minimum possible time through rehabilitating each mining block as mining continues.
- To ensure minimum impact on drainage, the applicant will take care not to leave any depressions in the mining floor. A surface slope (even if minimal) will be maintained across the mining floor in the drainage direction, so that all excavations are free draining. The mining depths will be controlled (on the down-slope side of the mine) so that the mining floor remains free-draining and above the low point for drainage out of the mining area.
- After mining, any steep slopes at the edges of excavations will be reduced to a minimum and profiled to blend with the surrounding topography, and allow the travel of area. The entire surface will be sufficiently smoothed and profiled.
- The stockpiled topsoil will then be evenly spread, to a depth of 300 mm, and smoothed over the entire mining area.
- The Applicant will strive to (when possible) spread topsoil at a time of the year when vegetation cover can be established as quickly as possible afterwards, so that erosion of returned topsoil by both rain and wind, is minimized.
- A cover crop that ties in with the proposed land use will be planted, irrigated and established, immediately after spreading of topsoil to stabilize the soil and protect it from erosion. The cover crop will be fertilised for optimum biomass production, and any soil chemical deficiencies will be corrected, based on a chemical analysis of the re-spread soil.
- The rehabilitated area as well as the land down slope of it will monthly be monitored for erosion and appropriately stabilized if any erosion occurs.
- The Applicant will ensure monthly monitoring of weeds/invasiver plants that may germinated within the rehabilitated area. The invasive plant species management plan (Appendix I) will continually be implemented on site.

Final rehabilitation will entail removal of the mining equipment from the site according to the closure objectives stipulated in the attached closure plan (Appendix L). Final landscaping, levelling and top dressing will be done on all areas not yet rehabilitated. Control of weeds and invasive plant species is an important aspect after topsoil replacement and seeding has been done in an area. Site management will implement

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

- 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.
- Securing all excavations.
- 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/invaser plant species by intensive management of the mining area.

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

The reinstatement of the mining area will be required during the decommissioning phase by removing the stored materials, site infrastructure/equipment, and altered footprints. The rehabilitation option is that the mining site will revert back to agricultural land.

The decommissioning activities will therefore consist of the following:

- Sloping and landscaping the sand mine 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 revert back to its previous state of agriculture. The current state of the area is undisturbed and inactive area, with extremely low agriculture potential. Upon replacement of the topsoil, the area around the excavation will once again return to the previous state, and the planting of the cover crop (to protect the topsoil) will tie in with the rehabilitation.

The flatter veld area at the base of the koppie, included in the 5 hectare application area, will be possible to restore as agricultural grazing land after mining.

Mitigation measures that will contribute to its restoration are:

- Prevent disturbance to the vegetation and soil surface as much as possible. Rather than removing vegetation and flattening or excavating the soil surface, all activities like stockpiling should simply take place on the existing vegetation and soil surface.
- Implement an effective system of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points by way of temporary bunds or ditches, and it must prevent any potential down slope erosion. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.
- Remove all stockpiled material from the area at closure.

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

☐ Rehabilitation of the excavated area:

Final rehabilitation shall entail landscaping, levelling, top dressing, land preparation, seeding (if required), and weed / alien clearing of the last strip as well as those areas in the remaining area that require additional attention;

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

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 plant, office and service areas, 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. SCC and protected plant species that are listed in schedules 3 and 4 of the Western Cape Nature Conservation Laws Amendment Act, 2000 (Act No. 3 of 2000) may not be picked or removed without the relevant permit from CapeNature. Moreover, it is highly recommended that such species be relocated, via suitable Search and Rescue Procedures, in order to avoid their destruction.

Upon final rehabilitation and closure the mining site will revert to agricultural use.

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 30 000 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.

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

As previously stated, the proposed access road intersects with more than 2 drainage lines which necessitates a water use application in terms of Section 21 of the NWA, 1998. This was confirmed by the Risk Matrix Assessment conducted by the Biodiversity Company (Pty) Ltd (please see Appendix M1).

A General Authorisation (please see Appendix Q) was obtained for the adjacent mine that uses the same road and will be used in support of this application, unless otherwise directed by the Department of Water and Sanitation (DWS).

An agreement is in place with the Municipality to secure treated water for dust suppression (please see Appendix R).

iv) Impacts to be mitigated in their respective phases

Table 24: 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	5 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 sand is only allowed within the boundaries of the approved area. <ul style="list-style-type: none"> 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	5 ha	<u>Loss of agricultural land for duration of mining:</u> According to the landowner, the agricultural potential of the study area (S1) is of low significance and therefore he supports the proposed mining operation. The proposed mining area will revert back to its previous state upon closure. The mining area	Use of agricultural land must be managed in accordance with the: <ul style="list-style-type: none"> CARA, 1983 Closure Plan (Appendix L) 	Throughout the site establishment-, and operational phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			in its original state was deemed with low agricultural potential.		
Site establishment and infrastructure development.	Site Establishment & Operational Phase	5 ha	Loss of the unnamed tributary due to the construction/extension of access road.	Any water related matters must be managed in accordance with the: <ul style="list-style-type: none"> NWA, 1998 WUL conditions 	Throughout the site establishment, and operational phase.
<ul style="list-style-type: none"> Site establishment and stockpiling of topsoil and overburden 	Site Establishment & Operational Phase	5 ha	<u>Visual Mitigation</u> <ul style="list-style-type: none"> The site must have a neat appearance and be kept in good condition at all times. Mining must be contained to the boundaries of the permitted area. 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. The excavation must be contained within the approved footprint of the permitted 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: <ul style="list-style-type: none"> MPRDA, 2008 NEMA, 1998 	Throughout the site establishment, and operational phase.
<ul style="list-style-type: none"> Site establishment 	Site Establishment phase	5 ha	<u>Management of vegetation removal:</u> <ul style="list-style-type: none"> The mining boundaries must be clearly demarcated, and all operations must be 	Natural vegetated areas must be managed in accordance with the: <ul style="list-style-type: none"> NEM:BA 2004 	Throughout the site establishment phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
<p>and infrastructure development.</p> <ul style="list-style-type: none"> Cumulative Impacts 			<p>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.</p> <ul style="list-style-type: none"> A pre-construction walk-through should be conducted in the flowering season by a suitably qualified botanist for SCC or protected plant species that will be affected (also to comply with provincial permit conditions), and to develop a more comprehensive plant species list of the area. For threatened species that may not be destroyed, it is recommended that professional search and rescue service providers be used to remove such plants and to use them either for later rehabilitation work or other conservation projects. Any individual of a protected plant species present on site requires a relocation or destruction permit to remove or destroy such an individual. High visibility flags must be placed near any threatened/protected plants in order to avoid any damage or destruction to them. If left undisturbed, the sensitivity and importance of these species must be part of the environmental awareness program. When infrastructure, development areas or routes intersect with protected plants, and which cannot be avoided, such plants should be removed from the soil and relocated/re-planted in similar habitats where they should be able to resprout and flourish again. All SCC and protected plant species should be relocated, and as many other geophytic species as possible. 	<ul style="list-style-type: none"> Western Cape Biodiversity Plan 	

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			<ul style="list-style-type: none"> • Permits must be kept on-site and in the possession of the flora search and rescue team at all times. • A pre-construction environmental induction must be provided for all staff to ensure compliance with basic environmental principles. This includes awareness of no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, and remaining within demarcated construction areas. Bush-clearance may only commence once the recommendations of the specialist (pre-commencement walkthrough) have been implemented. • Blanket clearing of vegetation must be limited to the proposed footprint and associated infrastructure. No clearing outside of the minimum required footprint to take place. • 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. • Clearing of vegetation should be minimized and avoided where possible. • Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. • Prevent disturbance to the vegetation and soil surface as much as possible. Rather than removing vegetation and flattening or excavating the soil surface, all activities like 		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			<p>crushing and stockpiling should simply take place on the existing vegetation and soil surface.</p> <ul style="list-style-type: none"> • Implement an effective system of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points by way of temporary bunds or ditches, and it must prevent any potential down slope erosion. Corrective action must be implemented to the run-off control system in the event of any erosion occurring. • 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 plant species, whether native or exotic, should be brought into, ore removed from, the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants. • 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 		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			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.		
<ul style="list-style-type: none"> Site establishment. Sloping and landscaping upon closure of the mining area. 	Site Establishment- and Decommissioning phase	±5 ha	<p><u>Topsoil Management:</u></p> <ul style="list-style-type: none"> 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 must 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 and inactive 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 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. 	<p>Topsoil must be managed in accordance with the:</p> <ul style="list-style-type: none"> 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
			<ul style="list-style-type: none"> 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 to its previous natural state and 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. The rehabilitated area must be monitored for erosion, and appropriately stabilized if any erosion occurs for at least 12 months after reinstatement. 		
<ul style="list-style-type: none"> 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	<p><u>Management of Invader Plant Species:</u></p> <ul style="list-style-type: none"> 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: 	<p>Invader plants must be managed in accordance with the:</p> <ul style="list-style-type: none"> CARA, 1983 NEM:BA 2004 Invasive Plant Species Management Plan (Appendix I) 	Throughout the site establishment-, operational, and decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			<ul style="list-style-type: none"> 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. 		
<ul style="list-style-type: none"> Site establishment. Mining of sand 	Site Establishment- and Operational phase	5 ha	<p><u>Protection of fauna</u></p> <ul style="list-style-type: none"> Site access should be controlled, and no unauthorised persons should be allowed onto the site. Any fauna directly threatened by the associated activities should be removed to a safe location by a site manager. The collection/trapping, hunting, or poisoning of any animals at the site is strictly forbidden. Signs must be put up to enforce this. Personnel should not be allowed to wander off demarcated areas. Fires must not be allowed on site. All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel, and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. All vehicles should adhere to a low-speed limit (40 km/h) to avoid collisions with susceptible species. 	<p>Fauna must be managed in accordance with the:</p> <ul style="list-style-type: none"> 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
			<ul style="list-style-type: none"> Construction vehicles must be limited to a minimal footprint on site (no movement outside of the earmarked footprint). 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. Schedule activities and operations during least sensitive periods, to avoid migration, nesting, and breeding seasons. Ensure that cables and connections are insulated successfully to reduce electrocution risk. Use environmentally friendly chemical products. No litter, food or other foreign material may be thrown or left around the site. 		
<ul style="list-style-type: none"> Site establishment and infrastructure development. Excavation, loading and hauling to the screening plant. 	Site Establishment, & Operational Phase.	5 ha	<p><u>Archaeological, Heritage and Palaeontological Aspects:</u></p> <ul style="list-style-type: none"> 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. 	<p>Cultural/heritage aspects on site must be managed in accordance with the:</p> <p>NHRA, 1999</p>	Throughout the site establishment-, and operational phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			<ul style="list-style-type: none"> 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 HWC. <p>Work may only continue once the go-ahead was issued by SAHRA.</p>		
<ul style="list-style-type: none"> Stripping and stockpiling of topsoil and/or overburden. Excavation, loading and hauling to the screening plant. Processing, stockpiling and transporting of material. 	Site Establishment-, Operational Phase	±1 ha	<p><u>Fugitive Dust Emission Mitigation:</u></p> <ul style="list-style-type: none"> 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. Loads must be flattened to prevent spillage during transportation on public roads. 	<p>Dust generation must be managed in accordance with the:</p> <ul style="list-style-type: none"> 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
			<ul style="list-style-type: none"> 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. 		
<ul style="list-style-type: none"> Site establishment. Mining of sand Screening, stockpiling and transporting material from site. Sloping and landscaping upon closure of the mining area. 	Site Establishment-, Operational-, and Decommissioning Phase	5 ha	<p>Noise Handling:</p> <ul style="list-style-type: none"> 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. 	<p>Noise generation must be managed in accordance with the:</p> <ul style="list-style-type: none"> NEM:AQA. 2004 Regulation 6(1) NRTA, 1996 Western Cape Noise Control Regulations Provincial Notice 200/2013. 	Throughout the site establishment-, operational-, and decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			<ul style="list-style-type: none"> Noise generated on-site from all the proposed activities must comply with the Western Cape Noise Control Regulations Provincial Notice 200/2013. 		
<ul style="list-style-type: none"> Stripping and stockpiling of topsoil and/or overburden. Excavation, loading and hauling to the screening plant. Processing, stockpiling and transporting of material. Sloping and landscaping during rehabilitation phase. 	Site Establishment-, Operational-, and Decommissioning Phase	5 ha	<p><u>Waste Management:</u></p> <ul style="list-style-type: none"> 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. 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 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. 	<p>Mining related waste must be managed in accordance with the:</p> <ul style="list-style-type: none"> 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
			<ul style="list-style-type: none"> • 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 area, to be removed when filled 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. • It is important that any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities is reported to the Department of Water and Sanitation and other relevant authorities. 		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			<ul style="list-style-type: none"> The Municipality should be consulted about available options to deal with green waste in accordance with its organic waste diversion plan to divert organic waste from its landfills. 		
<ul style="list-style-type: none"> Stripping and stockpiling of topsoil and overburden. Excavation, loading and hauling to the screening plant. Sloping and landscaping during rehabilitation. 	Operational Phase	5 ha	<p><u>Erosion Control and Storm Water Management:</u></p> <ul style="list-style-type: none"> 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. Prevent disturbance to the vegetation and soil surface as much as possible. Rather than removing vegetation and flattening or excavating the soil surface, all activities like crushing and stockpiling should simply take place on the existing vegetation and soil surface. Implement an effective system of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points by way of temporary bunds or ditches, and it must prevent any potential down slope erosion. Corrective action must be implemented to the run-off control system in the event of any erosion occurring. 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. 	<p>Storm water must be managed in accordance with the:</p> <ul style="list-style-type: none"> 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
			<ul style="list-style-type: none"> • When mining within steep slopes, it must be ensured that adequate slope protection is provided. • 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 because 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: <ul style="list-style-type: none"> ▪ 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 		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			<p>activity and over different hydrological cycles (rainfall patterns).</p> <ul style="list-style-type: none"> ▪ 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. ▪ 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. 		
<ul style="list-style-type: none"> • Screening, stockpiling and transporting 	Operational Phase	±1 ha	<p><u>Access Road Mitigation:</u></p> <ul style="list-style-type: none"> • Storm water must be diverted around the access road to prevent erosion. 	<p>The access road must be managed in accordance with the:</p> <ul style="list-style-type: none"> • NRTA, 1996 	Throughout the operational phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
material from site.			<ul style="list-style-type: none"> • Vehicular movement must be restricted to the existing access road to prevent crisscrossing of tracks through undisturbed and inactive 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. • In the event that the dam is full and alternative will be used along the dam 		
<ul style="list-style-type: none"> • Excavation, loading and hauling to the screening plant. • Sloping and landscaping during rehabilitation phase. 	Site Establishment-, Operational-, and Decommissioning phase	5 ha	<p><u>Management of health and safety risks:</u></p> <ul style="list-style-type: none"> • 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). 	<p>Health and safety aspects must be managed in accordance with the:</p> <ul style="list-style-type: none"> • MHSA, 1996 • OHSA, 1993 • OHSAS, 18001 	Throughout the site establishment-, operational and decommissioning phase.
<ul style="list-style-type: none"> • Site establishment and infrastructure development. 	Site Establishment, & Operational Phase.	±500 m ²	<p><u>Storage/Handling of Hazardous Substances/Chemicals:</u></p> <ul style="list-style-type: none"> • 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) 	<p>Chemicals/hazardous substances must be stored in accordance with the:</p> <ul style="list-style-type: none"> • 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
			<p>must be kept current for all chemicals used on site.</p> <ul style="list-style-type: none"> Any fuel/used oil tanks must have secondary containment in the form of an impermeable bund wall and base within which the tanks sit, 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 stored on bare soil. The wastewater originating from the cleaning of drip trays must be discarded into the oil sump. 		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
<ul style="list-style-type: none"> Sloping and landscaping during rehabilitation phase. 	Decommissioning Phase	5 ha	<p><u>Rehabilitation/landscaping of mining area:</u></p> <ul style="list-style-type: none"> The excavated area must serve as a final depositing area for the placement of overburden. 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 and 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. 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. Remove all stockpiled material from the area at closure. 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 	<p>Rehabilitation of the mining area must be in accordance with the:</p> <ul style="list-style-type: none"> ❖ CARA, 1983 ❖ NEM:BA, 2004 ❖ MPRDA, 2002 <p>Closure Plan (Appendix L)</p>	Throughout the decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			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 25: Impact Management Outcomes

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
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.)	(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)		In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))	(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. <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring Remedy through rehabilitation.	(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
<ul style="list-style-type: none"> • Demarcation of site with visible beacons. 	<ul style="list-style-type: none"> • No impact could be identified other than the beacons being outside the 	N/A	Site Establishment phase	Control through management and monitoring.	Mining of sand is only allowed within the boundaries of the approved area. <ul style="list-style-type: none"> • MPRDA, 2008

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
	boundaries of the approved mining area.				<ul style="list-style-type: none"> NEMA, 1998
<ul style="list-style-type: none"> Site establishment and infrastructure development. Stripping and stockpiling of topsoil and overburden. 	<ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> MPRDA, 2008 NEMA, 1998
<ul style="list-style-type: none"> Site establishment and infrastructure development. 	<ul style="list-style-type: none"> Loss of agricultural land for duration of mining. 	The impact may affect the agricultural opportunities of the property.	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. The impact could be controlled through progressive rehabilitation.	Use of agricultural land must be managed in accordance with the: <ul style="list-style-type: none"> CARA, 1983 Closure Plan (Appendix L)
<ul style="list-style-type: none"> Stripping and stockpiling of topsoil and overburden. Excavation, loading and hauling to the screening plant. Sloping and landscaping during rehabilitation. Construction of site access road 	<ul style="list-style-type: none"> 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	<u>Control & Remedy:</u> Proper housekeeping and storm water management.	Topsoil must be managed in accordance with the: <ul style="list-style-type: none"> CARA, 1983 NEM:BA, 2004 MPRDA, 2008
<ul style="list-style-type: none"> Site establishment Screening, stockpile, and transporting material from site. Sloping and landscaping upon closure of the mining area. 	<ul style="list-style-type: none"> Infestation of the topsoil heaps and mining area with invader plant species. Infestation of denuded areas with invader plant species 	This will impact on the biodiversity of the receiving environment.	Site Establishment-, Operational- and Decommissioning phase	<u>Control:</u> Implementing soil- and storm water management.	Invader plants must be managed in accordance with the: <ul style="list-style-type: none"> CARA, 1983 NEM:BA 2004 Invasive Plant Species Management Plan (Appendix I)

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
	<ul style="list-style-type: none"> Infestation of the reinstated area with invader plant species. 				
<ul style="list-style-type: none"> Site establishment and infrastructure development. Stripping and stockpiling of topsoil and overburden. 	<ul style="list-style-type: none"> Potential impact on fauna within the footprint area. Disturbance to aquatic fauna within the footprint area Loss of the unnamed tributary due to the construction/extension of access road. 	This will impact on the biodiversity of the receiving environment.	Site Establishment- and Operational phase	<u>Control & Stop:</u> Implementing good management practices.	<p>Fauna must be managed in accordance with the:</p> <ul style="list-style-type: none"> NEM:BA 2004 <p>Any water related matters must be managed in accordance with the:</p> <ul style="list-style-type: none"> NWA, 1998 WUL conditions
<ul style="list-style-type: none"> Stripping and stockpiling of topsoil and/or overburden. Construction of site access road Excavation, loading and hauling to the screening plant. Screening, stockpiling and transporting of material. 	<ul style="list-style-type: none"> 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.	<p>Dust generation must be managed in accordance with the:</p> <ul style="list-style-type: none"> NEM:AQA. 2004 Regulation 6(1) National Dust Control Regulations, GN No R827 ASTM D1739 (SANS 1137:2012)
<ul style="list-style-type: none"> Stripping and stockpiling of topsoil and/or overburden. Construction of site access road Excavation, loading and hauling to the screening plant. 	<ul style="list-style-type: none"> Noise nuisance generated by earthmoving machinery. Dust nuisance as a result of the mining activities.Noise 	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.	<p>Noise generation on site must be managed in accordance with the:</p> <ul style="list-style-type: none"> NEM:AQA, 2004 Regulation 6(1) NRTA, 1996 Western Cape Noise Control Regulations Provincial Notice 200/2013.

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
<ul style="list-style-type: none"> Screening, stockpiling and transporting of material. 	<ul style="list-style-type: none"> nuisance as a result of the mining activities. Noise nuisance stemming from operation of the processing plant. 				
<ul style="list-style-type: none"> Mining of sand . Screening, stockpile, and transporting material from site. Sloping and landscaping upon closure of the mining area. 	<ul style="list-style-type: none"> Soil contamination from hydrocarbon spills. Potential impact associated with littering and hydrocarbon spills. Potential impact associated with litter left at the mining area. 	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: <ul style="list-style-type: none"> NWA, 1998 NEM:WA, 2008 NEM:WA, 2008: National norms and standards for the storage of waste (GN 926) NEMA, 1998 (Section 30)
<ul style="list-style-type: none"> Site establishment and infrastructure development. Excavation, loading and hauling to the processing plant. 	<ul style="list-style-type: none"> 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	<u>Control & Stop:</u> Implementing good management practices, as well as the chance-find protocol.	Cultural/heritage aspects must be managed in accordance with the: <ul style="list-style-type: none"> NHRA, 1999
<ul style="list-style-type: none"> Construction of site access road Screening, stockpile, and transporting material from site. 	<ul style="list-style-type: none"> Deterioration of the access road to the mining area. Loss of the unnamed tributary due to extension/construction of access road. 	Collapse of the road infrastructure will affect the landowner.	Operational Phase	<u>Control & Remedy:</u> 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. Implementing the WUL conditions and specifications.	The access road must be managed in accordance with the: <ul style="list-style-type: none"> NRTA, 1996

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
<ul style="list-style-type: none"> Excavation, loading and hauling to the processing plant. Sloping and landscaping during rehabilitation phase. 	<ul style="list-style-type: none"> Health and safety risk posed by mining 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	<u>Stop & Control:</u> regulations, demarcation of the mining area and proper housekeeping.	Health and safety aspects on site must be managed in accordance with the: <ul style="list-style-type: none"> MHSA, 1996 OHSA, 1993 OHSAS 18001 USBM standards
<ul style="list-style-type: none"> Screening, stockpile, and transporting material from site. 	<ul style="list-style-type: none"> 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	<u>Control:</u> Proper site management.	Load weights must be managed in accordance with the: <ul style="list-style-type: none"> 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 26: Impact Management Actions

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
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.)	(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)	(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. <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring Remedy through rehabilitation.	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.	(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)
<ul style="list-style-type: none"> • Demarcation of site with visible beacons. 	<ul style="list-style-type: none"> • 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 sand is only allowed within the boundaries of the approved area. <ul style="list-style-type: none"> • MPRDA, 2008 • NEMA, 1998

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
<ul style="list-style-type: none"> Site establishment 	<ul style="list-style-type: none"> Visual intrusion as a result of site establishment. 	<ul style="list-style-type: none"> Visual Mitigation Mining must be contained to the boundaries of the permitted area. The site must have a neat appearance and be always kept in good condition. 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 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-construction walk-through should be conducted in the flowering season by a suitably qualified botanist for SCC or protected plant species that will be affected (also to comply with provincial permit conditions), and to develop a more comprehensive plant species list of the area. Prevent disturbance to the vegetation and soil surface as much as possible. Rather than removing vegetation and flattening or excavating the soil surface, all activities like crushing and stockpiling should simply take place on the existing vegetation and soil surface. 	<p>Throughout the site establishment-, and operational phase.</p>	<p>Management of the mining area must be in accordance with the:</p> <ul style="list-style-type: none"> MPRDA, 2008 NEMA, 1998

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		<ul style="list-style-type: none"> • Implement an effective system of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points by way of temporary bunds or ditches, and it must prevent any potential down slope erosion. Corrective action must be implemented to the run-off control system in the event of any erosion occurring. • For threatened species that may not be destroyed, it is recommended that professional search and rescue service providers be used to remove such plants and to use them either for later rehabilitation work or other conservation projects. • Any individual of an SCC or protected plant species present on site requires a relocation or destruction permit (from CapeNature) to remove or destroy such an individual. High visibility flags must be placed near any threatened/protected plants in order to avoid any damage or destruction to them. If left undisturbed, the sensitivity and importance of these species must be part of the environmental awareness program. When infrastructure, development areas or routes intersect with protected plants, and which cannot be avoided, such plants should be removed from the soil and relocated/re-planted in similar habitats where they should be able to resprout and flourish again. All SCC and protected plant species should be 		

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		<p>relocated, and as many other geophytic species as possible.</p> <ul style="list-style-type: none"> • Permits must be kept on-site and in the possession of the flora search and rescue team at all times. • A pre-construction environmental induction must be provided for all staff to ensure compliance with basic environmental principles. This includes awareness of no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, and remaining within demarcated construction areas. Bush-clearance may only commence once the recommendations of the specialist (pre-commencement walkthrough) have been implemented. • Blanket clearing of vegetation must be limited to the proposed footprint and associated infrastructure. No clearing outside of the minimum required footprint to take place. • 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. • Clearing of vegetation should be minimized and avoided where possible. • Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. 		

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		<ul style="list-style-type: none"> • 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 plant species, whether native or exotic, should be brought into, ore removed from, the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants. • As per the Terrestrial Biodiversity Impact Assessment by Dr. Jan-Hendrik Keet "The plant community type that will be the most affected is the <i>Ruschia intricata</i> - <i>Aristida diffusa</i> type since it is characterized by unique microhabitat conditions, specifically large sand sheets with very shallow overlying soils. While it might prove very difficult to replicate these exact microhabitat conditions, it is highly probable that this type might be successfully rehabilitated to its closely related counterpart, namely the <i>Aristida diffusa</i> - <i>Aristida congesta</i> type. This is because the <i>Ruschia intricata</i> - <i>Aristida diffusa</i> type can be regarded as a subtype of the former, and manifests in the areas where soils become much more shallow than usual. Thus, while the rehabilitation and restoration potential are low for the <i>Ruschia intricata</i> - <i>Aristida diffusa</i> type, it is indeed 		

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		<p>moderate to high for the <i>Aristida diffusa</i> - <i>Aristida congesta</i> type. In this sense, the loss of one plant community type can be mitigated by a gain in another type.</p> <ul style="list-style-type: none"> As per the Terrestrial Biodiversity Report - The impacts on the <i>Aristida congesta</i> - <i>Asparagus burchellii</i> type are not as high as the aforementioned, since no actual mining will occur in it. Thus, it has a high rehabilitation potential. Advised relocation guidelines should be followed to ensure that the majority of the protected plant species found on site are relocated with a high success rate. Only one species, namely <i>Gomphocarpus tomentosus</i> subsp. <i>tomentosus</i>, may be difficult to relocate, but only if individuals have deep root systems that are difficult to remove without significant damage. Therefor the appropriate relocation measures must be implemented. 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. 		

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
<ul style="list-style-type: none"> • Site establishment • Screening, stockpiling and transporting material from site. • Sloping and landscaping upon closure of the mining area. • Construction of site access road 	<ul style="list-style-type: none"> • 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 • Loss of the unnamed tributary due to extension/construction of access road. 	<p><u>Topsoil Management:</u></p> <ul style="list-style-type: none"> • 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 must 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 and inactive 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 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. 	<p>Throughout the site establishment-, operational, and decommissioning phase.</p>	<p>Topsoil must be managed in accordance with the:</p> <ul style="list-style-type: none"> • CARA, 1983 • NEM:BA, 2004 • MPRDA, 2008

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		<ul style="list-style-type: none"> • 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 to its previous natural state 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. • The rehabilitated area must be monitored for erosion and appropriately stabilized if any erosion occurs for at least 12 months after reinstatement. • Control: Implementing the WUL conditions and specifications. 		
<ul style="list-style-type: none"> • Site establishment • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area. • Construction of site access road 	<ul style="list-style-type: none"> • 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. 	<p><u>Management of Invader Plant Species:</u></p> <ul style="list-style-type: none"> • 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. 	Throughout the site establishment-, operational, and decommissioning phase.	<p>Invader plants must be managed in accordance with the:</p> <ul style="list-style-type: none"> • CARA, 1983 • NEM:BA 2004 • Invasive Plant Species Management Plan (Appendix I)

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		<ul style="list-style-type: none"> Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. The following control methods can be used: <ul style="list-style-type: none"> 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) using an herbicide recommended for use by the PCO in accordance with the directions for the use of such an herbicide. 		
<ul style="list-style-type: none"> Site establishment. Mining of sand. 	<ul style="list-style-type: none"> Potential impact on fauna within the footprint area. 	<p><u>Protection of Fauna:</u></p> <ul style="list-style-type: none"> 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.	<p>Fauna must be managed in accordance with the:</p> <ul style="list-style-type: none"> NEM:BA 2004
<ul style="list-style-type: none"> Site establishment Screening, stockpile, and transporting material from site. Construction of site access road 	<ul style="list-style-type: none"> Dust nuisance as a result of the mining activities. Dust nuisance as a result of the mining activities. 	<p><u>Fugitive Dust Emission Mitigation:</u></p> <ul style="list-style-type: none"> 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. 	Throughout the site establishment-, operational, and decommissioning phase.	<p>Dust generation must be managed in accordance with the:</p> <ul style="list-style-type: none"> 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
		<ul style="list-style-type: none"> 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 sand from site to minimize potential dust impacts. 		
<ul style="list-style-type: none"> Site establishment Mining of sand Screening, stockpile, and transporting material from site. 	<ul style="list-style-type: none"> Noise nuisance as a result of the mining activities. Noise nuisance as a result of the decommissioning activities. 	<p><u>Noise Handling:</u></p> <ul style="list-style-type: none"> 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 	Throughout the site establishment-, operational-, and decommissioning phase.	<p>Noise generation must be managed in accordance with the:</p> <ul style="list-style-type: none"> NEM: AQA. 2004 Regulation 6(1) NRTA, 1996 Western Cape Noise Control Regulations Provincial Notice 200/2013.

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
<ul style="list-style-type: none"> Sloping and landscaping upon closure of the mining area. Construction of site access road 		<p>condition in terms of the National Road Traffic Act, 1996 (Act No 93 of 1996).</p> <ul style="list-style-type: none"> Best practice measures shall be implemented in order to minimize potential noise impacts. A qualified occupational hygienist must be contracted to quarterly monitor and report on the personal noise exposure of the employees working at the mine. The monitoring must be done in accordance with the SANS 10083:2004 (Edition 5) sampling method as well as NEM: AQA, 2004, SANS 10103:2008. Noise generated on-site from all the proposed activities must comply with the Western Cape Noise Control Regulations Provincial Notice 200/2013. 		
<ul style="list-style-type: none"> Mining of sand . Screening, stockpile, and transporting material from site. Sloping and landscaping upon closure of the mining area. 	<ul style="list-style-type: none"> Soil contamination from hydrocarbon spills. Potential impact associated with littering and hydrocarbon spills. Potential impact associated with litter left at the mining area. 	<p><u>Waste Management:</u></p> <ul style="list-style-type: none"> 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. 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 	<p>Throughout the site establishment-, operational-, and decommissioning phase.</p>	<p>Mining related waste must be managed in accordance with the:</p> <ul style="list-style-type: none"> 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	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		<p>weeks for the duration of the mining activities.</p> <ul style="list-style-type: none"> • The use of any temporary, chemical toilet facilities may 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. • 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 		

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		<p>appropriate disposal at a recognized facility. Proof must be filed.</p> <ul style="list-style-type: none"> • 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 area, to be removed when filled to capacity to a recognised general waste landfill site. • Although clearing of vegetation will be limited to the proposed mining footprint and associated infrastructure, removed vegetation may be taken to a green/garden waste chipping facility for composting or be disposed of at an appropriately licensed waste management facility but may not be disposed of or dumped on adjacent land. The Municipality should be consulted for available options to deal with green waste in accordance with its organic waste diversion plan to divert organic waste from its landfills if such facilities are available. • No waste may be buried or burned on the site. • No chemicals or hazardous materials may be stored at the mining area. • It is important that any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities is reported to the Department of Water and Sanitation and other relevant authorities. • The Municipality should be consulted for available options to deal with green waste in 		

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		accordance with its organic waste diversion plan to divert organic waste from its landfills.		
<ul style="list-style-type: none"> Mining of sand . 	<ul style="list-style-type: none"> Potential impact on area/infrastructure of heritage or cultural concern. 	<p><u>Archaeological, Heritage and Palaeontological Aspects:</u></p> <ul style="list-style-type: none"> 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 HWC. Work may only continue once the go-ahead was issued by SAHRA. 	Throughout the operational phase.	<p>Cultural/heritage aspects must be managed in accordance with the:</p> <ul style="list-style-type: none"> NHRA, 1999

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
<ul style="list-style-type: none"> Screening, stockpiling and transporting material from site. Mining of sand Construction of site access road . 	<ul style="list-style-type: none"> Loss of stockpiled material due to ineffective storm water control. 	<ul style="list-style-type: none"> Storm Water Mitigation: Storm water must be diverted around the topsoil heaps and mining area to prevent erosion. Implement an effective system of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points by way of temporary bunds or ditches, and it must prevent any potential down slope erosion. Corrective action must be implemented to the run-off control system in the event of any erosion occurring. 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. 	<ul style="list-style-type: none"> Throughout the operational phase. 	<p>Storm water must be managed in accordance with the:</p> <ul style="list-style-type: none"> CARA, 1983 NEMA, 1998 NWA, 1998

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
<ul style="list-style-type: none"> Construction of site access road Screening, stockpile, and transporting material from site. 	<ul style="list-style-type: none"> Deterioration of the access road to the mining area. Overloading of trucks having an impact on the public roads. 	<p><u>Access Road Mitigation:</u></p> <ul style="list-style-type: none"> 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 and inactive 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.	<p>The access road must be managed in accordance with the:</p> <ul style="list-style-type: none"> NRTA, 1996
<ul style="list-style-type: none"> Site establishment. Mining of sand . Screening, stockpiling and transporting material from site. Sloping and landscaping upon closure of the mining area. 	<ul style="list-style-type: none"> Potential health and safety risk to employees. 	<p><u>Management of Health and Safety Risks:</u></p> <ul style="list-style-type: none"> 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.	<p>Health and safety aspects must be managed in accordance with the:</p> <ul style="list-style-type: none"> 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 decommissioning phase will entail the reinstatement of the processing area by removing the mining machinery from the site. Removal of the 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 Draft 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. Comments received during this period will be included in the FBAR.

- (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:
 - Rehabilitation of the surface area shall entail landscaping, levelling, top dressing, land preparation, seeding (if required), maintenance, and clearing of invasive plant species.
 - All 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) need to be eradicated from the site. SCC and protected plant species that are listed in schedules 3 and 4 of the Western Cape Nature Conservation Laws Amendment Act, 2000 (Act No. 3 of 2000) may not be picked or removed without the relevant permit from CapeNature. Moreover, it is highly recommended that such species be relocated, via suitable Search and Rescue Procedures, in order to avoid their destruction.
 - Final rehabilitation must be completed within a period specified by the Regional Manager (DMR).

(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	Sand
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
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Level of information

According to Step 4.2:

Level of information available	Limited
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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

Component No.	Main description	Applicability of closure components (Circle Yes or 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	338 597	0.04
7	Sealing of shafts, adits and inclines	-	-
8(A)	Rehabilitation of overburden and spoils	-	-
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	178817	1.00
11	River diversions	-	-
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	23797	1.00

Determine weighting factors

According to Tables B.7 and B.8

Weighting factor 1: Nature of terrain/accessibility	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 27: Calculation of closure cost

CALCULATION OF THE QUANTUM							
Mine:	CZ Sand Mine (Pty) Ltd			Location:	Beaufort West		
Evaluators:	M Saal			Date:	28 April 2025		
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	23	1.00	1	R 0,00
2(A)	Demolition of steel buildings and structures	m ²	0	323	1.00	1	R 0,00
2(B)	Demolition of reinforced concrete buildings and structures	m ²	0	476	1.00	1	R 0,00
3	Rehabilitation of access roads	m ²	0	58	1.00	1	R 0,00
4(A)	Demolition and rehabilitation of electrified railway lines	m	0	561	1.00	1	R 0,00
4(B)	Demolition and rehabilitations of non-electrified railway lines	m	0	306	1.00	1	R 0,00
5	Demolition of housing and/or administration facilities	m ²	0	646	1.00	1	R 0,00
6	Opencast rehabilitation including final voids and ramps	ha	1	338,597	0.04	1	R 13 543.88
7	Sealing of shaft, audits and inclines	m ³	0	174	1.00	1	R 0,00
8(A)	Rehabilitation of overburden and spoils	ha	0	225,731	1.00	1	R 0,00
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	ha	0	281,144	1.00	1	R 0,00
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	ha	0	816,575	0.51	1	R 0,00
9	Rehabilitation of subsided areas	ha	0	189,016	1.00	1	R 0,00
10	General surface rehabilitation	ha	2	178,817	1.00	1	R 357.634

11	River diversions	ha	0	178,817	1.00	1	R 0,00
12	Fencing	m	0	204	1.00	1	R 0,00
13	Water Management	ha	0	67,992	0.17	1	R 0,00
14	2 to 3 years of maintenance and aftercare	ha	5	23,797	1.00	1	R 118.985
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 490 162.88
Multiply Sum of 1-15 by Weighting factor 2 (Step 4.4)			R24,508.14		Sub Total 1		R 514 671.02

1	Preliminary and General	6% of Subtotal 1 if Subtotal 1 <R100 000 000.00	R 30 880.26
		12% of Subtotal 1 if Subtotal 1 >R100 000 000.00	-
2	Contingency	10.0% of Subtotal 1	R 51 467.10
Sub Total 2 (Subtotal 1 plus management and contingency)			R 597 018.39
Vat (15%)			R 89 552.76
GRAND TOTAL (Subtotal 3 plus VAT)			R 686 571.15

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 686 571.15**

(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 28: 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
<ul style="list-style-type: none"> Demarcation of site with visible beacons 	Maintenance of beacons	<ul style="list-style-type: none"> Visible beacons need to be placed at the corners of the mining area. 	<p><u>Role:</u></p> <ul style="list-style-type: none"> 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. <p><u>Responsibility:</u></p> <ul style="list-style-type: none"> Ensure beacons are in place throughout the life of the mine. 	<p>Applicable throughout site establishment-, operational-, and decommissioning phases.</p> <ul style="list-style-type: none"> Daily compliance monitoring by site management. Annual compliance monitoring of site by an Environmental Control Officer. All schedules should be consolidated into a checklist that will include all other possible inspections, checks, and audits, with the frequencies at which they will be conducted, to ensure ease of reference and tracking. These checks should be filed for presentation to the competent authority upon request thereof.
<ul style="list-style-type: none"> Site establishment 	<u>Visual Characteristics:</u>	<ul style="list-style-type: none"> Minimize the visual impact of the activity on 	<p><u>Role:</u></p>	<p>Applicable throughout site establishment-, operational-, and decommissioning phases.</p>

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
	<ul style="list-style-type: none"> Visual intrusion as a result of site establishment. 	<p>the surrounding environment through proper site management and implementing good housekeeping practices.</p>	<ul style="list-style-type: none"> 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. <p><u>Responsibility:</u></p> <ul style="list-style-type: none"> Contain mining to the boundaries of the permitted area. Ensure that the site have a neat appearance and is always kept in good condition. 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. 	<ul style="list-style-type: none"> Daily compliance monitoring by site management. Annual compliance monitoring of site by an Environmental Control Officer. All schedules should be consolidated into a checklist that will include all other possible inspections, checks, and audits, with the frequencies at which they will be conducted, to ensure ease of reference and tracking. These checks should be filed for presentation to the competent authority upon request thereof.
<ul style="list-style-type: none"> Site establishment screening, stockpiling and transporting material from site. Sloping and landscaping upon closure of the mining area. 	<p><u>Geology and Soil:</u></p> <ul style="list-style-type: none"> 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 . 	<ul style="list-style-type: none"> Earthmoving equipment to reinstate mined-out areas. Cover crop to be established on reinstated areas. Erosion control infrastructure (if necessary) 	<p><u>Role:</u></p> <ul style="list-style-type: none"> 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. <p><u>Responsibility:</u></p> <ul style="list-style-type: none"> 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 	<p>Applicable throughout site establishment-, operational-, and decommissioning phases.</p> <ul style="list-style-type: none"> Daily compliance monitoring by site management. Annual compliance monitoring of site by an Environmental Control Officer. All schedules should be consolidated into a checklist that will include all other possible inspections, checks, and audits, with the frequencies at which they will be conducted, to ensure ease of reference and tracking. These checks should be filed for presentation to the competent authority upon request thereof.

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
			<p>mining in such a way that topsoil is stockpiled for the minimum possible time.</p> <ul style="list-style-type: none"> Place topsoil heaps on a levelled area within the mining footprint area. Do not stockpile topsoil in undisturbed and inactive 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. 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. 	

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
<ul style="list-style-type: none"> Site establishment Screening, stockpile, and transporting material from site. Sloping and landscaping upon closure of the mining area. 	<p><u>Groundcover:</u></p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Designated team to cut or pull-out invasive plant species that germinated on site. Herbicide application equipment. 	<p><u>Role:</u></p> <ul style="list-style-type: none"> 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. <p><u>Responsibility:</u></p> <ul style="list-style-type: none"> 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. 	<p>Applicable throughout site establishment-, operational-, and decommissioning phases.</p> <ul style="list-style-type: none"> Daily compliance monitoring by site management. Annual compliance monitoring of site by an Environmental Control Officer. All schedules should be consolidated into a checklist that will include all other possible inspections, checks, and audits, with the frequencies at which they will be conducted, to ensure ease of reference and tracking. These checks should be filed for presentation to the competent authority upon request thereof.
<ul style="list-style-type: none"> Site establishment. Mining of sand . 	<p><u>Fauna:</u></p> <ul style="list-style-type: none"> Potential impact on fauna within the footprint area. Disturbance to fauna within the footprint area. 	<ul style="list-style-type: none"> Toolbox talks to educate employees how to handle fauna that enter the work areas. 	<p><u>Role:</u></p> <ul style="list-style-type: none"> 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. <p><u>Responsibility:</u></p> <ul style="list-style-type: none"> 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. 	<p>Applicable throughout site establishment-, and operational phases.</p> <ul style="list-style-type: none"> Daily compliance monitoring by site management. Annual compliance monitoring of site by an Environmental Control Officer. All schedules should be consolidated into a checklist that will include all other possible inspections, checks, and audits, with the frequencies at which they will be conducted, to ensure ease of reference and tracking. These checks should be filed for presentation to the competent authority upon request thereof.

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<ul style="list-style-type: none"> Site establishment Screening, stockpile, and transporting material from site. 	<p><u>Air Quality:</u></p> <ul style="list-style-type: none"> Dust nuisance as a result of the mining activities. 	<ul style="list-style-type: none"> Dust suppression equipment such as a water car. Signage that clearly reduce the speed on the access roads. 	<p><u>Role:</u></p> <ul style="list-style-type: none"> 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. <p><u>Responsibility:</u></p> <ul style="list-style-type: none"> Control the liberation of dust into the surrounding environment 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). 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. 	<p>Applicable throughout site establishment-, operational-, and decommissioning phases.</p> <ul style="list-style-type: none"> Daily compliance monitoring by site management. Annual compliance monitoring of site by an Environmental Control Officer. All schedules should be consolidated into a checklist that will include all other possible inspections, checks, and audits, with the frequencies at which they will be conducted, to ensure ease of reference and tracking. These checks should be filed for presentation to the competent authority upon request thereof.

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
			<ul style="list-style-type: none"> Best practise mitigation measures be implemented to ensure that particulate emissions, and their consequent impact on the receiving environment, is minimised and that off-site pollutant concentrations and dust fallout is compliant with the South African National Ambient Air Quality Standards (Gazette 32816, 24 December 2009) and the National Dust Control Regulations (Gazette 36974, 1 November 2013). A complaints register will be kept on-site and all interested and affected parties, including nearby residents but also personnel, may report any air quality related issued, no matter how trivial. 	
<ul style="list-style-type: none"> Site establishment Mining of sand Screening, stockpile, and transporting material from site. Sloping and landscaping upon closure of the mining area. 	<p>Noise Ambiance:</p> <ul style="list-style-type: none"> Noise nuisance as a result of the mining activities. Noise nuisance as a result of the decommissioning activities. 	<ul style="list-style-type: none"> 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. 	<p><u>Role:</u></p> <ul style="list-style-type: none"> 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. <p><u>Responsibility:</u></p> <ul style="list-style-type: none"> 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. 	<p>Applicable throughout site establishment-, operational-, and decommissioning phases.</p> <ul style="list-style-type: none"> Daily compliance monitoring by site management. Annual compliance monitoring of site by an Environmental Control Officer. All schedules should be consolidated into a checklist that will include all other possible inspections, checks, and audits, with the frequencies at which they will be conducted, to ensure ease of reference and tracking. These checks should be filed for presentation to the competent authority upon request thereof.

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
			<ul style="list-style-type: none"> 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: AQUA 2004, SANS 10103:2008. Noise generated on-site from all the proposed activities must comply with the Western Cape Noise Control Regulations Provincial Notice 200/2013. 	
<ul style="list-style-type: none"> Mining of sand Screening, stockpile, and transporting material from site. Sloping and landscaping upon closure of the mining area. 	<p><u>Waste Management:</u></p> <ul style="list-style-type: none"> Soil contamination from hydrocarbon spills. Potential impact associated with littering and hydrocarbon spills. Potential impact associated with litter left at the mining area. 	<ul style="list-style-type: none"> Oil spill kit. Sealed drip trays. Formal waste disposal system with waste registers. 	<p><u>Role:</u></p> <ul style="list-style-type: none"> 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. The bund area will be inspected at least weekly, <p><u>Responsibility:</u></p> <ul style="list-style-type: none"> 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. 	<p>Applicable throughout site establishment-, operational-, and decommissioning phases.</p> <ul style="list-style-type: none"> Daily compliance monitoring by site management. Annual compliance monitoring of site by an Environmental Control Officer. All schedules should be consolidated into a checklist that will include all other possible inspections, checks, and audits, with the frequencies at which they will be conducted, to ensure ease of reference and tracking. These checks should be filed for presentation to the competent authority upon request thereof.

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
			<ul style="list-style-type: none"> • Provide 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. • 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 	

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
			<p>remove waste from the mining area to a recognised general waste landfill site.</p> <ul style="list-style-type: none"> Although clearing of vegetation will be limited to the proposed mining footprint and associated infrastructure, removed vegetation may be taken to a green/garden waste chipping facility for composting or be disposed of at an appropriately licensed waste management facility but may not be disposed of or dumped on adjacent land. The Municipality should be consulted for available options to deal with green waste in accordance with its organic waste diversion plan to divert organic waste from its landfills if such facilities are available. 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 Department of Water and Sanitation and other relevant authorities. Park the machinery at the mining area with drip trays placed underneath stationary vehicles. The Municipality should be consulted for available options to deal with green waste in accordance with its organic waste diversion plan to divert organic waste from its landfills. 	
<ul style="list-style-type: none"> Mining of sand 	<ul style="list-style-type: none"> Potential impact on areas/infrastructure of heritage or cultural concern. 	<ul style="list-style-type: none"> Contact number of an archaeologist that can be contacted when a discovery is made on site. 	<p><u>Role:</u></p> <ul style="list-style-type: none"> 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. 	<p>Applicable throughout site establishment-, operational-, and decommissioning phases.</p> <ul style="list-style-type: none"> 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
			<u>Responsibility:</u> <ul style="list-style-type: none"> Confine all mining to the development footprint area. Implement the following change find procedure when discoveries are made on site: <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> All schedules should be consolidated into a checklist that will include all other possible inspections, checks, and audits, with the frequencies at which they will be conducted, to ensure ease of reference and tracking. These checks should be filed for presentation to the competent authority upon request thereof.
<ul style="list-style-type: none"> Screening, stockpiling and transporting material from site. Mining of sand . 	<u>Hydrology:</u> <ul style="list-style-type: none"> Storm water management Loss of the unnamed tributary due to extension/construction of access road. 	<ul style="list-style-type: none"> Storm water management structures such as berms to direct storm- and runoff water around the stockpiled topsoil area (when needed). 	<u>Role:</u> <ul style="list-style-type: none"> 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. 	<p>Applicable throughout site establishment-, operational-, and decommissioning phases.</p> <ul style="list-style-type: none"> 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
		<ul style="list-style-type: none"> Water use licence issued by the DWS. 	<ul style="list-style-type: none"> Adhere to the specifications of the water use licence for the duration of the mining operation. <p><u>Responsibility:</u></p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> All schedules should be consolidated into a checklist that will include all other possible inspections, checks, and audits, with the frequencies at which they will be conducted, to ensure ease of reference and tracking. These checks should be filed for presentation to the competent authority upon request thereof.
<ul style="list-style-type: none"> Screening, stockpile, and transporting material from site. 	<p><u>Existing Infrastructure:</u></p> <ul style="list-style-type: none"> Deterioration of the access road to the mining area. Overloading of trucks having an impact on the public roads. 	<ul style="list-style-type: none"> Grader to restore the road surface when needed. 	<p><u>Role:</u></p> <ul style="list-style-type: none"> 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. <p><u>Responsibility:</u></p> <ul style="list-style-type: none"> 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 and inactive 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. 	<p>Applicable throughout operational phases.</p> <ul style="list-style-type: none"> Daily compliance monitoring by site management. Annual compliance monitoring of site by an Environmental Control Officer. All schedules should be consolidated into a checklist that will include all other possible inspections, checks, and audits, with the frequencies at which they will be conducted, to ensure ease of reference and tracking. These checks should be filed for presentation to the competent authority upon request thereof.
<ul style="list-style-type: none"> Site establishment. Mining of sand . 	<ul style="list-style-type: none"> Potential health and safety risks to employees. 	<ul style="list-style-type: none"> Stocked first aid box. Level 1 certified first aider. 	<p><u>Role:</u></p> <ul style="list-style-type: none"> Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. 	<p>Applicable throughout operational-, and decommissioning phases.</p>

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
<ul style="list-style-type: none"> Screening, stockpiling and transporting material from site. Sloping and landscaping upon closure of the mining area. 		<ul style="list-style-type: none"> All appointments in terms of the Mine Health and Safety Act, 1996. 	<ul style="list-style-type: none"> Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <p><u>Responsibility:</u></p> <ul style="list-style-type: none"> 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). 	<ul style="list-style-type: none"> Daily compliance monitoring by site management. Annual compliance monitoring of site by an Environmental Control Officer. All schedules should be consolidated into a checklist that will include all other possible inspections, checks, and audits, with the frequencies at which they will be conducted, to ensure ease of reference and tracking. These checks should be filed for presentation to the competent authority upon request thereof.

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 regarding 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.
 - The Municipality should be consulted for available options to deal with green waste in accordance with its organic waste diversion plan to divert organic waste from its landfills.
- **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 and inactive 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 firewood.
 - 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.

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.

A Checklist must be compiled for the checking for the weekly inspection on bund areas, annual erosion control after re-instatements.

o) Environmental Monitoring and Inspection Checklist Requirements

Activity/Item	Frequency	Responsible Person	Record to be Maintained
Environmental Audit (General)	Annually	Environmental Officer	Audit report
Bund Area Inspection	Weekly	Site Supervisor/EO	Weekly inspection log
Erosion Monitoring (Rehabilitated Areas)	Monthly for 12 months post-reinstatement	Environmental Officer	Erosion monitoring report/photos
Wastewater Usage for Dust Suppression	Weekly/As needed	Site Supervisor	Water usage log
General Housekeeping & Waste Management	Weekly	Site Supervisor	Inspection checklist
Vegetation Regrowth (Post-Rehabilitation)	Quarterly	Environmental Officer	Vegetation assessment log
Spill Response Equipment Inspection	Monthly	Safety Officer	Equipment checklist
Access Road Condition	Monthly and after heavy rainfall	Site Supervisor	Road condition report
Stormwater Management System	Monthly and post-storm events	Environmental Officer	Stormwater inspection log
Fuel and Chemical Storage Areas	Weekly	Safety/Environmental Officer	Storage area inspection checklist
Noise and Dust Levels Monitoring	As required by authorisations	Environmental Consultant	Monitoring reports
Complaints Register Review	Monthly	Environmental Officer	Complaints register

Note:

- All records must be retained in both hard copy and electronic format for a minimum of five years.
- Records should be readily accessible for submission to the competent authority upon request.
- The checklist should be reviewed and updated annually or following changes in operational activities or regulatory requirements.

2. UNDERTAKING

The EAP herewith confirms

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



Signature of the environmental assessment practitioner:

Greenmined Environmental (Pty) Ltd

Name of Company:

9 May 2025

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 F

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.

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<u>ENVIRONMENTAL IMPACT STATEMENT</u>			
SITE ALTERNATIVE 1			
<u>TYPE OF IMPACT</u>	<u>DURATION</u>	<u>LIKELIHOOD</u>	<u>SIGNIFICANCE</u>
Site establishment & infrastructure development <ul style="list-style-type: none"> 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 vegetation and listed and/or protected plant species Dust nuisance due to site establishment Potential impact on archaeological artefacts; Work opportunities to 6 local residents (Positive Impact) 	Duration of site establishment phase (<1 month)	Possible Low Possibility Low Possibility Low Possibility Low Possibility Low Possibility Low Possibility Low Possibility Definite	Low-Medium Concern Low-Medium Concern Low-Medium Concern Low Concern Low Concern Low-Medium Concern Low Concern Medium-High (+)
<u>Construction of site access road:</u> <ul style="list-style-type: none"> Visual intrusion caused by construction of site access road Loss of stockpiled topsoil during construction of access road Dust nuisance as a result of the construction of access road Noise nuisance generated by earthmoving machinery. Intersection/ destruction of drainage lines Potential erosion of denuded areas. 	Duration of site establishment phase (<1 month)	Possible Low Possibility Low Possibility Low Possibility Low Possibility Low Possibility	Low Medium Concern Low-Medium Concern Low Concern Low Concern Medium Concern Low Concern

ENVIRONMENTAL IMPACT STATEMENT

SITE ALTERNATIVE 1

<ul style="list-style-type: none"> Potential contamination of footprint area and surface runoff as a result of hydrocarbon spillages. 		Low Possibility	Low Concern
<u>Mining of sand :</u> <ul style="list-style-type: none"> 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)	Low Possibility Low Possibility Low Possibility Low Possibility Low Possibility	Low Concern Low Concern Low Concern Low Concern Low Concern
<u>Stripping and stockpiling of topsoil and/or overburden :</u> <ul style="list-style-type: none"> 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; Loss of stockpiled material due to ineffective storm water control Potential contamination of footprint area and surface runoff as a result of hydrocarbon spillages; 	Duration of site establishment phase (<1 month)	Low Possibility Low Possibility Low Possibility Low Possibility Low Possibility Low Possibility Low Possibility Possible	Low Medium Concern Low Medium Concern Low Concern Low Concern Low Concern Low Concern Low Medium Concern Low Concern
<u>Excavation, loading and hauling to the screening plant:</u> <ul style="list-style-type: none"> Visual intrusion as a result of excavation and from loading and vehicles transporting the material 	Duration of operational phase (5 years maximum)	Low Possibility Low Possibility	Low Medium Concern Low Concern

ENVIRONMENTAL IMPACT STATEMENT

SITE ALTERNATIVE 1

<ul style="list-style-type: none"> 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; 		<p>Low Possibility</p> <p>Low Possibility</p> <p>Low Possibility</p> <p>Low Possibility</p>	<p>Low Concern</p> <p>Low Medium Concern</p> <p>Low Medium Concern</p> <p>Low Concern</p> <p>Low Concern</p>
<p><u>Processing, stockpiling and transporting of material :</u></p> <ul style="list-style-type: none"> Dust nuisance generated at the processing plant; Noise nuisance stemming from operation of the processing plant; Visual intrusion as a result of 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; 	<p>Duration of operational phase (5 years maximum)</p>	<p>Low Possibility</p> <p>Low Possibility</p> <p>Low Possibility</p> <p>Low Possibility</p> <p>Low Possibility</p> <p>Low Possibility</p>	<p>Low Concern</p> <p>Low Concern</p> <p>Low Medium Concern</p> <p>Low Concern</p> <p>Low Medium Concern</p> <p>Low Medium Concern</p>
<p><u>Cumulative impacts :</u></p> <ul style="list-style-type: none"> Impact the broad-scale ecological processes; 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 Impact on existing infrastructure as a direct result of the mining operation; 	<p>Duration of all phases</p>	<p><u>LIKELIHOOD</u></p> <p>Low Possibility</p> <p>Low Possibility</p> <p>Low Possibility</p>	<p><u>SIGNIFICANCE</u></p> <p>Low Medium Concern</p> <p>Low Medium Concern</p> <p>Low Medium Concern</p>

ENVIRONMENTAL IMPACT STATEMENT

SITE ALTERNATIVE 1

<p><u>Sloping and landscaping upon closure of the mining area:</u></p> <ul style="list-style-type: none"> • 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. • Return of the mining area to landscape feature upon closure (Positive Impact). 	<p style="text-align: center;">Duration of decommissioning phase (±2 months)</p>	<p style="text-align: center;"><u>LIKELIHOOD</u></p> <p>Low Possibility Low Possibility Low Possibility</p> <p>Low Possibility</p> <p>Low Possibility</p> <p>Definite</p>	<p style="text-align: center;"><u>SIGNIFICANCE</u></p> <p>Low Medium Concern Low Medium Concern Low Medium Concern</p> <p>Low Medium Concern</p> <p>Low Medium Concern</p> <p>Medium-High (+)</p>
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APPENDIX H

FINANCIAL AND TECHNICAL ABILITY



APPENDIX I

INVASIVE PLANT SPECIES

MANAGEMENT PLAN



APPENDIX J

PHOTOGRAPHS OF THE PROPOSED SITE



APPENDIX K

CV AND EXPERIENCE RECORD OF EAP



APPENDIX L

CLOSURE - REHABILITATION PLAN



APPENDIX M

AGRICULTURE IMPACT ASSESSMENT



APPENDIX M1

AQUATIC BIODIVERSITY IMPACT ASSESSMENT



APPENDIX M2 TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT

2025 LETTER OF APPLICABILITY & ADDENDUM 2025



APPENDIX M3

NOTICE OF INTENT TO DEVELOP



APPENDIX N

SCREENING REPORT



APPENDIX O

SITE SENSITIVITY REPORT



APPENDIX P

PROOF OF WATER USE APPLICATION



APPENDIX Q

LANDUSE APPLICATION



APPENDIX R MUNICIPAL TREATED WATER AGREEMENT

