PROPOSED SAND MINE ON A PORTION OF PORTION 2 (REMAINING EXTENT) OF FARM 199 RD, CLANWILLIAM, WESTERN CAPE PROVINCE

DRAFT BASIC ASSESSMENT REPORT

AUGUST 2019

REFERENCE NUMBER: *WC 30/5/1/3/2/10219 MP*

PREPARED FOR:

Smit Grondwerke (Pty) Ltd
P.O. Box 249
Clanwilliam
8135

Tel: 027 482 1701
E-mail: grondwerke@smiting.co.za

PREPARED BY:

Greenmined Environmental
Unit MO1, Office No 36
AECI Site, Baker Square
Paardevlei
De Beers Avenue
Somerset West
7130

Tel: 021 851 2673
Cell: 082 811 8514
Fax: 086 546 0579
E -mail: Christine.f@greenmined.co.za

EXECUTIVE SUMMARY

The Applicant, Smit Grondwerke (Pty) Ltd, applied for environmental authorisation and a mining permit to mine sand from a portion of Portion 2 (Remaining Extent) of Farm 199, Clanwilliam, Western Cape Province. The proposed mining area will be 4.9 ha and will be developed over an area currently used as centre pivots. The mineral (sand) will be loaded with a front-end-loader directly from the footprint area onto a truck that delivers it to the clients. Strip mining (1 ha strips) will be implemented with little to no stockpiling required. No washing of sand is needed. Due to the small scale of the operation no infrastructure, other than a chemical toilet, will be established within the mining footprint. The proposed project does not require any electrical connections, and no chemicals will be stored on site. Vehicle/equipment maintenance will be done at an existing off-site workshop (Clanwilliam Town) of the Applicant, and the area will be reached via an existing farm road.

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

Site Alternative 1 (Preferred Site):

Site Alternative 1, which entails the strip mining of sand from an area currently used for agricultural purposes (centre pivots), was identified during the assessment phase of the environmental impact assessment, by the Applicant and project team, as the preferred site alternative.

Site Alternative 2:

Site alternative 2 entails the mining of sand from an area directly adjacent to the current 1.5 ha mining area on the property. This alternative was considered as it will afford the Applicant a mining area that borders an existing sand mine, and allows access to the area via an existing road that does not require stabilizing. However, upon assessment of the alternative, read together with the potential impacts associated with S1, site alternative 2 was not deemed the preferred option as it will have a higher ecological 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 from the property will be sold to the building, road rehabilitation/maintenance and associated construction industry, if however, the no-go alternative is implemented the Applicant will not be able to mine the sand and the landowner will not receive assistance with the improvement of the agricultural potential of his fields. The no-go alternative was therefore not deemed a viable option.

Public Participation Process:

During the initial public participation process the stakeholders and I&AP's were informed of the project by means of background information documents that were sent directly to the contact persons. An advertisement that was placed in the Ons Kontrei, and two on-site notices were placed at conspicuous places. A 30-days commenting period was allowed which expired on 8 August 2019. In accordance with the timeframes stipulated in the EIA Regulations, 2014 (as amended by GNR 326 effective 7 April 2017) the Draft Basic Assessment Report was compiled and will be distributed for comment and perusal to the I&AP's and stakeholders. A 30-day commenting period, ending 07 October 2019, will be allowed for perusal of the documentation and submission of comments. The comments received on the DBAR will be incorporated into the Final Basic Assessment Report (FBAR) to be submitted for decision making to DMR.

Basic Assessment Report:

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

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

Topography:

- The excavation of the mining area has the potential to level the centre pivot lands, which will have advantages for preventing irrigation run-off and improving ease of agricultural management. It will however be important that mining depths are controlled across the entire mine so that excavations results in a levelling of the centre pivot lands rather than a hole with steep edges.

Visual Characteristics:

- It is proposed that the visual impact of the proposed sand mining operation will be of low-medium significance, especially as it will be developed within the footprint of existing pivots.
- The small scale of the proposed operation (1 ha disturbed at a time), the implementation of progressive rehabilitation, as well as the fact that no infrastructure will be establish contributes to the low visual significance. As the landowner will continue with the use of the area for cultivation purposes, no residual visual impact is expected upon closure of the mine.

Site specific air and noise quality:

- 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 machinery already operational at the property. The distance of the proposed mining area from residential infrastructure further lessens the potential noise impact.

Geology and Soil:

- The soils are limited by the very low clay content and leaching of the upper soil horizons and therefore have a low water and nutrient holding capacity. As a result they have a low to medium agricultural potential. The land capability of the investigated area is predominantly 4 and 5, which is very low to low. The grazing capacity of the natural veld is very low at 66 hectares per large stock unit.
- Because there is a gradual increase in the clay content with depth, removal of the upper sand (through mining) will leave a soil that has higher clay and resultant higher water holding capacity. This will alleviate, to some extent, the low water holding capacity limitation of the existing soil.

Hydrology:

- Should the proposed operation be established within the footprint of S1, and the permit holder contain all activities to the approved mining boundary no impact on the non-perennial stream could be identified.

Mining and Biodiversity Conservation Areas:

- When the mining footprints of both S1 and S2 is layered over the Mining and Biodiversity Map, it falls over and area of highest biodiversity importance with a corresponding rating of highest risk for mining. The High Biodiversity Importance area does however not corresponds with the boundaries

of the CBA's and ESA's identified in terms of the Western Cape Biodiversity Spatial Plan, which excludes the footprint of S1 from significant conservation areas.

- In order to avoid an impact on either the CBA's (terrestrial & aquatic) or the ESA's (terrestrial) it is proposed that S1 be considered for approval, as it does not extent over an area of conservation concern.

Groundcover:

- No natural occurring fynbos remains within the footprint of S1. Should the footprint of S1 be considered for approval, the potential impact on the endangered Leipoldtville Sand Fynbos is of low significance.

Cultural and Heritage Environment:

- No sites of archaeological or cultural importance were identified during the site inspection, and consultation with the interested and affected parties also did not identify any potential area of concern. Heritage Western Cape confirmed that no further action is required in terms of the NHRA, 1999. The potential impact of the proposed mining activities on the cultural and/or heritage environment is therefore deemed to be insignificant.

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

Environmental Management Programme (EMPR)

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

The financial provision amount that will be necessary for the rehabilitation of damages caused by the operation, both sudden closures during the normal operation of the project and at final, planned closure gives a sum total of R 60 370.00.

LIST OF ABBREVIATIONS

ACRM	Agency for Cultural Resource Management
BID	Background Information Document
BGIS	Biodiversity GIS
CARA	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
CBA	Critical Biodiversity Area
CLM	Cederberg Local Municipality
DBAR	Draft Basic Assessment Report
DEA&DP	Department of Environmental Affairs and Development Planning
DMR	Department of Mineral and Resources
DTPW	Department of Transport and Public Works
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)
EMPR	Environmental Management Programme
ESA	Ecological Support Areas
FBAR	Final Basic Assessment Report
FFd2	Leipoldtville Sand Fynbos
GDP	Gross Domestic Product
GNR	Government Notice
GVA	Gross Value Added
HWC	Heritage Western Cape
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)
NID	Notice of Intend to Develop
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
S1	Site Alternative 1
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SAMBE	South African Mining and Biodiversity Forum
USBM	US Bureau of Mines
WC	Western Cape Province
WCBSP	West Coast Biosphere Spatial Plan
WCDM	West Coast District Municipality
WMA	Water Management Area

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ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

NAME OF APPLICANT:	Smit Grondwerke (Pty) Ltd
TEL NO:	027 482 1701
FAX NO:	027 482 1701
POSTAL ADDRESS:	P.O. Box 249, Clanwilliam, 8135
PHYSICAL ADDRESS:	1 Industrial Road, Clanwilliam, Western Cape Province
FILE REFERENCE NUMBER SAMRAD:	WC 30/5/1/3/2/10219 MP

IMPORTANT NOTICE

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

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

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

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

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

OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

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

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

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

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

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

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

  (ii) the degree to which these impacts –

    (aa) can be reversed;

    (bb) may cause irreplaceable loss of resources; and

    (cc) can be managed, avoided or mitigated;

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

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

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

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

PART A

SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

1. CONTACT PERSON AND CORRESPONDENCE ADDRESS

a) Details of: Greenmined Environmental

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) the proponent must appoint an independent Environmental Assessment Practitioner (EAP) to undertake the environmental impact assessment (EIA) of any activities regulated in terms of the aforementioned Act. Smit Grondwerke (Pty) Ltd appointed Greenmined Environmental to undertake the study needed. Greenmined Environmental has no vested interest in Smit Grondwerke (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:	Ms Christine Fouche (Senior Environmental Specialist)
Tel No.:	021 851 2673
Fax No.:	086 546 0579
E-mail address:	christine.f@greenmined.co.za

ii) Expertise of the EAP.

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

Ms. Fouche has a Diploma in Nature Conservation and a B.Sc. in Botany and Zoology. Full cirriculum vitae with evidence is attached as Appendix M.

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

Ms Fouche has fourteen years' experience in doing Environmental Impact Assessments and Mining Applications in South Africa. See Appendix M.

b) Location of the overall Activity.

Table 1: Location of the proposed project.

Farm Name:	Portion 2 (Remaining Extent) of Farm 199 RD
Application area (Ha)	4.9 ha
Magisterial district:	Clanwilliam
Distance and direction from the nearest town	The site is located ±740 m south-west of the N7 national road approximately 6.5 km north of Clanwilliam town.
21 digit Surveyor General Code for each farm portion	C02000000000019900002

c) Locality map

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

The requested map is attached as Appendix B.

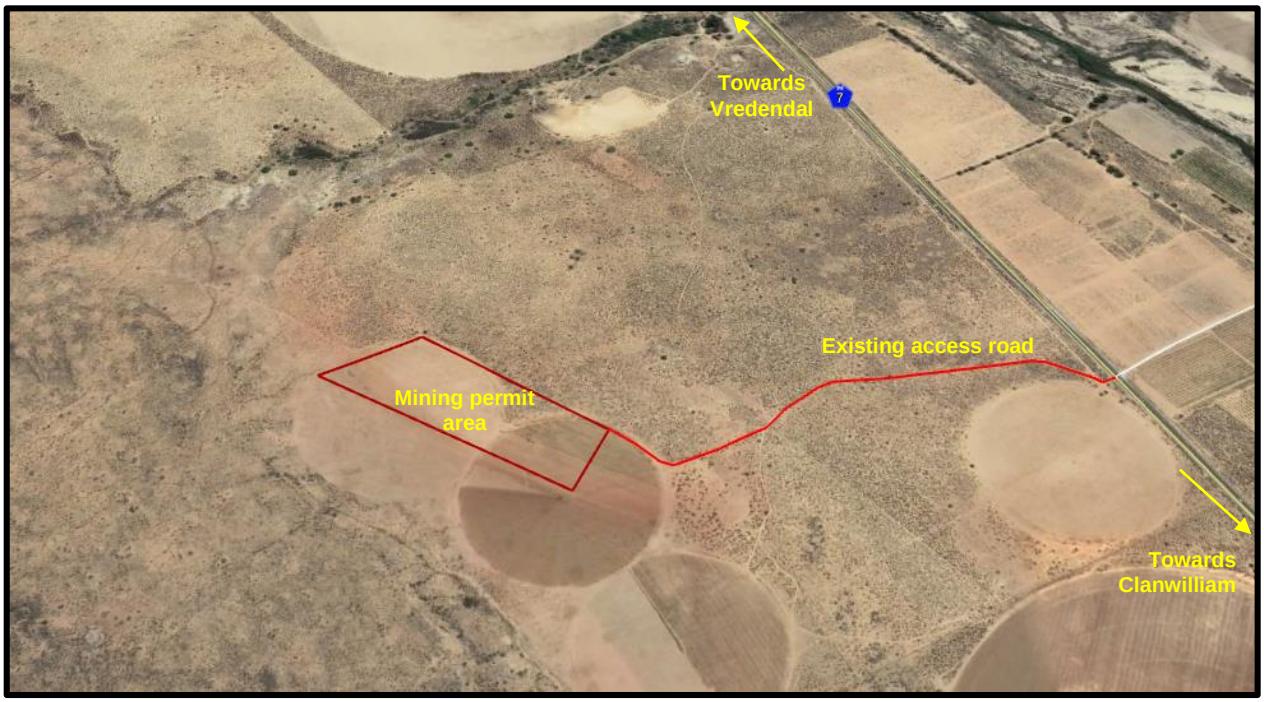

Figure 1: Satellite view of the proposed mining permit area (red polygon) of Smit Grondwerke (Pty) Ltd (image obtained from Google Earth).

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

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

Smit Grondwerke (Pty) Ltd (hereinafter referred to as "the Applicant"), applied for environmental authorisation and a mining permit to mine sand from a portion of Portion 2 (Remaining Extent) of Farm 199, Clanwilliam, Western Cape Province.

The proposed mining area of the Applicant will be 4.9 ha and will be developed over an area currently used for agricultural purposes. The mining method is representative of the small scale mining industry where the mineral (sand) is loaded with a front-end-loader (FEL) directly from the footprint area onto a truck that delivers it to the clients. Strip mining will be implemented with little to no stockpiling required. No washing of sand is needed. Due to the small scale of the operation no infrastructure, other than a chemical toilet, will be established within the mining footprint. The proposed project does not require any electrical connections, and no chemicals will be stored on site. Vehicle/equipment maintenance will be done at an existing off-site workshop (Clanwilliam Town) of the Applicant, and the area will be reached via an existing farm road.

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

i) Listed and specified activities

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

NAME OF ACTIVITY (E.g. For prospecting – drill site, site camp, ablution facilities, accommodation, equipment storage, sample storage, site office, access route etc... etc... etc E.g. for mining – excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	**Aerial extent of the activity** Ha or m^2	**LISTED ACTIVITY** Mark with an X where applicable or affected	**APPLICABLE LISTING NOTICE** (GNR 324, GNR 325, GNR 326 OR GNR 327)
Demarcation of site with visible beacons.	4.9 ha	N/A	Not listed
Stripping and stockpiling of topsoil.	±1 ha at a time	X	GNR 327 LN 1 Activity 27, 28. GNR 324 LN 3 Activity 12.
Loading and hauling of the sand from the mining footprint.	±1 ha at a time	X	GNR 327 LN 1 Activity 21, 28.

NAME OF ACTIVITY (E.g. For prospecting – drill site, site camp, ablution facilities, accommodation, equipment storage, sample storage, site office, access route etc... etc... etc E.g. for mining – excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	**Aerial extent of the activity** Ha or m^2	**LISTED ACTIVITY** Mark with an X where applicable or affected	**APPLICABLE LISTING NOTICE** (GNR 324, GNR 325, GNR 326 OR GNR 327)
Sloping and landscaping upon closure of the mining area.	±1 ha (last disturbed area)	X	GNR 327 LN 1 Activity 22.
Replacing the topsoil and vegetating the disturbed area.	±1 ha (last disturbed area)	X	GNR 327 LN 1 Activity 22.

ii) Description of the activities to be undertaken

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

Background Information:

Smit Ingenieurswerke and Transport BK (Mr Gideon Albertus Johannes Jacobus Smit) holds a sand mining permit on Portion 2 (Remaining Extent) of Farm 199 RD. The permit was issued in 2016 and allows for the mining of a 1.5 ha area. The first renewal of this permit lapses in October 2019, where after it can still be renewed twice for a maximum period of one year each. Ultimately, the permit will expire in 2021.

Smit Grondwerke (Pty) Ltd (Mr Tobias Gerhardus Smit & Mr Johannes Adriaan Elias Smit), a separate entity with different shareholding than the above entity, in collaboration with the landowner, Mr GE Smith, identified a potential 4.9 ha sand mining area currently used for the cultivation of potatoes and/or wheat. The proposed mining area lays ±520 m south-south-west of the current 1.5 ha permit area (see figure below).

Figure 2: Satellite view showing the position of the proposed mining area (red polygon) in relation to the existing 1.5 ha mining permit area (blue polygon). (Image obtained from Google Earth).

The motivation for placing the proposed 4.9 ha mining area over the centre pivots of the landowner was to assist with the reduction of the top sandy soil layer (through mining), whereby the clay content and resultant water holding capacity of the soil will be increased that will assist the farmer with future crop cultivation of the lands. Further to this, the natural vegetation cover of the proposed 4.9 ha area has historically been altered through agricultural practices and no fynbos needs to be disturbed in order to allow the mining of the area (refer to *i) Details of the development footprint alternatives considered*.).

Applying for a mining right in terms of section 22 of the MPRDA, 2002 (as amended) was not considered a viable option as:

- the proposed footprint area of 4.9 ha is adequate to supply the Applicant with the sand needed;
- the sand resource at the proposed mining footprint can be mined within the potential 5 years that a mining permit may be valid (if renewed); and
- although the proposed mining will temporarily render a portion of the centre pivots unavailable to farming (maximum 5 years), a mining right will extend the period beyond 5 years that will highly affect the landowner and associated agricultural activities.

- the Applicant does not currently hold, or has held, a mining permit on this property and is therefore permitted to apply for a sand mining permit in terms of section 27 of the MPRDA, 2002.

Project Proposal:

In light of the above, the Applicant applied for environmental authorisation and a mining permit to mine sand from a portion of Portion 2 (Remaining Extent) of Farm 199, Clanwilliam, Western Cape Province. The table below lists the GPS coordinates of the proposed mining area as shown on the Regulation 2(2) Mine Plan attached as Appendix A.

Table 3: GPS Coordinates of the proposed mining footprint.

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	32º08'06.508"	18º50'37.946"	-32.135141º	18.843874º
B	32º08'11.976"	18º50'49.070"	-32.136660º	18.846964º
C	32º08'15.353"	18º50'46.961"	-32.137598º	18.846378º
D	32º08'08.966"	18º50'32.136"	-32.135824º	18.842260º

The satellite image below shows the location of the MP application area in relation to the surrounding landscape.

Figure 3: Satellite view showing the location of the MP application area (red polygon) in relation to the surrounding landscape.

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 footprint area onto a truck that delivers it to the clients. Little to no stockpiling is required and no washing of sand is needed.

The mining activities will be as listed below:

- Stripping and stockpiling of the topsoil from a 1 ha strip;
- Loading and hauling of the sand from the open strip;
- Sloping and landscaping of the mined strip prior to the opening and mining of the consecutive strip; and
- Replacing the topsoil and vegetating the disturbed area.

Should the MP be issued and the mining of sand be allowed, the proposed project will comprise of activities that can be divided into 3 key phases (discussed in more detail below) namely the:

(1) *Site establishment 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.

(2) *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 to load the sand directly onto a truck that will deliver it to the clients. Little to no stockpiling will be required and no washing of sand is needed.

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

PHASES OF THE PROJECT

1. *Site Establishment Phase:*

Site establishment entails the demarcation of the mining boundaries, clearance of vegetation (when needed), and stripping and stockpiling of topsoil to access the mineral 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 has to be demarcated. The first 1 ha strip must also be identified and demarcated.

- **Clearing of Vegetation:**

According to Mucina and Rutherford (2012) the vegetation type of the natural areas is known as the Leipoldtville Sand Fynbos (FFd2). As mentioned earlier, the footprint of the proposed sand mine was chosen to extend over an area that is used for agricultural purposes (central pivots) and no natural fynbos needs to be disturbed to allow access to the mineral.

Although the proposed project will not necessitate the removal of natural Leipoldtville Sand Fynbos, the removal of some indigenous vegetation may be necessary should the cultivation of the pivots cease and indigenous vegetation establish through succession. The clearing of vegetation must be contained to the approved mining footprint, and no vegetation/bush clearance, outside the approved area, may be allowed. It is proposed that a botanist is consulted to clear uncultivated areas, where indigenous vegetation established, prior to the stripping of topsoil.

- **Topsoil Stripping:**

It is proposed that topsoil removal will be restricted to the exact footprint of areas required during the operational phase of the activity. The topsoil will be stockpiled at the edge of the strip (south-eastern boundary if possible) to be replaced during the rehabilitation of the area. The Applicant must take note that dry sand has a natural angle of repose of ±34°, accommodation of this must form part of the mine planning to prevent topsoil simply slide back into the mining area. It will be part of the obligations of site management to prevent the

mixing of topsoil heaps with overburden/other soil heaps. The complete A-horizon will be removed. If it is unclear where the topsoil layer ends the top 300 mm of soil will be stripped. The topsoil berm will measure a maximum of 1.5 m in height in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen.

- **Access Road:**

The proposed mining area will be reached via an existing farm road that has a formal (existing) entrance onto the N7. The surface of the farm road will be upgraded and maintained by the permit holder for the duration of the operational phase. The width of the road will not be increased and therefore does not trigger listed activities in terms of the NEMA EIA Regulations, 2014 (as amended 2017).

Figure 4: Satellite view showing the access road (red line) to the proposed mining area (red polygon).

- **Introduction of Mining Machinery:**

No infrastructure, other than a chemical toilet, needs to be established within the proposed 4.9 ha mining area. Mining machinery that will operate within the footprint is expected to consist of the following:

- Front-end-loader (1);
- Excavator (1) (part time); and
- ADT truck (1) (part time).

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 (south-eastern boundary if possible) to be replaced during the rehabilitation of the area. The sand will be removed from the stripped area with a front-end-loader that will directly load a truck that will haul the mined material, via the existing road, to the clients. 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 G), it will be important to control the mining depths across the entire mine so that the excavation results in a levelling of the centre pivot lands rather than a hole with steep edges.

If the proposed mining footprint is apportioned into five strips (figure below), the mining direction will be in a north-westerly direction starting from strip 1 working towards strip 5. Using the existing access road (red line in the figure below) 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.

Figure 5: Proposed strip mining direction of the footprint area where the red line shows the existing access road.

The proposed sand mine will appoint ±3 employees. The proposed project does not require any electrical connections, and no chemicals will be stored on site. Vehicle/equipment maintenance will be done at an existing off-site workshop (Clanwilliam Town) of the Applicant, and the sand mining operation will take place during normal working hours (no work on Sundays).

ℑ Water Use:

Due to the nature of the sand to be mined (heavy), very little to no water is needed as dust levels are typically low. Dust generated on the access road will as far as possible be managed through alternative dust suppression methods in order to restrict water use to the absolute minimum.

These measures will include a combination of the following:

- The speed of all mining equipment/vehicles will be restricted to 20 km/h on the internal farm road to minimize dust generation;
- When the truck leaves the mining area it will be covered to minimise windblown dust from the loads;
- The removal of vegetation (that established through succession within the mining footprint) will only be done immediately prior to the mining of the area in an attempt to lessen denuded areas (dust source) to the absolute minimum.

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

ℑ Waste Handling:

Due to the nature of the project, the small scale of the proposed operation, and the fact that no infrastructure will be established or maintenance work done within the earmarked footprint, 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 the existing waste disposal system at the Clanwilliam offices of the Applicant.

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 the Applicants Clanwilliam office 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 existing Clanwilliam workshop of the Applicant.

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 closure specific objectives entail progressive rehabilitation of each 1 ha strip as mining continues. The decommissioning activities will consist of the following:

- Sloping and landscaping the mining area;
- Replacing the topsoil;
- Vegetating the reinstated area; and
- Controlling the invasive plant species.

The Applicant proposes the following with regard to rehabilitation of the mined-out strips (see Appendix J for the Closure Plan):

- 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.

- 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 the centre pivot.
- 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.
- A cover crop that ties in with the proposed land use will be planted 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/invader plants that may germinated within the rehabilitated area. The invasive plant species management plan (Appendix K) will continually be implemented on site.

Once the entire mining area was rehabilitated the permit holder is required to submit a closure application to the Department of Mineral Resources in accordance with section 43(4) of the MPRDA, 2002 that states: *"An application for a closure certificate must be made to the Regional Manager in whose region the land in question is situated within 180 days of the occurrence of the lapsing, abandonment, cancellation, cessation, relinquishment or completion contemplated in subsection (3) and must be accompanied by the prescribed environmental risk report".* The Closure Application will be submitted in terms of Regulation 62 of the MPRDA, 2002, and Government Notice 940 of NEMA, 1998 (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)
Cederberg Municipality: By-Law on Municipal Land Use Planning (PN 137 of 15 April 2016)	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 will be submitted for approval to the competent authority.
Cederberg Municipality: Final IDP/PMS/Budget Progress Plan 2017/2022.	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: *Physical Environment – Geology and Soil.* Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Management of invader plant species*.	The mitigation measures proposed for the site includes specifications of the CARA, 1983.
Mine Health and Safety Act, 1996 (Act No 29 of 1996) read together with applicable amendments and regulations thereto including relevant OHSA regulations.	Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Management of Health and Safety Risks.*	The mitigation measures proposed for the site includes specifications of the MHSA, 1996
Mineral and Petroleum Resources Development Act, 2002, (Act No. 28 of 2002) read together with applicable amendments and regulations thereto. ℑ Section 27	Part A(1)(d) Description of the scope of the proposed overall activity	Application for a mining permit submitted to DMR-WC. Ref No: WC 30/5/1/3/2/10219 MP
National Environmental Management Act,1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2014 (as amended by GNR 326 effective 7 April 2017) ℑ GNR 324 Listing Notice 3 Activity 12	Part A(1)(d)(i) Listed and specified activities.	Application for environmental authorisation submitted to DMR-WC. Ref No: WC 30/5/1/3/2/10219 MP

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)
ℑ GNR 327 Listing Notice 1 Activity 21 ℑ GNR 327 Listing Notice 1 Activity 22 ℑ GNR 327 Listing Notice 1 Activity 27 ℑ GNR 327 Listing Notice 1 Activity 28		
National Environmental Management: Air Quality Control Act, 2004 (Act No 39 of 2004) read together with applicable amendments and regulations thereto specifically the National Dust Control Regulations, GN No R827	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – *Air and Noise Quality.* Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Dust Handling*.	The mitigation measures proposed for the site take into account the NEM:AQA, 2004 and the National Dust Control Regulations.
National Environmental Management Act: Biodiversity Act, 2004 (Act No. 10 of 2004) read together with applicable amendments and regulations thereto.	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity - *Biological Environment* Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Management of invader plant species*.	The mitigation measures proposed for the site includes specifications of the NEM:BA, 2004.
National Environmental Management: Waste Act, 2008 (Act No 59 of 2008) read together with applicable amendments and regulations thereto. NEM:WA, 2008: National norms and standards for the storage of waste (GN 926)	Part A(1)(d)(ii) Description of the activities to be undertaken	The mitigation measures proposed for the site take into account the NEM:WA.
National Heritage Resources Act. 1999 (Act No 25 of 1999).	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – *Human Environment*	The mitigation measures proposed for the site includes specifications of the NHRA, 1999.
National Water Act, 1998 (Act No 36 of 1998) read together with applicable amendments and regulations thereto.	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – *Hydrology.*	The mitigation measures proposed for the site includes specifications of the NWA, 1998.

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)
	Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk.	
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
Western Cape Biodiversity Spatial Plan	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 will be submitted for approval to the competent authority.
Western Cape Noise Control Regulations (PN 200/2013), June 2013	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – *Air and Noise Quality*.	The mitigation measures proposed for the site take into account the Western Cape Noise Control Regulations, 2013.
Western Cape Land Use Planning Act, 2014 (Act No 3 of 2014)	Part A(1)(h)(iv)(1)(b) Description of current land uses.	The proposed project requires a land development application to Provincial Government (DEA&DP) in terms of Section 53 of the Land Use Planning Act, 2014. The Applicant is in contact with a town and regional planner to commence with the land development application to Provincial Government.

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 sustainable mining of sand for the construction industry is an important economic sector in the West Coast accounting for a 7.5% contribution to the District GDP. The increase in building, construction and road maintenance projects in the vicinity of the property triggered the need to trade with the available sand from a permitted area. The construction work on the Clanwilliam Dam wall (DWS project), and the subsequent market for the mineral, added to the Applicants need for sand from a nearby area.

Portion 2 (Remaining Extent) of Farm 199 RD is mainly used for agricultural purposes (potato farming & grazing). However, since 2010 the land use of the property was extended to include small scale sand mining. The Applicant of this proposed project, applied for a sand mining permit of 4.9 ha that extends over a part of two centre pivots. The landowner is in agreement with this as the sand of the earmarked pivots are, in his opinion, very extensive and the slope of the area causes problematic run-off of rainwater.

This was confirmed by the soil scientist that found the soils of the study area very sandy with low water holding capacity which results in low to medium agricultural potential. The specialists found adequate reserves of sand on site for mining and rehabilitation, and identified two potential positive effects from the direct mining of the land namely:

- Increase in clay content and resultant water holding capacity of the soil, due to the removal of the upper, more sandy soil; and
- Decreased slope due to the levelling effect of excavation.

The AIA (see Appendix G) concludes that realising the positive effects and minimising the negative ones is highly dependent on effectively implementing the mitigation measures and rehabilitation plant. If rehabilitation is successful, the land is likely to have a slightly higher agricultural potential than what it was pre-mining.

The proposed operation will also contribute to the local economy of the area, both directly and through the multiplier effect that its presence will generate. Equipment and supplies will be purchased locally, and wages will be spent at local businesses, generating both jobs and income to the area.

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

During the EIA process two alternatives locations were considered for the proposed mining project (S1 & S2 in this report). Site Alternative 1 was identified during the assessment phase of the environmental impact assessment as the preferred site alternative due to the following:

- The natural fynbos (Leipoldtville Sand Fynbos) of the footprint area was historically altered by the current agricultural activities, and therefore the proposed mining of sand will not disturb or result in the loss of natural fynbos.
- Access to the proposed mining area is possible via an existing farm road with a formal (existing) entrance onto the N7.

- The reduction of the upper sandy soil layer will increase the clay content and resultant water holding capacity of the soil, and if rehabilitation is successful the land is likely to have a slightly higher agricultural potential than what it was pre-mining.
- The levelling effect of excavation will contribute to a decreased slope of the pivot area.
- The quality of the sand, in the earmarked area, complies with the requirements of the Applicant's clients and/or contracts.
- No watercourse, drainage line or wetland will be affected by the proposed mining area.
- The visibility of the mining area will be limited towards the south, and south-west. Highly limited towards the south-east, and negligible towards the north, and north-east. The mine will not be visible to the road users of the N7 national road.

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

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

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

i) Details of the development footprint alternatives considered.

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

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

Site Alternative 1 (S1) (Preferred Site Alternative): Site Alternative 1 entails the strip mining of sand from an area currently used for agricultural purposes within the GPS coordinates as listed in the table below.

Table 5: GPS Coordinates of Site Alternative 1 (preferred site alternative)

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	32º08'06.508"	18º50'37.946"	-32.135141º	18.843874º
B	32º08'11.976"	18º50'49.070"	-32.136660º	18.846964º
C	32º08'15.353"	18º50'46.961"	-32.137598º	18.846378º
D	32º08'08.966"	18º50'32.136"	-32.135824º	18.842260º

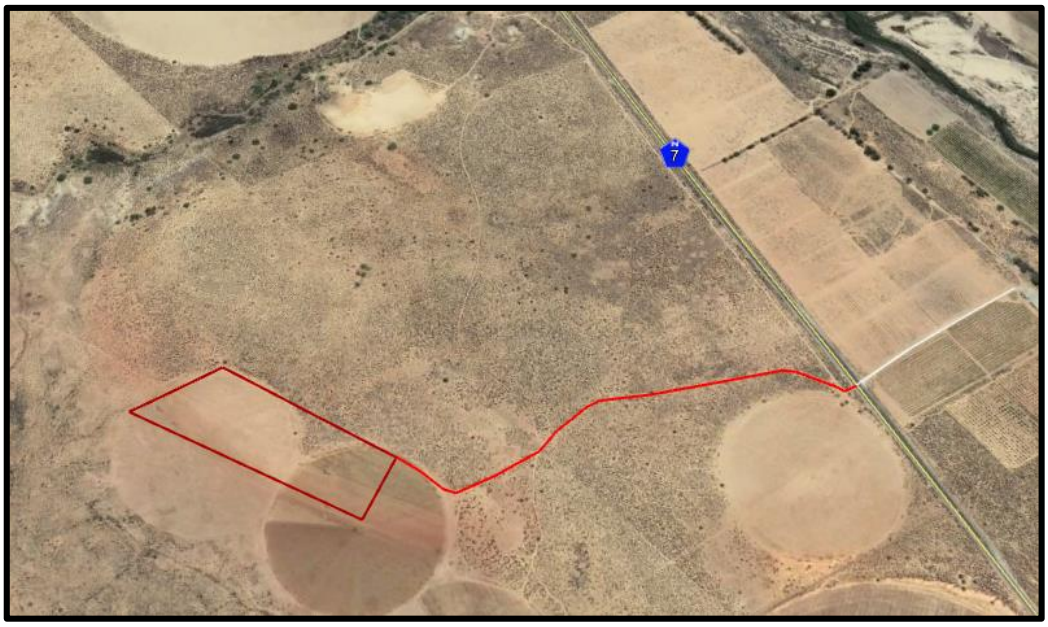

Figure 6: Satellite view showing the position of Site Alternative 1 (red polygon) within the surrounding landscape.

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

- The natural fynbos (Leipoldtville Sand Fynbos) of the footprint area was historically altered by the current agricultural activities, and therefore the proposed mining of sand will not disturb or result in the loss of natural fynbos.
- Access to the proposed mining area is possible via an existing farm road with a formal (existing) entrance onto the N7.
- The reduction of the upper sandy soil layer will increase the clay content and resultant water holding capacity of the soil, and if rehabilitation is successful the land is likely to have a slightly higher agricultural potential than what it was pre-mining.

- The levelling effect of excavation will contribute to a decreased slope of the pivot area.
- The quality of the sand, in the earmarked area, complies with the requirements of the Applicant's clients and/or contracts.
- No watercourse, drainage line or wetland will be affected by the proposed mining area.
- The visibility of the mining area will be limited towards the south, and south-west. Highly limited towards the south-east, and negligible towards the north, and north-east. The mine will not be visible to the road users of the N7 national road.

Potential negative aspects associated with Site Alternative include:

- The footprint of the mining area will temporarily be lost to the landowner as part of his pivots will be mined by the permit holder.
- Although an existing farm road can be used to access the mining area, the road surface has to be stabilized.

Site Alternative 2 (S2): Site Alternative 2 entails the mining of sand from an area directly adjacent to the current 1.5 ha mining permit footprint within the GPS coordinates as listed in the table below.

Table 6: GPS Coordinates of Site Alternative 2

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	32º07'47.94"	18º50'43.76"	-32.129983º	18.845488º
B	32º07'52.88"	18º50'30.85"	-32.131354º	18.841903º
C	32º07'57.19"	18º50'30.81"	-32.132552º	18.841891º
D	32º07'50.28"	18º50'47.00"	-32.130634º	18.846390º

Figure 7: Satellite view showing the position of Site Alternative 2 (yellow polygon) in relation to the existing mining permit (blue polygon) on the property.

Site Alternative 2 was considered as it will afford the Applicant a mining area that borders an existing sand mine, and allows access to the area via an existing road that does not require stabilizing.

Positive aspects associated with Site Alternative 2 include:

- No road improvements are required, and the Applicant can share the maintenance of the road with the permit holder.
- The haul road to S2 will be ±350 m shorter than the road to S1.
- Sand mining will be centred to one area on the property.
- Mining will not affect the centre pivots (as is the case with S1).

Potential negative aspects associated with Site Alternative 2 include:

- The footprint of S2 contains natural Leipoldtville Sand Fynbos and extends over a Terrestrial Critical Biodiversity Area (CBA) as well as an area classified as an Ecological Support Area (ESA): Aquatic and Terrestrial. In order to access the mineral, the Applicant will have to remove the fynbos, directly impacting the vulnerability of the ecosystem.

- The footprint of S2 is within 20 m from a non-perennial drainage line that passes towards the north/north-west. This area is classified as a channelled valley-bottom wetland on the National Wetland and NFEPA map viewer of BGIS. Mining within 500 m of a wetland will require a water use authorisation in terms of Section 39 of

the National Water Act, 1998 (Act No 36 of 1998) for water uses as defined in section 21 (c) and section 21 (i).

- Although the landowner will be able to plant the entire footprint of his pivots (S1), the sandy layer will remain thick and the drainage of the fields will not be altered. The improvement of the agricultural potential of the fields, as a result of the proposed sand mining activity, will be lost.

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

- the Applicant cannot utilise the mineral resource;
- the landowner will not receive compensation and assistance with the improvement of the agricultural potential of his fields;
- the mining permit of the 1.5 ha area will expire in 2021 and the Clanwilliam people/businesses, in need of sand will have to transport it from Vanrhynsdorp or as far as Piketberg, making building sand unaffordable.

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

ii) Details of the Public Participation Process Followed

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

During the initial public participation process the stakeholders and I&AP's were informed of the project by means of background information documents that were sent or hand delivered directly to the contact persons. A 30-days commenting period was allowed which expired on 8 August 2019. The following I&AP's and stakeholders were 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
Landowner: ℑ Mr & Mrs Smith **Surrounding landowners & lawful occupiers:** ℑ Mr CPJ Smith (Portion 0 (RE) of Farm 199) ℑ Mr MG Bergh (Portion 0 (RE) of Seekoevlei 110) ℑ Mr W Nel (Portion 2 of Zekoe Valley 107) ℑ Mr JGM Genis (Portion 0 (RE) of Kogelmanskloof 200) ℑ Mr P Steens (Portion 14 of Klein Valley 193) ℑ Mr B Beukes (Portion 15 of Klein Valley 193) ℑ Mr A Bergh (Portion 2 of Kleinvlei 196)	ℑ Cape West Coast Biosphere Reserve; ℑ CapeNature; ℑ Cederberg Local Municipality Ward Councillor (Ward 6); ℑ Cederberg Local Municipality; ℑ Department of Agriculture, Forestry and Fisheries; ℑ Department of Economic Development and Tourism; ℑ Department of Environmental Affairs and Development Planning; ℑ Department of Labour; ℑ Department of Rural Development and Land Reform; ℑ Department of Social Development; ℑ Department of Transport and Public Works; ℑ Department of Water and Sanitation; ℑ Heritage Western Cape ℑ SANRAL; and ℑ South African Heritage Resources Agency. ℑ West Coast District Municipality;
I&AP'S AND STAKEHOLDERS THAT REGISTERED/COMMENTED DURING THE INITIAL NOTIFICATION PERIOD	
ℑ CapeNature; ℑ Cederberg Local Municipality; ℑ Department of Environmental Affairs and Development Planning; ℑ Department of Water and Sanitation; ℑ Heritage Western Cape; and ℑ West Coast District Municipality.	

An advertisement was placed in the Ons Kontrei on 5 July 2019 and on-site notices were placed at Agrimark Clanwilliam (2 July 2019) and the entrance to the farm (4 July 2019). The advertisement, background information document (BID) and on-site notices invited the recipients to register/comment on the project before 8 August 2019.

In accordance with the timeframes stipulated in the EIA Regulations of December 2014 (amended by GNR 326 effective 7 April 2017) the Draft Basic Assessment Report (DBAR) was compiled and will be distributed for comment and perusal to the I&AP's and stakeholders listed above. A 30-day commenting period, ending 07 October 2019, will be allowed for perusal of the documentation and submission of comments. The comments received on the DBAR will be incorporated into the Final Basic Assessment Report (FBAR) to be submitted for decision making to DMR.

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 **List the name of persons consulted in this column, and** **Mark with an X where those who must be consulted were in fact consulted**		**Date Comments Received**	**Issues raised**	**EAPs response to issues as mandated by the applicant**	**Section and paragraph reference in this report where the issues and or response were incorporated.**
AFFECTED PARTIES	**X**				
Landowner/s					
Mr & Mrs Smith	X	18 June 2019	The landowner supports the proposed sand mine application. See following motivation:	N/A	N/A

Landowners consent and motivation for the proposed sand mine (translated to English for ease of reference):

With this I, Gerrit Erasmus Smith….., recommend that the proposed area for a new sand mine is more suitable.

My motivation is:

- the sand on the pivots is too thick and water runs off the area due to the slope. The slope can be improved when the sand is removed and the slope decreased.
- I would like to reduce the sand layer (this can happen as a result of the proposed sand mining) to enrich the soil with red earth.
- There is existing pivots, and the impact on the environment will be less since there is less vegetation and there is an existing road to the pivots where the proposed area for the new sand mine is.

"*Hiermee beveel ek, Gerrit Erasmus Smith…., aan dat die voorgestelde area vir 'n nuwe sandmyn meer geskik is.*

My motivering is:

- *Die sand op die afgemerkte sirkels is te dik en die water spoel weg a.g.v skuinste van area en die helling verbeter kan wanneer die sand weggery word en area meer plat gemaak word.*
- *Ek will graag die sand minder maak (en dit kan moontlik met die nuwe myn gebeur wanneer uitlaai van sand geskied) sodat rooigrond ingery kan word en dreinering beter kan wees.*
- *Dit is reeds bestaande landerye en die impak op die omgewing gaan minder wees, aangesien daar minder plantegroei is en daar ook reeds 'n bestaande pad na die sirkels is waar die beoogde area vir nuwe sandmyn is*."

Lawful occupier/s of the land					
N/A		N/A	N/A	N/A	

Interested and Affected Parties List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
Landowners or lawful occupiers on adjacent properties	**X**	-	-	-	-
Mr CPJ Smith adjacent landowner of: ℑ Portion 0 (RE) of Farm 199	X	No comments recevied	N/A	N/A	N/A
Mr MB Bergh adjacent landowner of: ℑ Portion 0 (RE) of Seekoevlei 110	X	No comments recevied	N/A	N/A	N/A
Mr W Nel adjacent landowner of: ℑ Portion 2 of Zekoe Valley 107	X	No comments recevied	N/A	N/A	N/A
Mr M JGM Genis adjacent landowner of: ℑ Portion 0 (RE) of Kogelmanskloof 200	X	No comments recevied	N/A	N/A	N/A
Mr P Steens adjacent landowner of ℑ Portion 14 of Klein Valley 193	X	No comments recevied	N/A	N/A	N/A
Mr B Beukes adjacent landowner of: ℑ Portion 15 of Klein Valley 193	X	No comments recevied	N/A	N/A	N/A
Mr A Bergh adjacent landowner of: ℑ Portion 2 of Kleinvlei 196	X	No comments recevied	N/A	N/A	N/A
Municipal councillor					
Cllr. R Witbooi (Ward 6)	X	No comments recevied	N/A	N/A	N/A
Municipality					

Interested and Affected Parties List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
Cederberg Local Municipality (CLM)	X	04 July 2019	Danné Joubert registered the Cederberg Municipality (CLM) as an I&AP on the project and requested a copy of the DBAR.	Greenmined acknowledged receipt of the registration on 5 July 2019 and confirmed that the CLM will be supplied with a copy of the DBAR.	N/A
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e					
Department of Transport and Public Works (DTPW)	X	4 July 2019	Schalk Carstens responded that the DTPW has no proclaimed roads in the area that may be affected and highlighted that SANRAL is the competent road authority for the N7.	Greenmined acknowledged receipt of the correspondence on 5 July 2019 and confirmed that SANRAL was already informed of the project.	N/A
SANRAL	X	No comments recevied.	N/A	N/A	N/A
Communities	No community were identified within the study area.				
Dept. Land Affairs					
Department of Rural Development and Land Reform	X	No comments received	N/A	N/A	N/A
Traditional Leaders	N/A				
Dept. Environmental 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 Environmental Affairs and Development Planning (DEA&DP)	X	12 July 2019	Adri La Meyer commented as follows on the proposed project on behalf of DEA&DP.	Greenmined responded to Me La Meyer's comments on the 9th of July 2019 as listed below.	Please refer to the list of references in the line below.

Comments received from DEA&DP:

"I hereby acknowledge receipt of the e-mail dated 4 July 2019. Thank you for providing the Department with the Background Information Document. Kindly register the Department of Environmental Affairs and Development Planning as a state Department that will be commenting on the application. Kindly further provide the Department with 1 hard copy and 3 CDs of the Draft Basic Assessment Report (marked for my attention) once it is released for public comment.

Whilst the relevant commenting directorates will provide comment on the Draft BAR (via combined comment collated by myself), and potentially (as separate comment) on the BID, please find my brief comment on the BID:

I note that an Agricultural Impact Assessment will be undertaken for the mining permit application. Please be advised to submit the Notification of Intent to Develop to Heritage Western Cape before the release of the Draft BAR. Ideally, a copy of the NID should be included in the Draft BAR.

Whilst the BID indicates that the "*proposed project will not necessitate the removal of natural Leipoldtville Sand Fynbos, the removal of some indigenous vegetation may be necessary should the cultivation of the footprint cease and indigenous vegetation establish through succession.*" Will a botanical specialist be appointed to provide a botanical statement or to compile a botanical assessment, which could inform the final mine layout plan?

I note that this is the 3rd mining permit application (assumingly by the same applicant) on the same property. The proposed mining permit application of 4.9ha falls just short of the need for a S&EIR process for a mining right. Without having the background to the two previous mining right applications, based on the limited information in the BID, the impression is that the applicant is trying to circumvent the process to apply for a mining right in terms section 22 of the MPRDA, 2002 by applying for separate mining permit applications of mining areas not exceeding 5ha in extent on the same site. It would be appreciated if this comment could be addressed in the Draft BAR."

Response to DEA&DP:

"Greenmined Environmental herewith thank you for your interest in the project, and acknowledge receipt of your correspondence received 5 July 2019 with regard to the proposed mining permit application to be submitted on behalf of Smit Grondwerke (Pty) Ltd. We have registered you, on behalf of the Department of Environmental Affairs and Development Planning, as the contact person and commenting party on the project, and will henceforth keep you posted on the progress of the Environmental Impact Assessment process as well as supply you with the requested copies of the draft basic assessment report.

Interested and Affected Parties List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.

In response to your comments:

- We take note of your request regarding the NID, however HWC (Heritage Western Cape) already confirmed that they are familiar with the area and "*that since there is no reason to believe that the t proposed sand mining activities on the Remainder of Portion 2 of the Farm No 199, Clanwilliam will impact on heritage resources, no further action under Section 38 of the NHRA, 1999 is required*". Proof of this will be attached the DBAR.

- Due to the disturbed nature of the footprint, a botanist study does not currently form part of the project proposal.

- Your comment regarding the mining permits on the same property is noted and will be discussed in the DBAR as requested. Please note that Smit Grondwerke (Pty) Ltd does not hold (or has held) mining permits on this property.

We trust you will find this in order. Please do not hesitate to contact me in the event of any uncertainties.

Agricultural Impact Assessment:

- Part A(1)(h)(iv)(c) Description of the specific environmental features and infrastructure on the site – *Site Specific Geology and Soil*
- Part A(1)(h)(v) Impacts and risks identified….
- Part A(1)(h)(viii) The possible mitigation measures that could be appliced and the level of risk – *Geology and Soil*
- Appendix G – Agricultural Impact Assessment

Heritage Western Cape:

- Part A(1)(h)(iii) Summary of issues raised by I&AP's – *Heritage Western Cape*
- Part A(1)(h)(iv)(c) Description of the specific environmental features and infrastructure on the site – *Site Specific Cultural and Heritage Environment*
- Part A(1)(h)(v) Impacts and risks identified….
- Part A(1)(h)(viii) The possible mitigation measures that could be appliced and the level of risk – *Cultural and Heritage Environment*
- Appendix F2 – Proof of Public Participation Process

Groundcover:

- Part A(1)(d)(ii) Description of the activities to be undertaken.
- Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – *Biodiversity Conservation Areas & Groundcover*.
- Part A(1)(h)(iv)(1)(c) Description of specific environmental features and infrastructure on site – *Site Specific Mining and Biodiversity Conservation Areas & Groundcover*.

Mining Right / Permit:

- Part A(1)(d)(ii) Description of the activities to be undertaken.

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.
Other Competent Authorities affected					
Department of Agriculture, Forestry and Fisheries	X	No comments received	N/A	N/A	N/A
Department of Economic Development and Tourism	X	No comments received	N/A	N/A	N/A
Department of Labour	X	No comments received	N/A	N/A	N/A
Department of Social Development	X	No comments received	N/A	N/A	N/A
Department of Water and Sanitation	X	12 July 2019	Leon Nomjila, from DWS, requested a site visit to look at the site and its surroundings in order to provide meaningful comments.	Greenmined arranged the site visit for Mr Nomjila and the inspection took place on 25 July 2019. Mr Nomjila mentioned, during the site visit, that he does not see any water related matters/aspects of concern. To date no formal feedback was received from DWS.	N/A
CapeNature	X	16 July 2019	Alana Duffel-Canham commented, on behalf of CapeNature, as listed below:	Greenmined acknowledged receipt of the comments on 17 July 2019, registered CapeNature as a commenting authority on the project and confirmed that their comments will be incorporated into the DBAR.	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – *Biodiversity Conservation Areas & Groundcover.* Part A(1)(h)(iv)(1)(c) Description of specific environmental features and infrastructure on site – *Site Specific Mining and*

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.
					Biodiversity Conservation Areas & Groundcover. Part A(1)(d)(ii) Description of the activities to be undertaken. Appendix J - Closure Plan
Comments received from CapeNature: "CapeNature would like to thank you for the opportunity to comment on the Background Information Document and wish to make the following comments: 1. The proposed mining site is located on an area which historically supported Leipoltdville Sand Fynbos. CapeNature's updated provincial ecosystem status statistics show that Leipoldtville Sand Fynbos has less than 34% of its original extent remaining. Therefore, under criterion A1 (irreversible loss of habitat) Leipoldtville Sand Fynbos meets the criteria for listing as Endangered in terms of Section 52 of the Biodiversity Act. 2. However, the proposed mining footprint has been historically transformed by agricultural activities and there is no natural vegetation remaining on site. There is natural vegetation adjacent to the site and it is important that no mining expansion or related activities occur outside of the application footprint. 3. No new roads should be created and only the existing farm track should be used to access the site. 4. Rehabilitation should occur concurrently with mining and no more than 1ha should be exposed at any one time to reduce erosion and contaminated runoff risks. A mining block plan should be provided in the Basic Assessment Report indicating the order of mining. Timeframes should also be provided for rehabilitation. CapeNature reserves the right to revise initial comments and request further information based on any additional information that may be received."					
Heritage Western Cape (HWC)	X	16 July 2019	Washeefa Dhansay commented as follows on behalf of HWC.	Greenmined acknowledged receipt of the comments on 9 July 2019.	N/A
Comments received from Heritage Western Cape: "Heritage Western Cape is in receipt of your application for the above matter received on 01 April 2016. This matter was discussed at the Heritage Officers meeting held on 15 April 2016. You are hereby notified that, since there is no reason to believe that the proposed sand mining activities on the Remainder of Portion 2 of the Farm No 199, Clanwilliam, will impact on heritage resources, no further action under Section 38 of the National Heritage Resources Act (Act 25 of 1999) is required.					

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.
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. This letter does not exonerate the applicant from obtaining any necessary approval from any other applicable statutory authority. HWC reverses the right to request additional information as required."					
South African Heritage Resources Agency	X	No comments received	N/A	N/A	N/A
West Coast District Municipality (WCDM)	X	4 July 2019	Doretha Kotze registered Mr D Joubert on behalf of the WCDM as an I&AP on the project and noted the following concerns: ℑ impact on roads; ℑ impact on water sources; ℑ air quality; ℑ visual impact.	Greenmined acknowledged receipt of the registration on 5 July 2019 and confirmed that the WCDM will be supplied with a copy of the DBAR in which the concerns would have been incorporated and discussed.	Please refer to the list of references in the line below.

Roads:

- Part A(1)(d)(ii) Descripton of the activities to be undertaken – *Access Road*
- Part A(1)(h)(v) Impacts and risks identified….
- Part A(1)(h)(viii) The possible mitigation meausres that could be appliced and the level of risk – *Access Road Mitigation*

Water Resources:

- Part A(1)(d)(ii) Description of the activities to be undertaken – *Water Use*
- Part A(1)(h)(i) Details of the development footprint alternatives considered
- Part A(1)(h)(iv)(1)(a) Type of environment to be affected by the proposed activity – *Hydrology*
- Part A(1)(h)(iv)(1)(c) Description of specific environmental features and infrastructure on the site – *Site Specific Hydrology*
- Part A(1)(h)(v) Impacts and risks identified….
- Part A(1)(h)(viii) The possible mitigation meausres that could be appliced and the level of risk – *Hydrology*

Air Quality:

- Part A(1)(d)(ii) Description of the activities to be undertaken – *Water Use*
- Part A(1)(h)(iv)(1)(a) Type of environment to be affected by the proposed activity – *Air and Noise Quality*
- Part A(1)(h)(iv)(1)(c) Description of specific environmental features and infrastructure on the site – *Site Specific Air and Noise Quality*
- Part A(1)(h)(v) Impacts and risks identified….

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.
ℑ Part A(1)(h)(viii) The possible mitigation meausres that could be appliced and the level of risk – *Air and Noise Quality* **Visual Impact:** ℑ Part A(1)(h)(iv)(1)(a) Type of environment to be affected by the proposed activity – *Visual Characteristics* ℑ Part A(1)(h)(iv)(1)(c) Description of specific environmental features and infrastructure on the site – *Site Specific Visual Characteristics* ℑ Part A(1)(h)(v) Impacts and risks identified…. ℑ Part A(1)(h)(viii) The possible mitigation meausres that could be appliced and the level of risk – *Visual Characteristics*				
OTHER AFFECTED PARTIES				
N/A				
INTERESTED PARTIES				
N/A				

iv) The Environmental attributes associated with the alternatives.

(The environmental attributes described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

(1) Baseline Environment

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

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

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

PHYSICAL ENVIRONMENT

CLIMATE

According to the saexplorer website, Clanwilliam normally receives about 274 mm of rain per year, with most rainfall occurring mainly during winter. The chart below (lower left) shows the average rainfall values for Clanwilliam per month. It receives the lowest rainfall (3 mm) in February and the highest (57 mm) in June. The monthly distribution of average daily maximum temperatures (centre chart below) shows that the average midday temperatures for Clanwilliam range from 17.9°C in July to 31.3°C in February. The region is the coldest during July when the mercury drops to 5.8°C on average during the night. Consult the chart below (lower right) for an indication of the monthly variation of average minimum daily temperatures.

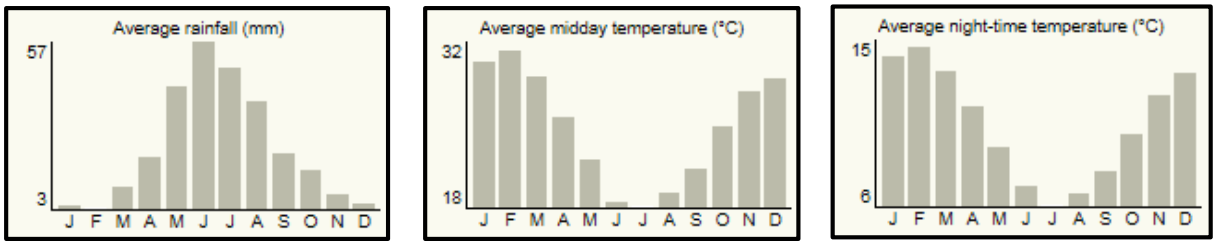

Figure 8: Statistical representation of the average rainfall, midday temperatures and night-time temperatures for the Clanwilliam region (Chart obtained from saexplorer).

The wind patterns in Clanwilliam are highly variable and influenced by seasonal changes. According to the wind statistics as presented on Windfinder.com the prevalent wind direction distribution of Clanwilliam is in a west, south-western direction from December to March. In April, September and October the wind changes direction to south-south-east, while the dominant direction is north-north-west from May to August. The figures below presents the wind direction distribution in % for the greater Clanwilliam area.

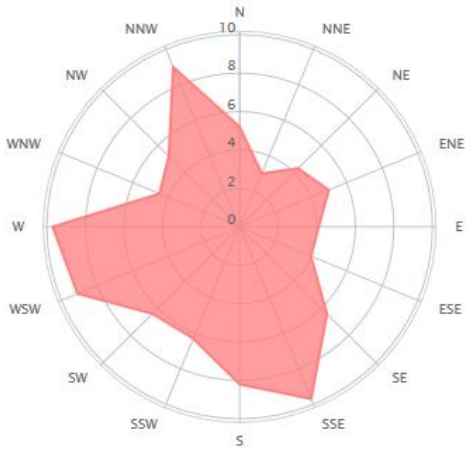

Figure 9: Annual wind direction distribution in % for the Clanwilliam area, where the furthest point to the north-north-west indicates 9%/year, the furthest point to the south-south-east indicates 9.7%/year, and the western trend equals 9.7% (west-south-west = 9.1%). (Image obtained from www.windfinder.com/windstatistics/clanwilliam)

Figure 10: Wind direction distribution in % for the Clanwilliam area where the first wind rose shows the data for the month of December (15.2% WNW; 13.5% E), and the second frame indicates the data of March (12% WSW; 10.9% SSE; 9.1% NNW)
(Images obtained from www.windfinder.com/windstatistics/clanwilliam)

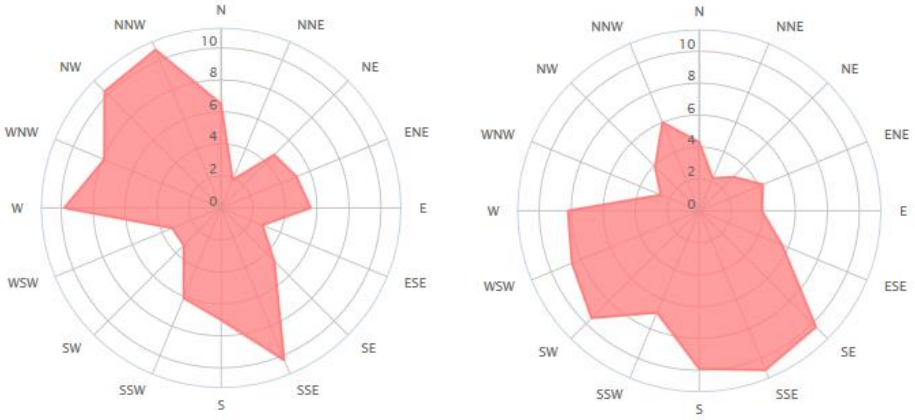

Figure 11: Wind direction distribution in % for the Clanwilliam area where the first frame shows the wind data of June (10.7% NNW; 10.3% NW; 9.8% W; 10.3% SSE), and the second image depicts the data of October (10.8% SSE; 10.3% SE; 9.9% S; 9.5% SW; 8.2% W).
(Images obtained from www.windfinder.com/windstatistics/clanwilliam)

TOPOGRAPHY

The natural topography of the area surrounding the proposed sand mine is best described as an undulating sandy landscape covered with shrublands. The surface elevation of the study area decreases towards the north (non-perennial drainage line), east (national road N7), and south-east (Olifants River) as shown in the figures below.

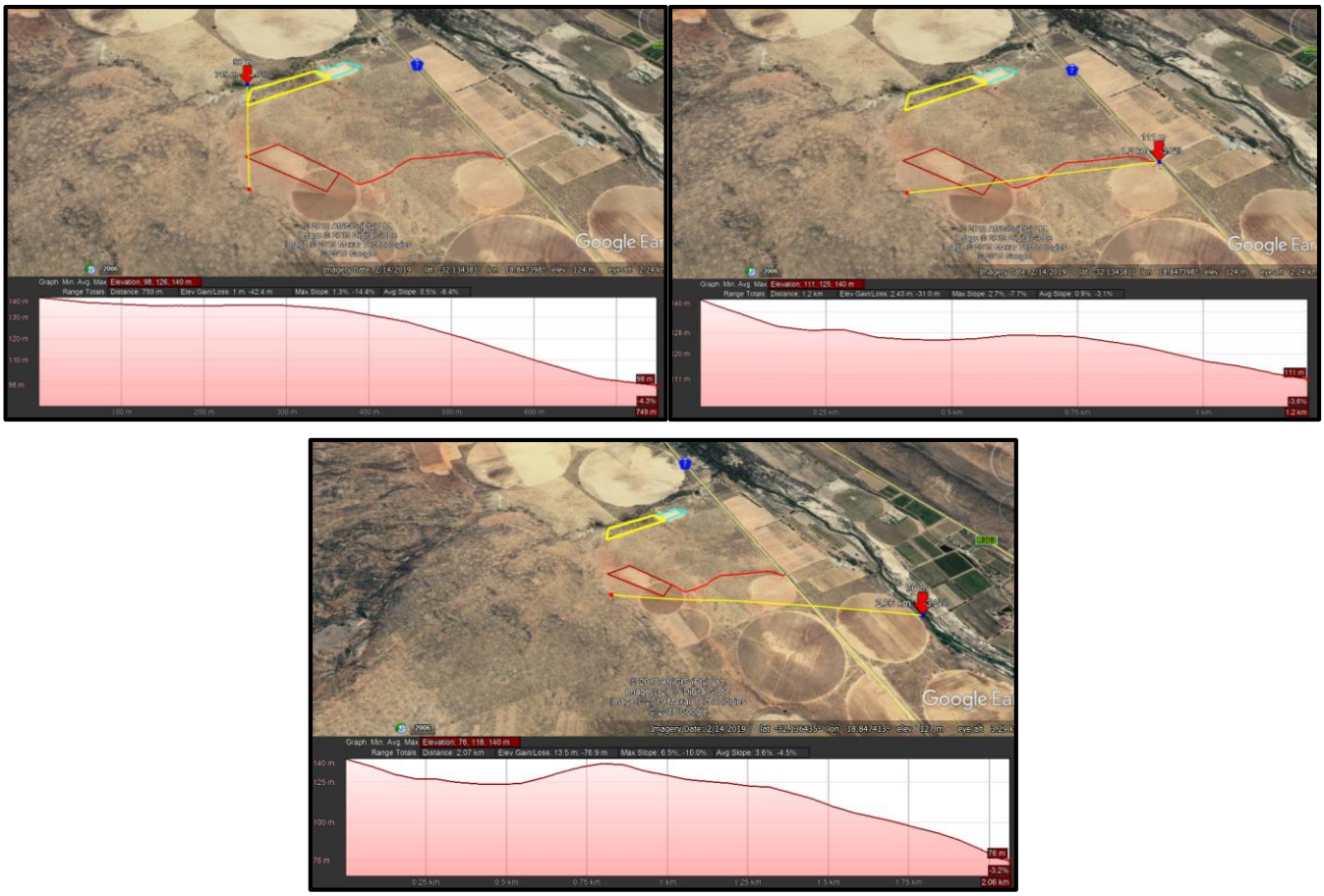

Figure 12: Elevation profile of the area to the north (first top image), east (second top image) and the south-east (lower image). (Image obtained from Google Earth).

VISUAL CHARACTERISTICS

The visual character of the surrounding areas mainly comprises of an agricultural setting, intersected by pivots, the N7 national road, and the 1.5 ha sand mining area. The aesthetic ambiance of the area is that of a rural area with highly natural landscapes.

AIR AND NOISE QUALITY

The air quality of the study area is generally very good given the area's predominant agricultural use and rural character. Likewise, the noise ambiance is very low (classified as ambient rural / pastoral) with noise levels mainly affected by traffic along the N7, and the farming equipment operational in the area.

GEOLOGY AND SOIL

The geology of the study area comprises mostly sediments of the Table Mountain Group (at depth) overlain with Cenozoic sands of the Sandveld Group. The underlying sediments consist of the Nardouw Supergroup which are light-coloured quartzitic sandstones. As seen in the figure below the geological map for the Council of Geoscience shows very little detail and omits the overlying Cenozoic sand cover of the study area.

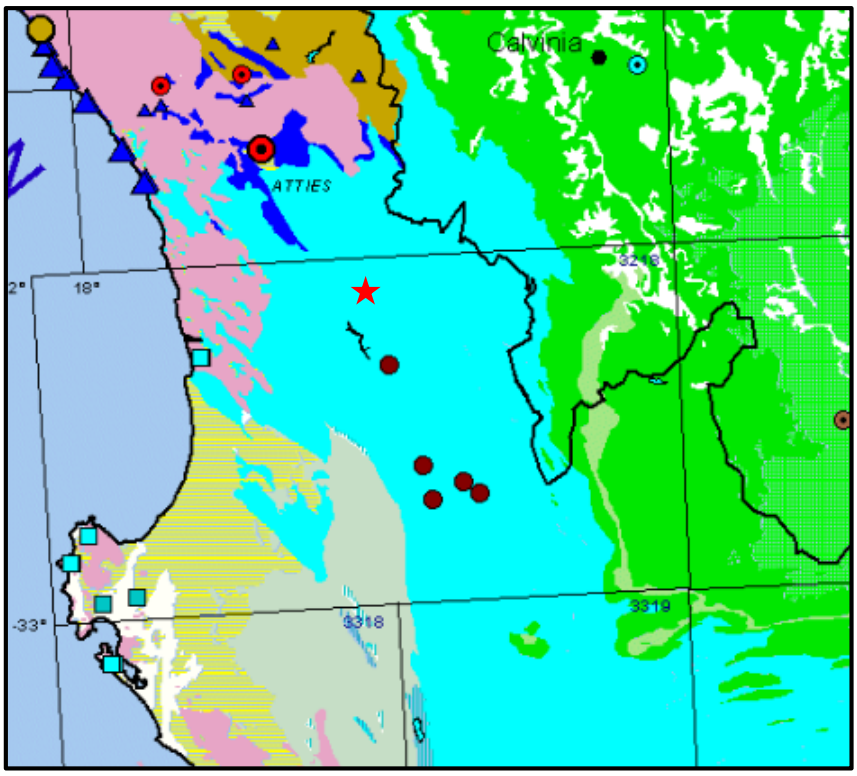

Figure 13: Indication of the simplified geology of the study area, where light blue represents Cape Supergroup, pink the Namaqua Metamorphic Provinces, green the Dwyka and ECC Groups, and the yellow lined area represents the Cenozoic Deposits. The proposed mining area is indicated by the red star. (Image obtained from the Council for Geoscience)

HYDROLOGY

The earmarked mining area is situated within the Olifants D sub water management area that forms part of the greater Olifants-Doring water management area. According to the National Freshwater Ecosystem Priority Areas (NFEPA) map as presented by SANBI, the NFEPA status of the study area (S1) is classified as a no priority area.

A non-perennial drainage line passes towards the north (±510 m from S1) before it joins up with the Olifants River on the opposite (eastern) side of the N7. The drainage line is classified as a channelled valley-bottom wetland on the National Wetland and NFEPA map viewer of BGIS. No other wetlands or other drainage lines were identified within a 500 m radius of the study area (S1). The figure below shows the position of the non-perennial stream and Olifants River that occur within the surrounding area.

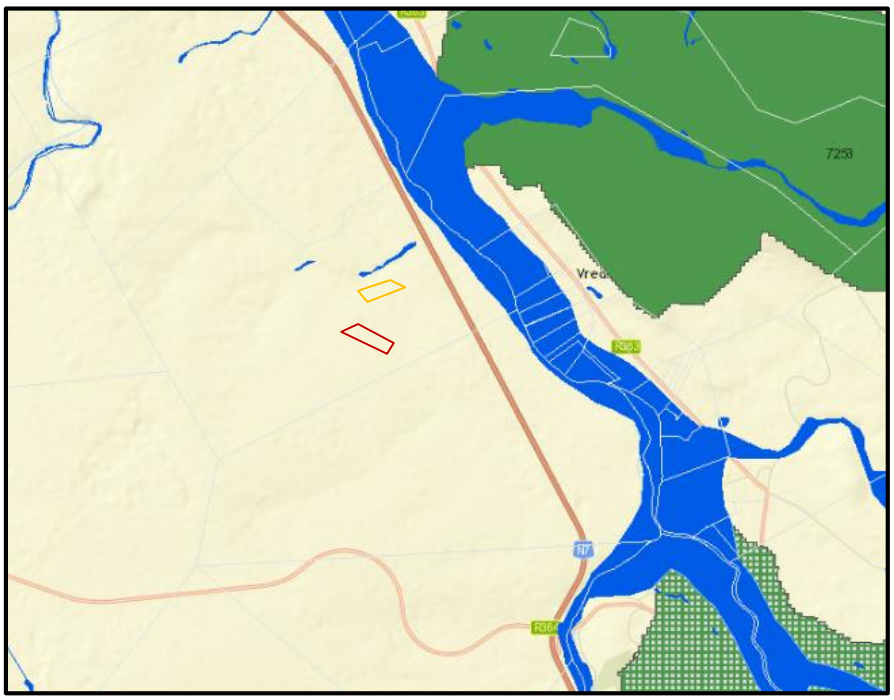

Figure 14: Map showing the position of the non-perennial drainage line to the north of the preferred mining area (S1) (red rectangle) and site alternative 2 (yellow rectangle), as well as the Olifants River to the east. (Image obtained from the BGIS Map Viewer – National Wetlands and NFEPA)

Mining at the 1.5 ha area has to date not encountered groundwater, and the potential impact of the proposed sand mining area on the groundwater table is deemed to be negligible.

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 footprints of both S1 and S2 are layered over the Mining and Biodiversity Map, as shown in the figure below, it falls over and area of highest biodiversity importance with a corresponding rating of highest risk for mining. The Mining and Biodiversity Guideline's describes areas of highest biodiversity importance as: "*these areas are viewed as necessary to ensure protection of biodiversity, environmental sustainability, and human well-being.*" 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.

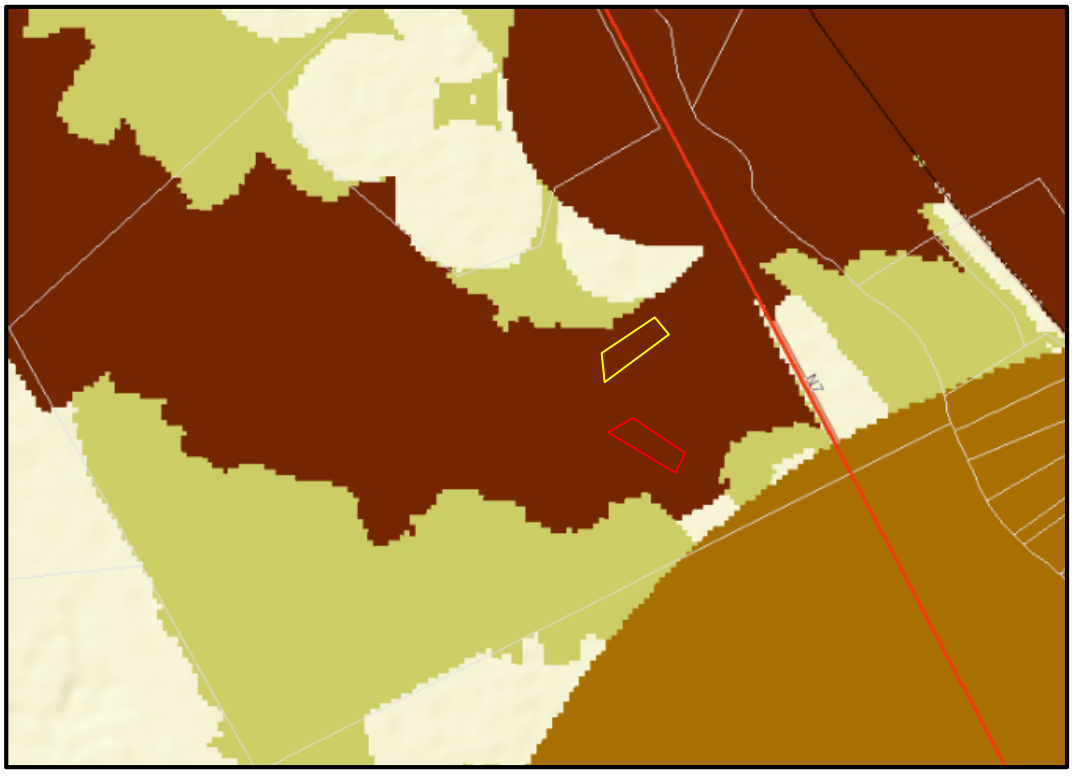

Figure 15: The Mining and Biodiversity importance map with the proposed mining footprint (S1) indicated by the red polygon and S2 indicated by the yellow polygon. Dark brown – highest biodiversity importance, highest risk for mining, light brown – high biodiversity Importance, high risk for mining, sand colour – moderate biodiversity importance, moderate risk for mining.

BIODIVERSITY CONSERVATION AREAS

The 2017 Western Cape Biodiversity Spatial Plan (WCBSP) shows the following areas of importance occurring within/nearby the study area (see figure below):

- Cederberg CBA1: Terrestrial
- Cederberg ESA1: Terrestrial
- Cederberg ESA2: Terrestrial
- Cederberg CBA1: Aquatic
- Cederberg ESA1: Aquatic

The Lexicon of Biodiversity Planning in South Africa provides the following definitions:

- Critical Biodiversity Area (CBA)*: "an area that must be maintained in a good ecological condition in order to meet biodiversity targets. CBA's collectively meet biodiversity targets for all ecosystem types as well as for species and ecological processes that depend on natural or near-natural habitat, that have not already been met in the protected area network."*

- Ecological Support Area (ESA): "*an area that must be maintained in at least fair ecological condition (semi-natural/moderately modified state) in order to support the ecological functioning of a CBA or protected area, or to generate or deliver ecosystem services, or to meet remaining biodiversity targets for ecosystem types or species when it is not possible or not necessary to meet them in natural or near-natural areas.".*

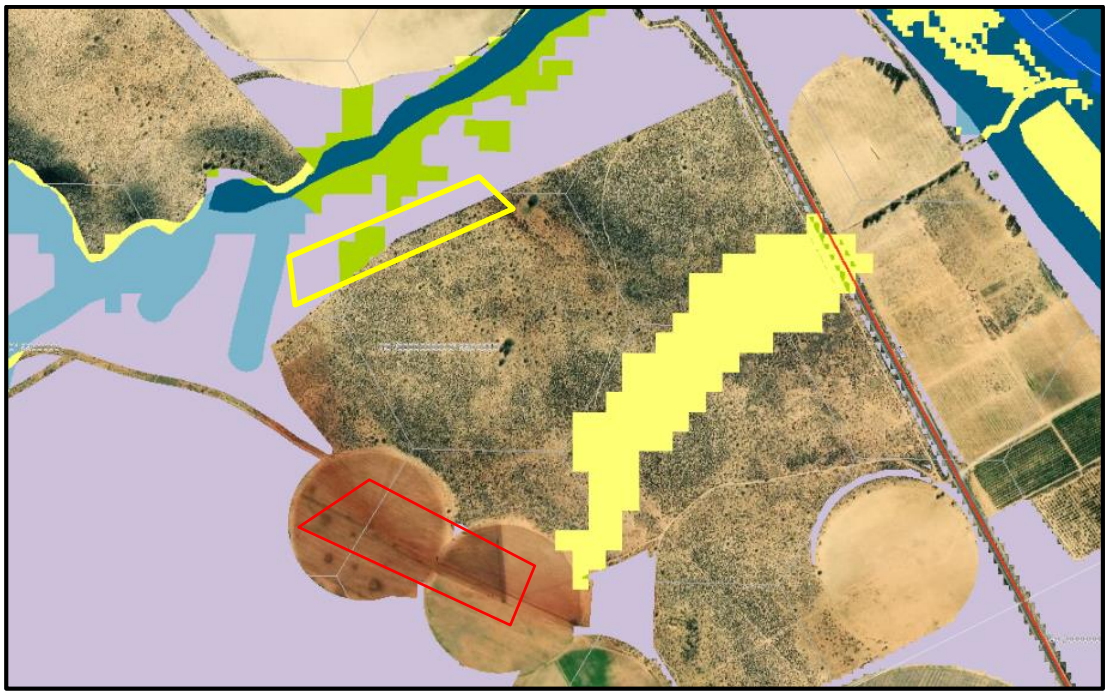

Figure 16: 2017 Western Cape Biodiversity Spatial Plan showing the preferred mining area (S1) (red polygon), as well as site alternative 2 (yellow polygon) in relation to the Cederberg ESA 1 (purple), Cederberg ESA 2 (yellow), Cederberg CBA 1 (green), Cederberg ESA: Aquatic (light blue), and Cederberg CBA: Aquatic (dark blue). (Image obtained from BGIS Map Viewer – 2017 Western Cape Biodiversity Spatial Plan).

GROUNDCOVER

According to Mucina and Rutherford (2012) the vegetation type of the natural areas is classified as Leipoldtville Sand Fynbos (FFd2). The vegetation and landscape features of this vegetation type is characterised by fairly dense, 1 – 1.2 m tall restiolands, with numerous medium tall to low shrubs scattered in between. The vegetation type is a dry form of sand fynbos lacking Ericaceae with proteoid elements relatively rare.

Some of the important taxa found in this vegetation type include tall shrubs such as *Aspalathus acuminata, Leucadendron pubescens, Chrysanthemoides monilifera, Diospyros glabra, Euclea racemosa, and Euryops speciosissimus*. Low shrubs includes *Aspalathus divaricata, Diosma acmaeophylla, Eriocephalus africanus, Anthospermum galioides, Metalasia adunca, Nenax arenicola*, and *Phylica cephalantha*. Succulent shrubs: *Rushia decurbans, Crassula nudicaulis, Euphorbia burmannii.*

The vegetation type is classified as Endangered and according to Mucina and Rutherford (2012) none of the unit is conserved in statutory or private conservation areas. 55% of the vegetation type has already undergone transformation, including cultivation with central pivot irrigation and pastures. A conservation target of 29% was set for the vegetation type.

Figure 17: National vegetation cover map for FFd2 Leipoldtville Sand Fynbos (light purple). (Image obtained from BGIS Map Viewer – National Vegetation Map).

FAUNA

The resident fauna identified during the site inspection mainly comprise of natural occurring small mammals, reptiles and various bird species. The faunal action is mainly contained to the natural vegetated areas and riparian areas along the non-perennial stream and the banks of the Olifants River. Due to the altered nature of the mining area, no protected or red data species were identified to be resident within the proposed footprint.

HUMAN ENVIRONMENT:

CULTURAL AND HERITAGE ENVIRONMENT

(Information extracted from the Basic Assessment and EMPR of the 1.5 ha sand mining area, June 2016.)

According to the BAR & EMPR of the 1.5 ha sand mining area on the same property, Mr J Kaplan from the Agency for Cultural Resource Management (ACRM) prepared an archaeological impact assessment report for the mining area (2010). No significant archaeological resources were identified during this study. Heritage Western Cape commented on the archaeological impact assessment and NID (2016), submitted by Mr Kaplan, that there is no reason to believe that the sand mining activities (±520 m from the proposed 4.9 ha mining area) on the Remainder of Portion 2 of the Farm 199, will impact on heritage resources.

The South African Heritage Resources Agency (SAHRA) compiled the Palaeontological (fossil) Sensitivity Map (PSM) to guide developers, heritage officers and practitioners in screening palaeontologically sensitive areas at the onset of a project. When the footprint of the earmarked mining area is placed on the PSM, it shows the study area to extend over an area of high (orange) concern as presented in the figure below.

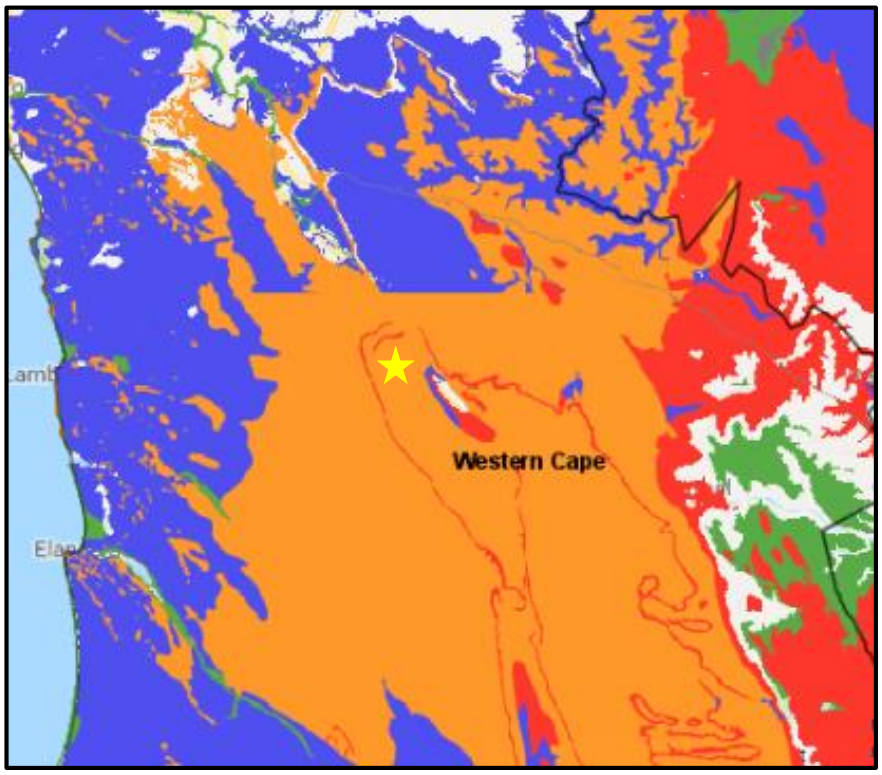

Figure 18: The SAHRA palaeontological sensitivity map shows the proposed mining footprint (yellow star) falls in an area of high concern.

SOCIO-ECONOMIC ENVIRONMENT

(Information extracted from the Revision to the Fourth Generation Integrated Development Plan (IDP) of Cederberg Municipality 2017-2022)

The proposed mining area is located within ward 6 of the Cederberg Local Municipality (CLM). The CLM forms part of the West Coast District Municipality and is located in the northern segment of the district wedged between the Matzikama municipality and the Bergrivier Municipality.

The following table (obtained from the CLM IDP 2017 – 2022) provides a summary of key datasets for the municipal area:

Table 9: Summary of key datasets for the Cederberg Local Municipality (obtained from the CLM IDP 2017 – 2022)

DATASET	VALUE
Total population	55 739
Young (0-14)	13 623
Working age (15-64)	38 016
Elderly (65+)	4 099
Dependency ratio	35.8
Population (total)	55 738 (2017)
Population growth rate	2.6% (2011 – 2017)
Household growth rate	2.3%
Unemployment rate	7.3%
Income levels	89.4% of households earn less than R 153 801 per annum
No schooling	19% (% change from 2011 – 2017)
Matric	55% (% change from 2011 – 2017)
Higher education	13% (% change from 2011 – 2017)
Average household size	3.7
Female headed households	35%
Formal dwellings	86.3% (decreased from 2011)
Informal dwellings	12.3%
Flush toilet connected to sewerage	82.2% (increased from 2011)
Weekly refuse removal	57.9% (increased from 2011)
Piped water inside dwelling	74.1% (decreased from 2011)
Electricity for lighting	88.2% (decreased from 2011)

Population Dynamics

According to the CLM IDP, the number of persons in the municipal area increased steadily from 1995 onwards. The overall annual population growth rate was 2.6% with a slightly lower increase (2.3%) per annum in the number of households.

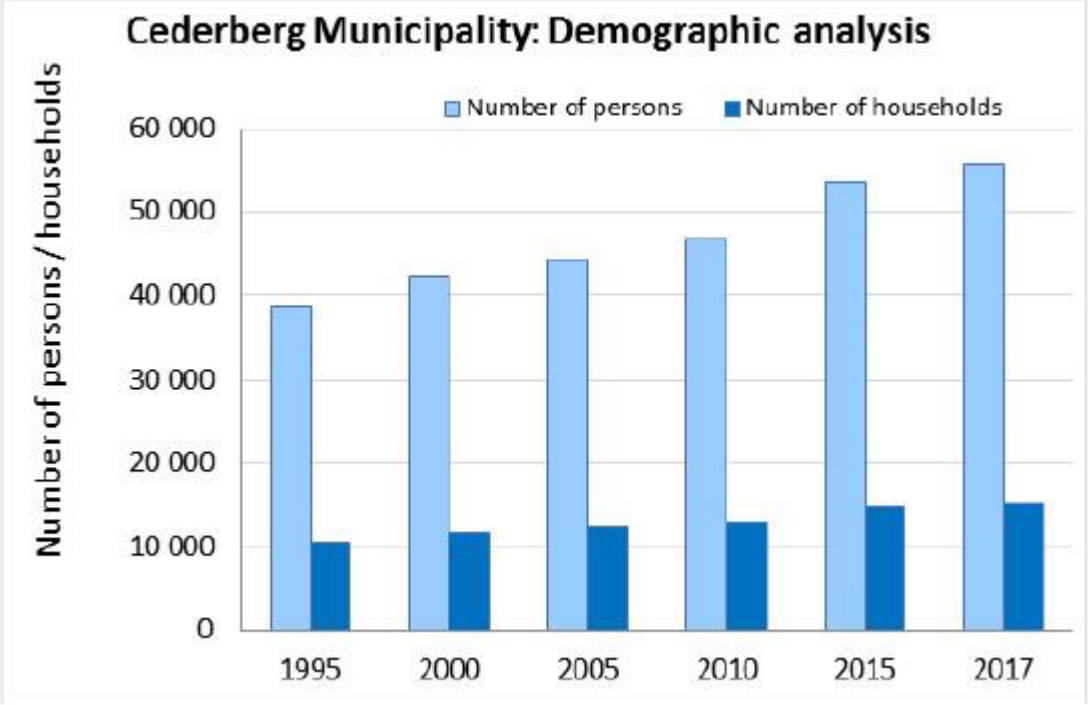

Figure 19: Demographic analysis (image obtained from the Cederberg IDP 2017 – 2022).

The White population group experienced a low average annual growth rate (0.5%) in the number of persons. The other three population groups (Black-African, Coloured, Asian) experienced higher growth rates over this period.

Indicators	Black-African		Coloured		White		Asian	
	2011	2017	2011	2017	2011	2017	2011	2017
Population size	5 970	7 830	36 087	42 214	5 326	5 534	116	161
Proportional share of total population	12.6%	14.0%	76.0%	75.7%	11.2%	9.9%	0.2%	0.3%
Number of households by population group	2 158	2 781	8 669	10 002	2 203	2 348	21	27
Source: Quantec								

Figure 20: Demographics of the Cederberg municipal area (image obtained from the Cederberg IDP 2017 – 2022).

Economic Profile

The IDP informs that the 2017 employment status of the working age population in the West Coast district of 45.9% formally employed and 7.5% unemployed shows a decrease from the situation in 2001 (63.4% employed; 2.9% unemployed). In the Cederberg area 48.2% of the working age population was formally employed in 2017 (67% in 2001, 52% in 2016).

Description	2001	2011	2016	2017
Cederberg				
Working age	28 490	31 785	37545	40 416
Employed (formal)	19 045	15 930	19 529	19 463
Unemployed	544	1 473	1 858	2 059

Figure 21: Employment status of the Cederberg municipal area (image obtained from the Cederberg IDP 2017 – 2022).

The table below shows the GDP contribution per main sector for the various municipal areas within the West Coast District.

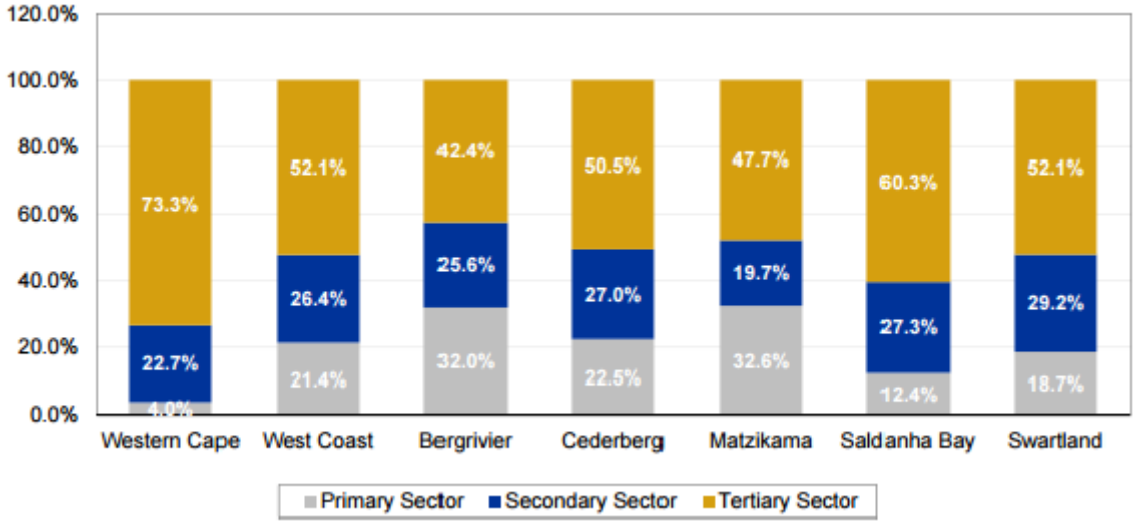

Figure 22: GDP contribution per main sector, 2015 (image obtained from the Cederberg IDP 2017 – 2022)

The agricultural, forestry and fishing industry comprised 23.7% of the municipality's GDP in 2015 and employed 40.3% of the municipality's workforce. The figure below indicated the sector that contribute the most to the West Coast district's economy. From the figure it is evident that mining contributes in a very small way to the GDP of the Cederberg area, with agriculture being the leading contributing sector. Although the mining and quarrying sectors grew faster than agriculture in the West Coast in 2014, because the sector is smaller, its actual contribution to the GDPR growth was significantly less.

Sector	West Coast District	Bergrivier	Cederberg	Matzikama	Saldanha Bay	Swartland
Agriculture, forestry and fishing	20.9	31.9	22.3	29.7	12.2	18.7
Mining and quarrying	0.5	0.1	0.2	2.9	0.2	0.0
Manufacturing	19.7	20.3	19.4	12.5	20.7	22.5
Electricity, gas and water	1.5	1.3	2.0	2.0	1.2	1.5
Construction	5.2	3.9	5.6	5.2	5.5	5.3
Wholesale and retail trade, catering and accommodation	15.3	12.0	13.9	15.3	16.1	16.9
Transport, storage and communication	7.8	5.1	13.0	5.9	8.7	7.1
Finance, insurance, real estate and business services	12.3	10.9	9.5	9.6	17.9	10.0
Community, social and personal services	6.3	5.7	5.6	6.6	6.3	6.8
General government	10.4	8.6	8.5	10.4	11.4	11.3

Source: Quantec Research, 2016

Figure 23: West Coast GDPR contribution per sector, 2015 (image obtained from the Cederberg IDP 2017 – 2022)

The Cederberg Municipality is a relatively small economy, making up 12.7% of 2017 GDP in the West Coast District. The economic activities in the CLM are dominated by agriculture and fishing, manufacturing and the following tertiary subsector articles: wholesale and retail trade, catering and accommodation, and transport, storage and communication. Collectively, these sectors contributed 67.9% to the Cederberg municipal area economy in 2017.

Description (subsector)	Subsector contribution: Gross value added at basic prices (R millions current prices)	
	2016	2017
Agriculture, forestry and fishing	765	838
Manufacturing	709	682
Wholesale and retail trade, catering and accommodation	482	515
Transport, storage and communication	420	459
Source: Quantec		

Figure 24: Economic growth analyses of the four largest economic subsectors in the municipality (image obtained from the Cederberg IDP 2017 – 2022).

The percentage share contribution by the tertiary sector in 2017 to the total GVA generated in the Cederberg municipal area is 51.0%. The primary sector contributed 23.1% and the secondary sector 25.9%. Between 200 and 2015, every sector in Cederberg grew positively in terms of GVA contribution.

Industry	Sector	1995	2000	2005	2010	2015	%change (2000 to 2015)	2016	2017	%change (2015 to 2017)
Agriculture, forestry and fishing	Primary	185	229	332	516	680	196%	765	838	10%
Mining (and quarrying)	Primary	2	1	2	4	6	304%	6	8	35%
Manufacturing	Secondary	65	105	211	390	653	521%	709	682	-4%
Electricity, gas and water	Secondary	5	6	10	32	68	978%	71	79	12%
Construction	Secondary	12	19	36	76	163	770%	172	191	11%
Wholesale and retail trade, catering and accommodation	Tertiary	58	91	158	263	439	380%	482	515	7%
Transport, storage and communication	Tertiary	23	44	95	187	396	806%	420	459	9%
Finance, insurance, real estate and business services	Tertiary	35	67	152	251	334	396%	359	381	6%
General government	Tertiary	37	61	91	163	272	349%	297	320	8%
Community, social and personal services	Tertiary	17	32	61	115	169	421%	179	196	9%
Source of data: Quantec										

Figure 25: GDP of the municipality (image obtained from the Cederberg IDP 2017 – 2022)

The proposed sand mining activity will directly contribute to the mining industry (primary sector) as well as indirectly to the construction industry (secondary sector).

(b) Description of the current land uses

Portion 2 (Remaining Extent) of Farm 199 RD is situated in a rural setting intersected by the N7 national road along the north-eastern boundary. The land use of the property mainly comprises of potato/wheat farming under irrigation, and grazing of the uncultivated areas. The two centre pivot irrigated lands, across which the S1 footprint extends, was developed from before 2012 to 2013, and has been used for the cultivation of potatoes, wheat and perennial pastures. The land use of the property was also extended to include small scale mining

Likewise, the main land use of the surrounding properties is agricultural. The Olifants River valley is a major economic corridor mainly based on intensive irrigation farming, transport infrastructure and tourism.

The following table provides a description of the land uses and/or prominent features that currently occur within a 500 m radius of S1 & S2:

Table 10: Land uses and/or prominent features that occur within 500 m radius of S1 and S2.

LAND USE CHARACTER	YES	NO	DESCRIPTION
Natural area	**YES**	-	The study area is surrounded by natural areas used for agricultural purposes. (S1 & S2)
Low density residential	-	**NO**	
Medium density residential	-	**NO**	
High density residential	-	**NO**	
Informal residential	-	**NO**	
Retail commercial & warehousing	-	**NO**	
Light industrial	-	**NO**	
Medium industrial	-	**NO**	
Heavy industrial	-	**NO**	
Power station	-	**NO**	
High voltage power line	-	**NO**	
Office/consulting room	-	**NO**	
Military or police base / station / compound	-	**NO**	
Spoil heap or slimes dam	-	**NO**	
Quarry, sand or borrow pit	-	**NO**	Site Alternative 1: The existing sand mine is ±530 m from the proposed 4.9 ha mining area.
Quarry, sand or borrow pit	**YES**	-	Site Alternative 2: The footprint of S2 borders the 1.5 ha mining area.
Dam or reservoir	-	**NO**	
Hospital/medical centre	-	**NO**	
School/ crèche	-	**NO**	
Tertiary education facility	-	**NO**	
Church	-	**NO**	
Old age home	-	**NO**	
Sewage treatment plant	-	**NO**	
Train station or shunting yard	-	**NO**	
Railway line	-	**NO**	
Major road (4 lanes or more)	-	**NO**	The N7 (less than 4 lanes) pass S1 ±735 m to the north, north-east, and S2 ±470 m to the north-east.
Airport	-	**NO**	
Harbour	-	**NO**	
Sport facilities	-	**NO**	
Golf course	-	**NO**	
Polo fields	-	**NO**	
Filling station	-	**NO**	
Landfill or waste treatment site	-	**NO**	
Plantation	-	**NO**	
Agriculture	**YES**	-	The proposed footprints of S1 and S2 fall over an agricultural active area. ℑ S1 – centre pivot irrigation; ℑ S2 – grazing.
River, stream or wetland	-	**NO**	Site Alternative 1: The non-perennial drainage line is ±510 m from the S1 footprint.
River, stream or wetland	**YES**	-	Site Alternative 2: The non-perennial drainage line is ±20 m from the S2 footprint.
Nature conservation area	-	**NO**	
Mountain, hill or ridge	-	**NO**	
Museum	-	**NO**	
Historical building	-	**NO**	
Protected Area	-	**NO**	

LAND USE CHARACTER	YES	NO	DESCRIPTION
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 of both site alternative 1 and 2 is relatively flat, with an average slope of 1.67% applicable at S1 (136 mamsl at the northern corner to 125 mamsl at the southern corner) and a slope of 4.4% applicable to S2 (113 mamsl at the eastern corner to 101 mamsl at the north-western corner) as shown in the figures below.

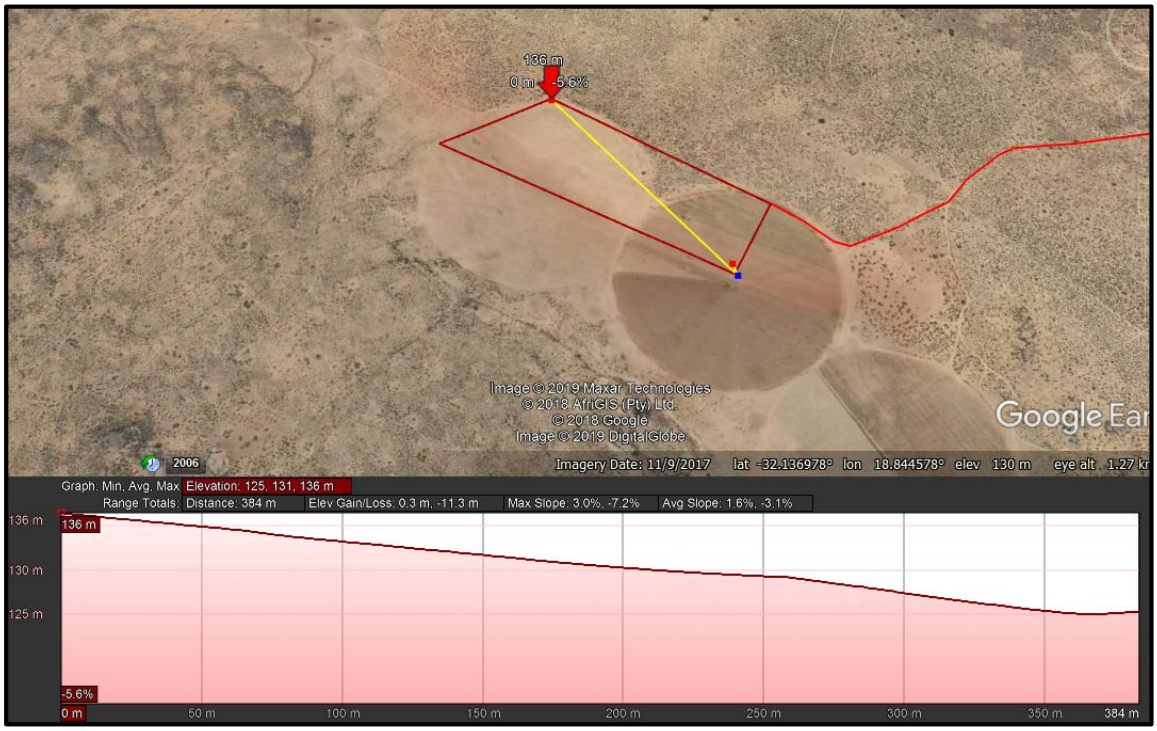

Figure 26: Elevation profile of site alternative 1 (Image obtained from Google Earth).

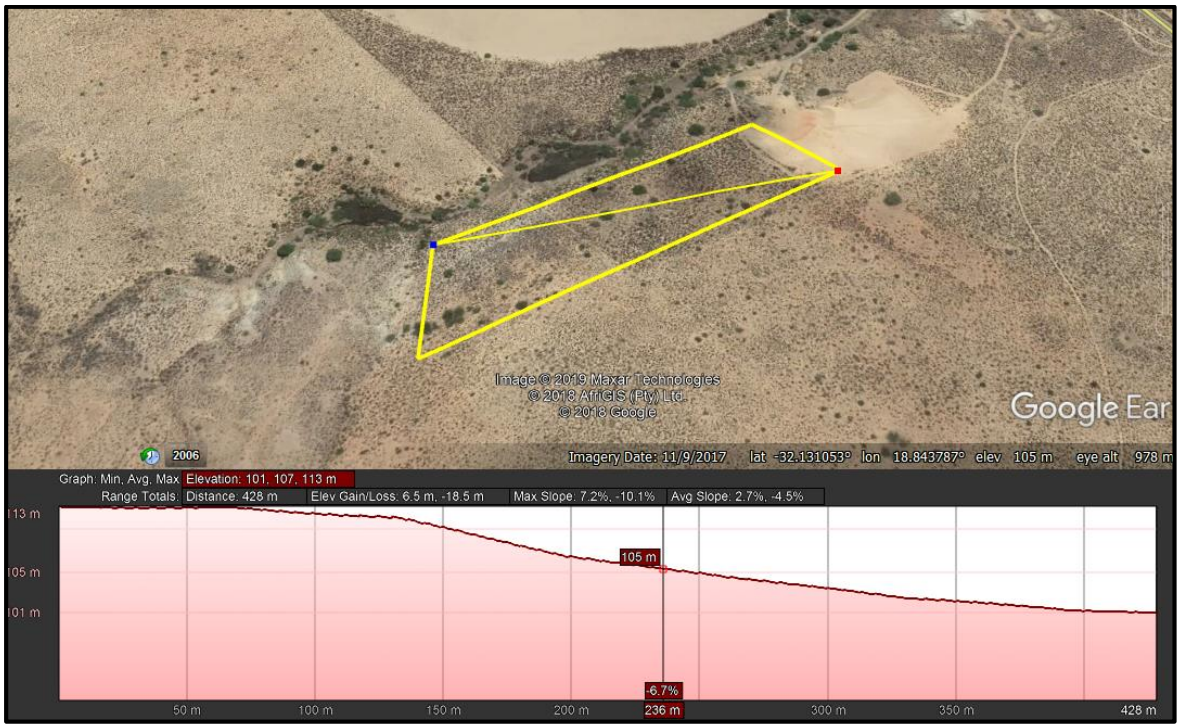

Figure 27: Elevation profile of site alternative 2 (Image obtained from Google Earth).

Therefore, drainage from S1 will be in an eastern direction, while S2 will drain naturally towards the non-perennial stream in the north.

As mentioned in the AIA (Appendix G) the excavation of the mining area (S1) has the potential to level the centre pivot lands, which will have advantages for preventing irrigation run-off and improving ease of agricultural management. It will however be important that mining depths are controlled across the entire mine so that excavations results in a levelling of the centre pivot lands rather than a hole with steep edges.

The mine planning of the proposed footprint must therefore be such that steep edges are reduced to a minimum and allows the travel of the centre pivot, no depression is left, the area remains free draining, and the rehabilitation objectives and mitigation measures as proposed in this document is implemented. Upon closure, the footprint area must be returned to agricultural use with no significant residual impact on the topography (following closure) remaining.

SITE SPECIFIC VISUAL CHARACTERISTICS

The footprint of Site alternative 1 (S1) will mainly be visible from high-ground areas along the north-east to east, as well as a few areas within close proximity to the north-west, and/or south. The mining area (S1) will not be visible from the N7 national road.

The figure below shows the viewshed analysis for the S1 footprint within a ±10 km radius. The green shaded areas shows the positions from where the mining area will

be visible. From this analysis it is proposed that the visual impact of the proposed sand mining operation (S1) will be of low-medium significance, especially as it will be developed within the footprint of existing pivots. The small scale of the proposed operation (1 ha disturbed at a time), the implementation of progressive rehabilitation, as well as the fact that no infrastructure will be establish contributes to the low visual significance. As the landowner will continue with the use of the area for cultivation purposes, no residual visual impact is expected upon closure of the mine.

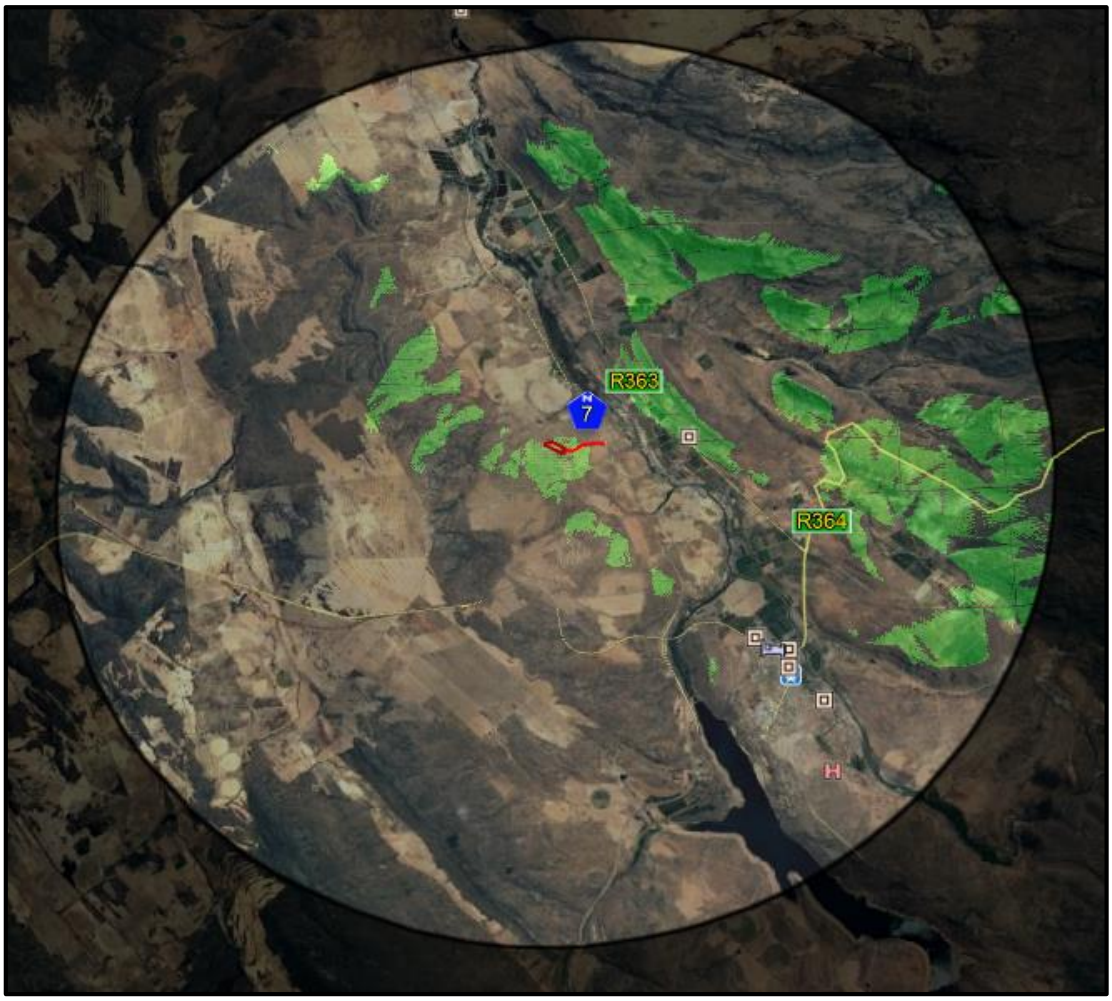

Figure 28: Viewshed of site alternative 1 where the green shaded areas shows the positions from where the mining area (red polygon) will be visible. (Image obtained from Google Earth).

When the viewshed analysis of site alternative 2 is drawn (figure below) it shows the footprint to be visible from a mainly northern direction, with a small visibility from the N7 national road. The visual impact of S2 is also deemed to be of low-medium significance, however slightly higher than S1 as the receiving footprint is currently undisturbed and harbours natural fynbos. Upon closure of the mining area, the permit holder would have to rehabilitate the area to resemble the pre-mining environment and a negligible residual impact is expected once the cover crop becomes established.

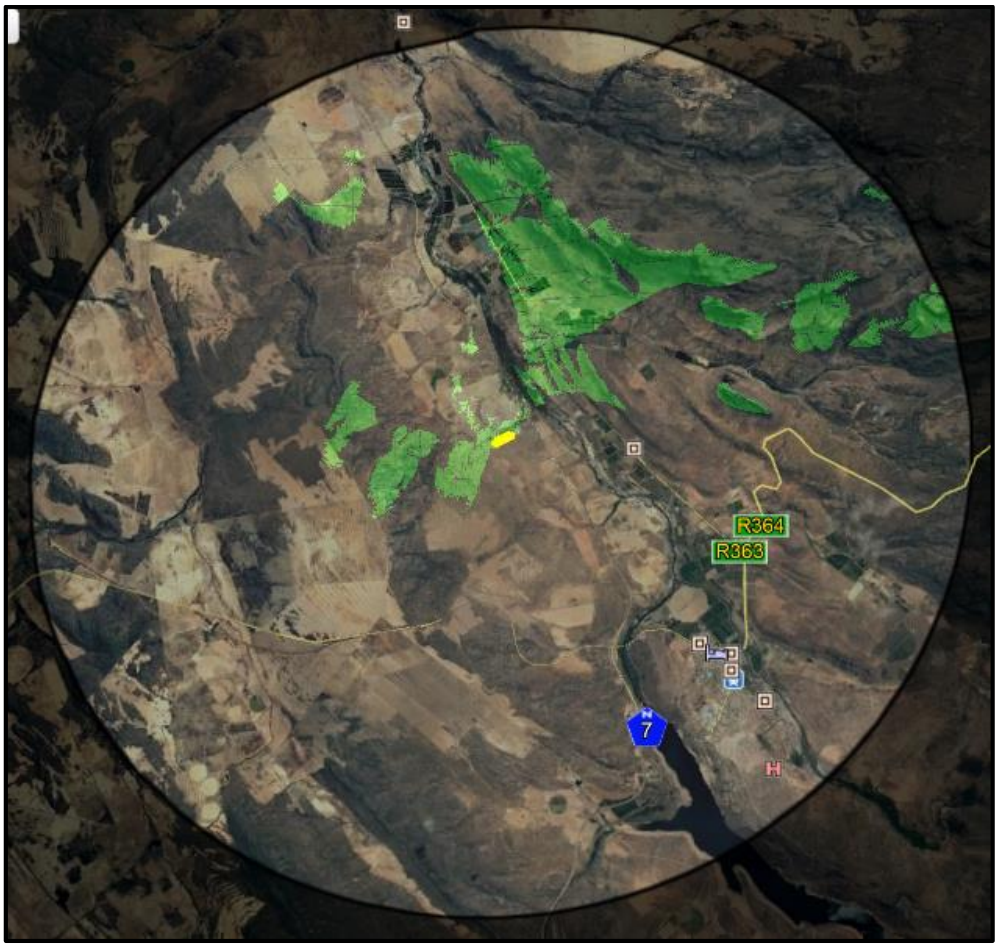

Figure 29: Viewshed of site alternative 2 where the green shaded areas shows the positions from where the mining area (yellow polygon) will be visible. (Image obtained from Google Earth).

SITE SPECIFIC AIR AND NOISE QUALITY

The residential dwelling nearest to the proposed footprint of site alternative 1 is opposite the N7 (east) approximately 1.2 km away. From the S2 footprint the farm yard of Mr Smith lies approximately 1 km towards the north (opposite the non-perennial stream). Currently the air quality of the study area is impacted on by farming operations as well as the traffic along the N7.

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 of one front-end-loader and an ADT truck 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.

As mentioned earlier, the proposed activity will require the use of one front-end-loader that will load the sand onto an ADT truck that will transport it from site. An excavator will be used when needed. The potential impact on the noise ambiance of the receiving environment is expected to be of low significance and representative of the machinery already operational at the property. The distance of the proposed mining area (S1 & S2) from residential infrastructure further lessens the potential noise impact.

SITE SPECIFIC GEOLOGY AND SOIL

(Information extracted from the Assessment of the impact of sand mining on agricultural potential on Portion 2 of RE of Farm number 199, near Clanwilliam, 2019)

The site specific underlying geology of the area is quartzitic sandstone with minor grit, conglomerate and shale lenses of the Piekenierskloof Formation; Table Mountain Group, covered by aeolian sand. The soils are very deep, well-drained, orange-yellow coloured, very sandy soils. They are of the Clovelly 1100 soil family, as classified by the South African soil classification system. The AIA mentions that based on an investigation of the excavation at the existing 1.5 ha mine, the sands are very uniform to a depth of about 8 metres, below which there is a gradual increase in the clay content.

The soils are limited by the very low clay content and leaching of the upper soil horizons and therefore have a low water and nutrient holding capacity. As a result they have a low to medium agricultural potential, and are rated between 4 and 5 out of 10 according to the system used by Western Cape soil scientists. However, because of their very low water holding capacity, they are highly dependent on effective irrigation for the cultivation of crops.

The land capability of the investigated area varies between land capability evaluation values of 3 and 6, but is predominantly 4 and 5, which is very low to low. The grazing capacity of the natural veld is very low at 66 hectares per large stock unit. The future agricultural potential, in terms of warming predictions, of this zone, which is Olifants irrigation, is rated as remaining viable as long as river flows and dams fill up, but it will be constrained by heat.

The soil scientist mentioned that the soil of S2 is likely to have similar soil conditions to that of S1. According to the AIA, because there is a gradual increase in the clay content with depth, removal of the upper sand (through mining) will leave a soil that has higher clay and resultant higher water holding capacity. This will alleviate, to some extent, the low water holding capacity limitation of the existing soil.

SITE SPECIFIC HYDROLOGY

As mentioned earlier, the foremost watercourse within close proximity to the study area is the non-perennial drainage line towards the north. The nearest corner of S1 to the non-perennial stream lays ±510 m away, with the nearest boundary of S2 being 20 m away. The Olifants River passes the study area on the opposite side of the N7.

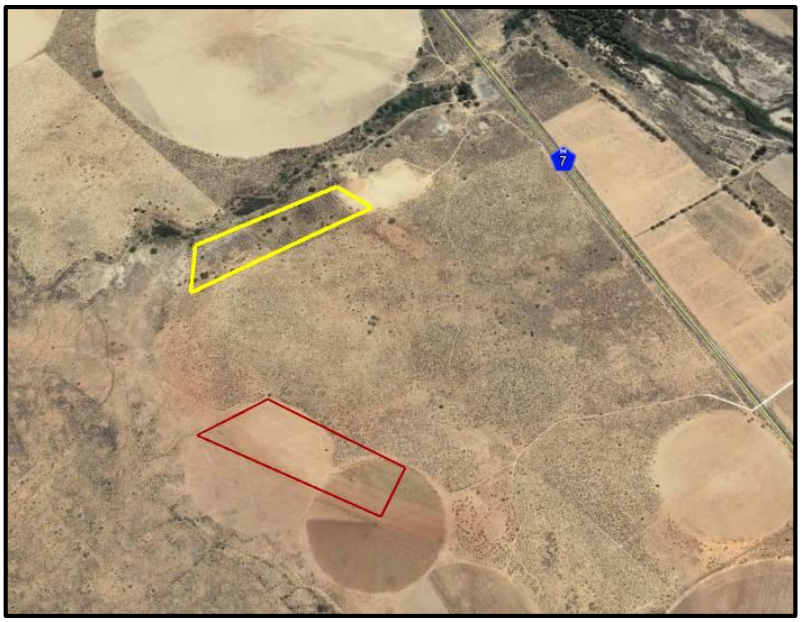

Figure 30: Satellite view showing the position of site alternative 1 (red polygon) and S2 (yellow polygon) in relation to the non-perennial stream on the property. (Image obtained from Google Earth)

The drainage line is classified as a channelled valley-bottom wetland on the National Wetland and NFEPA map viewer of BGIS, and mining within 500 m of a wetland requires a water use authorisation in terms of Section 39 of the National Water Act, 1998 (Act No 36 of 1998) for water uses as defined in section 21 (c) and section 21 (i).

Should the proposed operation be established within the footprint of S1, and the permit holder contain all activities to the approved mining boundary no impact on the non-perennial stream could be identified. Due to the close proximity of S2 to the watercourse, an application in this area will require water authorisation from DWS.

The sand of the study area consists of permeable unconsolidated sand which allows for the effective drainage of rainwater down to an underlying impermeable layer or to the groundwater layer. The mining area (S1) is at least 20 m in elevation above the height of the non-perennial stream which means that the floor of the mine will still be well above the groundwater table, and therefore no impact on the groundwater table is expected. The 1.5 ha mining area has been mined to an approximate depth of 10 m and groundwater has not been encountered.

As mentioned earlier, the proposed operation will require very little water. Water use will mainly be for dust suppression (when needed) along the access road. Water needed at the mining operation will be bought and transported to the farm in a water truck.

SITE SPECIFIC MINING AND BIODIVERSITY CONSERVATION AREAS

As mentioned earlier, when the mining footprints of both S1 and S2 is layered over the Mining and Biodiversity Map, it falls over and area of highest biodiversity importance with a corresponding rating of highest risk for mining. The High Biodiversity Importance area (in terms of the Mining and Biodiversity Guideline) does however not corresponds with the boundaries of the CBA's and ESA's identified in terms of the Western Cape Biodiversity Spatial Plan, which excludes the footprint of S1 from significant conservation areas (refer to Figure 15).

In order to avoid an impact on either the CBA's (terrestrial & aquatic) or the ESA's (terrestrial) it is proposed that S1 be considered for approval, as it does not extent over an area of conservation concern.

SITE SPECIFIC GROUNDCOVER

Although the earmarked mining area lays within the Leipoldtville Sand Fynbos vegetation type, the site specific groundcover of S1 was highly altered by the cultivation of the area under centre pivot irrigation. No natural occurring fynbos remains within the footprint of S1 as shown in the photographs below.

Figure 31: Photographs of the S1 footprint showing the lack of groundcover

In contrast with the altered groundcover of S1, the groundcover of S2 is in a near-natural state with a well-established plant layer that represents the dominant vegetation of the Leipoldtville Sand Fynbos (FFd2) as classified by Mucina and Rutherford (2012).

Figure 32: Photographs showing the vegetation cover of site alternative 2.

Should the footprint of S1 be considered for approval, the potential impact on the endangered Leipoldtville Sand Fynbos is of low significance, however, should the mining area be established within the footprint of S2 the impact will be of high significance. Due to the endangered status of the Leipoldtville Sand Fynbos it is proposed that the mining activities not be developed within the footprint of S2, and that the Applicant declare all areas outside the footprint of S1 as no-go areas.

SITE SPECIFIC FAUNA

The site specific fauna of the study area represents the fauna of the surrounding environment, and no protected or red data species were identified to be resident within the proposed footprint area.

The fauna at the site will not be impacted on by the proposed mining activity as they will be able to move away or through the site, without being harmed. Workers must be educated and managed to ensure that no fauna at the site is harmed.

SITE SPECIFIC CULTURAL AND HERITAGE ENVIRONMENT

No sites of archaeological or cultural importance were identified during the site inspection, and consultation with the interested and affected parties also did not identify any potential area of concern. Heritage Western Cape confirmed that the ROD (record of decision) issued by them (18 April 2016) still stands, and that no further action is required in terms of the NHRA, 1999. The potential impact of the proposed mining activities on the cultural and/or heritage environment is therefore deemed to be insignificant.

SITE SPECIFIC INFRASTRUCTURE

Site alternative 1 lays over an area under pivot irrigation and the only infrastructure of importance is that of the centre pivot.

Site alternative 2 extends across two camps used by the landowner for grazing purposes. The only infrastructure within the study area comprises of the fences.

(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 & STRIPPING AND STOCKPILING OF TOPSOIL

Alteration of the agricultural sense of place

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Partial**	
3	4	1	2.6	1	5	3	**7.8**
Rating: Medium-High			**Site Alternative 2**			**Degree of Mitigation: Partial**	
3	4	1	2.6	1	5	3	**7.8**

Loss of agricultural land for duration of mining

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium-High			**Site Alternative 1**			**Degree of Mitigation: Partial**	
3	4	4	3.7	5	5	5	**18.5**
Rating: Medium-High			**Site Alternative 2**			**Degree of Mitigation: Partial**	
3	4	4	3.7	5	5	5	**18.5**

Visual intrusion as a result of site establishment

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Partial**	
1	2	2	1.7	5	5	5	**8.5**
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Partial**	
1	2	2	1.7	5	5	5	**8.5**

Loss of Leipoldtville Sand Fynbos to access the mineral

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Full**	
5	4	5	4.7	1	1	1	**4.7**
Rating: High			**Site Alternative 2**			**Degree of Mitigation: No Mitigation**	
5	4	5	4.7	5	4	4.5	**21**

Potential negative impact on the CBA's and ESA's

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Full**	
5	4	5	4.7	1	1	1	**4.7**
Rating: High			**Site Alternative 2**			**Degree of Mitigation: No Mitigation**	
5	4	5	4.7	5	4	4.5	**21**

Loss of topsoil and fertility during mining and stockpiling

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
3	5	1	3	4	2	3	**9**
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	5	1	3	4	2	3	**9**

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

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

Potential impact on fauna within the footprint area

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

Dust nuisance as a result of the mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
2	4	2	2.7	3	3	3	**8.1**
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
2	4	2	2.7	3	3	3	**8.1**

Noise nuisance as a result of the mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Partial**	
2	4	2	2.7	1	5	3	**8.1**
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Partial**	
2	4	2	2.7	1	5	3	**8.1**

LOADING AND HAULING OF SAND FROM THE MINING FOOTPRINT

Creating steep slopes and uneven surfaces

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

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

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

Soil contamination from hydrocarbon spills

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
4	5	1	3.3	3	1	2	**6.6**
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
4	5	1	3.3	3	1	2	**6.6**

Disturbance to fauna within the footprint area

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

Dust nuisance as a result of the mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
2	4	2	2.7	3	3	3	**8.1**
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
2	4	2	2.7	3	3	3	**8.1**

Noise nuisance as a result of the mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
2	4	2	2.7	1	5	3	**8.1**
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
2	4	2	2.7	1	5	3	**8.1**

Potential impact associated with littering at the mining area

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
3	4	2	3	4	4	4	**12**
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	4	2	3	4	4	4	**12**

Deterioration of the access road to the mining area

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

Potential impact on areas/infrastructure of heritage or cultural concern

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Full**	
4	5	5	4.7	1	1	1	**4.7**
Rating: Low			**Site Alternative 2**			**Degree of Mitigation: Full**	
4	5	5	4.7	1	1	1	**4.7**

Increase in clay content and resultant water holding capacity of the soil **(Positive Impact)**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: N/A**	
1	5	1	2.3	5	5	5	**11.5**
			Site Alternative 2				
N/A							

Work opportunities to 3 local residents **(Positive Impact)**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium-High			**Site Alternative 1**			**Degree of Mitigation: N/A**	
1	4	5	3.3	5	5	5	**16.5**
Rating: Medium-High			**Site Alternative 2**			**Degree of Mitigation: N/A**	
1	4	5	3.3	5	5	5	**16.5**

Cumulative Impact: The operation of two sand mines on the same property

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: No Mitigation**	
1	4	1	2	5	5	5	**10**
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: No Mitigation**	
1	4	1	2	5	5	5	**10**

SLOPING AND LANDSCAPING UPON CLOSURE OF THE MINING AREA

Erosion of returned topsoil after rehabilitation

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
3	5	2	3.3	4	2	3	**9.9**
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	5	2	3.3	4	2	3	**9.9**

Infestation of the reinstated area with invader plant species

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
3	3	2	2.6	4	1	2.5	**6.5**
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	4	2	3	4	2	3	**9**

Dust nuisance as a result of the decommissioning activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Full**	
2	1	2	1.6	3	3	3	**4.8**
Rating: Low			**Site Alternative 2**			**Degree of Mitigation: Full**	
2	1	2	1.6	3	3	3	**4.8**

Noise nuisance as a result of the decommissioning activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Partial**	
1	1	2	1.3	1	5	3	**3.9**
Rating: Low			**Site Alternative 2**			**Degree of Mitigation: Partial**	
1	1	2	1.3	1	5	3	**3.9**

Potential impact associated with litter left at the mining area

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
3	5	2	3.3	4	4	4	**13.2**
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	5	2	3.3	4	4	4	**13.2**

Decreased slope of the footprint area **(Positive Impact)**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: N/A**	
1	5	1	2.3	5	5	5	**11.5**
			Site Alternative 2				
N/A							

Return of the mining area to agricultural use by the landowner **(Positive Impact)**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium-High			**Site Alternative 1**			**Degree of Mitigation: N/A**	
1	5	5	3.7	5	5	5	**18.5**
Rating: Medium-High			**Site Alternative 2**			**Degree of Mitigation: N/A**	
1	5	5	3.7	5	5	5	**18.5**

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

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

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

DEFINITIONS AND CONCEPTS:

Environmental significance:

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

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

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

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

Impact

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

Consequence

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

Likelihood

A qualitative term covering both probability and frequency.

Frequency

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

Probability

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

Environment

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

Methodology that will be used

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

Environmental Significance = Overall Consequence X Overall Likelihood

Determination of Overall Consequence

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

Determination of Severity / Intensity

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

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

Table 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 of little would be required, or both. In case of positive impacts alternative means for achieving this benefit would likely be easier, cheaper, more effective, less time-consuming, or some combination of these.
Low	Impact would be negligible. In the case of negative impacts, almost no mitigation and or remedial activity would be needed, and any minor steps, which might be needed, would be easy, cheap and simple. In the case of positive impacts, alternative means would almost all likely be better, in one or a number of ways, than this means of achieving the benefit
Insignificant	There would be a no impact at all – not even a very low impact on the system or any of its parts.

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

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

SITE ALTERNATIVE 1 (S1):

Site Alternative 1 entails the strip mining of sand from an area currently used for agricultural purposes. Site Alternative 1 was selected as the preferred and site alternative for the following reasons:

- The natural fynbos (Leipoldtville Sand Fynbos) of the footprint area was historically altered by the current agricultural activities, and therefore the proposed mining of sand will not disturb or result in the loss of natural fynbos.
- Access to the proposed mining area is possible via an existing farm road with a formal (existing) entrance onto the N7.
- The reduction of the upper sandy soil layer will increase the clay content and resultant water holding capacity of the soil, and if rehabilitation is successful the land is likely to have a slightly higher agricultural potential than what it was pre-mining.
- The levelling effect of excavation will contribute to a decreased slope of the pivot area.
- The quality of the sand, in the earmarked area, complies with the requirements of the Applicant's clients and/or contracts.
- No watercourse, drainage line or wetland will be affected by the proposed mining area.
- The visibility of the mining area will be limited towards the south, and south-west. Highly limited towards the south-east, and negligible towards the north, and north-east. The mine will not be visible to the road users of the N7 national road.

Potential negative aspects associated with Site Alternative include:

- The footprint of the mining area will temporarily be lost to the landowner as part of his pivots will be mined by the permit holder.
- Although an existing farm road can be used to access the mining area, the road surface has to be stabilized.

SITE ALTERNATIVE 2 (S2):

Site Alternative 2 entails the mining of sand from an area directly adjacent to the current 1.5 ha mining permit footprint. Site Alternative 2 was considered as it will afford the Applicant a mining area that borders an existing sand mine, and allow access to the area via an existing road that does not require any stabilizing.

Positive aspects associated with Site Alternative 2 include:

- No road improvements are required, and the Applicant can share the maintenance of the road with the permit holder.
- The haul road to S2 will be ±350 m shorter than the road to S1.
- Sand mining will be centred to one area on the property.
- Mining will not affect the centre pivots (as is the case with S1).

Potential negative aspects associated with Site Alternative 2 include:

- The footprint of S2 contains natural Leipoldtville Sand Fynbos and extends over a Terrestrial Critical Biodiversity Area (CBA) as well as an area classified as an Ecological Support Area (ESA): Aquatic and Terrestrial. In order to access to the mineral, the Applicant will have to remove the fynbos, directly impacting the vulnerability of the ecosystem.
- The footprint of S2 is within 20 m from a non-perennial drainage line that passes towards the north/north-west. This area is classified as a channelled valley-bottom wetland on the National Wetland and NFEPA map viewer of BGIS. Mining within 500 m of a wetland will require a water use authorisation in terms of Section 39 of the National Water Act, 1998 (Act No 36 of 1998) for water uses as defined in section 21 (c) and section 21 (i).
- Although the landowner will be able to plant the entire footprint of his pivots (S1), the sand layer will remain thick and the drainage of the fields will not be altered. The improvement of the agricultural potential of the fields, as a result of the proposed sand mining activity, will be lost.

PROJECT ASSOCIATED POSITIVE IMPACTS:

- Increase in clay content and resultant water holding capacity of the soil;
- Work opportunities to 3 local residents;
- Decreased slope of the footprint area (S1); and
- Return of the mining area to agricultural use by the landowner.

POTENTIAL NEGATIVE IMPACTS:

SITE ESTABLISHMENT & STRIPPING AND STOCKPILING OF TOPSOIL

- Alteration of the agricultural sense of place,
- Loss of agricultural land for duration of mining,
- Visual intrusion as a result of site establishment,
- Loss of Leipoldtville Sand Fynbos to access the mineral.
- Potential negative impact on the CBA's and ESA's,
- Loss of topsoil and fertility during mining and stockpiling,
- Infestation of the topsoil heaps and mining area with invader plant species,
- Potential impact on fauna within the footprint area,
- Dust nuisance as a result of the mining activities, and
- Noise nuisance as a result of the mining activities.

LOADING AND HAULING OF SAND FROM THE MINING FOOTPRINT

- Creating steep slopes and uneven surfaces,
- Infestation of the topsoil heaps and mining area with invader plant species,
- Soil contamination from hydrocarbon spills,
- Disturbance to fauna within the footprint area,
- Dust nuisance as a result of the mining activities,
- Noise nuisance as a result of the mining activities,
- Potential impact associated with littering at the mining area,
- Deterioration of the access road to the mining area,
- Potential impact on areas/infrastructure of heritage or cultural concern, and
- Cumulative Impact: The operation of two sand mines on the same property.

SLOPING AND LANDSCAPING UPON CLOSURE OF THE MINING AREA

- Erosion of returned topsoil after rehabilitation,
- Infestation of the reinstated area with invader plant species,
- Dust nuisance as a result of the decommissioning activities,
- Noise nuisance as a result of the decommissioning activities, and
- Potential impact associated with litter left at the mining area.

In light of the above, read together with the potential impacts associated with S1, site alternative 2 is not deemed the preferred option as this alternative is believed to have a higher ecological significance without the need or motivation justifying it.

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

<u>Landscaping of Mining Area:</u>

The risk of steep slopes or uneven surfaces resulting from the mining activity can be reduced to a Low significance though the implementation of the mitigation measures listed below:

- To ensure minimum impact on drainage, it is essential that no depressions are left in the mining floor. A surface slope (even if minimal) must be maintained across the mining floor in the drainage direction, so that all excavations are free draining. This means that

mining depths must 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.

- Mining depths must be controlled across the entire mine so that excavations results in a levelling of the pivot lands rather than a hole with steep edges.
- After mining, any steep slopes at the edges of excavations must be reduced to a minimum and profiled to blend with the surrounding topography, and allow the travel of the centre pivot. The entire surface must be sufficiently smoothed and profiled to allow cultivation.
- The closure plan (Appendix J) must be implemented upon decommissioning of the mining area.

VISUAL CHARACTERISTICS

Visual Mitigation:

The risk of the proposed mining activities having a negative impact on the aesthetic quality of the surrounding environment can be reduced to a low-medium risk through the implementation of the mitigation measures listed below.

- The site must have a neat appearance and be kept in good condition at all times.
- Mining equipment (loader and/or excavator) must be stored neatly in a dedicated area when not in use.
- Concurrent rehabilitation must be done as strip mining progress to limit the visual impact on the aesthetic value of the area.
- The permit holder must limit vegetation removal (if applicable), and stripping of topsoil may only be done immediately prior to the mining/use of a specific area.
- Upon closure the site must be rehabilitated and levelled to ensure that the visual impact on the aesthetic value of the area is kept to a minimum.

AIR AND NOISE QUALITY

Fugitive Dust Emission Mitigation:

The risk of dust, generated from the proposed mining activities, having a negative impact on the surrounding environment can be reduced to being low through the implementation of the following 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 the dust suppression equipment to confirm its effectiveness in addressing dust suppression.

- Speed on the access road must be limited to 20 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.

Noise Handling:

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

- The 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.

GEOLOGY AND SOIL

Topsoil Management:

The following topsoil management mitigation measures are proposed:

- The upper 300 mm of the soil of the strip to be mined must be stripped and stockpiled before mining.

- Topsoil is a valuable and essential resource for rehabilitation and it must therefore be managed carefully to conserve and maintain it throughout the stockpiling and rehabilitation processes.
- Topsoil stripping, stockpiling and re-spreading must be done in a systematic way. The mining plan have to be such that topsoil is stockpiled for the minimum possible time.
- The topsoil must be placed on a levelled area, within the mining footprint. No topsoil may be stockpiled in undisturbed areas.
- Topsoil stockpiles must be protected against losses by water and wind erosion. Stockpiles must be positioned so as not to be vulnerable to erosion by wind and water. The establishment of plants (weeds or a cover crop) on the stockpiles will help to prevent erosion.
- Topsoil heaps may not exceed 1.5 m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen.
- The temporary topsoil stockpiles must be kept free of invasive plant species.
- 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, irrigated and established immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. The cover crop must be fertilized for optimum biomass production, and any soil deficiencies must be corrected, based on a chemical analysis of the re-spread soil. A chemical analysis from an agricultural laboratory will include a recommendation of the appropriate quantities of chemical ameliorants (for example lime, phosphate etc.) that should be applied to optimize the soil chemistry for the relevant crop. It is important that rehabilitation be taken up to the point of cover crop stabilization. Rehabilitation cannot be considered complete until the first cover crop is well established.
- The rehabilitated area must be monitored for erosion, and appropriately stabilized if any erosion occurs for at least 12 months after reinstatement.

Mitigation of Impaired Soil Drainage:

The creation of surface and/or subsurface depressions that are not free draining, will cause water logging in the potential root zone. The retention of at least 300 mm of sandy rooting

material above the clay and ensuring that depressions are free draining will keep this impact of negligible significance.

- To ensure minimum impact on drainage, no surface depressions may remain after mining. A surface slope must be maintained across the mining area, and out of it on the down-slope side.

HYDROLOGY

Storm Water Mitigation:

The following mitigation measures are proposed with regard to storm water handling:

- Soil that are to be removed must be done so at right angles to the slope, as this will slow down surface runoff and help to prevent erosion.
- Storm water must be diverted around the topsoil heaps and mining areas to prevent erosion.
- 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. These must be in place at any points where overflow out of the excavation might occur.
- Mining must be conducted only in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department may impose:
  - Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems.
  - Dirty water must be collected and contained in a system separate from the clean water system.
  - Dirty water must be prevented from spilling or seeping into clean water systems.
  - A storm water management plan must apply for the entire life cycle of the mining activity and over different hydrological cycles (rainfall patterns).
  - The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into a storm water management plan.

MINING AND BIODIVERSITY & GROUNDCOVER

Vegetation control including the protection of Leipoldtville Sand Fynbos, and the ESA:

The risk of the proposed mining activities, as proposed in S1, having a negative impact on the fynbos of the surrounding area can be reduced to being Low through the implementation of the mitigation measures listed below:

- 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 employees must be educated accordingly.
- It is proposed that a botanist is consulted to clear uncultivated areas, where indigenous vegetation established, prior to stripping of topsoil.
- On cultivated areas that will return to being cultivated after mining, the replanting of crops must take place as soon as feasible once the topsoil was replaced.
- The invasive plant species management plan attached as Appendix K must be implement on site to control weeds and invasive plants on denuded areas, topsoil heaps and reinstated areas.

Management of Invasive Plant Species:

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

- An invasive plant species management plan (Appendix K) must be implemented at the site to ensure the management and control of all species regarded as Category 1a and 1b invasive species in terms of NEM:BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto). Weed/alien clearing must be done on an ongoing basis throughout the life of the mining activities.
- All stockpiles (topsoil) must be kept free of invasive plant species.
- Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. The following control methods can be used:
  - The plants can be uprooted, felled or cut off and can be destroyed completely.
  - The plants can be treated chemically by a registered pest control officer (PCO) through the use of an herbicide recommended for use by the PCO in accordance with the directions for the use of such an herbicide.

FAUNA

Protection of Fauna:

The risk resulting from the proposed mining activity on the terrestrial fauna of the footprint area as well as the surrounding environment, can be reduced to Low through the implementation of the mitigation measures listed below:

- 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.

CULTURAL AND HERITAGE ENVIRONMENT

Archaeological, Heritage and Palaeontological Aspects:

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

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

LAND USE

Loss of agricultural land for duration of mining:

The following mitigation measures can be implemented to accommodate the landowner:

- The permit holder must present the landowner with a mining schedule, which upon agreement between the holder and the landowner, could allow the cultivation of areas not to be mined in the near future.

- Mined-out areas can be signed back to the farmer, to be used for agricultural purposes, once final rehabilitation was done and the area vegetated.

EXISTING INFRASTRUCTURE

Access Road Mitigation:

The impact on the access road, as a result of the proposed mining activities, can be reduced to being Low through the implementation of the mitigation measures listed below:

- Storm water must be diverted around the access road to prevent erosion.
- Vehicular movement must be restricted to the existing access road and crisscrossing of tracks through undisturbed areas must be prohibited.
- Rutting and erosion of the access road caused as a direct result of the mining activities must be repaired by the permit holder.
- Overloading of the truck must be prevented.

GENERAL

Waste Management:

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

- Regular vehicle maintenance, repairs and services may only take place at the off-site workshop and service area of the permit holder. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 litre closed container/bin to be removed from the emergency service area (same day) to the workshop in order to ensure proper disposal.
- Ablution facilities must be provided in the form of a chemical toilet. The chemical toilet shall be serviced at least once every two weeks for the duration of the mining activities.
- 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.
- 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.

- 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.
- All general waste must be contained within the site vehicles and daily be removed from the mining area to the general waste storage area of the permit holder in Clanwilliam.
- No waste may be buried or burned on the site.
- It is important that any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities is reported to the Department of Water and Sanitation and other relevant authorities.

Management of Health and Safety Risks:

The following mitigation measures are proposed to minimise the potential health and safety impacts:

- 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).

ix) Motivation where no alternative sites were considered.

Not applicable.

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

As previously mentioned, the strip mining of site alternative 1 is deemed the preferred option as it will not have an impact on any fynbos or other natural area of conservation importance; be further than 500 m from the non-perennial drainage line classified as a valley-bottom wetland, will decrease the slope of the pivot area, and increase the clay content and resultant water holding capacity of the lands. Should the conditions listed below be implemented it is believed that the potential impacts associated with the proposed project can be mitigated, and the overall impact of the proposed project on the surrounding environment can be controlled:

1. **Topography** – Mining depths must be controlled across the entire mine so that excavation results in a levelling of the centre pivot lands rather than a hole with steep edges. The mine planning of the proposed footprint must therefore be such that steep edges are reduced to a minimum and allows the travel of the centre pivot, no depression is left, the area remains free draining, and the rehabilitation objectives and mitigation measures as proposed in this document is implemented. Upon closure, the footprint area must be returned to agricultural use.

2. **Hydrology** – The outflow of run-off water from the mining excavation must be controlled to prevent any down-slope erosion.

3. **Groundcover –** The mining area must be demarcated and all areas outside the mining footprint must be managed as no-go areas for the duration of the project. It is proposed that a botanist is consulted to clear uncultivated areas, where indigenous vegetation established, prior to stripping of topsoil.

4. **Impact on agricultural potential –** The permit holder must present the landowner with a mining schedule, which upon agreement between the holder and the landowner, could allow the cultivation of areas not to be mined in the near future. The mining area must progressively be rehabilitated according to the mitigation measures and rehabilitation plan proposed in the agricultural impact assessment (Appendix G) and closure plan (Appendix J). Mined-out areas can be signed back to the farmer once final rehabilitation was done and the area vegetated.

5. **CapeNature –** No new roads should be created and only the existing farm track should be used to access the site. Rehabilitation should occur concurrently with mining and no more than 1 ha should be exposed at any one time.

6. **Heritage Western Cape –** Should any heritage resources, including evidence of graves and human burials, archaeological material and palaeontological material be discovered during the excavation of the activities, all works must be stopped immediately and HWC must be notified without delay.

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 & STRIPPING AND STOCKPILING OF TOPSOIL

Alteration of the agricultural sense of place

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Partial**	
1	4	1	2	1	5	3	**6**
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Partial**	
1	4	1	2	1	5	3	**6**

Loss of agricultural land for duration of mining

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Medium-High			**Site Alternative 1**			**Degree of Mitigation: Partial**	
3	4	4	3.7	5	5	5	**18.5**
Rating: Medium-High			**Site Alternative 2**			**Degree of Mitigation: Partial**	
3	4	4	3.7	5	5	5	**18.5**

Visual intrusion as a result of site establishment

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Low-Medium			**Site Alternative 1**			**Degree of Mitigation: Partial**	
1	2	2	1.7	5	5	5	**8.5**
Rating: Low-Medium			**Site Alternative 2**			**Degree of Mitigation: Partial**	
1	2	2	1.7	5	5	5	**8.5**

Loss of Leipoldtville Sand Fynbos to access the mineral

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Full**	
5	4	5	4.7	1	1	1	**4.7**
Rating: High			**Site Alternative 2**			**Degree of Mitigation: No Mitigation**	
5	4	5	4.7	5	4	4.5	**21**

Potential negative impact on the CBA's and ESA's

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Full**	
5	4	5	4.7	1	1	1	**4.7**
Rating: High			**Site Alternative 2**			**Degree of Mitigation: No Mitigation**	
5	4	5	4.7	5	4	4.5	**21**

Loss of topsoil and fertility during mining and stockpiling

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Full**	
3	1	1	1.7	3	2	2.5	**4.3**
Rating: Low			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	1	1	1.7	3	2	2.5	**4.3**

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

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

Potential impact on fauna within the footprint area

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Full**	
2	4	1	2.3	2	1	1.5	**3.5**
Rating: Low			**Site Alternative 2**			**Degree of Mitigation: Full**	
2	4	1	2.3	2	1	1.5	**3.5**

Dust nuisance as a result of the mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Full**	
2	1	2	1.7	2	3	2.5	**4.3**
Rating: Low			**Site Alternative 2**			**Degree of Mitigation: Full**	
2	1	2	1.7	2	3	2.5	**4.3**

Noise nuisance as a result of the mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Partial**	
2	4	2	2.7	1	2	1.5	**4**
Rating: Low			**Site Alternative 2**			**Degree of Mitigation: Partial**	
2	4	2	2.7	1	2	1.5	**4**

LOADING AND HAULING OF SAND FROM THE MINING FOOTPRINT

Creating steep slopes and uneven surfaces

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Full**	
3	3	1	2.3	2	1	1.5	**3.5**
Rating: Low			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	3	1	2.3	2	1	1.5	**3.5**

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

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

Soil contamination from hydrocarbon spills

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

Disturbance to fauna within the footprint area

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Full**	
2	4	1	2.3	2	1	1.5	**3.5**
Rating: Low			**Site Alternative 2**			**Degree of Mitigation: Full**	
2	4	1	2.3	2	1	1.5	**3.5**

Dust nuisance as a result of the mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Full**	
2	1	2	1.7	2	3	2.5	**4.3**
Rating: Low			**Site Alternative 2**			**Degree of Mitigation: Full**	
2	1	2	1.7	2	3	2.5	**4.3**

Noise nuisance as a result of the mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Full**	
2	4	2	2.7	1	2	1.5	**4**
Rating: Low			**Site Alternative 2**			**Degree of Mitigation: Full**	
2	4	2	2.7	1	2	1.5	**4**

Potential impact associated with littering at the mining area

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Full**	
3	1	1	1.7	2	1	1.5	**2.6**
Rating: Low			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	1	1	1.7	2	1	1.5	**2.6**

Deterioration of the access road to the mining area

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

Potential impact on areas/infrastructure of heritage or cultural concern

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low			**Site Alternative 1**			**Degree of Mitigation: Full**	
4	5	5	4.7	1	1	1	**4.7**
Rating: Low			**Site Alternative 2**			**Degree of Mitigation: Full**	
4	5	5	4.7	1	1	1	**4.7**

Increase in clay content and resultant water holding capacity of the soil **(Positive Impact)**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: N/A**	
1	5	1	2.3	5	5	5	**11.5**
			Site Alternative 2				
N/A							

Work opportunities to 3 local residents **(Positive Impact)**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium-High			**Site Alternative 1**			**Degree of Mitigation: N/A**	
1	4	5	3.3	5	5	5	**16.5**
Rating: Medium-High			**Site Alternative 2**			**Degree of Mitigation: N/A**	
1	4	5	3.3	5	5	5	**16.5**

Cumulative Impact: The operation of two sand mines on the same property

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Medium			**Site Alternative 1**		**Degree of Mitigation: No Mitigation**		
1	4	1	2	5	5	5	**10**
Rating: Medium			**Site Alternative 2**		**Degree of Mitigation: No Mitigation**		
1	4	1	2	5	5	5	**10**

SLOPING AND LANDSCAPING UPON CLOSURE OF THE MINING AREA

Erosion of returned topsoil after rehabilitation

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

Infestation of the reinstated area with invader plant species

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

Dust nuisance as a result of the decommissioning activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Full**		
2	1	2	1.7	2	3	2.5	**4.3**
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Full**		
2	1	2	1.7	2	3	2.5	**4.3**

Noise nuisance as a result of the decommissioning activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Low			**Site Alternative 1**		**Degree of Mitigation: Partial**		
1	1	2	1.3	1	5	3	**3.9**
Rating: Low			**Site Alternative 2**		**Degree of Mitigation: Partial**		
1	1	2	1.3	1	5	3	**3.9**

Potential impact associated with litter left at the mining area

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: Full**	
3	1	1	1.7	2	1	1.5	**2.6**
Rating: Medium			**Site Alternative 2**			**Degree of Mitigation: Full**	
3	1	1	1.7	2	1	1.5	**2.6**

Decreased slope of the footprint area **(Positive Impact)**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium			**Site Alternative 1**			**Degree of Mitigation: N/A**	
1	5	1	2.3	5	5	5	**11.5**
			Site Alternative 2				
N/A							

Return of the mining area to agricultural use by the landowner **(Positive Impact)**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium-High			**Site Alternative 1**			**Degree of Mitigation: N/A**	
1	5	5	3.7	5	5	5	**18.5**
Rating: Medium-High			**Site Alternative 2**			**Degree of Mitigation: N/A**	
1	5	5	3.7	5	5	5	**18.5**

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 not mitigated.
ℑ Demarcation of site with visible beacons.	ℑ No impact could be identified other than the beacons being outside the boundaries of the approved mining area.	N/A	Site Establishment phase	N/A	Control through management and monitoring.	N/A
ℑ Site establishment & Stripping and stockpiling of topsoil	ℑ Alteration of the agricultural sense of place.	This impact affects the agricultural operations of the property.	Site Establishment & Operational Phase	ℑ Low-Medium (S1 & S2)	The study area does not have a high agritourism potential, and the proposed mine has a low visibility. The significance is therefore deemed to be low-medium during the operational phase and negligible upon the closure of the mine.	ℑ Low-Medium (S1 & S2)
ℑ Site establishment & Stripping and stockpiling of topsoil	ℑ Loss of agricutlural land for duration of mining.	This impact affects the agricultural operations of the property.	Site Establishment & Operational Phase	ℑ Medium-High (S1 & S2)	Should the proposed project be approved, the impact will temporarily interrupt the agricultural activities of the footprint area, only to be reversed upon the closure of the mine.	ℑ Medium-High (S1 & S2)

ACTIVITY Whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	POTENTIAL IMPACT (E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, air pollution, etc…etc…etc.)	ASPECTS AFFECTED	PHASE In which impact is anticipated. (E.g. Construction, commissioning, operational Decommissioning closure, post closure.)	SIGNIFICANCE If not mitigated.	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc etc) E.g. Modify through alternative method Control through noise control Control through management and monitoring through rehabilitation.	SIGNIFICANCE If not mitigated.
ℑ Site establishment & Stripping and stockpiling of topsoil	ℑ Visual intrusion as a result of site establishment.	The visual impact may affect the aesthetics of the landscape.	Site Establishment & Operational Phase	ℑ Low-Medium (S1 & S2)	<u>Control:</u> Implementing proper housekeeping.	ℑ Low-Medium (S1 & S2)
ℑ Site establishment & Stripping and stockpiling of topsoil	ℑ Loss of Leipoldtville Sand Fynbos to access the mineral.	This will impact on the biodiversity of the receiving environment.	Site Establishment phase	ℑ Low (S1) ℑ High (S2)	<u>Modify & Control:</u> Implementing S1 instead of S2, and keeping mining operations to the approved boundaries.	ℑ Low (S1) ℑ High (S2)
ℑ Site establishment & Stripping and stockpiling of topsoil	ℑ Potential negative impact on the CBA's and ESA's	This will impact on the biodiversity of the receiving environment.	Site Establishment phase	ℑ Low (S1) ℑ High (S2)	<u>Modify & Control:</u> Implementing S1 instead of S2, and keeping mining operations to the approved boundaries.	ℑ Low (S1) ℑ High (S2)
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Sloping and landscaping upon closure of the mining area.	ℑ Loss of topsoil and fertility during mining and stockpiling. ℑ Erosion of returned topsoil after rehabilitation.	Loss of topsoil will affect the rehabilitation success upon closure of the mine.	Site Establishment- and Decommissioning phase	ℑ Low-Medium (S1 & S2) ℑ Low-Medium (S1 & S2)	<u>Control & Remedy:</u> Proper housekeeping and storm water management.	ℑ Low (S1 & S2) ℑ Low (S1 & S2)

ACTIVITY Whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	POTENTIAL IMPACT (E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, air pollution, etc…etc…etc.)	ASPECTS AFFECTED	PHASE In which impact is anticipated. (E.g. Construction, commissioning, operational Decommissioning closure, post closure.)	SIGNIFICANCE If not mitigated.	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc etc) E.g. Modify through alternative method Control through noise control Control through management and monitoring through rehabilitation.	SIGNIFICANCE If not mitigated.
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	ℑ Infestation of the topsoil heaps and mining area with invader plant species. ℑ Infestation of the reinstated area with invader plant species.	This will impact on the biodiversity of the receiving environment.	Site Establishment-, Operational- and Decommissioning phase	ℑ Low-Medium (S1 & S2) ℑ Low-Medium (S1 & S2)	<u>Control:</u> Implementing soil- and storm water management.	ℑ Low (S1 & S2) ℑ Low (S1 & S2)
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Loading and hauling of sand from the mining footprint.	ℑ Potential impact on fauna within the footprint area.	This will impact on the biodiversity of the receiving environment.	Site Establishment- and Operational phase	ℑ Low-Medium (S1 & S2)	<u>Control & Stop:</u> Implementing good management practices.	ℑ Low (S1 & S2)
ℑ Site establishment & Stripping and stockpiling of topsoil.	ℑ Dust nuisance as a result of the mining activities.	Increased dust generation will impact	Site Establishment-, Operational-, and	ℑ Low-Medium (S1 & S2) ℑ Low (S1 & S2)	<u>Control:</u> Dust suppression methods and proper housekeeping.	ℑ Low (S1 & S2) ℑ Low (S1 & S2)

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 not mitigated.
ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	ℑ Dust nuisance as a result of the decommissioning activities.	on the air quality of the receiving environment.	Decommissioning Phase			
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	ℑ Noise nuisance as a result of the mining activities. ℑ Noise nuisance as a result of the decomissiononig activities.	Should noise levels become excessive it may have an impact on the noise ambiance of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	ℑ Low-Medium (S1 & S2) ℑ Low (S1 & S2)	<u>Control:</u> Noise suppression methods and proper housekeeping.	ℑ Low (S1 & S2) ℑ Low (S1 & S2)

ACTIVITY Whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	POTENTIAL IMPACT (E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, air pollution, etc…etc…etc.)	ASPECTS AFFECTED	PHASE In which impact is anticipated. (E.g. Construction, commissioning, operational Decommissioning closure, post closure.)	SIGNIFICANCE If not mitigated.	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc etc) E.g. Modify through alternative method Control through noise control Control through management and monitoring through rehabilitation.	SIGNIFICANCE If not mitigated.
ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	ℑ Creating steep slopes and uneven surfaces.	The impact will prevent or hinder future cultivation.	Operational- and Decommissioning Phase.	ℑ Medium (S1 & S2)	<u>Control:</u> Effective rehabilitation according to the closure plan.	ℑ Low (S1 & S2)
ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	ℑ Soil contamination from hydrocarbon spills. ℑ Potential impact assocaited with littering at the mining area. ℑ 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	ℑ Low-Medium (S1 & S2) ℑ Medium (S1 & S2) ℑ Medium (S1 & S2)	<u>Control & Remedy:</u> Proper housekeeping and implementation of an emergency response plan and waste management plan.	ℑ Low (S1 & S2) ℑ Low (S1 & S2) ℑ Low (S1 & S2)
ℑ Loading and hauling of sand from the mining footprint.	ℑ Deterioration of the access road to the mining area.	Collapse of the road infrastructure will affect the landowner.	Operational Phase	ℑ Low-Medium (S1 & S2)	<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.	ℑ Low (S1 & S2)

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 not mitigated.
ℑ Loading and hauling of sand from the mining footprint.	ℑ Potential impact on areas/infrastructure of heritage or cultural concern.	This could impact on the cultural and heritage legacy of the receiving environment.	Operational Phase	ℑ Low (S1 & S2)	<u>Control & Stop:</u> Implementing good management practices, as well as the chance-find protocol.	ℑ Low (S1 & S2)
ℑ Loading and hauling of sand from the mining footprint.	ℑ Increase in clay content and resultant water holding capacity of the soil **(Positive Impact)**	An increase in the water holding capacity of the soil improves to the agricultural potential of the lands.	Operational- and Decommissioning Phase	**Positive**: ℑ Medium (S1)	N/A	**Positive**: ℑ Medium (S1)
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	ℑ Work opportunities to 3 local residents **(Positive Impact)**	Positive impact towards the socio-economic status of the area.	Site Establishment-, Operational- and Decommissioning Phase	**Positive**: ℑ Medium-High (S1 & S2)	N/A	**Positive**: ℑ Medium-High (S1 & S2)

ACTIVITY Whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	POTENTIAL IMPACT (E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, air pollution, etc…etc…etc.)	ASPECTS AFFECTED	PHASE In which impact is anticipated. (E.g. Construction, commissioning, operational Decommissioning closure, post closure.)	SIGNIFICANCE If not mitigated.	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc etc) E.g. Modify through alternative method Control through noise control Control through management and monitoring through rehabilitation.	SIGNIFICANCE If not mitigated.
ℑ Loading and hauling of sand from the mining footprint.	ℑ Cumulative Impact: The operation of two sand mines on the same property.	The operation of the sand mines, temporarily affects the land use of the property.	Operational Phase	ℑ Medium (S1 & S2)	<u>Control:</u> Site management, of each mine, must implement the approved mitigation measures to minimise the impact on the receiving environment.	ℑ Medium (S1 & S2)
ℑ Sloping and landscaping upon closure of the mining area.	ℑ Decreased slope of the footprint area **(Positive Impact).**	Levelling of the pivot lands will prevent irrigation run-off and improve ease of agricultural management.	Decommissioning Phase	**Positive**: ℑ Medium (S1)	N/A	**Positive**: ℑ Medium (S1)
ℑ Sloping and landscaping upon closure of the mining area.	ℑ Return of the mining area to agricultural use by the landowner **(Positive Impact).**	Continuation of agricultural activities on the property.	Decommissioning Phase	**Positive**: ℑ Medium-High (S1 & S2)	N/A	**Positive**: ℑ Medium-High (S1 & S2)

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

k) Summary of specialist reports.

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

Table 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 an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
Agricultural Impact Assessment Assessment of the impact of sand mining on agricultural potential on Portion 2 of RE of Farm number 199, near Clanwilliam. *(See Appendix G for a full copy of the document)*	**Recommendations:** 1. The upper 30 cm of the soil across the entire mining area must be stripped and stockpiled before mining. 2. 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. 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 (weeds or a cover crop) on the stockpiles will help to prevent erosion. Stockpiles should be no more than 2 metres high. 4. During mining, the outflow of run-off water from the mining excavation must be controlled to prevent any down-slope erosion. This must be done by way of the construction of temporary banks and ditches that will direct run-off water. These should be in place at any points where overflow out of the excavation might occur. 5. To ensure minimum impact on drainage, it is essential that no depressions are left in the mining floor. A surface slope (even if minimal) must be maintained across the mining floor in the drainage direction, so that all excavations are free draining. This means that mining depths will need to 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. 6. It is also important that mining depths are controlled across the entire mine so that excavation results in a levelling of the centre pivot lands rather than a hole with steep edges.	All the recommendations proposed by the specialist were included in the EIA report.	Part A(1)(h)(iv)(c) Description of specific environmental features and infrastructure on the site – *Site Specific Topography.* Part A(1)(h)(iv)(c) Description of specific environmental features and infrastructure on the site – *Site Specific Geology and Soil.* Part A(1)(h)(viii) The possible mitigation measures that could be applied and the level of risk. Part A(1)(h)(x) Statement motivating the alternative development location within the overall site. Part A(1)(m) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPR.

	7. After mining, any steep slopes at the edges of excavations, must be reduced to a minimum and profiled to blend with the surrounding topography, and allow the travel of the centre pivot. The entire surface must also be sufficiently smoothed and profiled to allow cultivation and the travel of the centre pivot. 8. The stockpiled topsoil must then be evenly spread, to a depth of 30cm, and smoothed over the entire mining area. 9. A cover crop must be planted, irrigated and established, immediately after spreading of topsoil, to stabilise the soil and protect it from erosion. The cover crop should be fertilized for optimum biomass production, and any soil chemical deficiencies must be corrected, based on a chemical analysis of the re-spread soil. A chemical analysis from an agricultural laboratory will include a recommendation of the appropriate quantities of chemical ameliorants (for example lime, phosphate etc) that should be applied to optimize the soil chemistry for the relevant crop. It is important that rehabilitation is taken up to the point of cover crop stabilisation. Rehabilitation cannot be considered to be complete until the first cover crop is well established. 10. The rehabilitated area must be monitored for erosion, and appropriately stabilised if any erosion occurs. 11. If any alien vegetation is introduced by mining activity it must be removed and on-going alien vegetation control must keep the area free of alien vegetation.		

l) Environmental impact statement

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

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

Project proposal:

- The project entails the strip mining of site alternative 1 over an area currently used as centre pivot lands. If the footprint is apportioned into five strips mining will be in a north-westerly direction starting from strip 1 working towards strip 5. Using the existing access road the Applicant could access each strip 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 strip mining of site alternative 1 is deemed the preferred option as it will not have an impact on any fynbos or other natural area of conservation importance; be further than 500 m from the non-perennial drainage line classified as a valley-bottom wetland, will contribute to decrease the slope of the pivot area, and increase the clay content and resultant water holding capacity of the lands.

- Site alternative 2 is deemed not be the preferred option as this alternative is believed to have a higher ecological significance without the need or motivation justifying it.

- The no-go alternative was not deemed a viable option as it will prevent the mining of the available sand resource and the associated likely improvement of the agricultural potential of the footprint area.

Topography:

- The excavation of the mining area (S1) has the potential to level the centre pivot lands, which will have advantages for preventing irrigation run-off and improving ease of agricultural management. It will however be important that mining depths are controlled across the entire mine so that excavations results in a levelling of the centre pivot lands rather than a hole with steep edges.

- The mine planning of the proposed footprint must therefore be such that steep edges are reduced to a minimum and allows the travel of the centre pivot, no depression is left, the area remains free draining, and the rehabilitation objectives and mitigation measures as proposed in this document is implemented.

Visual Characteristics:

- It is proposed that the visual impact of the proposed sand mining operation (S1) will be of low-medium significance, especially as it will be developed within the footprint of existing pivots.

- The small scale of the proposed operation (1 ha disturbed at a time), the implementation of progressive rehabilitation, as well as the fact that no infrastructure will be establish contributes to the low visual significance. As the landowner will continue with the use of the area for cultivation purposes, no residual visual impact is expected upon closure of the mine

Site specific air and noise quality:

- The proposed activity will contribute the emissions of one front-end-loader and an ADT truck to the receiving environment for the duration of the operational phase. An excavator will be used when needed.

- 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 machinery already operational at the property. The distance of the proposed mining area from residential infrastructure further lessens the potential noise impact

Geology and Soil:

- The soils are limited by the very low clay content and leaching of the upper soil horizons and therefore have a low water and nutrient holding capacity. As a result they have a low to medium agricultural potential. The land capability of the investigated area varies is predominantly 4 and 5, which is very low to low. The grazing capacity of the natural veld is very low at 66 hectares per large stock unit.

- Because there is a gradual increase in the clay content with depth, removal of the upper sand (through mining) will leave a soil that has higher clay and resultant higher water holding capacity. This will alleviate, to some extent, the low water holding capacity limitation of the existing soil.

Hydrology:

- Should the proposed operation be established within the footprint of S1, and the permit holder contain all activities to the approved mining boundary no impact on the non-perennial stream could be identified.

Mining and Biodiversity Conservation Areas:

- When the mining footprints of both S1 and S2 is layered over the Mining and Biodiversity Map, it falls over and area of highest biodiversity importance with a corresponding rating of highest risk for mining. The High Biodiversity Importance area (in terms of the Mining and Biodiversity Guideline) does however not corresponds with the boundaries of the CBA's and ESA's identified in terms of the Western Cape Biodiversity Spatial Plan, which excludes the footprint of S1 from significant conservation areas.

- In order to avoid an impact on either the CBA's (terrestrial & aquatic) or the ESA's (terrestrial) it is proposed that S1 be considered for approval, as it does not extent over an area of conservation concern.

Groundcover:

- No natural occurring fynbos remains within the footprint of S1. Should the footprint of S1 be considered for approval, the potential impact on the endangered Leipoldtville Sand Fynbos is of low significance.

Cultural and Heritage Environment:

- No sites of archaeological or cultural importance were identified during the site inspection, and consultation with the interested and affected parties also did not identify any potential area of concern. Heritage Western Cape confirmed that no further action is required in terms of the NHRA, 1999. The potential impact of the proposed mining activities on the cultural and/or heritage environment is therefore deemed to be insignificant.

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:

- Increase in clay content and resultant water holding capacity of the soil;
- Work opportunities to 3 local residents;
- Decreased slope of the footprint area; and
- Return of the mining area to agricultural use by the landowner.

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

Alteration of the agricultural sense of place (S1 & S2)	**Low-Medium**
Loss of agricultural land for duration of mining (S1 & S2)	**Medium-High**
Visual intrusion as a result of site establishment (S1 & S2)	**Low-Medium**
Loss of Leipoldtville Sand Fynbos to access the mineral (S2)	**High**
Potential negative impact on the CBA's and ESA's (S2)	**High**
Cumulative Impact: The operation of two sand mines on the same property (S1 & S2)	**Medium**

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

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

Table 22: 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.	ℑ 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. ℑ Control mining depths across the entire mine so that excavations results in a levelling of the pivot lands rather than a hole with steep edges. ℑ Implement the closure plan upon decommissioning of the mining area.	ℑ Return land with an improved agricultural potential or at least the same potential as prior to mining, to the landowner for continued agricultural use upon closure.
VISUAL CHARACTERISTICS Mitigating the visual impact.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	ℑ Ensure that the site have a neat appearance and is kept in good condition at all times. ℑ Store mining equipment in a dedicated area when not in use. ℑ Implement concurrent rehabilitation as strip mining progress to limit the visual impact on the aesthetic value of the area. ℑ Limit vegetation removal, and only strip topsoil immediately prior to the mining/use of a specific area. ℑ 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.	ℑ Minimise the impact of the proposed project on the visual characteristics of the receiving environment during the operational phase, and ensure no residual impact remains after closure.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
AIR QUALITY Dust management	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	ℑ 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). ℑ Ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. ℑ Limit speed on the haul roads to 20 km/h to prevent the generation of excess dust. ℑ Minimise areas devoid of vegetation, and only remove vegetation immediately prior to mining. ℑ Flatten and cover loads to prevent spillage and windblown dust during transportation. ℑ Take weather conditions into consideration upon commencement of daily operations. Limit operations during very windy periods to reduce airborne dust and resulting impacts. ℑ 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). ℑ Implement best practice measures during the stripping of topsoil, excavation, and transporting of material from site to minimize potential dust impacts.	ℑ Dust prevention measures are applied to minimise the generation of dust.
NOISE AMBIANCE Noise mitigation.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	ℑ Ensure that employees and staff conduct themselves in an acceptable manner while on site. ℑ No loud music may be permitted at the mining area. ℑ 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. ℑ Implement best practice measures to minimise potential noise impacts.	ℑ Prevent unnecessary noise to the environment by ensuring that noise from development activity is mitigated.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		ℑ 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.	
GEOLOGY AND SOIL Topsoil management mitigation measures	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	ℑ Strip and stockpile the upper 300 mm of the soil before mining. ℑ Carefully manage and conserve the topsoil throughout the stockpiling and rehabilitation process. ℑ 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. ℑ Place topsoil heaps on a levelled area within the mining footprint area. Do not stockpile topsoil in undisturbed areas. ℑ 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. ℑ 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. ℑ Keep temporary stockpiles free of invasive plant species. ℑ Divert storm- and runoff water around the stockpile area to prevent erosion. ℑ Spread the topsoil evenly over the rehabilitated area, to a depth of 300 mm, upon closure of the site. ℑ 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. ℑ 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,	ℑ Adequate fertile topsoil is available to rehabilitate the mined area upon closure.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		and correct any soil deficiencies based on a chemical analysis of the re-spread soil. Rehabilitation extends until the first cover crop is well established. ℑ Monitor the rehabilitated area for erosion, and appropriately stabilize if erosion do occur, for at least 12 months after reinstatement.	
GEOLOGY AND SOIL Management of soil drainage.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	ℑ Ensure no surface depressions remain after mining. Maintain a surface slope across the mining area, and out of it on the down-slope side.	ℑ Mining does not affect soil drainage of the mined area.
HYDROLOGY 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.	ℑ Remove soils at right angles to the slope, as this will slow down surface runoff and help to prevent erosion. ℑ Divert storm water around the topsoil heaps and mining areas to prevent erosion. ℑ Control all drainage from the project area to prevent off-site pollution, flooding or damage to infrastructure downstream of any storm water discharge points. ℑ Conduct activity in terms of the Best Practice Guidelines for small-scale mining as developed by DWS.	ℑ Impact to the environment caused by storm water discharge is avoided.
MINING AND BIODIVERSITY GROUNDCOVER Mitigating potential impact on fynbos and the ESA.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Botanist to clear uncultivated area prior to stripping of topsoil. Compliance to be monitored by the Environmental Control Officer.	ℑ Clearly demarcate the mining boundaries and contain all operations to the approved mining area. ℑ Declared the area outside the mining boundaries a no-go area, and educate all employees accordingly. ℑ Consult a botanist to clear uncultivated areas, where indigenous vegetation established prior to stripping of topsoil. ℑ Replant crops on cultivated areas that will return to being cultivated after mining as soon as feasible once the topsoil was replaced.	ℑ Vegetation clearing is restricted to the authorised development footprint of the mine.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		ℑ Implement the invasive plant species management plan on site to control weeds and invasive plants on denuded areas, topsoil heaps and reinstated areas.	
GROUNDCOVER Mitigating invader plants.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	ℑ Implement an invasive plant species management plan to control all invasive plant species on site in terms of NEM:BA, 2004 and CARA, 1983. ℑ Keep all stockpiles (topsoil) free of invasive plant species. ℑ Control declared invader or exotic species on the rehabilitated areas.	ℑ Mining area is kept free of invasive plant species.
FAUNA Mitigating the fauna component.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	ℑ Ensure no fauna is caught, killed, harmed, sold or played with. ℑ Instruct workers to report any animals that may be trapped in the working area. ℑ Ensure no snares are set or nests raided for eggs or young.	ℑ Disturbance to fauna is minimised.
CULTURE/HERITAGE Mitigating cultural/heritage aspects.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	ℑ Confine all mining to the development footprint area. ℑ Implement the following change find procedure when discoveries are made on site: ▪ If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. ▪ It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area. ▪ The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an	ℑ Impact to cultural/heritage resources is avoided or at least minimised.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		assessment of the finds who will notify Heritage Western Cape (HWC). ▪ Work may only continue once the go-ahead was issued by HWC.	
LAND USE Use 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.	ℑ Present the landowner with a mining schedule that upon agreement between the holder and the landowner, could allow the cultivation of areas not to be mined in the near future. ℑ Sign mined-out areas back to the farmer, to be used for agricultural purposes, once final rehabilitation was done and the area vegetated.	ℑ Mining has the least possible impact on the operations of the farm.
EXISTING INFRASTRUCTURE Control of access road.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	ℑ Divert storm water around the access road to prevent erosion. ℑ Restrict vehicular movement to the existing access road to prevent crisscrossing of tracks through undisturbed areas. ℑ Repair rutting and erosion of the access road caused as a direct result of the mining activities. ℑ Prevent the overloading of the truck.	ℑ The access road remains accessible to the landowner 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.
GENERAL Waste management	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	ℑ Ensure regular vehicle maintenance, repairs and services takes place at the off-site workshop and service area of the permit holder. Make sure drip trays are used when emergency repairs have to be done on equipment not able to move to the workshop. ℑ Provide ablution facilities in the form of a chemical toilet. Ensure the toilet is serviced at least once a week for the duration of the mining activities. ℑ 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.	ℑ Wastes are appropriately stored, handled and safely disposed of at a recognised waste facility.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		ℑ 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. ℑ Clean drip trays after use. Do not use dirty drip trays. ℑ 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. ℑ 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. ℑ Contain all general waste within the site vehicles and daily remove it from the mining area to the general waste storage area of the permit holder in Clanwilliam. ℑ Prevent the burning or burying of waste on site. ℑ 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.	
GENERAL Health and safety aspects.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	ℑ Ensure adequate ablution facilities and water for human consumption is daily available on site. ℑ Ensure that workers have access to the correct PPE as required by law. ℑ Manage all operations in compliance with the Mine Health and Safety Act, 1996 (Act No 29 of 1996).	ℑ 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 with regard to 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 in order to correspond with the validity of the mining permit.

r) Undertaking

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

The undertaking required to meet the requirements of this section is provided at the end of the EMPR and is applicable to both the Basic Assessment Report and the Environmental Management Programme report.

s) Financial Provision

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

i) Explain how the aforesaid amount was derived

The annual amount required to manage and rehabilitate the environment was estimated to be R 32 000. Please see the explanation as to how this amount was derived at attached as Appendix I – 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).

Smit Grondwerke (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 I 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:

- **Potential alteration of the agricultural sense of place:**

  The study area does not have a high agritourism potential, and the proposed mine has a low visibility. The significance is therefore deemed to be low-medium during the operational phase and negligible upon the closure of the mine.

- **Loss of agricultural land for the duration of mining:**

  Should the proposed project be approved, the impact will temporarily interrupt the agricultural activities of the footprint area, only to be reversed upon the closure of the mine.

However the AIA showed that the proposed mining project may also have two positive effects on the agricultural potential of the area:

- Increase in clay content and resultant water holding capacity of the soil; and
- Decreased slope.

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

From the analysis it is proposed that the visual impact of the proposed sand mining operation (S1) will be of low-medium significance, especially as it will be developed within the footprint of existing pivots. The small scale of the proposed operation (1 ha disturbed at a time), the implementation of progressive rehabilitation, as well as the fact that no infrastructure will be establish contributes to the low visual significance. As the landowner will continue with the use of the area for cultivation purposes, no residual visual impact is expected upon closure of the mine.

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

The residential dwelling nearest to the proposed footprint of site alternative 1 is opposite the N7 (east) approximately 1.2 km away. The proposed activity will contribute the emissions of one front-end-loader and an ADT truck 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. There will be no residual impact after closure.

ℑ **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 machinery already operational at the property. The distance of the proposed mining area (S1) from residential infrastructure further lessens the potential noise impact.There will be no residual impact after closure.

(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).

No sites or artefacts classified as national estate as referred to in section 3(2) of the NHRA, 1999 were identified within the footprint of the proposed mining area.

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)

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

1. Site Alternative 1 – Mining of sand from an area currently used for agricultural purposes (centre pivots).

2. Site Alternative 2 – Mining of sand from an area directly adjacent to the current 1.5 ha mining permit footprint with natural occurring fynbos.

3. No-go Alternative: No mining of sand.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1. DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME.

a) Details of the EAP,

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

The details and expertise of Christine Fouché of Greenmined Environmental that acts as EAP on this project has been included in Part A Section 1(a) as well as Appendix M 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 draft 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 draft 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 end objective is for the entire mining area to return to agricultural use (as agreed with the landowner). The closure specific objectives entail progressive rehabilitation of each 1 ha strip as mining continues.

The Applicant proposes the following with regard to rehabilitation of the mined-out strips (see Appendix J for the Closure Plan):

- 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 the centre pivot. The entire surface will be sufficiently smoothed and profiled to allow cultivation and the travel of the centre pivot.
- 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/invader plants that may germinated within the rehabilitated area. The invasive plant species management plan (Appendix K) 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 J). 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.

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

- 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.
- Final rehabilitation must be completed within a period specified by the Regional Manager (DMR).

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

Due to the nature of the sand to be mined (heavy), very little to no water is needed as dust levels are typically low. Dust generated on the access road will as far as possible be managed through alternative dust suppression methods in order to restrict water use to the absolute minimum. Under very windy/dusty conditions the permit holder might have to substitute the above mentioned dust suppression methods with the spraying of water, in which case water will be bought and transported to the farm in a water truck that will moisten the problem area. A maximum of 10 000 l/month is expected to be needed during the dry months.

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

The proposed project does not require a water use licence as it does not trigger the NWA, 1998.

iv) Impacts to be mitigated in their respective phases

Table 23: Impact to be mitigated in their respective phases

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Demarcation of site with visible beacons.	Site Establishment phase	4.9 ha	Demarcation of the site will ensure that all employees are aware of the boundaries of the mining area, and that work stay within the approved area.	Mining of sand is only allowed within the boundaries of the approved area. ℑ MPRDA, 2008 ℑ NEMA, 1998	Beacons need to be in place throughout the life of the activity.
ℑ Site Establishment; & Stripping and stockpiling of topsoil.	Site Establishment & Operational Phase	±1 ha	**<u>Loss of agricultural land for duration of mining:</u>** ℑ The permit holder must present the landowner with a mining schedule, which upon agreement between the holder and the landowner, could allow the cultivation of areas not to be mined in the near future. ℑ Mined-out areas can be signed back to the farmer, to be used for agricultural purposes,	Use of agricultural land must be managed in accordance with the: ℑ CARA, 1983 ℑ Requirements of the agricultural impact assessment (Appendix G) ℑ Closure Plan (Appendix J)	Throughout the site establishment-, and operational phase.

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			once final rehabilitation was done and the area vegetated.		
ℑ Site establishment & Stripping and stockpiling of topsoil	Site Establishment & Operational Phase	±1 ha	**<u>Visual Mitigation</u>** ℑ The site must have a neat appearance and be kept in good condition at all times. ℑ Mining equipment (loader and/or excavator) must be stored neatly in a dedicated area when not in use. ℑ Concurrent rehabilitation must be done as strip mining progress to limit the visual impact on the aesthetic value of the area. ℑ The permit holder must limit vegetation removal (if applicable), and stripping of topsoil may only be done immediately prior to the mining/use of a specific area. ℑ Upon closure the site must be rehabilitated and levelled to ensure that the visual impact on the aesthetic value of the area is kept to a minimum.	Management of the mining area must be in accordance with the: ℑ MPRDA, 2008 ℑ NEMA, 1998	Throughout the site establishment-, and operational phase.

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
ℑ Site establishment & Stripping and stockpiling of topsoil	Site Establishment phase	±1 ha	**<u>Vegetation Management including the protection of Leipoldtville Sand Fynbos, and the ESA:</u>** ℑ The mining boundaries must be clearly demarcated and all operations must be contained to the approved mining area. ℑ The area outside the mining boundaries must be declared a no-go area, and all employees must be educated accordingly. ℑ It is proposed that a botanist is consulted to clear uncultivated areas, where indigenous vegetation established, prior to stripping of topsoil. ℑ On cultivated areas that will return to being cultivated after mining, the replanting of crops must take place as soon as feasible once the topsoil was replaced. ℑ The invasive plant species management plan attached as Appendix K must be implement on site to control weeds and invasive plants	Natural vegetated areas must be managed in accordance with the: ℑ NEM:BA 2004 ℑ Western Cape Biodiversity Spatial Plan	Throughout the site establishment phase.

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			on denuded areas, topsoil heaps and reinstated areas.		
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Sloping and landscaping upon closure of the mining area.	Site Establishment- and Decommissioning phase	±1 ha	**<u>Topsoil Management:</u>** ℑ The upper 300 mm of the soil must be stripped and stockpiled before mining. ℑ 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. ℑ Topsoil stripping, stockpiling and re-spreading must be done in a systematic way. The mining plan have to be such that topsoil is stockpiled for the minimum possible time. ℑ The topsoil must be placed on a levelled area, within the mining footprint. No topsoil may be stockpiled in undisturbed areas. ℑ Topsoil stockpiles must be protected against losses by water and wind erosion. Stockpiles must be positioned so as not to be vulnerable	Topsoil must be managed in accordance with the: ℑ CARA, 1983 ℑ NEM:BA, 2004 ℑ MPRDA, 2008 ℑ Agricultural Impact Assessment (Appendix G) ℑ Closure Plan (Appendix J) ℑ Western Cape Noise Control Regulations (PN 200/2013), June 2013	Throughout the site establishment-, operational, and decommissioning phase.

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			to erosion by wind and water. The establishment of plants (weeds or a cover crop) on the stockpiles will help to prevent erosion. ℑ 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. ℑ The temporary topsoil stockpiles must be kept free of invasive plant species. ℑ Storm- and runoff water must be diverted around the stockpile area to prevent erosion. ℑ The stockpiled topsoil must be evenly spread, to a depth of 300 mm, over the rehabilitated area upon closure of the site. ℑ 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		

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			there is moisture in the soil for vegetation establishment and the risk of heavy rainfall events is minimal. ℑ A cover crop must be planted, irrigated and established immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. The cover crop must be fertilized for optimum biomass production, and any soil deficiencies must be corrected, based on a chemical analysis of the re-spread soil. A chemical analysis from an agricultural laboratory will include a recommendation of the appropriate quantities of chemical ameliorants (for example lime, phosphate etc.) that should be applied to optimize the soil chemistry for the relevant crop. 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. ℑ The rehabilitated area must be monitored for erosion, and appropriately stabilized if any		

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			erosion occurs for at least 12 months after reinstatement.		
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	Site Establishment-, Operational- and Decommissioning phase	±1 ha	**<u>Management of Invader Plant Species:</u>** ℑ An invasive plant species management plan (Appendix K) must be implemented at the site to ensure the management and control of all species regarded as Category 1a and 1b invasive species in terms of NEM:BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto). Weed/alien clearing must be done on an ongoing basis throughout the life of the mining activities. ℑ All stockpiles (topsoil) must be kept free of invasive plant species. ℑ Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. The following control methods can be used:	Invader plants must be managed in accordance with the: ℑ CARA, 1983 ℑ NEM:BA 2004 ℑ Invasive Plant Species Management Plan (Appendix K)	Throughout the site establishment-, operational, and decommissioning phase.

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			▪ 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.		
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Loading and hauling of sand from the mining footprint.	Site Establishment- and Operational phase	±1 ha	**<u>Protection of Fauna:</u>** ℑ The site manager must ensure no fauna is caught, killed, harmed, sold or played with. ℑ Workers must be instructed to report any animals that may be trapped in the working area. ℑ No snares may be set or nests raided for eggs or young.	Fauna must be managed in accordance with the: ℑ NEM:BA 2004	Throughout the site establishment-, and operational phase.

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	Site Establishment-, Operational-, and Decommissioning Phase	±1 ha	**<u>Fugitive Dust Emission Mitigation:</u>** ℑ 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). ℑ The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. ℑ Speed on the access road must be limited to 20 km/h to prevent the generation of excess dust. ℑ 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. ℑ Loads must be flattened and covered to ensure that minimal spillage of material takes	Dust generation must be managed in accordance with the: ℑ NEM:AQA. 2004 Regulation 6(1) ℑ National Dust Control Regulations, GN No R827 ℑ ASTM D1739 (SANS 1137:2012)	Throughout the site establishment-, operational, and decommissioning phase.

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			place during transportation, also preventing windblown dust. ℑ 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. ℑ 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). ℑ Best practice measures shall be implemented during the stripping of topsoil, loading, and transporting of the sand from site to minimize potential dust impacts.		

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	Site Establishment-, Operational-, and Decommissioning Phase	±1 ha	**<u>Noise Handling:</u>** ℑ The permit holder must ensure that employees and staff conduct themselves in an acceptable manner while on site. ℑ No loud music may be permitted at the mining area. ℑ 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). ℑ Best practice measures shall be implemented in order to minimize potential noise impacts. ℑ A qualified occupational hygienist must be contracted to quarterly monitor and report on the personal noise exposure of the employees working at the mine. The monitoring must be done in accordance with the SANS 10083:2004 (Edition 5) sampling method as well as NEM:AQA, 2004, SANS 10103:2008.	Noise generation must be managed in accordance with the: ℑ NEM:AQA. 2004 Regulation 6(1) ℑ NRTA, 1996 ℑ Western Cape Noise Control Regulations (PN 200/2013), June 2013	Throughout the site establishment-, operational-, and decommissioning phase.

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	Operational- and Decommissioning Phase.	±1 ha	**<u>Landscaping of Mining Area:</u>** ℑ To ensure minimum impact on drainage, it is important that no depressions are left in the mining floor. A surface slope (even if minimal) must be maintained across the mining floor in the drainage direction, so that all excavations are free draining. This means that mining depths must 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. ℑ Mining depths must be controlled across the entire mine so that excavations results in a levelling of the pivot lands rather than a hole with steep edges. ℑ After mining, any steep slopes at the edges of excavations must be reduced to a minimum and profiled to blend with the surrounding topography, and allow the travel of the centre pivot. The entire surface must be sufficiently smoothed and profiled to allow cultivation.	Management of the mining area must be in accordance with the: ℑ CARA, 1983 ℑ NEM:BA, 2004 ℑ MPRDA, 2008 ℑ Closure Plan	Throughout the operational-, and decommissioning phase.

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			ℑ The closure plan (Appendix J) must be implemented upon decommissioning of the mining area.		
ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	Site Establishment-, Operational-, and Decommissioning Phase	±1 ha	**<u>Waste Management:</u>** ℑ Regular vehicle maintenance, repairs and services may only take place at the off-site workshop and service area of the permit holder. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 litre closed container/bin to be removed from the emergency service area (same day) to the workshop in order to ensure proper disposal. ℑ Ablution facilities must be provided in the form of a chemical toilet. The chemical toilet shall be serviced at least once a week for the duration of the mining activities. ℑ The use of any temporary, chemical toilet facilities must not cause any pollution to water	Mining related waste must be managed in accordance with the: ℑ NWA, 1998 ℑ NEM:WA, 2008 ℑ NEM:WA, 2008: National norms and standards for the storage of waste (GN 926) ℑ NEMA, 1998 (Section 30)	Throughout the site establishment-, operational-, and decommissioning phase.

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			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. ℑ 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. ℑ Site management must ensure drip trays are cleaned after each use. No dirty drip trays may be used on site. ℑ 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. ℑ Should spillage occur, such as oil or diesel leaking from a burst pipe, the contaminated		

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			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. - All general waste must be contained within the site vehicles and daily be removed from the mining area to the general waste storage area of the permit holder in Clanwilliam. - No waste may be buried or burned on the site. - 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 (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
ℑ Loading and hauling of sand from the mining footprint.	Operational Phase	±1 ha	**<u>Access Road Mitigation:</u>** ℑ Storm water must be diverted around the access road to prevent erosion. ℑ Vehicular movement must be restricted to the existing access road to prevent crisscrossing of tracks through undisturbed areas. ℑ Rutting and erosion of the access road caused as a direct result of the mining activities must be repaired by the permit holder. ℑ Overloading of the truck must be prevented.	The access road must be managed in accordance with the: ℑ NRTA, 1996	Throughout the operational phase.
ℑ Loading and hauling of sand from the mining footprint.	Operational Phase	±1 ha	**<u>Archaeological, Heritage and Palaeontological Aspects:</u>** ℑ All mining must be confined to the development footprint area. ℑ 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	Cultural/heritage aspects must be managed in accordance with the: ℑ NHRA, 1999	Throughout the operational phase.

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			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 Heritage Western Cape (HWC). - Work may only continue once the go-ahead was issued by HWC.		

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ℑ Site establishment and stripping of topsoil ℑ Loading and hauling of sand from the mining footprint ℑ Sloping and landscaping upon closure of the mining area.	Site Establishment-, Operational-, and Decommissioning phase	±1 ha	**<u>Management of Health and Safety Risks:</u>** ℑ Adequate ablution facilities and water for human consumption must daily be available on site. ℑ Workers must have access to the correct personal protection equipment (PPE) as required by law. ℑ All operations must comply with the Mine Health and Safety Act, 1996 (Act No 29 of 1996).	Health and safety aspects must be managed in accordance with the: ℑ MHSA, 1996 ℑ OHSA, 1993 ℑ OHSAS, 18001	Throughout the decommissioning phase.
ℑ Loading and hauling of sand from the mining footprint	Operational-, and Decommissioning phase	±1 ha	**<u>Storm Water Mitigation:</u>** ℑ Soil that are to be removed must be done so at right angles to the slope, as this will slow down surface runoff and help to prevent erosion.	Storm water must be managed in accordance with the: ℑ CARA, 1983 ℑ NEMA, 1998 ℑ NWA, 1998	Throughout the decommissioning phase.

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
ℑ Sloping and landscaping upon closure of the mining area.			ℑ Storm water must be diverted around the topsoil heaps and mining areas to prevent erosion. ℑ 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. These must be in place at any points where overflow out of the excavation might occur. ℑ 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		

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			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.		

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
ℑ Sloping and landscaping upon closure of the mining area.	Decommissioning phase	±1 ha	**<u>Mitigation of Impaired Soil Drainage:</u>** ℑ To ensure minimum impact on drainage, no surface depressions may remain after mining. A surface slope must be maintained across the mining area, and out of it on the down-slope side	Soil drainage must be managed in accordance with the: ℑ CARA, 1983	Throughout the decommissioning phase.

e) Impact Management Outcomes

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

Table 24: Impact Management Outcomes

ACTIVITY whether listed or not listed **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)**	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated **(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through** **(e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation.**	**STANDARD TO BE ACHIEVED** **(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.**
ℑ Demarcation of site with visible beacons.	ℑ No impact could be identified other than the beacons being outside the boundaries of the approved mining area.	N/A	Site Establishment phase	Control through management and monitoring.	Mining of sand is only allowed within the boundaries of the approved area. ℑ MPRDA, 2008 ℑ NEMA, 1998
ℑ Site establishment & Stripping and stockpiling of topsoil	ℑ Alteration of the agricultural sense of place.	This impact affects the agricultural operations of the property.	Site Establishment & Operational Phase	The study area does not have a high agritourism potential, and the proposed mine has a low visibility. The significance is therefore deemed to be low-medium during the operational phase and negligible upon the closure of the mine.	Mining of agricultural land must be managed in accordance with the: ℑ MPRDA, 2002 ℑ NEMA, 1998 ℑ CARA, 1983 ℑ Requirements of the agricultural impact assessment (Appendix G) ℑ Closure Plan (Appendix J)

ACTIVITY whether listed or not listed **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)**	**POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)**	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated **(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))**	**MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation.**	**STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.**
ℑ Site establishment & Stripping and stockpiling of topsoil	ℑ Loss of agricutlural land for duration of mining.	This impact affects the agricultural operations of the property.	Site Establishment & Operational Phase	Should the proposed project be approved, the impact will temporarily interrupt the agricultural activities of the footprint area, only to be reversed upon the closure of the mine.	Use of agricultural land must be managed in accordance with the: ℑ CARA, 1983 ℑ Requirements of the agricultural impact assessment (Appendix G) ℑ Closure Plan (Appendix J)
ℑ Site establishment & Stripping and stockpiling of topsoil	ℑ 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: ℑ MPRDA, 2008 ℑ NEMA, 1998
ℑ Site establishment & Stripping and stockpiling of topsoil	ℑ Loss of Leipoldtville Sand Fynbos to access the mineral.	This will impact on the biodiversity of the receiving environment.	Site Establishment phase	<u>Modify & Control:</u> Implementing S1 instead of S2, and keeping mining operations to the approved boundaries.	Natural vegetated areas must be managed in accordance with the: ℑ NEM:BA 2004 ℑ Western Cape Biodiversity Spatial Plan
ℑ Site establishment & Stripping and stockpiling of topsoil	ℑ Potential negative impact on the CBA's and ESA's.	This will impact on the biodiversity of the receiving environment.	Site Establishment phase	<u>Modify & Control:</u> Implementing S1 instead of S2, and keeping mining operations to the approved boundaries.	Natural vegetated areas must be managed in accordance with the: ℑ NEM:BA 2004 ℑ Western Cape Biodiversity Spatial Plan

ACTIVITY whether listed or not listed **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)**	**POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)**	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated **(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))**	**MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation.**	**STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.**
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Sloping and landscaping upon closure of the mining area.	ℑ Loss of topsoil and fertility during mining and stockpiling. ℑ Erosion of returned topsoil after rehabilitation.	Loss of topsoil will affect the rehabilitation success upon closure of the mine.	Site Establishment- and Decommissioning phase	Control & Remedy: Proper housekeeping and storm water management.	Topsoil must be managed in accordance with the: ℑ CARA, 1983 ℑ NEM:BA, 2004 ℑ MPRDA, 2008 ℑ Agricultural Impact Assessment (Appendix G) ℑ Closure Plan (Appendix J) ℑ Western Cape Noise Control Regulations (PN 200/2013), June 2013
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	ℑ Infestation of the topsoil heaps and mining area with invader plant species. ℑ Infestation of the reinstated area with invader plant species.	This will impact on the biodiversity of the receiving environment.	Site Establishment-, Operational- and Decommissioning phase	Control: Implementing soil- and storm water management.	Invader plants must be managed in accordance with the: ℑ CARA, 1983 ℑ NEM:BA 2004 ℑ Invasive Plant Species Management Plan (Appendix K)
ℑ Site establishment & Stripping and stockpiling of topsoil.	ℑ Potential impact on fauna within the footprint area.	This will impact on the biodiversity of the	Site Establishment- and Operational phase	Control & Stop: Implementing good management practices.	Fauna must be managed in accordance with the: ℑ NEM:BA 2004

ACTIVITY whether listed or not listed **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)**	**POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)**	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated **(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))**	**MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation.**	**STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.**
ℑ Loading and hauling of sand from the mining footprint.		receiving environment.			
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	ℑ Dust nuisance as a result of the mining activities. ℑ Dust nuisance as a result of the decommissioning activities.	Increased dust generation will impact on the air quality of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	Control: Dust suppression methods and proper housekeeping.	Dust generation must be managed in accordance with the: ℑ NEM:AQA. 2004 Regulation 6(1) ℑ National Dust Control Regulations, GN No R827 ℑ ASTM D1739 (SANS 1137:2012)
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	ℑ Noise nuisance as a result of the mining activities. ℑ Noise nuisance as a result of the decomissiononig activities.	Should noise levels become excessive it may have an impact on the noise ambiance of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	Control: Noise suppression methods and proper housekeeping.	Noise generation must be managed in accordance with the: ℑ NEM:AQA. 2004 Regulation 6(1) ℑ NRTA, 1996 ℑ Western Cape Noise Control Regulations (PN 200/2013), June 2013
ℑ Loading and hauling of sand from the mining footprint.	ℑ Creating steep slopes and uneven surfaces.	The impact will prevent or hinder future cultivation.	Operational- and Decommissioning Phase.	Control: Effective rehabilitation according to the closure plan.	Management of the mining area must be in accordance with the: ℑ CARA, 1983 ℑ NEM:BA, 2004

ACTIVITY whether listed or not listed **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)**	**POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)**	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated **(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))**	**MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation.**	**STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.**
ℑ Sloping and landscaping upon closure of the mining area.					ℑ MPRDA, 2008 ℑ Closure Plan
ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	ℑ Soil contamination from hydrocarbon spills. ℑ Potential impact assocaited with littering at the mining area. ℑ 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	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan.	Mining related waste must be managed in accordance with the: ℑ NWA, 1998 ℑ NEM:WA, 2008 ℑ NEM:WA, 2008: National norms and standards for the storage of waste (GN 926) ℑ NEMA, 1998 (Section 30)
ℑ Loading and hauling of sand from the mining footprint.	ℑ Deterioration of the access road to the mining area.	Collapse of the road infrastructure will affect the landowner.	Operational Phase	Control & Remedy: Maintaining the access road for the duration of the operational phase, as well as leaving it in a representative or better condition than prior to mining.	The access road must be managed in accordance with the: ℑ NRTA, 1996
ℑ Loading and hauling of sand from the mining footprint.	ℑ Potential impact on areas/infrastructure of heritage or cultural concern.	This could impact on the cultural and heritage legacy of	Operational Phase	Control & Stop: Implementing good management practices, as well as the chance-find protocol.	Cultural/heritage aspects must be managed in accordance with the: ℑ NHRA, 1999

ACTIVITY whether listed or not listed **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)**	**POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)**	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated **(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))**	**MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation.**	**STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.**
		the receiving environment.			
ℑ Loading and hauling of sand from the mining footprint.	ℑ Increase in clay content and resultant water holding capacity of the soil **(Positive Impact)**	An increase in the water holding capacity of the soil improves to the agricultural potential of the lands.	Operational- and Decommissioning Phase	N/A	The mining area must be returned to a status that complies with: ℑ CARA, 1983 ℑ MPRDA, 2002 ℑ NEMA, 1998 ℑ Closure Plan (Appendix J)
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	ℑ Work opportunities to 3 local residents **(Positive Impact)**	Positive impact towards the socio-economic status of the area.	Site Establishment-, Operational- and Decommissioning Phase	N/A	Work conditions must be managed in accordance with the: ℑ MHSA, 1996 ℑ OHSA, 1993 ℑ OHSAS, 18001
ℑ Loading and hauling of sand from the mining footprint.	ℑ Cumulative Impact: The operation of two sand mines on the same property.	The operation of the sand mines, temporarily affects the land use of the property.	Operational Phase	<u>Control:</u> Site management, of each mine, must implement the approved mitigation measures to minimise the impact on the receiving environment.	Mining must be conducted in accordance with: ℑ MPRDA, 2002 ℑ NEMA, 1998

ACTIVITY whether listed or not listed **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)**	**POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)**	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated **(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))**	**MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation.**	**STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.**
ℑ Sloping and landscaping upon closure of the mining area.	ℑ Decreased slope of the footprint area **(Positive Impact).**	Levelling of the pivot lands will prevent irrigation run-off and improve ease of agricultural management.	Decommissioning Phase	N/A	The mining area must be returned to a status that complies with: ℑ CARA, 1983 ℑ MPRDA, 2002 ℑ NEMA, 1998 ℑ Closure Plan (Appendix J)
ℑ Sloping and landscaping upon closure of the mining area.	ℑ Return of the mining area to agricultural use by the landowner **(Positive Impact).**	Continuation of agricultural activities on the property.	Decommissioning Phase	N/A	The mining area must be returned to a status that complies with: ℑ CARA, 1983 ℑ MPRDA, 2002 ℑ NEMA, 1998 ℑ Closure Plan (Appendix J)
ℑ Site establishment and stripping of topsoil ℑ Loading and hauling of sand from the mining footprint ℑ Sloping and landscaping upon closure of the mining area.	ℑ Health and safety risks to employees.	Impact will negatively affect the workforce.	Operational Phase	Control: Adhering to the requirements of the MHSA, 1996.	Health and safety aspects must be managed in accordance with the: ℑ MHSA, 1996 ℑ OHSA, 1993 ℑ OHSAS, 18001

ACTIVITY whether listed or not listed **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)**	**POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)**	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated **(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))**	**MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation.**	**STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.**
ℑ Loading and hauling of sand from the mining footprint ℑ Sloping and landscaping upon closure of the mining area.	ℑ Storm water management	Uncontrolled storm water runoff can facilitate erosion.	Operational & Decommissioning Phase	<u>Control:</u> Implementing storm water control measures.	Storm water must be managed in accordance with the: ℑ CARA, 1983 ℑ NEMA, 1998 ℑ NWA, 1998
ℑ Sloping and landscaping upon closure of the mining area.	ℑ Soil drainage	Impaired soil drainage may impact the future agricultural potential of the lands.	Decommissioning Phase	<u>Control</u>: Implement proper rehabilitation mitigation measures as proposed in the closure report.	Soil drainage must be managed in accordance with the: ℑ CARA, 1983

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 25: Impact Management Actions

ACTIVITY whether listed or not listed **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc... etc.)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation.**	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: Upon cessation of the individual activity Or. Upon the cessation of mining bulk sampling or alluvial diamond prospecting as the case may be.	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
ℑ Demarcation of site with visible beacons.	ℑ No impact could be identified other than the beacons being outside the boundaries of the approved mining area.	Control through management and monitoring.	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. ℑ MPRDA, 2008 ℑ NEMA, 1998
ℑ Site establishment & Stripping and stockpiling of topsoil	ℑ Alteration of the agricultural sense of place.	The study area does not have a high agritourism potential, and the proposed mine has a low visibility. The significance is therefore deemed to be low-medium during the operational phase and negligible upon the closure of the mine.	Site Establishment & Operational Phase	Mining of agricultural land must be managed in accordance with the: ℑ MPRDA, 2002 ℑ NEMA, 1998 ℑ CARA, 1983 ℑ Requirements of the agricultural impact assessment (Appendix G) ℑ Closure Plan (Appendix J)

ACTIVITY whether listed or not listed **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through** **(e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc... etc.)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation.**	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: Upon cessation of the individual activity Or. Upon the cessation of mining bulk sampling or alluvial diamond prospecting as the case may be.	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
ℑ Site establishment & Stripping and stockpiling of topsoil	ℑ Loss of agricutlural land for duration of mining.	Should the proposed project be approved, the impact will temporarily interrupt the agricultural activities of the footprint area, only to be reversed upon the closure of the mine.	Throughout the site establishment-, and operational phase.	Use of agricultural land must be managed in accordance with the: ℑ CARA, 1983 ℑ Requirements of the agricultural impact assessment (Appendix G) ℑ Closure Plan (Appendix J)
ℑ Site establishment & Stripping and stockpiling of topsoil	ℑ Visual intrusion as a result of site establishment.	<u>Control:</u> Implementing proper housekeeping.	Throughout the site establishment-, and operational phase.	Management of the mining area must be in accordance with the: ℑ MPRDA, 2008 ℑ NEMA, 1998
ℑ Site establishment & Stripping and stockpiling of topsoil	ℑ Loss of Leipoldtville Sand Fynbos to access the mineral.	<u>Modify & Control:</u> Implementing S1 instead of S2, and keeping mining operations to the approved boundaries.	Throughout the site establishment phase.	Natural vegetated areas must be managed in accordance with the: ℑ NEM:BA 2004 ℑ Western Cape Biodiversity Spatial Plan

ACTIVITY whether listed or not listed **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc... etc.)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation.**	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: Upon cessation of the individual activity Or. Upon the cessation of mining bulk sampling or alluvial diamond prospecting as the case may be.	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
ℑ Site establishment & Stripping and stockpiling of topsoil	ℑ Potential negative impact on the CBA's and ESA's.	<u>Modify & Control:</u> Implementing S1 instead of S2, and keeping mining operations to the approved boundaries.	Throughout the site establishment phase.	Natural vegetated areas must be managed in accordance with the: ℑ NEM:BA 2004 ℑ Western Cape Biodiversity Spatial Plan
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Sloping and landscaping upon closure of the mining area.	ℑ Loss of topsoil and fertility during mining and stockpiling. ℑ Erosion of returned topsoil after rehabilitation.	<u>Control & Remedy:</u> Proper housekeeping and storm water management.	Throughout the site establishment-, operational, and decommissioning phase.	Topsoil must be managed in accordance with the: ℑ CARA, 1983 ℑ NEM:BA, 2004 ℑ MPRDA, 2008 ℑ Agricultural Impact Assessment (Appendix G) ℑ Closure Plan (Appendix J) ℑ Western Cape Noise Control Regulations (PN 200/2013), June 2013
ℑ Site establishment & Stripping and stockpiling of topsoil.	ℑ Infestation of the topsoil heaps and mining area with invader plant species.	<u>Control:</u> Implementing soil- and storm water management.	Throughout the site establishment-, operational, and decommissioning phase.	Invader plants must be managed in accordance with the: ℑ CARA, 1983

ACTIVITY whether listed or not listed **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc... etc.)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation.**	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: Upon cessation of the individual activity Or. Upon the cessation of mining bulk sampling or alluvial diamond prospecting as the case may be.	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	ℑ Infestation of the reinstated area with invader plant species.			ℑ NEM:BA 2004 ℑ Invasive Plant Species Management Plan (Appendix K)
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Loading and hauling of sand from the mining footprint.	ℑ Potential impact on fauna within the footprint area.	Control & Stop: Implementing good management practices.	Throughout the site establishment-, and operational phase.	Fauna must be managed in accordance with the: ℑ NEM:BA 2004
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Loading and hauling of sand from the mining footprint.	ℑ Dust nuisance as a result of the mining activities. ℑ Dust nuisance as a result of the decommissioning activities.	Control: Dust suppression methods and proper housekeeping.	Throughout the site establishment-, operational, and decommissioning phase.	Dust generation must be managed in accordance with the: ℑ NEM:AQA. 2004 Regulation 6(1) ℑ National Dust Control Regulations, GN No R827 ℑ ASTM D1739 (SANS 1137:2012)

ACTIVITY whether listed or not listed **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc... etc.)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation.**	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: Upon cessation of the individual activity Or. Upon the cessation of mining bulk sampling or alluvial diamond prospecting as the case may be.	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
ℑ Sloping and landscaping upon closure of the mining area.				
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	ℑ Noise nuisance as a result of the mining activities. ℑ Noise nuisance as a result of the decomissiononig activities.	Control: Noise suppression methods and proper housekeeping.	Throughout the site establishment-, operational-, and decommissioning phase.	Noise generation must be managed in accordance with the: ℑ NEM:AQA. 2004 Regulation 6(1) ℑ NRTA, 1996 ℑ Western Cape Noise Control Regulations (PN 200/2013), June 2013
ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	ℑ Creating steep slopes and uneven surfaces.	Control: Effective rehabilitation according to the closure plan.	Throughout the operational-, and decommissioning phase.	Management of the mining area must be in accordance with the: ℑ CARA, 1983 ℑ NEM:BA, 2004 ℑ MPRDA, 2008 ℑ Closure Plan

ACTIVITY whether listed or not listed **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc... etc.)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation.**	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: Upon cessation of the individual activity Or. Upon the cessation of mining bulk sampling or alluvial diamond prospecting as the case may be.	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	ℑ Soil contamination from hydrocarbon spills. ℑ Potential impact assocaited with littering at the mining area. ℑ Potential impact associated with litter left at the mining area.	<u>Control & Remedy:</u> Proper housekeeping and implementation of an emergency response plan and waste management plan.	Throughout the site establishment-, operational-, and decommissioning phase.	Mining related waste must be managed in accordance with the: ℑ NWA, 1998 ℑ NEM:WA, 2008 ℑ NEM:WA, 2008: National norms and standards for the storage of waste (GN 926) ℑ NEMA, 1998 (Section 30)
ℑ Loading and hauling of sand from the mining footprint.	ℑ Deterioration of the access road to the mining area.	<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.	Throughout the operational phase.	The access road must be managed in accordance with the: ℑ NRTA, 1996
ℑ Loading and hauling of sand from the mining footprint.	ℑ Potential impact on areas/infrastructure of heritage or cultural concern.	<u>Control & Stop:</u> Implementing good management practices, as well as the chance-find protocol.	Throughout the operational phase.	Cultural/heritage aspects must be managed in accordance with the: ℑ NHRA, 1999
ℑ Loading and hauling of sand from the mining footprint.	ℑ Increase in clay content and resultant water holding capacity of the soil **(Positive Impact)**	N/A	Operational- and Decommissioning Phase	The mining area must be returned to a status that complies with: ℑ CARA, 1983

ACTIVITY whether listed or not listed **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc... etc.)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation.**	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: Upon cessation of the individual activity Or. Upon the cessation of mining bulk sampling or alluvial diamond prospecting as the case may be.	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
				ℑ MPRDA, 2002 ℑ NEMA, 1998 ℑ Closure Plan (Appendix J)
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	ℑ Work opportunities to 3 local residents **(Positive Impact)**	N/A	Site Establishment-, Operational- and Decommissioning Phase	Work conditions must be managed in accordance with the: ℑ MHSA, 1996 ℑ OHSA, 1993 ℑ OHSAS, 18001
ℑ Loading and hauling of sand from the mining footprint.	ℑ Cumulative Impact: The operation of two sand mines on the same property.	<u>Control:</u> Site management, of each mine, must implement the approved mitigation measures to minimise the impact on the receiving environment.	Throughout the operational phase.	Mining must be conducted in accordance with: ℑ MPRDA, 2002 ℑ NEMA, 1998

ACTIVITY whether listed or not listed **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc... etc.)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation.**	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: Upon cessation of the individual activity Or. Upon the cessation of mining bulk sampling or alluvial diamond prospecting as the case may be.	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
ℑ Sloping and landscaping upon closure of the mining area.	ℑ Decreased slope of the footprint area **(Positive Impact).**	N/A	Decommissioning Phase	The mining area must be returned to a status that complies with: ℑ CARA, 1983 ℑ MPRDA, 2002 ℑ NEMA, 1998 ℑ Closure Plan (Appendix J)
ℑ Sloping and landscaping upon closure of the mining area.	ℑ Return of the mining area to agricultural use by the landowner **(Positive Impact).**	N/A	Decommissioning Phase	The mining area must be returned to a status that complies with: ℑ CARA, 1983 ℑ MPRDA, 2002 ℑ NEMA, 1998 ℑ Closure Plan (Appendix J)
ℑ Site establishment and stripping of topsoil ℑ Loading and hauling of sand from the mining footprint	ℑ Health and safety risks to employees.	Control: Adhering to the requirements of the MHSA, 1996.	Throughout the decommissioning phase.	Health and safety aspects must be managed in accordance with the: ℑ MHSA, 1996 ℑ OHSA, 1993 ℑ OHSAS, 18001

ACTIVITY whether listed or not listed **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc... etc.)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation.**	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: Upon cessation of the individual activity Or. Upon the cessation of mining bulk sampling or alluvial diamond prospecting as the case may be.	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
ℑ Sloping and landscaping upon closure of the mining area.				
ℑ Loading and hauling of sand from the mining footprint ℑ Sloping and landscaping upon closure of the mining area.	ℑ Storm water management	<u>Control:</u> Implementing storm water control measures.	Throughout the decommissioning phase.	Storm water must be managed in accordance with the: ℑ CARA, 1983 ℑ NEMA, 1998 ℑ NWA, 1998
ℑ Sloping and landscaping upon closure of the mining area.	ℑ Soil drainage	<u>Control</u>: Implement proper rehabilitation mitigation measures as proposed in the closure report.	Throughout the decommissioning phase.	Soil drainage must be managed in accordance with the: ℑ CARA, 1983

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.

As a strip/block is mined-out the area will be rehabilitated prior to the opening of another strip. The stockpiled topsoil will be spread over the mined area to a depth of at least 300 mm.

Final rehabilitation will entail the removal of all equipment from the mining area. Final landscaping, levelling and top dressing will be done on all areas not yet rehabilitated. Control of weeds and alien 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 (Appendix K) 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 DMR.

(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.

(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 on all areas not yet rehabilitated. The rehabilitation of the mining area as indicated on the rehabilitation plan attached as Appendix E will comply with the minimum

closure objectives as prescribed by DMR and detailed below, and therefore is deemed to be compatible:

- Rehabilitation of the 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.
- 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

Level of information

According to Step 4.2:

Level of information available	Limited

Identify closure components

According to Table B.5 and site-specific conditions

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

Component No.	Main description	Applicability of closure components (Circle Yes or 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	-	NO

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	238 697	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	-	-
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	-	-

Determine weighting factors

According to Tables B.7 and B.8

Weighting factor 1: Nature of terrain/accessibility	1.00 (Flat)
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 26: Calculation of closure cost

CALCULATION OF THE QUANTUM							
Mine:	Smit Grondwerke Sand Mine			**Location:**	Clanwilliam		
Evaluators:	C Fouché			**Date:**	15 August 2019		
No	**Description**	**Unit**	**A Quantity**	**B Master rate**	**C Multiplication factor**	**D Weighting factor 1**	**E=A *B*C*D Amount (Rand)**
			Step 4.5	**Step 4.3**	**Step 4.3**	**Step 4.4**	
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	m^2	0	16	1.00	1.00	R 0.00
2(A)	Demolition of steel buildings and structures	m^2	0	228	1.00	1.00	R 0.00
2(B)	Demolition of reinforced concrete buildings and structures	m^2	0	336	1.00	1.00	R 0.00
3	Rehabilitation of access roads	m^2	0	41	1.00	1.00	R 0.00
4(A)	Demolition and rehabilitation of electrified railway lines	m	0	395	1.00	1.00	R 0.00
4(B)	Demolition and rehabilitations of non-electrified railway lines	m	0	216	1.00	1.00	R 0.00
5	Demolition of housing and/or administration facilities	m^2	0	455	1.00	1.00	R 0.00
6	Opencast rehabilitation including final voids and ramps	ha	1	238 697	0.04	1.00	R 9 547.88
7	Sealing of shaft, audits and inclines	m^3	0	122	1.00	1.00	R 0.00
8(A)	Rehabilitation of overburden and spoils	ha	0	159 131	1.00	1.00	R 0.00
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	ha	0	198 195	1.00	1.00	R 0.00
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	ha	0	575 653	0.51	1.00	R 0.00
9	Rehabilitation of subsided areas	ha	0	133 249	1.00	1.00	R 0.00
10	General surface rehabilitation	ha	0	126 059	1.00	1.00	R 0.00
11	River diversions	ha	0	126 059	1.00	1.00	R 0.00

12	Fencing	m	0	144	1.00	1.00	R 0.00
13	Water Management	ha	0	47 931	0.17	1.00	R 0.00
14	2 to 3 years of maintenance and aftercare	ha	2	16 776	1.00	1.00	R 33 552.00
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 43 099.88
Multiply Sum of 1-15 by Weighting factor 2 (Step 4.4)		1.05		R 43 099.88		**Sub Total 1**	R 45 254.87

1	Preliminary and General	6% of Subtotal 1 if Subtotal 1 <R100 000 000.00	R 2 715.29
		12% of Subtotal 1 if Subtotal 1 >R100 000 000.00	-
2	Contingency	10.0% of Subtotal 1	R 4 525.49
		Sub Total 2 (Subtotal 1 plus management and contingency)	R 52 495.65
		Vat (15%)	R 7 874.35
		GRAND TOTAL (Subtotal 3 plus VAT)	**R 60 370.00**

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 60 370.00.**

(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 27: Mechanisms for monitoring compliance with and performance assessment against the EMPR and reporting thereon.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Demarcation of site with visible beacons	Maintenance of beacons	ℑ Visible beacons need to be placed at the corners of the mining area.	<u>Role:</u> ℑ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ℑ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> ℑ Ensure beacons are in place throughout the life of the mine.	Applicable throughout site establishment-, operational-, and decommissioning phases. ℑ Daily compliance monitoring by site management. ℑ Annual compliance monitoring of site by an Environmental Control Officer.
ℑ Site establishment & Stripping and stockpiling of topsoil	ℑ Loss of agricutlural land for duration of mining.	ℑ Mining schedule.	<u>Role:</u> ℑ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ℑ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> ℑ Present the landowner with a mining schedule that upon agreement between the holder and	Throughout the site establishment-, and operational phase. ℑ Daily compliance monitoring by site management. ℑ 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
			the landowner, could allow the cultivation of areas not to be mined in the near future. ℑ Sign mined-out areas back to the farmer, to be used for agricultural purposes, once final rehabilitation was done and the area vegetated.	
ℑ Site establishment & Stripping and stockpiling of topsoil	Visual Characteristics: ℑ Visual intrusion as a result of site establishment.	ℑ Minimize the visual impact of the activity on the surrounding environment through proper site management and implementing good housekeeping practices.	Role: ℑ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ℑ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. Responsibility: ℑ Ensure that the site have a neat appearance and is kept in good condition at all times. ℑ Store mining equipment in a dedicated area when not in use. ℑ Implement concurrent rehabilitation as strip mining progress to limit the visual impact on the aesthetic value of the area. ℑ Limit vegetation removal, and only strip topsoil immediately prior to the mining/use of a specific area. ℑ 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.	Applicable throughout site establishment-, operational-, and decommissioning phases. ℑ Daily compliance monitoring by site management. ℑ Annual compliance monitoring of site by an Environmental Control Officer.
ℑ Site establishment & Stripping and stockpiling of topsoil	**Mining and Biodiversity, Groundcover** ℑ Loss of Leipoldtville Sand Fynbos to access the mineral.	ℑ Visible beacons indicating the boundary of the mining area. ℑ Walkthrough with botanist should mining extend into areas not cultivated at the time of extension.	Role: ℑ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ℑ Botanist to clear uncultivated area prior to stripping of topsoil. ℑ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit.	Applicable throughout site establishment-, and operational phases. ℑ Daily compliance monitoring by site management. ℑ 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
	ℑ Potential negative impact on the CBA's and ESA's.	ℑ Removal permit should protected or red data species be relocated. ℑ Cover crop to seed reinstated areas.	Responsibility: ℑ Clearly demarcate the mining boundaries and contain all operations to the approved mining area. ℑ Declared the area outside the mining boundaries a no-go area, and educate all employees accordingly. ℑ Consult a botanist to clear uncultivated areas, where indigenous vegetation established prior to stripping of topsoil. ℑ Replant crops on cultivated areas that will return to being cultivated after mining as soon as feasible once the topsoil was replaced. ℑ Implement the invasive plant species management plan on site to control weeds and invasive plants on denuded areas, topsoil heaps and reinstated areas.	
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Sloping and landscaping upon closure of the mining area.	**Geology and Soil:** ℑ Loss of topsoil and fertility during mining and stockpiling. ℑ Erosion of returned topsoil after rehabilitation.	ℑ Earthmoving equipment to reinstate mined-out areas. ℑ Cover crop to be established on reinstated areas. ℑ Erosion control infrastructure (if necessary)	Role: ℑ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ℑ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. Responsibility: ℑ Strip and stockpile the upper 300 mm of the soil before mining. ℑ Carefully manage and conserve the topsoil throughout the stockpiling and rehabilitation process. ℑ 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.	Applicable throughout site establishment-, operational-, and decommissioning phases. ℑ Daily compliance monitoring by site management. ℑ 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
			ℑ Place topsoil heaps on a levelled area within the mining footprint area. Do not stockpile topsoil in undisturbed areas. ℑ 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. ℑ 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. ℑ Keep temporary stockpiles free of invasive plant species. ℑ Divert storm- and runoff water around the stockpile area to prevent erosion. ℑ Spread the topsoil evenly over the rehabilitated area, to a depth of 300 mm, upon closure of the site. ℑ 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. ℑ 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. ℑ 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
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	**Groundcover:** ℑ Infestation of the topsoil heaps and mining area with invader plant species. ℑ Infestation of the reinstated area with invader plant species.	ℑ Designated team to cut or pull out invasive plant species that germinated on site. ℑ Herbicide application equipment.	Role: ℑ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ℑ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. Responsibility: ℑ Implement an invasive plant species management plan to control all invasive plant species on site in terms of NEM:BA, 2004 and CARA, 1983. ℑ Keep all stockpiles (topsoil) free of invasive plant species. ℑ Control declared invader or exotic species on the rehabilitated areas.	Applicable throughout site establishment-, operational-, and decommissioning phases. ℑ Daily compliance monitoring by site management. ℑ Annual compliance monitoring of site by an Environmental Control Officer.
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Loading and hauling of sand from the mining footprint.	**Fauna:** ℑ Potential impact on fauna within the footprint area.	ℑ Toolbox talks to educate employees how to handle fauna that enter the work areas.	Role: ℑ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ℑ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. Responsibility: ℑ Ensure no fauna is caught, killed, harmed, sold or played with. ℑ Instruct workers to report any animals that may be trapped in the working area. ℑ Ensure no snares are set or nests raided for eggs or young.	Applicable throughout site establishment-, and operational phases. ℑ Daily compliance monitoring by site management. ℑ 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
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	**Air Quality:** ℑ Dust nuisance as a result of the mining activities. ℑ Dust nuisance as a result of the decommissioning activities.	ℑ Dust suppression equipment such as a water car. ℑ Signage that clearly reduce the speed on the access roads.	Role: ℑ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ℑ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. Responsibility: ℑ 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). ℑ Ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. ℑ Limit speed on the haul roads to 20 km/h to prevent the generation of excess dust. ℑ Minimise areas devoid of vegetation, and only remove vegetation immediately prior to mining. ℑ Flatten and cover loads to prevent spillage and windblown dust during transportation. ℑ Take weather conditions into consideration upon commencement of daily operations. Limit operations during very windy periods to reduce airborne dust and resulting impacts. ℑ 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). ℑ Implement best practice measures during the stripping of topsoil, excavation, and transporting of material from site to minimize potential dust impacts.	Applicable throughout site establishment-, operational-, and decommissioning phases. ℑ Daily compliance monitoring by site management. ℑ 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
ℑ Site establishment & Stripping and stockpiling of topsoil. ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	**Noise Ambiance:** ℑ Noise nuisance as a result of the mining activities. ℑ Noise nuisance as a result of the decomissiononig activities.	ℑ 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.	Role: ℑ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ℑ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. Responsibility: ℑ Ensure that employees and staff conduct themselves in an acceptable manner while on site. ℑ No loud music may be permitted at the mining area. ℑ 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. ℑ Implement best practice measures to minimise potential noise impacts. ℑ Contract a qualified occupational hygienist to quarterly monitor and report on the personal noise exposure of the employees working at the mine. Monitoring must be in accordance with SANS 10083:2004 (Edition 5) sampling method as well as NEM:AQA 2004, SANS 10103:2008.	Applicable throughout site establishment-, operational-, and decommissioning phases. ℑ Daily compliance monitoring by site management. ℑ Annual compliance monitoring of site by an Environmental Control Officer.
ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	**Topography:** ℑ Creating steep slopes and uneven surfaces.	ℑ Earthmoving equipment to reinstate mined-out areas.	Role: ℑ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ℑ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit.	Applicable throughout operational-, and decommissioning phases. ℑ Daily compliance monitoring by site management. ℑ Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			Responsibility: ℑ 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. ℑ Control mining depths across the entire mine so that excavations results in a levelling of the pivot lands rather than a hole with steep edges. ℑ Reduce and profile any steep slopes at the edges of excavations, after mining to blend with the surrounding topography and allow the travel of the centre pivot. Ensure the entire surface is sufficiently smoothed and profiled to allow cultivation. ℑ Implement the closure plan upon decommissioning of the mining area.	
ℑ Loading and hauling of sand from the mining footprint. ℑ Sloping and landscaping upon closure of the mining area.	**Waste Management:** ℑ Soil contamination from hydrocarbon spills. ℑ Potential impact assocaited with littering at the mining area. ℑ Potential impact associated with litter left at the mining area.	ℑ Oil spill kit. ℑ Sealed drip trays. ℑ Formal waste disposal system with waste registers.	Role: ℑ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ℑ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. Responsibility: ℑ Ensure regular vehicle maintenance, repairs and services takes place at the off-site workshop and service area of the permit holder. Make sure drip trays are used when emergency repairs have to be done on equipment not able to move to the workshop.	Applicable throughout site establishment-, operational-, and decommissioning phases. ℑ Daily compliance monitoring by site management. ℑ 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
			ℑ Provide ablution facilities in the form of a chemical toilet. Ensure the toilet is serviced at least once a week for the duration of the mining activities. ℑ 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. ℑ 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. ℑ Clean drip trays after use. Do not use dirty drip trays. ℑ 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. ℑ 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. ℑ Contain all general waste within the site vehicles and daily remove it from the mining area to the general waste storage area of the permit holder in Clanwilliam. ℑ Prevent the burning or burying of waste on site. ℑ Report any significant spillage of chemicals, fuels etc. during the lifespan of the mining	

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
			activities to the Department of Water and Sanitation and other relevant authorities.	
ℑ Loading and hauling of sand from the mining footprint.	ℑ Deterioration of the access road to the mining area.	ℑ Grader to restore the road surface when needed.	<u>Role:</u> ℑ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ℑ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> ℑ Divert storm water around the access road to prevent erosion. ℑ Restrict vehicular movement to the existing access road to prevent crisscrossing of tracks through undisturbed areas. ℑ Repair rutting and erosion of the access road caused as a direct result of the mining activities. ℑ Prevent the overloading of the truck.	Applicable throughout operational phases. ℑ Daily compliance monitoring by site management. ℑ Annual compliance monitoring of site by an Environmental Control Officer.
ℑ Loading and hauling of sand from the mining footprint.	ℑ Potential impact on areas/infrastructure of heritage or cultural concern.	ℑ Contact number of an archaeologist that can be contacted when a discovery is made on site.	<u>Role:</u> ℑ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ℑ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> ℑ Confine all mining to the development footprint area. ℑ Implement the following change find procedure when discoveries are made on site: ▪ If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors	Applicable throughout site establishment-, operational-, and decommissioning phases. ℑ Daily compliance monitoring by site management. ℑ 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
			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 Heritage Western Cape (HWC). ▪ Work may only continue once the go-ahead was issued by HWC.	
ℑ Loading and hauling of sand from the mining footprint.	ℑ Cumulative Impact: The operation of two sand mines on the same property.	ℑ Copy of the Environmental Management Programme	<u>Role:</u> ℑ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ℑ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> ℑ Ensure that the approved mitigation measures are implemented on site.	Applicable throughout operational phase. ℑ Daily compliance monitoring by site management. ℑ Annual compliance monitoring of site by an Environmental Control Officer.
ℑ Site establishment and stripping of topsoil	ℑ Health and safety risks to employees.	ℑ Stocked first aid box. ℑ Level 1 certified first aider.	<u>Role:</u> ℑ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ℑ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit.	Applicable throughout operational-, and decommissioning phases. ℑ Daily compliance monitoring by site management.

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
ℑ Loading and hauling of sand from the mining footprint ℑ Sloping and landscaping upon closure of the mining area.		ℑ All appointments in terms of the Mine Health and Safety Act, 1996.	<u>Responsibility:</u> ℑ Ensure adequate ablution facilities and water for human consumption is daily available on site. ℑ Ensure that workers have access to the correct PPE as required by law. ℑ Manage all operations in compliance with the Mine Health and Safety Act, 1996 (Act No 29 of 1996).	ℑ Annual compliance monitoring of site by an Environmental Control Officer.
ℑ Loading and hauling of sand from the mining footprint ℑ Sloping and landscaping upon closure of the mining area.	ℑ Storm water management	ℑ Storm water management structures such as berms to direct storm- and runoff water around the stockpiled topsoil area (when needed).	<u>Role:</u> ℑ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ℑ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> ℑ Remove soils at right angles to the slope, as this will slow down surface runoff and help to prevent erosion. ℑ Divert storm water around the topsoil heaps and mining areas to prevent erosion. ℑ Control all drainage from the project area to prevent off-site pollution, flooding or damage to infrastructure downstream of any storm water discharge points. ℑ Conduct activity in terms of the Best Practice Guidelines for small-scale mining as developed by DWS.	Applicable throughout site establishment-, operational-, and decommissioning phases. ℑ Daily compliance monitoring by site management. ℑ Annual compliance monitoring of site by an Environmental Control Officer.
ℑ Sloping and landscaping upon closure of the mining area.	ℑ Soil drainage	ℑ Earthmoving equipment to reinstate and landscape mined-out areas.	<u>Role:</u> ℑ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR.	Applicable throughout decommissioning phase. ℑ Daily compliance monitoring by site management.

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
			ℑ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> ℑ Ensure no surface depressions remain after mining. Maintain a surface slope across the mining area, and out of it on the down-slope side.	ℑ Annual compliance monitoring of site by an Environmental Control Officer.

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

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

m) Environmental Awareness Plan

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

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

An induction meeting will be held with all the site workers to inform them of the Basic Rules of Conduct with regard to the environment.

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

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

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

- **Site Management:**

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

- **Water Management and Erosion:**

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

- **Waste Management:**

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

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

  - Never mix general waste with hazardous waste.
  - Use only sealed, non-leaking containers.
  - Keep all containers closed and store only in approved areas.
  - Always put drip trays under vehicles and machinery.
  - Empty drip trays after rain.
  - Stop leaks and spills, if safe:
    - ✓ Keep spilled liquids moving away.
    - ✓ Immediately report the spill to the site manager/supervision.
    - ✓ Locate spill kit/supplies and use to clean-up, if safe.
    - ✓ Place spill clean-up wastes in proper containers.
    - ✓ Label containers and move to approved storage area.

- **Discoveries:**

  - Stop work immediately.
  - Notify site manager/supervisor.
  - Includes – archaeological finds, cultural artefacts, contaminated water, pipes, containers, tanks and drums, any buried structures.

- **Air Quality:**

  - Wear protection when working in very dusty areas.
  - Implement dust control measures:
    - ✓ Water all roads and work areas.

- ✓ Minimize handling of material.
- ✓ Obey speed limit and cover trucks.

ℑ **Driving and Noise:**

- Use only approved access roads.
- Respect speed limits.
- Only use turn-around areas – no crisscrossing through undisturbed areas.
- Avoid unnecessary loud noises.
- Report or repair noisy vehicles.

ℑ **Vegetation and Animal life:**

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

ℑ **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 DMR for review and approved as being sufficient to cover the environmental liability at the time and for closure of the mine at that time.

2. UNDERTAKING

The EAP herewith confirms

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

Signature of the environmental assessment practitioner:

Greenmined Environmental (Pty) Ltd

Name of Company:

16 August 2019

Date:

-END-

APPENDIX A

REGULATION 2(2) MINE MAP

APPENDIX B

1:250 000 LOCALITY MAP

APPENDIX C
SITE ACTIVITIES PLAN

APPENDIX D

LAND USE MAP

APPENDIX E
REHABILITATION PLAN

APPENDIX F1 & F2

COMMENTS AND RESPONSE REPORT

&

PROOF OF PUBLIC PARTICIPATION

APPENDIX G

AGRICULTURAL IMPACT ASSESSMENT

APPENDIX H

SUPPORTING IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT STATEMENT

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

ENVIRONMENTAL IMPACT STATEMENT			
SITE ALTERNATIVE 1			
TYPE OF IMPACT	**DURATION**	**LIKELIHOOD**	**SIGNIFICANCE**
Site Establishment & Stripping and Stockpiling of Topsoil:	**Duration of site establishment phase (<1 month)**		
ℑ Alteration of the agricultural sense of place		**Low Possibility**	**Medium-Low Concern**
ℑ Loss of agricultural land for duration of mining.		**Definite**	**Medium-High Concern**
ℑ Visual intrusion as a result of site establishment.		**Possible**	**Low-Medium Concern**
ℑ Loss of Leipoldtville Sand Fynbos to access the mineral.		**Low Possibility**	**Low Concern**
ℑ Potential impact on the CBA's and ESA's.		**Low Possibility**	**Low Concern**
ℑ Loss of topsoil and fertility during mining and stockpiling.		**Low Possibility**	**Low Concern**
ℑ Infestation of the topsoil heaps and mining area with invader plant species.		**Low Possibility**	**Low Concern**
ℑ Potential impact on fauna within the footprint area.		**Low Possibility**	**Low Concern**
ℑ Dust nuisance as a result of the mining activities.		**Low Possibility**	**Low Concern**
ℑ Noise nuisance as a result of the mining activities.		**Low Possibility**	**Low Concern**
Loading and Hauling of Sand from the Mining Footprint:	**Duration of operational phase (5 years maximum)**	**LIKELIHOOD**	**SIGNIFICANCE**
ℑ Creating steep slopes and uneven surfaces.		**Low Possibility**	**Low Concern**
ℑ Infestation of the topsoil heaps and mining area with invader plant species.		**Low Possibility**	**Low Concern**
ℑ Soil contamination from hydrocarbon spills.		**Low Possibility**	**Low Concern**
ℑ Disturbance to fauna within the footprint area.		**Low Possibility**	**Low Concern**
ℑ Dust nuisance as a result of the mining activities.		**Low Possibility**	**Low Concern**

ℑ Noise nuisance as a result of the mining activities. ℑ Potential impact associated with littering at the mining area. ℑ Deterioration of the access road to the mining area. ℑ Potential impact on areas/infrastructure of heritage or cultural concern. ℑ Increase in clay content and resultant water holding capacity of the soil **(Positive Impact)**. ℑ Working opportunities to 3 local residents **(Positive Impact)**. ℑ Cumulative Impact: The operation of two sand mines on the same property.		**Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Definite** **Definite** **Definite**	**Low Concern** **Low Concern** **Low Concern** **Low Concern** **Medium (+)** **Medium-High (+)** **Medium Concern**
<u>Sloping and Landscaping upon Closure of the Mining Area:</u> ℑ Erosion of returned topsoil after rehabilitation. ℑ Infestation of the reinstated area with invader plant species. ℑ Dust nuisance as a result of the decommissioning activities. ℑ Noise nuisance as a result of the decommissioning activities. ℑ Potential impact associated with litter left at the mining area. ℑ Return of the mining area to agricultural use by the landowner **(Positive Impact)**.	**Duration of decommissioning phase (±2 months)**	**<u>LIKELIHOOD</u>** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Definite**	**<u>SIGNIFICANCE</u>** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Medium-High (+)**
SITE ALTERNATIVE 2			
<u>TYPE OF IMPACT</u> <u>Site Establishment & Stripping and Stockpiling of Topsoil:</u> ℑ Alteration of the agricultural sense of place ℑ Loss of agricultural land for duration of mining. ℑ Visual intrusion as a result of site establishment. ℑ Loss of Leipoldtville Sand Fynbos to access the mineral. ℑ Potential impact on the CBA's and ESA's. ℑ Loss of topsoil and fertility during mining and stockpiling.	**Duration of site establishment phase (<1 month)**	**<u>LIKELIHOOD</u>** **Low Possibility** **Definite** **Possible** **Definite** **Definite** **Low Possibility**	**<u>SIGNIFICANCE</u>** **Low-Medium Concern** **Medium-High Concern** **Low-Medium Concern** **High Concern** **High Concern** **Low Concern**

ℑ Infestation of the topsoil heaps and mining area with invader plant species. ℑ Potential impact on fauna within the footprint area. ℑ Dust nuisance as a result of the mining activities. ℑ Noise nuisance as a result of the mining activities.		**Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility**	**Low Concern** **Low Concern** **Low Concern** **Low Concern**
<u>Loading and Hauling of Sand from the Mining Footprint:</u> ℑ Creating steep slopes and uneven surfaces. ℑ Infestation of the topsoil heaps and mining area with invader plant species. ℑ Soil contamination from hydrocarbon spills. ℑ Disturbance to fauna within the footprint area. ℑ Dust nuisance as a result of the mining activities. ℑ Noise nuisance as a result of the mining activities. ℑ Potential impact associated with littering at the mining area. ℑ Deterioration of the access road to the mining area. ℑ Potential impact on areas/infrastructure of heritage or cultural concern. ℑ Working opportunities to 3 local residents **(Positive Impact)**. ℑ Cumulative Impact: The operation of two sand mines on the same property.	**Duration of operational phase (5 years maximum)**	**<u>LIKELIHOOD</u>** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Definite** **Definite**	**<u>SIGNIFICANCE</u>** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Medium-High (+)** **Medium Concern**
<u>Sloping and Landscaping upon Closure of the Mining Area:</u> ℑ Erosion of returned topsoil after rehabilitation. ℑ Infestation of the reinstated area with invader plant species. ℑ Dust nuisance as a result of the decommissioning activities. ℑ Noise nuisance as a result of the decommissioning activities. ℑ Potential impact associated with litter left at the mining area. ℑ Return of the mining area to agricultural use by the landowner **(Positive Impact)**.	**Duration of decommissioning phase (±2 months)**	**<u>LIKELIHOOD</u>** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Definite**	**<u>SIGNIFICANCE</u>** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Medium-High (+)**

APPENDIX I
FINANCIAL AND TECHNICAL COMPETENCE

APPENDIX J

CLOSURE PLAN

APPENDIX K

INVASIVE PLANT SPECIES MANAGEMENT PLAN

APPENDIX L

PHOTOGRAPHS OF THE PROPOSED SITE

PHOTOGRAPHS OF SITE ALTERNATIVE 1

PHOTOGRAPHS OF SITE ALTERNATIVE 2

PHOTOGRAPHS OF THE 1.5 HA MINING AREA	
	
VIEW OF THE NON-PERENNIAL DRAINAGE LINE	
	
UPSTREAM	DOWNSTREAM

APPENDIX M

CV AND EXPERIENCE RECORD OF EAP