



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

ENVIRONMENTAL IMPACT ASSESSMENT REPORT
And
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

NAME OF APPLICANT: Afrimat Aggregates (Operations) Pty Ltd

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FILE REFERENCE NUMBER SAMRAD: WC 30/5/1/2/2/10067MR

1. IMPORTANT NOTICE

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

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

In terms of section 16(3)(b) of the EIA Regulation, 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 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 order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

2. OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The objective of the environmental impact assessment process is to, through a consultative process-

- (a) determine the policy and legislative context within the activity is located and document how the proposed activity complies with and responds to the policy and legislative context,
- (b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location,
- (c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment,
- (d) determine the –
 - (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives, and
 - (ii) degree to which these impacts-
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources, and
 - (cc) can be avoided, managed or mitigated;
- (e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;
- (f) identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity;
- (g) identify suitable measures to manage, avoid or mitigate identified impacts, and
- (h) identify residual risks that need to be managed and monitored.

PART A

SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

3 Contact Person and correspondence address

a) **Details of** Greenmined Environmental

In terms of NEMA the proponent must appoint an independent Environmental Assessment Practitioner (EAP) to undertake the EIA of any activities regulated in terms of the aforementioned Act. Afrimat Aggregates (Operations) (Pty) Ltd appointed Greenmined Environmental to undertake the study needed. Greenmined Environmental has no vested interest in Afrimat Aggregates (Operations) (Pty) Ltd or the proposed project and hereby declares its independence as required by the EIA Regulations.

i) **Details of the EAP**

Name of the Practitioner: Ms. Christine Fouche (Senior Environmental Specialist)

Tel No: 021 850 8875

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 BSc in Botany and Zoology. Full CV 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 ten years' experience in doing Environmental Impact Assessments and Mining Applications in South Africa. See a list of past project attached as Appendix M.

b) **Description of the property**

Farm Name:	Portion 2 of the farm Woodlands 874
Application area (Ha)	92 ha
Magisterial district:	Swartland Municipality
Distance and direction from nearest town	The site is situated approximately 15km south of Malmesbury along the R304.
21 digit Surveyor General Code for each farm portion	C04600000000087400002

c) **Locality map**

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

The requested map is attached as Appendix A.

d) Description of the scope of the proposed overall activity

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

The applicant, Afrimat Aggregates (Operations) (Pty) Ltd intends to mine 92 ha of Portion 2 (Remaining Extent) of the farm Woodlands 874 for the winning of sand. The mining procedure will entail strip mining of the proposed footprint area with an excavator that will load the sand directly onto trucks transporting the sand from the site to the clients.

The footprint area of the proposed sand mine was divided into four major areas each consisting of 23 ha. Each major areas represents a separate phase of the proposed mining activities. Each major area/phase will be mined through the above mentioned strip mining method by dividing the major area into various minor areas of 480 m² (6m x 80m). Once all the minor areas in a major area has been mined the applicant will move the equipment (including office and toilet) to the next major area upon which the mining of the minor areas will commence again.

Phase 1 – 4:

- ◆ Major Area 1 – 4 - 23 ha each
 - Minor Area 1 - 479 - 480 m² each

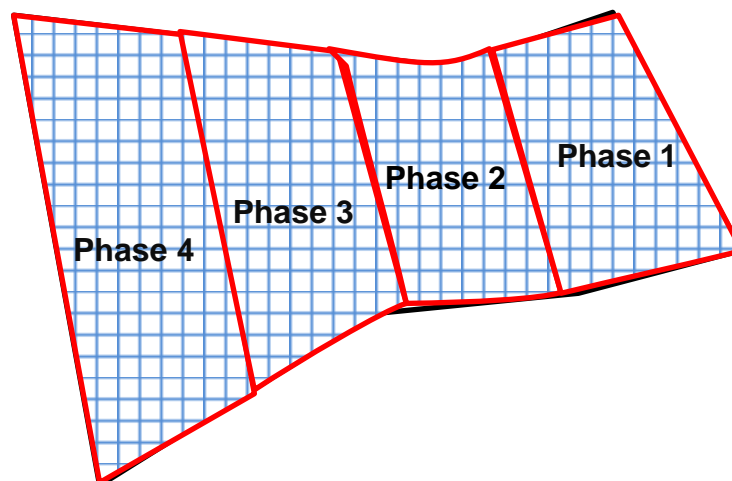


Figure 1: Schematic representation of the major- (red outline) and minor areas (blue blocks) to be managed on-site.

Site infrastructure:

A temporary container will serve as a site office. A solar panel fitted to the container will provide power and potable water will daily be transported to site in closed containers. The mining activities will not require any process water and the solid waste produced during the operational phase of the project will be transported from site to the Malmesbury landfill site. A chemical toilet will serve as ablution facility to the employees and will regularly be serviced by a recognized contractor. No workers will reside on-site but will daily be transported to site.

The equipment/infrastructure on site will therefore entail:

- ◆ one excavator to strip the sand
- ◆ trucks to transport the sand to the clients
- ◆ a portable office fitted with solar panel
- ◆ chemical toilet

See attached as Appendix B a copy of the plan and schematic indication of the proposed mining activities.

(i) **Listed and specified activities**

NAME OF THE ACTIVITY (All activities including activities 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.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected	APPLICABLE LISTING NOTICE (GNR 554, GNR 545 or GNR 546)/NOT LISTED
Demarcate site with visible beacons	92 ha	N/A	Not listed
Establish temporary office and ablution infrastructure within boundaries of site	15 m ²	N/A	Not listed
Strip and stockpile topsoil	6 m x 80 m strips at a time up to 92 ha	X	GNR 983 Listing Notice 1 Activity 28 GNR 984 Listing Notice 2 Activity 17
Excavate and load sand to be sold	6 m x 80 m strips at a time up to 92 ha	X	GNR 983 Listing Notice 1 Activity 28 GNR 984 Listing Notice 2 Activity 17

Transport sand from mining area to clients	6 m x 80 m strips at a time up to 92 ha	X	GNR 983 Listing Notice 1 Activity 28 GNR 984 Listing Notice 2 Activity 17
Replace topsoil over mined-out area (Minor Area)	6 m x 80 m strips at a time up to 92 ha	X	GNR 983 Listing Notice 1 Activity 22
Final rehabilitation of entire major area	23 ha up to 92 ha	X	GNR 983 Listing Notice 1 Activity 22

(ii) Description of the activities to be undertaken

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

The applicant, Afrimat Aggregates (Operations) (Pty) Ltd intends to mine 92 ha of Portion 2 (Remaining Extent) of the farm Woodlands 874 for sand.

The GPS coordinates for the proposed site is:

- A. 33°35'53.761"S 18°44'38.821"E
- B. 33°35'58.2"S 18°45'14.339"E
- C. 33°35'54.899"S 18°45'26.341"E
- D. 33°36'12.121"S 18°45'34.859"E
- E. 33°36'15.48"S 18°45'24.001"E
- F. 33°36'18.839"S 18°45'06.059"E
- G. 33°36'31.079"S 18°44'48.721"E

(See Appendix A for Regulation 2.2 Mine Map)

The proposed sand mining activity triggers the following listed activities in terms of NEMA and the EIA Regulations, 2014:

- ◆ GNR 983 Listing Notice 1:
 - ✓ Activity 22: upon closure of the site a closure permit in terms of the MPRDA will be required,
 - ✓ Activity 28: upon approval the site, that was previously used for agricultural purposes, will be used as a commercial mine source.
- ◆ GNR 984 Listing Notice 2:
 - ✓ Activity 17: the project requires a mining right in terms of the MPRDA,

Site Establishment / Construction phase:

During the site establishment phase the applicant have to demarcate the boundaries of the site and clear the topsoil of the first minor area to be mined.

Upon stripping, the topsoil will be stockpiled along the edge of the minor area to be used during the rehabilitation phase. Topsoil stripping will be restricted to the area to be mined. The top 500 mm of soil will be removed. The topsoil will be stockpiled in the form of a berm along the edge of the strip being mined, where it will not be driven over, contaminated, flooded or moved until replaced during the rehabilitation of the strip. The topsoil berm will measure a maximum of 1.5 m high and should be planted with indigenous grass species if vegetation does not naturally establish within 6 months of stockpiling to prevent soil erosion and to discourage growth of weeds. The roots of the grass will also improve the viability of the soil for rehabilitation purposes.

The applicant will introduce the mining equipment to the area during the site establishment phase. The equipment to be used on site will entail the following:

- ◆ Portable container to be used as site office
- ◆ Chemical Toilet
- ◆ Excavator
- ◆ Trucks for the transport of the sand

The temporary container will serve as a site office and is proposed to move four times, from the one major area to the next, as mining progress. A solar panel fitted to the container will provide power and site management will daily transport potable water to site.

Operational phase:

The mining procedure will entail strip mining of the proposed footprint area and the applicant intends to:

- ◆ grade the topsoil (top 500 mm) off a strip of approximately 6 x 80 meter long. The topsoil will be handled as described above,
- ◆ remove the sand from the stripped area up to the underlying clay layer with an excavator that will load it onto a truck,
- ◆ transport the sand from the mining area to the clients using the existing roads,
- ◆ once the sand is removed from a strip (minor area), rehabilitate the area through the replacement of the topsoil.
- ◆ strip the topsoil of the next minor area and the mining process will be repeated until the entire 92 ha has been mined.

The mining activities will therefore entail:

- ◆ Topsoil stripping and stockpiling
- ◆ Excavation and loading of sand
- ◆ Transportation of sand from site

The proposed activity will not require any blasting, crushing or washing of the sand. Approximately three to four employees will be needed on-site. Mining will only take place during daylight hours.

The mining activities will not require any process water and solid waste, produced during the operational phase, will be contained in a sealable refuse bin to be placed at the site office until it is transported to the Malmesbury landfill site. A recognized contractor will service the chemical toilet that will serve as ablution facility to the employees. Should water be needed for dust suppression purposes the water will be bought from the landowner.

The machinery used in the operation will be serviced at the applicants existing off-site workshop. Only emergency repairs will be conducted on site with regular maintenance of the equipment done at the above mentioned Afrimat workshop. The mining site will not require the storage of large quantities of diesel. Fueling of the excavator will be done from a diesel bowser and the use of drip trays will be compulsory.

The existing farm road will be used to access the mining area. Trucks leaving the site will use the existing gravel farm road that connects to the Wellington road (tar road) from where the trucks will either turn left towards Wellington or right towards the R104.

Decommissioning phase:

The closure objectives entail progressive rehabilitation of each strip as mining progress. A soil scientist conducted an assessment of the impact of the sand mining on the agricultural potential of the area upon closure of the site and proposed the following with regard to rehabilitation of the mined-out strips:

- ◆ The mining plan should be such that topsoil is stockpiled for the minimum possible time by rehabilitating different mining blocks progressively as the mining process continues.
- ◆ To ensure minimum impact on drainage, it is important that no depressions be 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.
- ◆ After mining, any steep slopes at the edges of excavations, must be reduced to a minimum and profiled to blend with the surrounding topography.
- ◆ The stockpiled topsoil must then be evenly spread over the entire mining area, so that there is a depth of 500 mm of sandy topsoil above the underlying clay. The depth should be monitored during spreading to ensure that coverage is adequate and even.
- ◆ Topsoil spreading should only be done 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 the end of the rainy season, when there is moisture in the soil for vegetation establishment and the risk of heavy rainfall events is minimal.
- ◆ A cover crop must be planted and established immediately after spreading of topsoil to stabilize the soil and protect it from erosion. The cover crop should be fertilized for optimum production. It is important that rehabilitation is taken up to the point of 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.
- ◆ On-going alien vegetation control must keep the area free of alien vegetation after mining.

Final rehabilitation will entail the removal of all infrastructure and equipment from the site. 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 management plan during the 12 months aftercare period to address germination of problem plants in the area.

e) Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process);	REFERENCE WHERE APPLIED (i.e. Where in this document has it been explained how the development complies with and responds to the legislation and policy context)	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT (E.g in terms of the National Water Act: Water use license has/has not been applied for).
Mineral and Petroleum Resources Development Act, 2002, (Act No. 28 of 2002) ◆ Section 27	Part A(d) Description of the scope of the proposed overall activity.	Application for a mining right submitted to DMR-WC Ref No: WC30/5/1/2/2/10067MP
National Environmental Management Act,1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2014 ◆ GNR 983 Listing Notice 1 Activity 22 & 28 ◆ GNR 984 Listing Notice 2 Activity 17	Part A(d)(i) Listing and specified activities.	Application for environmental authorisation submitted to DMR-WC Ref No: WC30/5/1/2/2/10067MP
National Environmental Management Act: Biodiversity Act, 2004 (Act No. 10 of 2004) and amendments	Part A(iv)(1)(a) Type of environment affected by the proposed activity - Biological Environment	Should Site Alternative 1 be approved and the proposed mitigation measures be implemented no aspects of the project could be identified that triggers the NEMA:BA.
Mine Health and Safety Act, 1996 (Act No 29 of 1996)	The mitigation measures proposed for the site includes specifications of the MHSA (Part A(iv)(1)(viii) The possible mitigation measures that could be applied on the level of risk.)	◆ The mitigation measures proposed for the site includes specifications of the MHSA. ◆ The applicant has a permanent Health and Safety Representative that will be responsible for the implementation and compliance of the mine with the requirements of the MHSA.
National Heritage Resources Act No 25 of 1999.	Part A(iv)(1)(a) Type of environment affected by the proposed activity – Human Environment	No aspects of the project could be identified that triggers the NHRA.
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	Part A(iv)(1)(viii) The possible mitigation measures that could be	All alien invader plants on site need to be controlled in terms of CARA. This was included in the mitigation

	applied on the level of risk – Management of weed- or invader plants.	measures proposed for the site.
Land Use Planning Ordinance (Ordinance 15 of 1985)	Part A(iv)(1)(b) Description of the current land uses	The applicant will submit a land use application for sand mining in terms of the Swartland Integrated Zoning Scheme Regulations of Ordinance 15 of 1985 prior to commencement of the mining activities.
Public Participation Guideline in terms of the NEMA EIA Regulations	Part A(ii) Details of the Public Participation Process Followed	Public participation was conducted in accordance with the guidelines published in terms of the NEMA EIA Regulations.

f) Need and desirability of the proposed activities.

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

The applicant previously mined sand from the property and is well aware of the sales environment and demand for the product in the Malmesbury region. This was confirmed by the comments received from the West Coast District Municipality (WCDM) stating that the sustainable mining of sand for the construction industry is an important economic sector in the West Coast accounting for 7.5% contribution to the District GDP. The WCDM further stated that given the site's proximity to the Cape Metropole (i.e. Paarl, Stellenbosch etc.) and surrounding towns the proposed mine would also benefit the greater region.

In light of the above, the applicant has applied for a mining right to commercially source the available sand on Portion 2 of the farm Woodlands 874. The mining of sand from the property will also enable the landowner to diversify the income generating activities on the property, extending it from agriculture to include small-scale mining.

g) Motivation for the preferred development footprint within the approved site including a full description of the process followed to reach the proposed development footprint within the approved 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.

The initial site layout entailed the mining of the proposed 92 ha area within the boundaries of the proposed GPS coordinates through strip mining.

During the environmental impact assessment process the following matters were identified that needed to be incorporated into the preferred development footprint:

1. **CapeNature** - A buffer of at least 20 metres must be allowed for between the mining site and the adjacent natural areas. A buffer of at least 10 metres should be provided between mining activities and the edge of the streams and riparian vegetation should not be impacted on in any way.

2. **Eskom** – The application affects the Malmesbury/Prospect Hill 132kV overhead power line as well as the Klipheuwel 11kV overhead power line.
 - ◆ No work is allowed within Eskom reserve areas and servitudes (132kV - 15.5 m & 11kV - 9.0 m either side of center line)
 - ◆ No construction work may be executed closer than 6 meters from any Eskom structure or structure-supporting mechanism.
 - ◆ No work or no machinery nearer than 3.8 m to the conductors of the 132 kV and 3.0 m to the 11kV.
 - ◆ A minimum ground clearance must be maintained of 7.5 m above ground to the 132kV and 6.3 m to the 11kV.
 - ◆ Eskom must have at least a 10 m obstruction free zone around all pylons.

3. **Geohydrological Specialist** – The geohydrologist proposed the following measures to ensure successful rehabilitation results during and after the sand mining operation that needed to be incorporated into the mining proposal:
 - ◆ The sand mining must not go deeper than the consolidated silt / clay layer.
 - ◆ The strips of soil that are removed should be done so at right angles to the slope, as this will slow down surface runoff and help to prevent erosion.
 - ◆ Rehabilitation by replacing topsoil on the stripped land should take place before the next strip is opened and mined.

4. **Department of Water and Sanitation conditions** – DWS recommended that the following conditions must be adhered to during the mining activities:
 - ◆ A geohydrological assessment of potential mining impacts is required once data for groundwater levels and fluctuations across the site are available. The report must address potential impacts on groundwater interactions with surface water.
 - ◆ A monitoring program must be established to measure the water levels at least monthly. A higher frequency is preferable during the high rainfall winter months when the water table is potentially at its highest. The readings must be recorded against date and time.
 - ◆ The application can be considered once sufficient water level fluctuation data are available (at least 1 year).
 - ◆ The Department would request that the data for the report and the monitoring be made available to the Department annually.
 - ◆ A reasonable buffer needs to be determined by this Department above the highest water level once water level fluctuation data is obtained to limit impact on groundwater flow and storage character as well as limit groundwater contamination.
 - ◆ If, the mining activities go below the water level, dewatering may be required, which would necessitate a water use license from DWS.

- ◆ Every precaution should be taken to prevent groundwater contamination, as groundwater is very difficult and almost impossible to remediate. Thus, the precautionary principle would apply.
- ◆ Consideration should be taken about the proposed future use of the land after mine closure, as this would have an impact on the mining activity and management. It also has the potential to impact on groundwater.
- ◆ Closure and post closure impact must be assessed and mitigation actions must be implemented.
- ◆ Clarity must be provided to this Department whether a field hydrocensus within a 2 km radius was conducted at this site (which must include groundwater users, what they use the water for, water quality and water level measurements).

5. **Soil Scientist** – The soil scientist proposed the following measures to ensure successful rehabilitation:

- ◆ The upper 500 mm of the soil must be stripped and stockpiled before mining.
- ◆ Mining can then be done down to the clay layer
- ◆ A surface slope (even if minimal) must be maintained across the mining floor in the drainage direction, so that all excavations are free draining.
- ◆ Run-off water must be controlled via temporary banks during mining, where necessary on the slopes, to ensure that accumulation of run-off does not cause down-slope erosion.
- ◆ After mining, any steep slopes at the edges of excavations must be reduced to a minimum and profiled to blend with the surrounding topography.

In light of the above mentioned the mining proposal was updated to incorporate the matters raised during the assessment process. The site activities plan (Appendix B) was also updated to depict the conditions and requirements stipulated above.

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.

Afrimat Aggregates (Operations) Pty Ltd identified the need for sand in the area due to an increase in building and construction projects. As mentioned earlier the proposed property has previously been used for sand mining purposes and the quality and availability of the mineral on the proposed property is known.

Two site alternatives were considered during the planning phase of the project. These included the following:

Site Alternative 1 (S1) (Preferred Alternative):

Sand mining from a previously disturbed area within the boundaries of the following GPS coordinates:

A.	33°35'53.76"S 18°44'38.82"E	(-33.598267°S 18.744117°E)
B.	33°35'58.20"S 18°45'14.34"E	(-33.599500°S 18.753983°E)
C.	33°35'54.90"S 18°45'26.34"E	(-33.598583°S 18.757317°E)
D.	33°36'12.12"S 18°45'34.86"E	(-33.603367°S 18.759683°E)
E.	33°36'15.48"S 18°45'24.00"E	(-33.604300°S 18.756667°E)
F.	33°36'18.84"S 18°45'6.06"E	(-33.605233°S 18.751683°E)
G.	33°36'31.08"S 18°44'48.72"E	(-33.608633°S 18.746867°E)



Figure 2: Satellite view of the location of Site Alternative 1

The agricultural activities of the farm caused disturbance to the proposed footprint of this alternative through the transformation of the vegetation from natural occurring Fynbos to pasture. The mining of the sand from the proposed footprint area will therefore not necessitate the removal of fynbos. This is of high importance as the property falls within the Atlantis Sand Fynbos (FFd4) with Swartland Granite Renosterveld (FRg2) occurring immediately east of the site. Both of these vegetation types are considered Critically Endangered.

Site alternative 1 was selected as the preferred alternative for the following reasons:

- ◆ The proposed footprint area was previously disturbed by agricultural activities and no greenfield area needs to be disturbed
- ◆ No fynbos need to be disturbed in order to allow for the establishment of the sand mine.
- ◆ No drainage line, stream or river is present within the proposed footprint area.
- ◆ The existing access roads can be used to reach the proposed mining area

- ◆ The soil scientist concluded that:
 - ✓ adequate reserves of sand are available on-site for mining and rehabilitation.
 - ✓ the specialist further concluded that soils are sandy and the agricultural potential across the site is low to medium.
 - ✓ due to soil conditions, the land is fairly marginal for cultivation.
 - ✓ mining of the site can proceed, subject to the recommended mitigation measures provided.The specialist stated that if these measures are followed and effectively implemented, the agricultural potential of the land could be successfully rehabilitated to allow ongoing production.

Negative aspects associated with Site alternative 1 entails:

- ◆ The mining area will be lost to agricultural production for the duration of mining activity on them.
 - ✓ The soil specialist however stated that given the low to medium agricultural potential of the land and the fact that more than half of the area is not currently utilized for agriculture, the significance of this impact is low.
- ◆ The proposed mining area falls within 500 m from the drainage line and artificial wetland to the south of the mining area and requires Water Use Authorization in terms of Section 21(c) and (i) of the National Water Act, 1998.

Should the mitigation measures and monitoring programs 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.

Site Alternative 2 (S2):

The applicant also investigated the potential of sand mining from the more pristine area currently covered by fynbos within the boundaries of the following GPS coordinates:

- A. 33°35'52.26"S 18°44'38.78"E (-33.597851°S 18.744106°E)
- B. 33°35'31.69"S 18°44'33.86"E (-33.592136°S 18.742739°E)
- C. 33°35'35.53"S 18°45'21.11"E (-33.593204°S 18.755863°E)
- D. 33°35'54.06"S 18°45'27.67"E (-33.598349°S 18.757686°E)



Figure 3: Satellite view of the location of Site Alternative 2

This alternative was investigated as it will have a lower impact on the agricultural activities of the landowner, enabling him to continue the use of the adjacent pasture for grazing purposes. This option will however entail the removal of ±75 ha fynbos occurring within the footprint of the proposed mining area.

Positive aspects associated with Site alternative 2 include:

- ◆ The landowner will be able to continue his use of the adjacent pasture (Site alternative 1) during the operational phase of the mine.
- ◆ No drainage line, stream or river is present within the footprint area.
- ◆ The proposed mining area will be further than 500 m from the drainage line and artificial wetland to the south of the mining area. This will eliminate the need to apply for Water Authorization in terms of the National Water Act, 1998 as no activities will take place within 500 m of a wetland.

Negative aspects associated with Site alternative 2 entails:

- ◆ The mining of this area will entail the removal of ±75 ha indigenous fynbos from the footprint area. As mentioned earlier the property falls within the Atlantis Sand Fynbos (FFd4) vegetation

types that is considered Critically Endangered, and the removal of more than 70 ha fynbos is of high significance.

- ◆ The footprint area of S2 falls over two properties namely Morgenwagt 881/1 and Woodlands 874. Although Vlakfontein Familie Trust (Mr. Van Blerk) owns both properties, the applicant prefers the establishment of the entire mining area on a single property.
- ◆ Should S2 be approved as mining area, it will necessitate the construction of a new access road to reach the site.

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

Project Alternatives:

Various project alternatives were considered during the planning phase of the project. These included the following:

Activity Alternative 1 (A1): Strip mining vs Open-pit mining:

Strip mining is the practice of mining the desired mineral from a designated strip upon which the area is rehabilitated before mining moves to the next strip. Strip mining is only practical when the mineral is found near the surface.

Open-pit mining refers to the extraction of a mineral from the entire footprint of the approved mining area. Rehabilitation most commonly only commence at the end of the mining operation when the area has been mined-out and the site is closed.

Strip mining was identified as the preferred alternative for the following reasons:

- ◆ The sand sought by the applicant is found at surface level and no quarrying is needed.
- ◆ Strip mining has a much lower visual impact on the surrounding environment than quarrying as progressive rehabilitation is done throughout the operational phase. This ensures that the smallest possible disturbed area is open at any given time, where quarrying entails a large area that stays open until the rehabilitation stage.
- ◆ Due to progressive rehabilitation being done throughout the operational phase topsoil does not have to be stored as long as in the quarrying process and re-vegetation of the mined-out area can establish much faster.
- ◆ Strip mining also has the advantage that only a small section (last strip) needs to be rehabilitated at the end of the mining process and closure of the site.
- ◆ DWS support the strip mining method as it will minimize the impacts of surface runoff, infiltration and groundwater recharge.

Activity Alternative 2 (A2): Temporary Infrastructure vs Permanent Infrastructure:

Due to the small size of the proposed sand mining activity the use of a temporary container for office purposes with a chemical toilet will be sufficient to address the needs of employees on site. The use of temporary infrastructure firstly enables the applicant to move the infrastructure within the boundaries of the mining area as mining of the sand progresses. Secondly, the decommissioning phase is facilitated, as the removal of infrastructure from the mining area during the rehabilitation of the site is easy and highly effective.

Permanent infrastructure will entail the building of an office with ablution facilities on site. The use of permanent infrastructure will increase the impact of the proposed project on the environment as it will entail the establishment of more structures, necessitate the use of concrete products on site in order to establish these infrastructure, lengthen the period required for rehabilitation as well as increase the rehabilitation amount as the permanent infrastructure will either have to be decommissioned or be maintained after the closure of the site.

In the light of the above, the use of temporary infrastructure is deemed the most viable preferred alternative.

No-Go Alternative:

The no-go alternative entails no change to the status quo and is therefore a real alternative that needs to be considered. The sand to be mined at the site will be used for the building and construction industries, if however the no-go alternative is implemented the applicant will not be able to mine the sand, not being able to utilize the mineral present in the area. This could have major impacts on aspects such as transporting of material to construction sites from far off mining areas, cost effectiveness of material, impact on roads and road users due to long distance hauling of sand and loss of income to the Malmesbury and West Coast region.

The no-go alternative will result in a loss of income to the applicant as well as the landowner as he will not be able to diversify the operations on his property. The work opportunities to the proposed employees will be lost and the identified Skills and Development Training programme identified as LED project for the operation will not be implemented. This will reduce the possibility of unemployed youths receiving training in carpentry, plumbing, pottery, sewing and needlework. The economic income of the Malmesbury area that would be contributed by the mining operation, with regard to the sand being sold as well as local produce being bought, will also be lost if the application does not proceed.

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 attend 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).

An application for environmental authorisation was submitted in terms of NEMA, 1998 and the EIA Regulations, 2010 to the Department of Environmental Affairs and Development Planning on the 26th of November 2014. Initial public participation was done in terms of this application and the stakeholders, the landowner and I&AP's were notified of the proposed project.

Following the amendment of NEMA and the MPRDA on 8 December 2014 a mining right application for the project was lodged at DMR on the 4th of February 2015. A draft Scoping Report (DSR) was distributed to the stakeholders and I&AP's for their perusal over a 30 days commenting period ending on the 2nd of April 2015.

Subsequent to discussions with DMR it was decided that the Environmental Authorisation application submitted at DEA&DP-WC will be withdrawn as well as the first mining right application (WC 30/5/1/2/2/10065MR) submitted to DMR. A new mining right application was submitted to DMR that received WC 30/5/1/2/2/10067MR as reference number.

Due to these changes it was required that the public participation process be repeated through re-advertising, replacement of on-site notices and re-circulation of notification letter to I&AP and stakeholders. A Draft Scoping Report, with reference number WC30/5/1/2/2/10067MR, replaced the above mentioned DSR and was distributed to the stakeholders and I&APs for their perusal over a 30 days commenting period ending on the 20th of April 2015. The comments received on the DSR during the commenting period were incorporated into the Final Scoping Report approved by DMR on the 15th of June 2015.

In the light of the above mentioned consultation with DEA&DP and DMR the public participation process followed can be summarized as listed in the table below:

1. DEA&DP BASIC ASSESSMENT APPLICATION PUBLIC PARTICIPATION PROCESS:
The I&AP's and stakeholders were informed of the proposed project by means of direct communication as well as a background information document that was distributed for their perusal over a 40 days commenting period. This consultation was done in terms of the NEMA and the 2010 EIA regulations for the Basic Assessment Application that was lodged with DEA&DP.
2. DMR MINING RIGHT APPLICATION (WC 30/5/1/2/2/10065MR) PUBLIC PARTICIPATION PROCESS:
A draft Scoping Report was circulated to the I&AP's and stakeholders for their perusal over a 30 days commenting period ending on the 2 nd of April 2015.
3. DMR MINING RIGHT APPLICATION (WC 30/5/1/2/2/10067MR) PUBLIC PARTICIPATION PROCESS:
The project was again advertised, on-site notices were placed and a background information document (BID) with draft Scoping Report was circulated to the I&AP's and stakeholders for their perusal. The commenting period ended on the 20 th of April 2015.
All the comments received during the commenting periods were incorporated into the Final Scoping Report. Proof of the above mentioned correspondence was attached as Appendix 5.
The Draft Environmental Impact Assessment Report and Environmental Management Programme Report (EIAR) will be circulated to the registered I&AP's and stakeholders for their perusal. All comments received on the draft report will be included into the Final EIAR to be submitted for approval to DMR.

The I&AP's and stakeholders were informed of the proposed project through:

- ◆ telephonic discussions,
- ◆ direct communication with notification letters,
- ◆ placement of on-site notices, and
- ◆ placement of two advertisements in the Swartland Gazette.

The table below shows a list of the stakeholders and I&AP's initially informed of the project as well as the names of those that registered as interested parties:

I&AP'S & STAKEHOLDERS INFORMED OF THE PROPOSED PROJECT	I&AP'S & STAKEHOLDERS REGISTERED AS INTERESTED PARTIES ON THE PROJECT
<ul style="list-style-type: none"> ◆ CapeNature ◆ Cape West Coast Biosphere Reserve ◆ Department of Agriculture, Forestry and Fisheries ◆ Department of Economic Development and Tourism ◆ Department of Environmental Affairs and Development Planning ◆ Department of Labour ◆ Department of Mineral Resources ◆ Department of Social Development ◆ Department of Transport and Public Works ◆ Department of Water and Sanitation ◆ Heritage Western Cape ◆ Karsten Woodland Boerdery (Pty) Ltd (Surrounding landowner) ◆ Morgenwacht Sand Mine ◆ Mr EE Nel (Surrounding landowner) ◆ Mr SP van Blerk (Landowner) ◆ Mr J van Heerden (Surrounding landowner) ◆ Mr AM Voigt (Surrounding landowner) ◆ Mr L Vorster (Surrounding landowner) ◆ Rich Rewards Trading 11 (Pty) Ltd (Surrounding landowner) ◆ Swartland Local Municipality ◆ Swartland Local Municipality Ward Councillor (Ward 6) ◆ West Coast District Municipality 	<ul style="list-style-type: none"> ◆ CapeNature ◆ Cape West Coast Biosphere ◆ Department of Agriculture, Forestry and Fisheries ◆ Department of Environmental Affairs and Development Planning ◆ Department of Water and Sanitation ◆ Eskom ◆ Mr Van Blerk ◆ Mr Van Heerden ◆ Rich Rewards Trading (Pty) Ltd (Mr Levetan) ◆ Swartland Local Municipality ◆ West Coast District Municipality

The Draft EIA report will be distributed to the registered I&AP's and stakeholders for their perusal over a 30 days commenting period. The comments received on the Draft EIA report will be incorporated into the Final EIA report to be submitted for decision making to DMR.

The comments and response report with proof of the public participation process thus far is attached as Appendix F.

iii) Summary of issues raised by I&Aps

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

Interested and Affected Parties		Date Comments Received	Issues Raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.					
AFFECTED PARTIES					
Landowner/s					
Mr SP van Blerk (Landowner)	X	25 November 2014	Mr SP van Blerk has signed a landowner's agreement.	Greenmined and the applicant is in continuous discussions with the landowner.	See Appendix E for a copy of the landowner consent
Lawful occupiers/s of the land					
Mr Van Blerk is the only lawful occupier of the property.					
Landowners or lawful occupiers on adjacent properties					
Mr. L Vorster (Surrounding landowner)	X		No comments received		
Rich Rewards Trading 11 (Pty) Ltd (Surrounding landowner)	X	18 March 2015	<p>ENSAfrica submitted the following comments on behalf of their client Mr Olivier:</p> <ul style="list-style-type: none"> As you are aware, our client operates certain intensive poultry farming operation in the vicinity of the proposed site of the sand mining operation. These are clearly marked on the Google images which you have supplied to us and have annotated as "Poultry Infrastructure" thereon. The distances from the boundaries of the proposed mining area to our client's farms don't of itself pose a threat to our client's 	<p>Greenmined responded:</p> <ul style="list-style-type: none"> The comments received from Mr Levetan on behalf of his client, Rich Rewards Trading 11 (Pty) Ltd, was acknowledged and included into the Final Scoping Report. The concern with regard to trucks passing the Droogelaagte broiler farm causing an increase in dust particles and noise will be assessed in the EIA 	<p>Part A (iv)(1)(a) Physical Environment</p> <p>Part A (iv)(1)(viii) Mitigation measures</p> <p>Part A (u)(i)(1) Socio-economic conditions</p>

			<p>stringent bio-security concerns. However, the route that the mining trucks will follow as shown on the attached Google image which you supplied us with under cover of your e-mail dated 17 March 2015 does present a serious problem to our client's broiler farm, Droogelaagte.</p> <ul style="list-style-type: none"> ◆ By reference to the aforesaid Google image which you provided us with a copy of which is attached hereto marked "A" for ease of reference, this farm is the one that is alongside the tarred road which travels westwards to join the R304. It is our instructions that this tarred road is known as the Wellington Road. ◆ On our client's Droogelaagte boiler farm, our client has 12 chicken houses housing 424 800 broilers. The broilers spend a cycle of 33 days on the farm before they are removed for slaughter. The farm then remains open for cleaning purposes for approximately 10 days where after fresh 1 day old broiler stock is then placed in the chicken houses. Our client has 8 cycles a year on his farm. In addition, the farm contains a foreman's cottage and labourers cottages and 10 permanent employees reside thereon. ◆ In order to ensure the success of our client's farming operations on this farm and to prevent the spread of disease to the broiler chickens, our client has imposed a stringent system of bio-security. In this regard, we are instructed to highlight the following: <ol style="list-style-type: none"> 1. Our client's broiler farms are wholly reliant on an isolated and sanitised environment. 2. As stated above the broiler chicks are housed in 12 chicken houses on the farm and if any of these chicken houses should be affected by disease and wiped out simultaneously, the farm would effectively be out of production for two months, with a resultant economic loss to our client in the order of some R2.7 million. 3. The areas which are of utmost concern to our client may be grouped as follows: <ol style="list-style-type: none"> 3.1 The types of poultry diseases: <ol style="list-style-type: none"> 3.1.1 The diseases which are of concern to Country Fair may be group as follows: "Bacterial viral, mycoplasma, internal and external parasites". 	<p>report and mitigation measures will be proposed.</p> <ul style="list-style-type: none"> ◆ A copy of the Draft EIA report will be distributed to Mr Levetan for theirperusal and comments. 	
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3.1.2 These diseases are further grouped as follows:

Bacterial - Salmonella
- Haemophiles (Coryza)
- Ornithobacterium rhinotracheitis
- Pasterella

Viral diseases - Newcastle disease
- Infectious bronchitis
- Egg Drop Syndrome
- Infectious laryngotracheitis
- Infectious Bursal Disease
- Marek's Disease
- Fowl Pox
- Avian Encephalitis
- Reo Virus
- Pneumovirus
- Chicken Infectious Anaemia Virus
- Avian influenza

External Parasites - Red Mite
- Northern Fowl Mite
- Lice
- Fleas

Internal Parasites - Coccidiosis
- Worms

Mycoplasma - Mycoplasma gallisepticum
- Mycoplasma synoviae

3.1.3 The most common dangerous diseases are salmonella infection, Newcastle disease, mycoplasma infection and Avian influenza.

3.1.3.1 Salmonella infection:

- Salmonella is prevalent in rats and other animals, birds and humans.
- Salmonella is carried by rats, wild birds, humans and contaminated feed or water.
- Salmonella bacteria can kill 10-60% of susceptible chickens.

- Chickens infected with salmonella remain carriers of the infection and hence the only means of stopping transmission thereof is to slaughter the infected flock.
- Chickens which survive salmonella can remain infected and pass on the disease to consumers.
- Two types of salmonella have been known to cause death by human consumption of infected poultry.

3.1.3.2 Newcastle disease:

- Newcastle disease is prevalent in wild birds and poultry. It is carried by wild birds, domesticated birds and vectors such as human flies, insects, windborne dust, etc.
- Newcastle disease constitutes the most dangerous threat to poultry production in South Africa.
- The virus can cause 100% mortality and significantly reduces growth in surviving birds.
- Vaccinated birds that survived Newcastle disease frequently remain infected for weeks after recovery and constitute an uncontrollable source of infection which can result in an epidemic.
- Once infected, a poultry farmer would be required to slaughter his entire stock.

3.1.3.3 Mycoplasma infection:

- Mycoplasma infection is prevalent in avian species and carried most commonly by wild birds, poultry or rats, windborne and human/vehicles as vectors.
- Mycoplasma infection is chronic erosive disease.
- Mycoplasma can only be treated by eradicating the broiler stock.
- Mycoplasma infection is transmitted vertically, so a hen can pass on the infection to her eggs and thereafter to the hatching chicks.
- Mycoplasma can only be treated by eradicating the breeding stock, and

this will require months or years to eliminate its effect on breeding stock.

3.2 The threat of disease:

3.2.1 An outbreak of disease among the broiler chickens presents a great risk to commercial poultry farming.

3.2.2 The risk of infection is also a threat to our client's workforce and to the public at large. Certain diseases, such as Salmonella, can be transmitted from poultry products to humans causing severe illness and possible death. The abovementioned diseases can be present from the breeding stage through to the final marketable product without being detected and hence the critical need to prevent any infection at all. These diseases can, in turn, be transmitted back to the poultry.

3.3 Mandatory bio-security plan:

3.3.1 In light of the susceptibility of the broiler chicken stock to disease and their paramount importance to our client's operations, our client complies with a stringent bio-security plan to isolate its stock from disease. The two key elements of the bio-security plan are:

3.3.1.1 The distance between the broiler farms and any source of infection and

3.3.1.2 The human-entry procedures.

3.3.2 In terms of the human-entry procedures, no one is allowed on site without having had multiple showers and changes of clothing. All staff changes into a first set of protective clothing in an interim change room, approximately 100 – 150 metres from the site, leaving all personal clothing and effects behind. Thereafter, they proceed to their shower with soap and

			<p>shampoo and change into a second set of protective clothing before entering the sites.</p> <p>3.3.3 All vehicular access is strictly controlled and all vehicles are sprayed with disinfectants before entry onto the sites. Moreover, all equipment is disinfected before being brought onto the site. Electronic equipment that cannot be washed is fumigated for 30 minutes in a sealed container before being taken onto site.</p> <p>3.3.4 It is vital that a mandatory distance be maintained between the broiler chicken farms and any source of infection, as many poultry disease are carried by birds and by the wind, and by the increased levels of dust which will pass along the tarred road immediately in front of our client's chicken houses. Any airborne molecules, including dust, water, fog etc are a potential carrier of disease. Dust particles attach these molecules and are thereafter spread by the wind which vectors the disease-laden carrier onto our client's sites.</p> <p>3.3.5 For this reason, the broiler chicken farms are usually located in the most remote places possible and this apparent from Annexure "A".</p> <p>4. As indicated above, the distance between the proposed mining site and our client's farms is such that the mining activities on the site will not compromise our client's stringent bio-security measures. However, in your e-mail to use of 17 March 2015, you indicated that the gravel farm road indicated on Annexure "A" will be used by the mining trucks and that at the intersection of the gravel road with the tarred road, the trucks will either turn left going towards Wellington or right going towards the R304. It is the trucks turning to the right towards the R304 that will pass our client's Droogelaagte farm and this will increase</p>	
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			<p>the risk of dust particles being sprayed or blown towards the chicken houses. In addition the increased noise levels will have a negative affect particularly on the young broiler chickens.</p> <p>5. Our client will have no difficulty with the mining rucks turning left at the intersection of the gravel road and the tarred road and proceeding towards Wellington and would request the authorities in approving the Environmental Authorisation and Mining Right to specify this route as a Condition of Approval. Our client would object to the trucks turning right at this intersection and passing their Droogelaagte farm.</p> <p>6. Our client accepts that there are many trucks using the tarred road passing in front of its farm, including some sand mining vehicles from other sand mining operations in the area but the extent of the anticipated operations upon which the sand is to be mined are such that there will be a significant increase in the movement of large trucks from the site which up to now is absent. In paragraph 2.6. of the Draft Scoping Report it is indicated that some 20 to 25 trucks per day will transport sand from the site and it is this increase of trucks along the road passing in front of our clients Droogelaagte farm that is a major concern to it.</p> <p>7. To the extent highlighted herein, our client takes issues with the statement contained in paragraph 4.1 of the Draft Scoping Report to the effect that the proposed mining activities are not expected to have an impact on our client's poultry farming operations.</p>		
Mr J van Heerden (Surrounding landowner)	X		Mr van Heerden registered as I&AP on the project, but no additional comments was received to date.		
Mr EE Nel (Surrounding landowner)	X		No response received.		
Mr AM Voigt (Surrounding landowner)	X		No response received.		

Karsten Woodland Boerdery (Pty) Ltd (Surrounding landowner)	X		No response received.		
Municipal councillor	X		No response received.		
Municipality	X	31 March 2015	<p>The West Coast District Municipality responded with the following comments:</p> <ul style="list-style-type: none"> ◆ The WCDM supports the sustainable mining of sand required for the construction industry. The construction industry is an important economic sector in the West Coast, accounting for a 7.5% contribution towards District GDP. Furthermore, given the site's proximity to the Cape Metropole and surrounding towns (i.e. Paarl, Stellenbosch, etc.) the proposed mine will also benefit the greater region. ◆ However, any negative impacts associated with sand mining should be properly mitigated. In this regard, all activities must conform to the requirements of a duly approved EMPr. ◆ Rehabilitation measures to be included in the EMPr should ideally be determined in conjunction with CapeNature and the Provincial Department of Agriculture to ensure that the land is suitable for agricultural purposes upon mine closure. ◆ All legislative requirements must be met and the EAP's attention is drawn to the provisions of the Land Use Planning Ordinance (Ord 15 of 1985) in terms of which the relevant local authority must approve a change in land use prior to the commencement of any mining activities. No mining is allowed without the explicit approval of Swartland Municipality in terms of said Ordinance. 	<p>Greenmined Response:</p> <ul style="list-style-type: none"> ◆ The comments of the WCDM were added to the Final Scoping Report and the mitigation measures of negative impacts associated with the project will be discussed in the EIA report. ◆ CapeNature and the Provincial Department of Agriculture are registered as stakeholders on the project. ◆ The applicant is aware of the requirements in terms of the Land Use Planning Ordinance and an application will be submitted to the Swartland Municipality to commencement of mining. 	Part A(iv)(1)(b) Description of the current land uses
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA, etc	X				

Cape West Coast Biosphere Reserve	X		No response received.		
CapeNature	X	19 February 2015	<p>CapeNature submitted the following comments:</p> <ol style="list-style-type: none"> 1. CapeNature notes that the application is for the mining of approximately 92ha on a portion of the Farm Woodlands No. 874. Our comments refer to the mining area as indicated in the map provided in the BID as “the site”. 2. The site was historically covered by Atlantis Sand Fynbos with Swartland Granite Renosterveld occurring immediately east of the site. Both of these vegetation types are considered Critically Endangered. However, the proposed mining site has been largely transformed by agriculture and there is very little natural vegetation remaining on site. 3. Although the proposed mining site has no significant natural vegetation remaining, it must be noted that the area north of the site and an area south-east of the site are still covered by natural vegetation and there are several known localities of Species of Conservation Concern (SCC) within these areas. These areas have been determined as Critical Biodiversity Areas (CBAs). The natural area to the north, known as “Vlakfontein” was identified approximately 10 years ago as a CAPE Lowlands Renosterveld - West Coast Core Site as well as 100% Irreplaceable through the C.A.P.E plan of 2002. It was included as one of the priority sites to be pursued through Stewardship and was part of the 5-year plan at the time but due to various difficulties and the development threat being subdued at the time, CapeNature had to step back to focus on other priorities in the area. However Vlakfontein remains a priority site as no other site that has been secured in the area thus far, presents us with a similar representation of biodiversity as is contained within the boundaries of Vlakfontein. CREW have also carried out several investigations on the site and have consistently added to the list of rare and endangered species found on site over the last few years. The remaining natural area on Farm 875 and 881/1 area should be safeguarded and formally protected through CapeNature’s stewardship programme before any 	<p>Greenmined responded:</p> <ul style="list-style-type: none"> ◆ The geohydrologist was appointed and conducted the requested study. The findings and recommendations of the specialist were included in the Draft EIA report. A copy of the draft EIA report will be circulated for perusal by all stakeholders and registered I&AP’s. ◆ The proposed buffer areas were added as mitigation measures to be implemented on site during the site establishment, operational and decommissioning phases. 	<p><u>Geohydrology:</u></p> <ul style="list-style-type: none"> ◆ Part A(1)(g) Motivation for the preferred development footprint ◆ Part A(iv)(1)(a) Physical Environment ◆ Part A(1)(x) Motivating the alternative development ◆ Part A(1)(g) Motivation for preferred development footprint ◆ Part A(1)(j) Summary of specialist reports. <p><u>Buffer Areas:</u></p> <ul style="list-style-type: none"> ◆ Part A(iv)(1)(a) Biological Environment ◆ Part A(iv)(1)(c) Specific Environmental Features ◆ Part A(viii) Possible Mitigation Measures

			<p>further disturbance or development is allowed in the surrounding area.</p> <p>4. The streams on site are non-perennial and heavily impacted by agriculture. Nevertheless, they still have some limited ecological functioning in terms of providing ecological corridors and they have therefore been determined as Ecological Support Areas. An opinion should be obtained from a geohydrologist and/or hydrologist as to how the removal of sand will impact on runoff and infiltration. The presence/absence of seasonal wetlands and seepage areas must be confirmed and if any are present on site, they must be demarcated as no-go areas.</p> <p>5. A buffer of at least 20 metres must be allowed for between the mining site and the adjacent natural areas. A buffer of at least 10 metres should be provided between mining activities and the edge of the streams and riparian vegetation should not be impacted on in any way. Note that larger buffer areas may be required for wetlands and seepage areas should any occur within the proposed mining site.</p>		
Department of Agriculture, Forestry and Fisheries	X		No response received.		
Department of Water and Sanitation	X	18 February 2015	<p>DWS responded with the following comments:</p> <p>The Department is concerned that the groundwater level is relatively shallow and there is uncertainty on the seasonal groundwater fluctuations. More information is needed before the application can be supported. The proposed mining operations will entail the removal of sand at an average depth of approximately 1.5 meters. The depth to groundwater in an un-mined state is at approximately 1.69 meters. These measurements were taken by the Department at the end of the summer season. Seasonal water level fluctuations are absent from the report as water levels is expected to rise in winter and be even closer to the surface.</p> <p>The Department's groundwater section supports the strip mining method, as this will minimize the impacts of surface runoff, infiltration and groundwater recharge.</p> <p>The Department would like to recommend that following</p>	<p>Greenmined responded:</p> <p>The recommended conditions of DWS were added to the Draft EIA report to ensure compliance of the applicant during the mining activities:</p> <ul style="list-style-type: none"> ◆ A geohydrologist will be appointed to monthly monitor the water levels in the mining area. The frequency will be increased should the specialist deem it necessary. ◆ The geohydrologist will compile the monitoring program and assess the mining impacts once data for groundwater levels and fluctuations across the site is available. ◆ This report will be submitted to DWS for their perusal and commenting. ◆ Any additional conditions proposed by DWS upon review of the monitoring 	<ul style="list-style-type: none"> ◆ Part A(1)(g) Motivation for preferred footprint ◆ Part A(iv)(1)(a) Physical Environment ◆ Part A(viii) Possible Mitigation Measures ◆ Part A(1)(j) Summary of specialist reports

			<p>conditions must be adhered to during the mining activities:</p> <ul style="list-style-type: none"> ◆ A geohydrological assessment of potential mining impacts is required once data for groundwater levels and fluctuations across the site are available. The report must address potential impacts on groundwater interactions with surface water. ◆ A monitoring program must be established to measure the water levels at least monthly. A higher frequency is preferable during the high rainfall winter months when the water table is potentially at its highest. The readings must be recorded against date and time. ◆ The application can be considered once sufficient water level fluctuation data are available (at least 1 year). ◆ The Department would request that the data for the report and the monitoring be made available to the Department annually. ◆ A reasonable buffer needs to be determined by this Department above the highest water level once water level fluctuation data is obtained to limit impact on groundwater flow and storage character as well as limit groundwater contamination. ◆ If, the mining activities go below the water level, dewatering may be required, which would necessitate a water use license from DWS. ◆ Every precaution should be taken to prevent groundwater contamination, as groundwater is very difficult and almost impossible to remediate. Thus, the precautionary principle would apply. ◆ Consideration should be taken about the proposed future use of the land after mine closure, as this would have an impact on the mining activity and management. It also has the potential to impact on groundwater. ◆ Closure and post closure impact must be assessed and mitigation actions must be implemented. ◆ Clarity must be provided to this Department whether a field hydrocensus within a 2 km radius was conducted at this site (which must include groundwater users, what they use the water for, water quality and water level measurements). 	<p>program will be implemented on-site.</p> <ul style="list-style-type: none"> ◆ Should the mining activities go below the water level, an application for a dewatering water use license will be submitted to DWS. ◆ The precautionary principle will be strictly applied on-site to prevent contamination of groundwater. ◆ The rehabilitation of the mining area will be done as stipulated by the soil specialist in order to ensure the effective end-use of the mining area. ◆ To date no field hydrocensus within a 2 km radius was conducted. 	
Eskom	X	7 July 2015	<p>Eskom responded that the application affects the Malmesbury/Prospect Hill 132kV and Klipheuwel 11kV overhead power lines and submitted the following comments:</p> <ul style="list-style-type: none"> ◆ Eskom does not support the proposed establishment of sand mining within Eskom servitudes. The servitude widths on either side of centerline of overhead power lines are 15.5m for 132kV lines and 	<p>The applicant responded as follows:</p> <ul style="list-style-type: none"> ◆ No mining will be done within the servitude areas of either the 132kV or the 11kV overhead power lines. A buffer area of 16 m either side of the centerline of the 132kV power line will be demarcated and maintained. 	<ul style="list-style-type: none"> ◆ Part A(1)(g) Motivation for preferred footprint ◆ Part A(iv)(1)(c) Specific Environmental

			<p>9.0m for 11kV lines.</p> <ul style="list-style-type: none"> ◆ Natural ground level must be maintained within Eskom reserve areas and servitudes. ◆ Any rerouting or relocation of Eskom power lines and infrastructure would be for the cost of the applicant. ◆ That Eskom rights or servitudes, including agreements with any of the landowners, obtained from the operation and maintenance of these existing power lines and infrastructure be acknowledged and honoured through its lifecycle which includes but are not limited to: <ul style="list-style-type: none"> ✓ Having 24 hour access ✓ To perform maintenance on its infrastructure according to its maintenance programmes ✓ To upgrade or refurbish its existing power lines and infrastructure as determined by Eskom ✓ To perform any other activity not listed above to ensure the safe operation and maintenance of the Eskom power line or infrastructure ◆ No construction work may be executed closer than 6 meters from any Eskom structure or structure-supporting mechanism. ◆ No work or machinery nearer than 3.8m for 132kV or 3.0m for 11kV lines to conductors. ◆ No blasting or use of explosives within 500m of the power line. ◆ A minimum ground clearance of 7.5m to 132kV and 6.3m to 11kV lines must be maintained. ◆ Eskom must have at least a 10m obstruction free zone around all pylons. ◆ Any development which necessitates the relocation of Eskom's services will be to the account of the developer. This application must be made at least 6 months in advance. ◆ No work is allowed within Eskom reserve areas and servitudes. ◆ Eskom shall not be liable for the death or injury of any person, or for loss of or damage to any property, whether as a result of the encroachment or use of the area where Eskom has its service, by the applicant, his/her agent, contractors, employees, successors in title and assignee. ◆ The applicant indemnifies Eskom against loss, claims or damages, including claims pertaining to interference with Eskom services, apparatus or otherwise. 	<p>Similarly, a buffer area of 10 m either side of the centerline of the 11kV power line will be maintained on-site.</p> <ul style="list-style-type: none"> ◆ No sand mining will be done within the buffer areas and the natural ground level will be maintained. ◆ No rerouting of any Eskom power lines or infrastructure will be required. ◆ The applicant takes note of the Eskom rights, servitudes and agreement with the landowner and will honor the agreements throughout the operational phase of the project. ◆ Due to the proposed buffer areas (32 m around the 132kV power line and 20 m around the 11kV power line) no work will be executed closer than 6 m from any Eskom structure and no machinery will work nearer than 3 m to any conductors. ◆ No blasting will be required at the mining site. ◆ No machinery will work within the above mentioned buffer areas and thus the stipulated ground clearance will be maintained. ◆ Eskom will have at least a 10 m obstruction free zone around all pylons. ◆ The applicant takes note of the indemnity clause stipulated by Eskom. 	<p>Features</p>
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Communities					
Department of Economic Development and Tourism	X		No response received.		
Department of Social Development	X	5 February 2015	DSD responded on the 5 th of February that they have no comment on the project.		
Department of Transport and Public Works	X		No response received.		
Department of Labor	X	5 February 2015	<ul style="list-style-type: none"> ◆ DoL responded on 6 February 2015 that the BID has been forwarded to OHS for their perusal. ◆ To date no response has been received. 		
Dep. Land Affairs	N/A		The Department of Land Affairs were not contacted as the property is privately owned by Mr Van Blerk.		
Traditional Leaders	N/A				
Dept. Environmental Affairs	X				
Department of Environmental Affairs and Development Planning	X	31 October 2014 13 October 2014 26 November 2014 17	<ul style="list-style-type: none"> ◆ A downgrade application was submitted to DEA&DP on 31 October 2014 that was approved on 13 November 2014. ◆ An application for BA was submitted on 26 November 2014 that was acknowledged on 17 December 2014 and provided with 16/3/1/1/F5/1/6/3063/14 as reference number. ◆ The application was withdrawn on 3 March 2015 to prevent the duplication of approval processes at DEA&DP and DMR subsequent to the amendment of 		

		<p>December 2014</p> <p>3 March 2015</p> <p>18 March 2015</p> <p>02 June 2015</p>	<p>NEMA and the MPRDA.</p> <p>DEA&DP submitted the following comments on the 18th of March 2015:</p> <ul style="list-style-type: none"> ◆ You are hereby informed that this Department will provide comment on the Scoping Report for the mining right as administered by the Department of Mineral Resources (“DMR”) on receipt of an official request from DMR. ◆ Further note that comments on the proposed development will be provided directly to the DMR and copied to you on receipt of a document from the DMR. ◆ This Directorate thus awaits the relevant documentation with respect to your proposed development from the DMR for commenting purposes. <p>Below a summary of the comments submitted by DEA&DP to DMR on the 2nd of June 2015 is listed:</p> <ul style="list-style-type: none"> ◆ The draft Scoping Report does not comply with regulation 28(1)(a)(i)(ii), (f), (n) of GN No. R. 542 of the NEMA, 1998 EIA Regulation of 2010, because there are no details of the EAP who prepared the report and expertise of the EAP to carry out scoping procedures in the draft scoping report submitted to the Department. ◆ You are reminded that a Plan of Study for EIA, which set out the approach to the EIA phase, must be included in the final Scoping Report. ◆ Please ensure that each specialist report that is to be submitted complies with the requirements of Regulation 32(3) of the EIA Regulations of 2010. ◆ The department recommends that the applicant be requested to meet the requirements of CapeNature with regard to the proposed buffer areas in the Final Scoping Report. ◆ The draft Scoping Report does not indicate how much sand will be mined and the footprint or extent of the area to be cleared. ◆ The EIA report must contain all the information outlined in Regulation 31(2) of the NEMA, 1998 EIA Regulations of 2010. 		
Other Competent Authorities affected					
Heritage Western Cape	X	3 March 2015	Heritage Western Cape responded with the following comments:	The condition will be added to the mitigation measures proposed in the EIAR and EMPr.	◆ Part A(iv)(1)(a) Human

			<ul style="list-style-type: none"> ◆ You are hereby notified that since there is no reason to believe that the proposed sand mining will impact on heritage resources, further processes under Section 38 of the National Heritage Resources Act (Act 25 of 1999) does not apply. ◆ However should any evidence of human burials be discovered during the execution of the activities above, all works must be stopped immediately and Heritage Western Cape be notified without delay. 		Environment
Swartland Local Municipality	X	26 March 2015	<p>The Swartland Municipality responded with the following comments:</p> <ul style="list-style-type: none"> ◆ Portion 2 of the farm Woodlands no 874, Division Malmesbury is zoned agricultural zone 1 in terms of the Swartland Integrated Zoning Scheme Regulations of Ordinance 15 of 1985. ◆ Agriculture zone 1 has agriculture as primary use. ◆ Agriculture zone 1 can also accommodate the following consent uses (can only be obtained with special permission from Council), including: additional dwelling unit, guesthouse, tourist facility, farm shop, farm stall, aquaculture, intensive stock farming, horticulture, nursery, riding school, service trade, mining, 4x4 route, commercial pet kennel, bed & breakfast establishment, conservation usage, agri-village, composting, racing track, boat launching facility, conference facility, exhibition centre, transmission tower, rooftop base station, renewable energy structure. ◆ Please note that an applicable land use application for the sand mining needs to be made in terms of the Swartland Integrated Zoning Scheme Regulations of Ordinance 15 of 1985 and that no mining activities may commence without all relevant approvals. ◆ Also, please note that the social and labour plan of the proposed project needs to address the identified needs as per the Integrated Development Plan (IDP) of Swartland Municipality. 	<p>Greenmined responded:</p> <ul style="list-style-type: none"> ◆ The applicant is aware of the requirements in terms of the Land Use Planning Ordinance and an application will be submitted prior to commencement of mining. ◆ The Local Economic Development project proposed as part of the Social and Labour Plan was derived at following discussions with the Swartland Municipality in order to ensure its alignment with the needs identified in the IDP. 	<ul style="list-style-type: none"> ◆ Part A(iv)(1)(b) Current Land Uses

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

(1) Baseline Environment

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

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

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 sand mining activity.

A detailed site selection and sensitivity analysis were conducted for the proposed sand mining project and it was indicated that the proposed site (Site alternative 1) is the preferred and acceptable development area. A comprehensive Environmental Management Programme (EMPr) has been developed and need to be implemented to mitigate and minimise the impacts during the site establishment/construction and operational phases.

PHYSICAL ENVIRONMENT

Rainfall:

The Malmesbury area receives an average of 237 mm of precipitation per year. The highest amount of rainfall usually occurs in June and July averaging 39 mm each, while the lowest occurs in January and February with an average of 3 mm. The Malmesbury weather station is situated closest to the farm Woodlands.

Air and Noise Quality:

The air and noise ambiance of the study area is representative of that of an agricultural environment in which farming equipment operates with occasional high dust emissions from denuded areas. The traffic on the R304 and surrounding roads also contribute to air and noise emissions.

As the sand mining will not require any blasting or crushing to be done the expected impact of the activity on the air quality is deemed to be low. If needed dust suppression will be implemented on the gravel access roads to be used by the trucks transporting sand from the site.

The noise impact of the proposed mining activity is deemed to be of low significance as sand will be excavated and directly loaded onto trucks transporting it from the site. The mining activity will contribute the noise generation of one Excavator and approximately 20 - 25 trucks per day. The noise impact of the proposed activity is expected to be representative of the traffic travelling along the R304.

A potential impact from trucks travelling to and from the mining site, has been identified that may have a negative impact on some of the surrounding land uses (poultry farming in particular). This impact will need mitigation in order to reduce/prevent mining activity impacting negatively on the surrounding environment.

Topography:

The topography of the area can be described as moderately undulating to flat sand plains. The altitude of the proposed mining area lays between 184masl at the eastern boundary and 150masl at the western mine boundary. Further to the north-east the altitude increases to approximately 670masl at the top of Paardenberg.

Geology and Soil:

The geology of the site is Quaternary quartz sand of the Springfontein Formation, covering greywacke and phyllite of the Moorreesburg Formation, Malmesbury Group. The soils are generally deep sands overlaying clay. They have a slightly darker topsoil horizon underlain by bleached light colored or yellow sand, and are predominantly of the Fernwood soil form, as classified by the South African soil classification system. There is podzolisation in certain profiles. This gives a fairly dark brown horizon in the subsoil, and such soils are classified as Lamotte soil form. Where the clay is shallower, the soil form is classified as Kroonstad. The depth to the clay below surface is generally 3 meters but is shallower in some places.

The soils are limited by the 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 as >3 - <5 out of 10 according to the system used by Western Cape soil scientists. The area is classified on Cape Farm Mapper as having a Dryland Potential Index of high and a land capability of Class III, moderate potential arable land. However, the sandy soils of the specific site decrease its agricultural potential.

Surface and Groundwater:

The proposed mining area will be more than 100m from any natural water source. The streams on the farm are non-perennial and heavily impacted by agriculture. The streams however still have some limited ecological functioning in terms of providing ecological corridors and have therefore been determined as Ecological Support Areas. The proposed mining area falls within 500 m of a drainage line and artificial wetland to the south and requires Water Use Authorization in terms of Section 21(c) and (i) of the National Water Act, 1998.

A geohydrologist found that the site consist of unconsolidated sands overlying granite. Groundwater is used in the area, and is usually abstracted from a fractured aquifer, with generally low yields (0.1 – 0.5 L/s). Recharge of the groundwater takes place through infiltration of rainwater through the unconsolidated sand deposits. The water level in the unconsolidated sands overlying the granite was measured at 3 locations on the site. The deepest measurement was measured in the south east of the site, and was 2.37 mbgl. The water levels at PZ3 and

PZ4 were both less than 2 m below ground level. Groundwater levels generally have a seasonal fluctuation, and these measurements were taken in summer. The water levels are expected to increase in winter, and be closer to the surface.

In order to avoid impacting on infiltration, groundwater recharge and flow, the Department of Water and Sanitation (DWS) generally stipulates that sand mining not be allowed within 1.5 m of the shallow groundwater level.

The background information document states that due to the sandy geology of the area, rainwater that falls directly on the mining site will effectively soak away eliminating the risk for soil erosion. However, if mining is undertaken within 1.5 m of the water table, the scope for infiltration to the aquifer is reduced, and the potential for erosion damage is increased.

The groundwater flow on the site is expected to generally follow topography, and flow towards the topographical low points adjacent to the site. If mining is undertaken within 1.5 m of the water table, the impacts of evapotranspiration are expected to increase which would reduce groundwater flow toward the nearby channel. The specialist concluded that groundwater levels are relatively shallow, even though measurements were taken at the end of the low rainfall season. Groundwater levels generally have a seasonal fluctuation, and these measurements were taken in summer. The water levels are expected to increase in winter, and be closer to the surface. The sand mining will inevitably change infiltration rates and thus runoff rates, however the negative impact of erosion can be decreased greatly if rehabilitation is successful by conducting both mining and rehabilitation in the summer months before any major rainfall events occur.

The above mentioned information was provided to the Department of Water and Sanitation (DWS) and although they responded that more information is needed before the application can be supported they also stated that they do support the strip mining method as it will minimize the impact of surface runoff, infiltration and groundwater recharge. DWS found the groundwater depth in the un-mined state to be approximately 1.69 meters (end of the summer season). In the light of the above mentioned it is proposed that the applicant mine the area up to the clay level as stipulated by the soil scientist and conduct monthly geohydrological assessment of the impact of the mine on the groundwater interactions with surface water. At the end of the first year it is proposed that the geohydrological assessment report be submitted to DWS for further consideration. The applicant will comply with the buffer area above the highest water level to be determined by DWS once water level fluctuation data has been obtained.

BIOLOGICAL ENVIRONMENT

Groundcover:

Historically the area was covered by Atlantis Sand Fynbos (FFd4) with Swartland Granite Renosterveld (FRg2) occurring immediately east of the site. Both of these vegetation types are considered Critically Endangered. However the footprint of the proposed mining area has

previously been disturbed by the agricultural activities of the farm transforming the vegetation of the area from natural occurring Fynbos to pasture. The mining of the sand from the proposed footprint area will therefore not necessitate the removal of fynbos.

CapeNature highlighted that although the mining site has no significant natural vegetation remaining, the area north of the site and an area south-east of the site are still covered by natural vegetation and there are several known localities of Species of Conservation Concern (SCC) within these areas. These areas have been determined as Critical Biodiversity Areas (CBAs). The natural area to the north, known as "Vlakfontein" was identified approximately 10 years ago as a CAPE Lowlands Renosterveld - West Coast Core Site as well as 100% Irreplaceable through the C.A.P.E plan of 2002. It was included as one of the priority sites to be pursued through Stewardship and was part of the 5-year plan at the time but due to various difficulties and the development threat being subdued at the time, CapeNature had to step back to focus on other priorities in the area. However Vlakfontein remains a priority site as no other site has been secured in the area thus far, presents with a similar representation of biodiversity as is contained within the boundaries of Vlakfontein. CapeNature proposed that a buffer area of at least 20 metres must be allowed for between the mining site and the adjacent natural areas.

Fauna:

No resident fauna were noticed within the boundaries of the proposed mining site. The farmer currently utilise the area for sheep grazing with small game species such as duiker and steenbok moving periodically through the area. The proposed sand mining will not impact on the fauna as they will be able to move away or through the work area without being harmed. The proposed strips of the mining area will not be deep as mining will only be done up to the clay level allowing accidentally trapped fauna easy exodus.

HUMAN ENVIRONMENT:

Cultural and Heritage Environment:

According to discussions with the landowner the property has been farmed for at least three generations. The particular area earmarked for the mining of the sand was transformed from fynbos to pastures and used for the grazing of stock.

During a desktop study several archaeological impact assessments were found for the Malmesbury area as the town was identified as a core area for industrial, commercial and residential development. The studies indicated that the area is not an area of pre-colonial archaeological importance. According to one study (ACRM, 2008) this fact is attributed to the region being characterised by intensive agriculture activities for more than 100 years and that the archaeological landscape has already been largely destroyed. In this light no potential impact on heritage resources could be identified.

A Notification of Intent to Develop was submitted to Heritage Western Cape (HWC) (8 February 2015) for their input. HWC responded that since there is no reason to believe that the proposed

sand mining will impact on heritage resources further processes under Section 38 of the National Heritage Resources Act (Act 25 of 1999) does not apply. However, should any evidence of human burials be discovered during the execution of the activities above, all works must be stopped immediately and HWC be notified without delay.

Socio-Economic Environment:

The proposed sand mine is situated within the West Coast District under the Swartland Local Municipality. According to the 2011 census, the municipality has a population of 113 762 with Malmesbury contributing 25 176 to the total.

Malmesbury is the largest in the Swartland Local Municipality. The area is especially known for its grain and wine cultivation as well as sheep and poultry farming. A total of 40 651 people are economically active (employed or unemployed but looking for work) and of these 15% are unemployed. The economically active youth (15 - 34 years) in the area total 18 248 of which 17.9% are unemployed. The key economic activity in the area is in the primary sector. The contribution per sector in the Swartland Municipal area is as follows:

◆ Agriculture	-0.33%
◆ Mining	-28.35%
◆ Manufacturing	-1.59%
◆ Electricity, gas and water supply	3.05%
◆ Construction	6.53%
◆ Wholesale and retail trade	2.76%
◆ Transport, storage, communication	0.96%
◆ Financial, insurance, real estate	14.60%
◆ Community, social, personal services	-1.00%

The sand to be recovered from the mining area will be sold locally within the Western Cape region as filling and building sand. As sand mining was previously done on the farm, it is known that a market for this mineral exists in the area.

The West Coast District Municipality (WCDM) responded that they support sustainable mining of sand required for the construction industry, as the industry is an important economic sector in the West Coast accounting for a 7.5% contribution towards District GDP. WCDM furthermore stated that given the site's proximity to the Cape Metropole and surrounding towns (i.e. Paarl, Stellenbosch, etc.) the proposed mine will also benefit the greater region.

A recent survey done by Swartland Municipality identified the following training needs:

- ◆ Carpentry
- ◆ Plumbing
- ◆ Pottery
- ◆ Sewing and Needlework

With this in mind, the applicant identified a Skills Development Training programme as the LED project for the operation. The municipality will head the project. The municipality will use their database of unemployed youth to identify and select the candidates to be educated. The project will be implemented over two periods of five years each.

(b) Description of the current land uses

Portion 2 of the farm Woodlands 874 is situated in a rural setting surrounded by other farming properties. The property is approximately 15km south of Malmesbury along the R304. Although sections of the farm have previously been used for sand mining purposes the bulk of the income is generated from agricultural activities.

The land use of the surrounding properties mainly consists of agriculture with some of the following specialized uses:

- ◆ Poultry farming >900 m from the proposed mining area

Various poultry farms border the proposed mining area to the north, east and south. The broiler houses of Country Fair to the north of the proposed mining area is approximately 900 m from the site with the broiler houses to the south (Droogelaagte) being approximately 1.7 km from the site.

A potential impact from trucks travelling to and from the mining site, has been identified that may have a negative impact on the poultry houses of Droogelaagte. This impact will need mitigation in order to reduce/prevent mining activity impacting negatively on the surrounding land use.

- ◆ Conservation >2 km from the proposed mining area

The Paardenberg Conservation Area borders the property to the north. The natural area to the north, known as "Vlakfontein" was identified approximately 10 years ago as a CAPE Lowlands Renosterveld - West Coast Core Site as well as 100% Irreplaceable through the C.A.P.E plan of 2002. Several Species of Conservation Concern are found within the natural vegetation areas and protection of natural areas are therefore of the utmost importance.

The proposed mining area will be established over a footprint area from which natural vegetation was removed in order to establish pastures and will therefore not have an impact on any of the identified natural areas.

- ◆ Sand mining >4 km from the proposed mining area

Sand mining is a common practice in the Malmesbury region. Morgenwacht Sand Mine borders the R304 to the west of the proposed mining activities of the applicant.

- ◆ Wine production/sales >4 km from the proposed mining area

Perdeberg Winery is approximately 4 km from the proposed mining area.

It is expected that the proposed mining method will have a very low impact on the surrounding environment as activities will be contained within the boundaries of the site and will entail the removal of the sand with an excavator loading it directly onto tipper trucks transporting it from site. The mining activity will not require blasting, crushing or washing of sand to be done. The mining site will require three to four workers to be employed at the site that will daily be transported to site. The mining area will not require the building of any permanent structures.

Swartland Local Municipality (SLM) confirmed that Portion 2 of the farm Woodlands no 874 is zoned agricultural zone 1 in terms of the Swartland Integrated Zoning Scheme Regulations of Ordinance 15 of 1985. Agricultural zone 1 has agriculture as primary use. SLM stated that an applicable land use application for sand mining needs to be made in terms of the Swartland Integrated Zoning Scheme Regulations of Ordinance 15 of 1985 and that no mining activities may commence without all relevant approvals.

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

SPECIFIC ENVIRONMENTAL FEATURES

Vegetation:

The site was historically covered by Atlantis Sand Fynbos with Swartland Granite Renosterveld occurring immediately east of the site. Both of these vegetation types are considered Critically Endangered. However the proposed mining site has been largely transformed by agriculture and there is very little natural vegetation remaining on site.

However, CapeNature highlighted that the area north of the site and an area south-east of the site have been determined as Critical Biodiversity Areas (CBAs). The natural area to the north, known as "Vlakfontein" was identified approximately 10 years ago as a CAPE Lowlands Renosterveld - West Coast Core Site as well as 100% Irreplaceable through the C.A.P.E plan of 2002. It was included as one of the priority sites to be pursued through Stewardship and was part of the 5-year plan at the time but due to various difficulties and the development threat being subdued at the time, CapeNature had to step back to focus on other priorities in the area. Vlakfontein remains a priority site as no other site that has been secured in the area thus far, presents with a similar representation of biodiversity as is contained within the boundaries of Vlakfontein. CREW have also carried out several investigations on

the site and have consistently added to the list of rare and endangered species found on site over the last few years. CapeNature proposed that a buffer area of at least 20 metres must be allowed for between the mining site and the adjacent natural areas.

Hydrology:

Although the streams on site are non-perennial and heavily impacted by agriculture. They still have some limited ecological functioning in terms of providing ecological corridors and are therefore determined as Ecological Support Areas. CapeNature proposed that a buffer of at least 10 metres be provided between mining activities and the edge of the stream.

The water use license, for mining within 500 m of a wetland, needs to be approved by DWS.

DWS found the groundwater depth in the un-mined state to be approximately 1.69 meters (end of the summer season). In order to mitigate the impact on the groundwater level it is proposed that the applicant mine the area up to the clay level as stipulated by the soil scientist and conduct monthly geohydrological assessment of the impact of the mine on the groundwater interactions with surface water. At the end of the first year it is proposed that the geohydrological assessment report be submitted to DWS for further consideration. The applicant will comply with the buffer area above the highest water level to be determined by DWS once water level fluctuation data has been obtained.

Should mining go below the water level, a water use license application for the dewatering of the mining area should be submitted and approved by DWS.

Existing Infrastructure:

As the proposed footprint area is currently used for grazing purposes, no buildings or similar infrastructure exists within the boundaries of the mining area or within a 1 km radius that could be impacted by the proposed activity.

The Malmesbury/Prospect Hill 132kV overhead power line as well as the Klipheuwel 11kV overhead power line cross the property. The requirements of Eskom with regard to their power lines and infrastructure will be implemented by the applicant. This will entail the demarcation and maintenance of buffer areas around the power lines to ensure no mining is done within the servitudes of the two power lines.

Existing roads will be used to gain access to the mining area. Access to the mining area will be along the tarred Wellington Road, from where vehicles will turn onto the existing gravel farm road that provides direct access to the mining area. The

applicant will be responsible for continuous maintenance of the gravel access road for the duration of the operational phase.

(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 C.

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 for each main activity in each phase. The significance rating was determined using the methodology as explained under *vi) Methodology Used in Determining and Ranking the Significance*. The impact rating listed below was determined for each impact **prior** to bringing the proposed mitigation measures into consideration, therefore the worst case scenario and should be seen as a preliminary assessment. The degree of mitigation indicates the possibility of partial, full or no mitigation of the identified impact.

POTENTIAL NEGATIVE IMPACTS:

STRIPPING AND STOCKPILING OF TOPSOIL:

Loss of agricultural land for duration of mining (Site Alternative 1)

Rating: Low – Medium

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
1	3	1	1.7	5	5	5	8.5

Visual impact due to the removal of the topsoil

Rating: Medium

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	5	1	2.6	5	5	5	13

Dust nuisance caused by the disturbance of the soil

Rating: Low – Medium

Degree of Mitigation: Full

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	5	1	2.6	3	3	3	7.8

Noise nuisance caused by machinery stripping and stockpiling the topsoil

Rating: Low – Medium

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	5	1	2.6	2	3	2.5	6.5

Infestation of the topsoil heaps by weeds or invader plants

Rating: Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	5	1	3	5	2	3.5	10.5

Loss of topsoil due to incorrect storm water management

Rating: Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	5	1	3	5	2	3.5	10.5

EXCAVATION AND LOADING OF SAND TO BE SOLD

Reduction in soil depth

Rating: Medium – High

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	5	1	3	5	5	5	15

Dust nuisance from denuded areas

Rating: Medium – High

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	5	2	3.3	4	5	4.5	15

Noise nuisance generated by excavation equipment

Rating: Medium

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	5	1	2.6	3	5	4	10.4

Negative impact on the fynbos (Site Alternative 1)

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	5	1	3.3	1	1	1	3

Negative impact on the fynbos (Site Alternative 2)

Rating: Medium – High

Degree of Mitigation: No Mitigation

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	5	1	3.3	5	5	5	16.5

Negative impact on fauna that may enter the area

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	5	1	3	1	1	1	3

Impaired soil drainage resulting in water logging in potential root zone

Rating: Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	5	1	3.3	4	5	4.5	14.9

Contamination of surface or groundwater due to hazardous spills not cleaned

Rating: Low – Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	5	1	3.3	2	1	1.5	5

Infestation of mining area and soil heaps with weeds/invader plants

Rating: Low – Medium

Degree of Mitigation: Fully Mitigated

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
3	5	1	3	4	2	3	9

Potential impact of mining activities on the runoff and infiltration of storm water

Rating: Medium – High

Degree of Mitigation: Partial

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
3	5	4	4	4	5	4.5	18

TRANSPORTATION OF SAND FROM MINING AREA TO CLIENTS

Dust nuisance due to vehicles transporting the sand from site

Rating: Medium

Degree of Mitigation: Fully Mitigated

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
3	5	2	3.3	3	5	4.5	13

Noise nuisance generated by vehicles transporting the sand from site

Rating: Medium

Degree of Mitigation: Partial

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
3	5	2	3.3	4	5	4.5	14.9

Degradation of the gravel access road.

Rating: Low – Medium

Degree of Mitigation: Fully Mitigated

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
3	5	2	3.3	3	2	2.5	8

Increase in dust particles and noise levels negatively affecting poultry farming at Droogelaagte.

Rating: Medium

Degree of Mitigation: Partial

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
4	5	4	4.3	3	2	2.5	11

REPLACEMENT OF TOPSOIL OVER MINED-OUT AREA AND FINAL REHABILITATION

Erosion of returned topsoil after rehabilitation

Rating: Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	5	2	4.3	4	2	3	12.9

Creation of uneven surfaces or steep slopes

Rating: Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	5	1	3	4	5	4.5	13.5

POTENTIAL POSITIVE IMPACTS

- ◆ Work opportunities to three/four workers,
- ◆ Skills development plan for employees,
- ◆ Local economic development plan that entails a skills development training programme to unemployed youth candidates within the Swartland municipal area,
- ◆ Contribution to the construction industry that is an important economic sector in the West Coast.
- ◆ No loss of agricultural land for duration of mining.

Associated Positive Impacts – Strip Mining:

- ◆ Lower visual impact
- ◆ Only a section of the mining area op at a given time
- ◆ Progressive rehabilitation possible
- ◆ Topsoil replacement is faster
- ◆ Re-vegetation of mined-out areas faster

Associated Positive Impacts – Temporary Infrastructure:

- ◆ Low intensity site establishment
- ◆ Easy movement of infrastructure as mining progress
- ◆ Complete removal of infrastructure at closure of the mine

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 recognized 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 realized (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 organization operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation (ISO 14004, 1996).

Methodology that will be used

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

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

Determination of Overall Consequence

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

Determination of Severity / Intensity

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

Table 1 will be used to obtain an overall rating for severity, taking into consideration the various criteria.

Rating of Severity:

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)	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

production, fauna and flora)					
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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.

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.

Rating of Extent / Spatial Scale:

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

Determination of Overall Consequence

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

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.

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.

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 summarized below, and then dividing the sum by 2.

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.

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 prioritizations and decision making process associated with this event, aspect or impact.

Description of Environmental Significance and related action required

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

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

- High** Of the highest order possible within the bounds of impacts which could occur. In the case of negative impacts, there would be no possible mitigation and / or remedial activity to offset the impact at the spatial or time scale for which it was predicted. In the case of positive impacts, there is no real alternative to achieving the benefit.
- Medium-High** Impacts of a substantial order. In the case of negative impacts, mitigation and / or remedial activity would be feasible but difficult, expensive, time-consuming or some combination of these. In the case of positive impacts, other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.
- Medium** Impact would be real but not substantial within the bounds of those, which could occur. In the case of negative impacts, mitigation and / or remedial activity would be both feasible and fairly easily possible, In case of positive impacts; other means of achieving these benefits would be about equal in time, cost and effort.
- Low-Medium** Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and / or remedial activity would be either easily achieved or little would be required, or both. In case of positive impacts alternative means for achieving this benefit would likely be easier, cheaper, more effective, less time-consuming, or some combination of these.
- Low** Impact would be negligible. In the case of negative impacts, almost no mitigation and or remedial activity would be needed, and any minor steps, which might be needed,

would be easy, cheap and simple. In the case of positive impacts, alternative means would almost all likely be better, in one or a number of ways, than this means of achieving the benefit

Insignificant There would be a no impact at all – not even a very low impact on the system or any of its parts.

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

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

SITE ALTERNATIVE 1:

Site Alternative 1 (S1) entails the sand mining from a previously disturbed area. The footprint of this alternative was previously disturbed by the agricultural activities of the farm transforming the vegetation of the area from natural occurring Fynbos to pasture. The mining of sand from the proposed footprint area will therefore not necessitate the removal of fynbos.

Site alternative 1 was selected as the preferred alternative for the following reasons:

- ◆ The proposed footprint area was previously disturbed by agricultural activities and no greenfield area needs to be disturbed
- ◆ No fynbos need to be disturbed in order to allow for the establishment of the sand mine.
- ◆ No drainage line, stream or river is present within the proposed footprint area.
- ◆ The existing access roads can be used to reach the proposed mining area
- ◆ The soil scientist concluded that:
 - ✓ adequate reserves of sand are available on-site for mining and rehabilitation.
 - ✓ the specialist further concluded that soils are sandy and the agricultural potential across the site is low to medium.
 - ✓ due to soil conditions, the land is fairly marginal for cultivation.
 - ✓ mining of the site can proceed, subject to the recommended mitigation measures provided. The specialist stated that if these measures are followed and effectively implemented, the agricultural potential of the land could be successfully rehabilitated to allow ongoing production.

Negative aspects associated with Site alternative 1 entails:

- ◆ The mining area will be lost to agricultural production for the duration of mining activity on them.
 - ✓ The soil specialist however stated that given the low to medium agricultural potential of the land and the fact that more than half of the area is not currently utilized for agriculture, the significance of this impact is low.
- ◆ The proposed mining area falls within 500 m from the drainage line and artificial wetland to the south of the mining area and requires Water Use Authorization in terms of Section 21(c) and (i) of the National Water Act, 1998.

Associated Positive Impacts:

- ◆ Work opportunities to three/four workers,
- ◆ Skills development plan for employees,
- ◆ Local economic development plan that entails a skills development training programme to unemployed youth candidates within the Swartland municipal area,
- ◆ Contribution to the construction industry that is an important economic sector in the West Coast.

Potential Negative Impacts:

STRIPPING AND STOCKPILING OF TOPSOIL:

- ◆ Loss of agricultural land for duration of mining
- ◆ Visual impact due to the removal of the topsoil
- ◆ Dust nuisance caused by the disturbance of the soil
- ◆ Noise nuisance caused by machinery stripping and stockpiling the topsoil
- ◆ Infestation of the topsoil heaps by weeds or invader plants
- ◆ Loss of topsoil due to incorrect storm water management

EXCAVATION AND LOADING OF SAND TO BE SOLD

- ◆ Reduction in soil depth
- ◆ Dust nuisance from denuded areas
- ◆ Noise nuisance generated by excavation equipment
- ◆ Negative impact on the fynbos (Site Alternative 1)
- ◆ Negative impact on fauna that may enter the area
- ◆ Impaired soil drainage resulting in water logging in potential root zone
- ◆ Contamination of surface or groundwater due to hazardous spills not being cleaned
- ◆ Infestation of mining area and soil heaps with weeds/invader plants
- ◆ Potential impact of mining activities on the runoff and infiltration of storm water

TRANSPORTATION OF SAND FROM MINING AREA TO CLIENTS

- ◆ Dust nuisance due to vehicles transporting the sand from site
- ◆ Noise nuisance generated by vehicles transporting the sand from site
- ◆ Degradation of the gravel access road.
- ◆ Increase in dust particles and noise levels negatively affecting poultry farming at Droogelaagte.

REPLACEMENT OF TOPSOIL OVER MINED-OUT AREA AND FINAL REHABILITATION

- ◆ Erosion of returned topsoil after rehabilitation
- ◆ Creation of uneven surfaces or steep slopes

SITE ALTERNATIVE 2:

The applicant also investigated the potential of sand mining from the more pristine area currently covered by fynbos. This alternative was investigated, as it will have a lower impact on the agricultural activities of the landowner, enabling him to continue the use of the adjacent pasture for grazing purposes. This option will however entail the removal of ±75 ha fynbos occurring within the footprint of the proposed mining area.

Positive aspects associated with Site alternative 2 include:

- ◆ The landowner will be able to continue his use of the adjacent pasture (Site alternative 1) during the operational phase of the mine.
- ◆ No drainage line, stream or river is present within the footprint area.
- ◆ The proposed mining area will be further than 500 m from the drainage line and artificial wetland to the south of the mining area. This will eliminate the need to apply for Water Authorization in terms of the National Water Act, 1998 as no activities will take place within 500 m of a wetland.

Negative aspects associated with Site alternative 2 entails:

- ◆ The mining of this area will entail the removal of ±75 ha indigenous fynbos from the footprint area. As mentioned earlier the property falls within the Atlantis Sand Fynbos (FFd4) vegetation types that is considered Critically Endangered, and the removal of more than 70 ha fynbos is of high significance.
- ◆ The footprint area of S2 falls over two properties namely Morgenwagt 881/1 and Woodlands 874. Although Vlakfontein Familie Trust (Mr. Van Blerk) owns both properties, the applicant prefers the establishment of the entire mining area on a single property.
- ◆ Should S2 be approved as mining area, it will necessitate the construction of a new access road to reach the site.

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

Associated Positive Impacts:

- ◆ Work opportunities to three/four workers,
- ◆ Skills development plan for employees,
- ◆ Local economic development plan that entails a skills development training programme to unemployed youth candidates within the Swartland municipal area,
- ◆ Contribution to the construction industry that is an important economic sector in the West Coast.
- ◆ No loss of agricultural land for duration of mining

Potential Negative Impacts:

STRIPPING AND STOCKPILING OF TOPSOIL:

- ◆ Visual impact due to the removal of the topsoil
- ◆ Dust nuisance caused by the disturbance of the soil
- ◆ Noise nuisance caused by machinery stripping and stockpiling the topsoil
- ◆ Infestation of the topsoil heaps by weeds or invader plants
- ◆ Loss of topsoil due to incorrect storm water management

EXCAVATION AND LOADING OF SAND TO BE SOLD

- ◆ Reduction in soil depth
- ◆ Dust nuisance from denuded areas
- ◆ Noise nuisance generated by excavation equipment
- ◆ Negative impact on the fynbos (Site Alternative 2)
- ◆ Negative impact on fauna that may enter the area
- ◆ Impaired soil drainage resulting in water logging in potential root zone
- ◆ Contamination of surface or groundwater due to hazardous spills not being cleaned
- ◆ Infestation of mining area and soil heaps with weeds/invader plants
- ◆ Potential impact of mining activities on the runoff and infiltration of storm water

TRANSPORTATION OF SAND FROM MINING AREA TO CLIENTS

- ◆ Dust nuisance due to vehicles transporting the sand from site
- ◆ Noise nuisance generated by vehicles transporting the sand from site
- ◆ Degradation of the gravel access road.
- ◆ Increase in dust particles and noise levels negatively affecting poultry farming at Droogelaagte.

REPLACEMENT OF TOPSOIL OVER MINED-OUT AREA AND FINAL REHABILITATION

- ◆ Erosion of returned topsoil after rehabilitation
- ◆ Creation of uneven surfaces or steep slopes

PROJECT ALTERNATIVE 1:

Strip mining was identified as the preferred alternative for the following reasons:

- ◆ The sand sought by the applicant is found at surface level and no quarrying is needed. The specialist also recommended that mining may only be conducted up to the clay level, eliminating the possibility of quarrying.
- ◆ Strip mining has a much lower visual impact on the surrounding environment than quarrying as progressive rehabilitation is done throughout the operational phase. This ensures that the smallest possible disturbed area is open at any given time, where quarrying entails a large area that stays open until the rehabilitation stage.

- ◆ Due to progressive rehabilitation being done throughout the operational phase topsoil does not have to be stored as long as in the quarrying process and re-vegetation of the mined-out area can establish much faster.
- ◆ Strip mining also has the advantage that only a small section (last strip) needs to be rehabilitated at the end of the mining process and closure of the site.
- ◆ DWS support the strip mining method as it will minimize the impacts of surface runoff, infiltration and groundwater recharge.

Associated Positive Impacts – Strip Mining:

- ◆ Lower visual impact
- ◆ Only a section of the mining area op at a given time
- ◆ Progressive rehabilitation possible
- ◆ Topsoil replacement is faster
- ◆ Re-vegetation of mined-out areas faster

PROJECT ALTERNATIVE 2:

Due to the small size of the proposed sand mining activity the use of a temporary container for office purposes with a chemical toilet will be sufficient to address the needs of employees on site. The use of temporary infrastructure firstly enables the applicant to move the infrastructure within the boundaries of the mining area as mining of the sand progresses. Secondly, the decommissioning phase is facilitated, as the removal of infrastructure from the mining area during the rehabilitation of the site is easy and highly effective. As the need of the proposed project can be satisfied through the placement of temporary infrastructure the establishment of permanent infrastructure is not deemed to be the preferred option.

Associated Positive Impacts – Temporary Infrastructure:

- ◆ Low intensity site establishment
- ◆ Easy movement of infrastructure as mining progress
- ◆ Complete removal of infrastructure at closure of the mine

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

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

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

Loss of agricultural land for duration of mining (Site Alternative 1):

Given the low to medium agricultural potential of the land and the fact that more than half of it is not currently utilized for agriculture the risk of the proposed mining activities having a negative impact on the yield of the footprint area is deemed to be of low-medium significance. The following mitigation measures can also be implemented on-site to accommodate the landowner:

- ◆ The major areas not yet mined by the applicant can be made available to the farmer as pasture for his stock.
- ◆ Mined-out major areas can be signed back to the farmer once final rehabilitation has been done and the area been vegetated.

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 needs to have a neat appearance and be kept in good condition at all times.
- ◆ Concurrent rehabilitation needs to be done as strip mining progress to limit the visual impact on the aesthetic value of the area.

Dust Handling:

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 mitigation measures listed below:

- ◆ The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents.
- ◆ The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression.
- ◆ Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust.
- ◆ Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.
- ◆ Trucks transporting sand from the mining area has to be covered to prevent sand being blown from the trucks.

Noise Handling:

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

- ◆ The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site.

- ◆ No loud music may be permitted at the mining area.
- ◆ All mining vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.

Management of weed- or invader plants:

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

- ◆ A weed and invader plant control management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of Conservation of Agricultural Act (Act No 43 1983).
- ◆ Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. The following control methods can be used:
 - ✓ "The plants can be uprooted, felled or cut off and can be destroyed completely."
 - ✓ "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide."
- ◆ The temporary topsoil stockpiles needs to be kept free of weeds.

Loss of topsoil due to incorrect storm water management

The risk of erosion or loss of topsoil due to uncontrolled storm water flowing through the mining area can be reduced to being low through the implementation of the mitigation measures listed below:

- ◆ The strips of soil that are removed should 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.
- ◆ 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.
 - ✓ The storm water management plan must apply for the entire life cycle of the mine and over different hydrological cycles (rainfall patterns).
 - ✓ The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management plan.

Reduction in soil depth:

The risk of a decrease in the depth of suitable rooting materials above the depth limiting clay layer can be reduced to being low through the implementation of the mitigation measures listed below:

- ◆ The upper 500 mm of the soil must be stripped and stockpiled before mining. Mining can then be done down to the clay layer (or other depth limiting layer).
- ◆ After mining, any steep slopes at the edges of excavations, must be reduced to a minimum and profiled to blend with the surrounding topography.
- ◆ The stockpiled topsoil must then be evenly spread over the entire mining area, so that there is a depth of 500 mm of sandy topsoil above the underlying clay. The depth should be monitored during spreading to ensure that coverage is adequate and even.

Negative impact on the fynbos (Site Alternative 1):

The risk of the proposed mining activities of S1 having a negative impact on the fynbos of the surrounding environment can be reduced to being low through the implementation of the mitigation measures listed below:

- ◆ A 20 m buffer area needs to be demarcated, sign posted and managed as no-go area around areas with natural vegetation.
- ◆ No plants or trees may be removed without the approval of the ECO.

Negative impact on the fynbos (Site Alternative 2):

The risk of the proposed mining activities of S2 having a negative impact on the fynbos of the footprint area cannot be reduced and is deemed to be of medium-high significance.

Negative impact on fauna that may enter the area:

The risk of the proposed mining activities having a negative impact on the fauna of the footprint area as well as the surrounding environment can be reduced to being low through the implementation of the mitigation measures listed below:

- ◆ The site manager should ensure that no fauna is caught, killed, harmed, sold or played with.
- ◆ Workers should be instructed to report any animals that may be trapped in the working area.
- ◆ No snares may be set or nests raided for eggs or young.

Impaired soil drainage resulting in water logging in potential root zone:

Reduction in the elevation of the surface above a water table, or the creation of surface depressions that are not free draining, has the potential to cause water logging in the potential root zone. The retention of at least 500 mm depth of rooting material above the clay and ensuring that depressions are free draining will keep this impact of low significance.

- ◆ To ensure minimum impact on drainage, it is important that no depressions be 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.

Contamination of surface or groundwater due to hazardous spills not cleaned:

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

- ◆ Regular vehicle maintenance may only take place at the applicants off-site workshop. If emergency repairs is 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 liter closed container/bin to be removed from the emergency service area to the workshop in order to ensure proper disposal.
- ◆ Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility.
- ◆ Spills must be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof should be filed.
- ◆ Suitable covered receptacles should be available at all times and conveniently placed for the disposal of waste.
- ◆ Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc, should be stored in a container with a closable lid at a collecting point and collected on a regular basis and disposed of at a recognised landfill site. Specific precautions should be taken to prevent refuse from being dumped on or in the vicinity of the mine area.
- ◆ Biodegradable refuse generated should be handled as indicated above.

Potential impact of mining activities on the runoff and infiltration of storm water

The impact of the mining activities on the runoff and infiltration of storm water can be reduced to being low through the implementation of the mitigation measures listed below:

- ◆ The strip mining method must be used as it minimizes the impacts of surface runoff, infiltration and groundwater recharge.
- ◆ A geohydrological assessment of potential mining impacts must be done once data for groundwater levels and fluctuations across the site is available.
- ◆ A monitoring program must be established to measure the water levels at least monthly. The frequency must be increased during high rainfall winter months. The readings must be recorded against date and time.
- ◆ The monitoring data and report must annually be submitted to DWS.
- ◆ The buffer to be determined by DWS above the highest water level once water fluctuation data is obtained has to be adhered to by the applicant.

- ◆ If mining activities go below the water level, a water use license for dewatering has to be obtained from DWS.

Degradation of the gravel access road:

The risk of the condition of the gravel roads deteriorating 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 should be diverted around the access roads to prevent erosion.
- ◆ Vehicular movement must be restricted to existing access routes to prevent crisscrossing of tracks through undisturbed areas.
- ◆ Rutting and erosion of the access road caused as a result of the mining activities should be repaired by the applicant.

Increase in dust particles and noise levels negatively affecting poultry farming at Droogelaagte:

The risk of the proposed mining activities having a negative impact on the poultry farming at Droogelaagte can be reduced to being low through the implementation of the mitigation measures listed below:

- ◆ Trucks transporting sand from the mining area need to be covered to prevent sand blowing from the trucks.
- ◆ Dust suppression has to be done on the gravel roads leading up to the tar road. This will prevent dusty trucks passing the poultry infrastructure of Droogelaagte.

Erosion of returned topsoil after rehabilitation:

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

- ◆ Run-off water must be controlled via temporary banks during mining, where necessary on the slopes, to ensure that accumulation of run-off does not cause down-slope erosion.
- ◆ Topsoil spreading should only be done at a time of year when vegetation cover can be established as quickly as possible afterwards, so that erosion of returned topsoil by both rain and wind, before vegetation is established, is minimized. The best time of year is at the end of the rainy season, when there is moisture in the soil for vegetation establishment and the risk of heavy rainfall events is minimal.
- ◆ A cover crop must be planted and established immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. The cover crop should be fertilized for optimum production. It is important that rehabilitation be taken up to the point of cover crop stabilization. Rehabilitation cannot be considered complete until the first cover crop is well established.
- ◆ The rehabilitated area must be monitored for erosion, and appropriately stabilized if any erosion occurs.

Creation of uneven surfaces or steep slopes

The risk of uneven surfaces or steep slopes being created on-site can be reduced to being low through the implementation of the mitigation measures listed below:

- ◆ 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.
- ◆ After mining, any steep slopes at the edges of excavations must be reduced to a minimum and profiled to blend with the surrounding topography.

Management of Health and Safety Risks:

- ◆ Workers must have access to the correct personal protection equipment (PPE) as required by law.
- ◆ All operations must comply with the Occupational Health and Safety Act as well as the Mine Health and Safety Act.

Topsoil Handling:

Poor topsoil management during mining may result in the loss of topsoil for rehabilitation through burial or erosion from stockpiles. Also disturbance and dilution of topsoil can cause loss of fertility as a result of reduced organic carbon and biological activity. The natural topsoil has low natural fertility and therefore a reduction of this is of low significance for agricultural use. The following mitigation measures with regard to topsoil handling is proposed:

- ◆ Topsoil is a valuable and essential resource for rehabilitation and it should therefore be managed carefully to conserve and maintain it throughout the stockpiling and rehabilitation processes.
- ◆ Topsoil stripping, stockpiling and re-spreading must be done in a systematic way. The mining plan should be such that topsoil is stockpiled for the minimum possible time by rehabilitating different mining blocks progressively.
- ◆ The upper 500 mm of the soil must be stripped and stockpiled before mining.
- ◆ Topsoil stockpiles should be protected against losses by water and wind erosion. The establishment of plants on the stockpiles will help to prevent erosion.
- ◆ Topsoil heaps should not exceed 1.5 m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen.
- ◆ Storm- and runoff water should be diverted around the stockpile area and access roads to prevent erosion.

ix) Motivation where no alternative sites were considered.

N/A

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 site as it will not have an impact on any fynbos or other natural vegetation deemed to be critically endangered. 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. **CapeNature** - A buffer of at least 20 metres must be allowed for between the mining site and the adjacent natural areas. A buffer of at least 10 metres should be provided between mining activities and the edge of the streams and riparian vegetation should not be impacted on in any way.
2. **Eskom** – The application affects the Malmesbury/Prospect Hill 132kV overhead power line as well as the Klipheuwel 11kV overhead power line.
 - ◆ No work is allowed within Eskom reserve areas and servitudes (132kV - 15.5 m & 11kV - 9.0 m either side of center line)
 - ◆ No construction work may be executed closer than 6 meters from any Eskom structure or structure-supporting mechanism.
 - ◆ No work or no machinery nearer than 3.8 m to the conductors of the 132 kV and 3.0 m to the 11kV.
 - ◆ A minimum ground clearance must be maintained of 7.5 m above ground to the 132kV and 6.3 m to the 11kV.
 - ◆ Eskom must have at least a 10 m obstruction free zone around all pylons
3. **Geohydrological Specialist** – The geohydrologist proposed the following measures to ensure successful rehabilitation results during and after the sand mining operation that needed to be incorporated into the mining proposal:
 - ◆ The sand mining must not go deeper than the consolidated silt / clay layer.
 - ◆ The strips of soil that are removed should be done so at right angles to the slope, as this will slow down surface runoff and help to prevent erosion.
 - ◆ Rehabilitation by replacing topsoil on the stripped land should take place before the next strip is opened and mined.
4. **Department of Water and Sanitation conditions** – DWS recommended that the following conditions must be adhered to during the mining activities:
 - ◆ A geohydrological assessment of potential mining impacts is required once data for groundwater levels and fluctuations across the site are available. The report must address potential impacts on groundwater interactions with surface water.
 - ◆ A monitoring program must be established to measure the water levels at least monthly. A higher frequency is preferable during the high rainfall winter months

when the water table is potentially at its highest. The readings must be recorded against date and time.

- ◆ The application can be considered once sufficient water level fluctuation data are available (at least 1 year).
- ◆ The Department would request that the data for the report and the monitoring be made available to the Department annually.
- ◆ A reasonable buffer needs to be determined by this Department above the highest water level once water level fluctuation data is obtained to limit impact on groundwater flow and storage character as well as limit groundwater contamination.
- ◆ If, the mining activities go below the water level, dewatering may be required, which would necessitate a water use license from DWS.
- ◆ Every precaution should be taken to prevent groundwater contamination, as groundwater is very difficult and almost impossible to remediate. Thus, the precautionary principle would apply.
- ◆ Consideration should be taken about the proposed future use of the land after mine closure, as this would have an impact on the mining activity and management. It also has the potential to impact on groundwater.
- ◆ Closure and post closure impact must be assessed and mitigation actions must be implemented.
- ◆ Clarity must be provided to this Department whether a field hydrocensus within a 2 km radius was conducted at this site (which must include groundwater users, what they use the water for, water quality and water level measurements).

5. **Soil Scientist** – The soil scientist proposed the following measures to ensure successful rehabilitation:

- ◆ The upper 500 mm of the soil must be stripped and stockpiled before mining.
- ◆ Mining can then be done down to the clay layer
- ◆ A surface slope (even if minimal) must be maintained across the mining floor in the drainage direction, so that all excavations are free draining.
- ◆ Run-off water must be controlled via temporary banks during mining, where necessary on the slopes, to ensure that accumulation of run-off does not cause down-slope erosion.
- ◆ After mining, any steep slopes at the edges of excavations must be reduced to a minimum and profiled to blend with the surrounding topography.

- h) 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.

STRIPPING AND STOCKPILING OF TOPSOIL:

Loss of agricultural land for duration of mining (Site Alternative 1)

Rating: Low – Medium

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
1	3	1	1.7	5	5	5	8.5

Visual impact due to the removal of the topsoil

Rating: Low – Medium

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
1	5	1	2.3	3	5	4	9.2

Dust nuisance caused by the disturbance of the soil

Rating: Low

Degree of Mitigation: Full

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	1	1	1.3	2	2	2	2.6

Noise nuisance caused by machinery stripping and stockpiling the topsoil

Rating: Low – Medium

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
1	4	1	2	2	3	2.5	5

Infestation of the topsoil heaps by weeds or invader plants

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	1	1	1.6	2	2	2	3.2

Loss of topsoil due to incorrect storm water management

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	1	1	1.6	2	1	1.5	2.4

EXCAVATION AND LOADING OF SAND TO BE SOLD

Reduction in soil depth

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	1	1	1.6	2	1	1.5	2.4

Dust nuisance from denuded areas

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	1	1	1.6	3	3	3	4.8

Noise nuisance generated by excavation equipment

Rating: Low – Medium

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
1	4	1	2	2	3	2.5	5

Negative impact on the fynbos (Site Alternative 1)

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	5	1	3.3	1	1	1	3

Negative impact on the fynbos (Site Alternative 2)

Rating: Medium – High

Degree of Mitigation: No Mitigation

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	5	1	3.3	5	5	5	16.5

Negative impact on fauna that may enter the area

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	5	1	3	1	1	1	3

Impaired soil drainage resulting in water logging in potential root zone

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	1	1	2	2	1	1.5	3

Contamination of surface or groundwater due to hazardous spills not cleaned

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	1	1	2	2	1	1.5	3

Infestation of mining area and soil heaps with weeds/invader plants

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	1	1	1.6	2	2	2	3.2

Potential impact of mining activities on the runoff and infiltration of storm water

Rating: Low

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	1	2	2	2	1	1.5	3

TRANSPORTATION OF SAND FROM MINING AREA TO CLIENTS

Dust nuisance due to vehicles transporting the sand from site

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	1	2	2	2	2	2	4

Noise nuisance generated by vehicles transporting the sand from site

Rating: Low – Medium

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	5	2	3.3	2	2	2	6.6

Degradation of the gravel access road.

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	1	2	2	2	2	2	4

Increase in dust particles and noise levels negatively affecting poultry farming at Droogelaagte.

Rating: Low

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	1	4	3	2	1	1.5	4.5

REPLACEMENT OF TOPSOIL OVER MINED-OUT AREA AND FINAL REHABILITATION

Erosion of returned topsoil after rehabilitation

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	1	1	2	2	2	2	4

Creation of uneven surfaces or steep slopes

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	1	1	1.6	2	2	2	3.2

i) 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).

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.
Demarcation of site with visible beacons.	No impact could be identified other than the beacons being outside the boundaries of the approved mining right area.	N/A	Construction / Site Establishment phase	N/A	N/A	N/A
Establishment of temporary office and ablution infrastructure within boundaries of site.	If the infrastructure is established within the boundaries of the approved mining area no impact could be identified.	N/A	Construction / Site Establishment phase	N/A	N/A	N/A
STRIPPING AND STOCKPILING OF TOPSOIL	Loss of agricultural land for duration of mining (S1)	Agricultural land use	Operational phase	Low – Medium	<u>Control:</u> Signed use agreement with landowner	Low – Medium
	Visual impact due to removal of topsoil.	The visual impact may	Operational phase	Medium	<u>Control:</u> Implementation of proper housekeeping	Low – Medium

		affect the aesthetics of the landscape.				
	Dust nuisance caused by the disturbance of soil.	Dust will be contained within the property boundaries and will therefore affect only the landowner.	Operational phase	Low – Medium	<u>Control:</u> Dust suppression	Low
	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.	Operational phase	Low – Medium	<u>Control:</u> Noise control measures	Low – Medium
	Infestation of the topsoil heaps by weeds and invader plants.	Biodiversity	Operational phase	Medium	<u>Control & Remedy:</u> Implementation of weed control	Low
	Loss of topsoil due to incorrect storm water management	Loss of topsoil will affect the rehabilitation of the mining area and the future agricultural potential of the site.	Operational phase	Medium	<u>Control:</u> Storm water management	Low

EXCAVATION AND LOADING OF SAND TO BE SOLD	Reduction in soil depth	Decrease depth of suitable rooting material will affect the future agricultural potential of the site.	Operational phase	Medium – High	<u>Control:</u> Implementation of proper topsoil management and rehabilitation	Low
	Dust nuisance from denuded areas	Dust will be contained within the property boundaries and will therefore affect only the landowner.	Operational phase	Medium – High	<u>Control:</u> Dust suppression	Low
	Noise nuisance generated by excavation equipment	The noise impact should be contained within the boundaries of the property, and will relate to the existing equipment operating on-site.	Operational phase	Medium	<u>Control:</u> Noise management	Low – Medium
	Negative impact on the fynbos (S1)	Biodiversity	Operational phase	Low	<u>Control:</u> Management of buffer areas and demarcation of work areas	Low
	Negative impact on the fynbos (S2)	Biodiversity	Operational phase	Medium – High	<u>Modify:</u> Consider use of a less sensitive area	Medium – High

	Negative impact on fauna that may enter the area	Biodiversity	Operational phase	Low	<u>Control:</u> Management of employees working on-site and fauna entering mining area	Low
	Impaired soil drainage resulting in water logging in potential root zone	Agricultural potential	Operational phase	Medium	<u>Control:</u> Topsoil management and rehabilitation	Low
	Contamination of surface or groundwater due to hazardous spills not cleaned	Contamination may cause surface or ground water contamination if not addressed	Operational phase	Low – Medium	<u>Control:</u> Waste management	Low
	Infestation of mining area and soil heaps with weeds/invasers plants	Biodiversity	Operational phase	Low – Medium	<u>Control & Remedy:</u> Implementation of weed control	Low
	Potential impact of mining activities on the runoff and infiltration of storm water.	The impact may affect the groundwater source	Operational phase	Medium – High	<u>Control:</u> Implementation of monitoring and correct topsoil replacement practices	Low
TRANSPORTATION OF SAND FROM MINING AREA TO CLIENTS	Dust nuisance due to vehicles transporting the sand from site	Should dust levels become excessive it may have an impact on surrounding landowners.	Operational phase	Medium	<u>Control:</u> Dust suppression	Low

	Noise nuisance caused by vehicles transporting the sand from site	The noise levels of the surrounding environment may temporarily increase during the operational phase, affecting the ambient noise levels.	Operational phase	Medium	<u>Control:</u> Noise management	Low – Medium
	Degradation of access roads	All road users will be affected	Operational phase	Low – Medium	<u>Control & Remedy:</u> Road management	Low
	Increase in dust particles and noise levels negatively affecting poultry farming at Droogelaagte.	Poultry farming of Droogelaagte	Operational phase	Medium	<u>Control:</u> Dust and noise management	Low
REPLACEMENT OF TOPSOIL OVER MINED-OUT AREA AND FINAL REHABILITATION	Erosion of returned topsoil after rehabilitation	Soil erosion, may affect the agricultural potential of the site after closure of the mine.	Decommissioning phase	Medium	<u>Control:</u> Soil management and seeding of mined areas	Low
	Creation of uneven surfaces or steep slopes	Impact will prevent or hinder future cultivation.		Medium	<u>Control:</u> Effective rehabilitation to prevent uneven surfaces	Low

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

j) 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):

<p style="text-align: center;">LIST OF STUDIES UNDERTAKEN</p>	<p style="text-align: center;">RECOMMENDATIONS OF SPECIALIST REPORTS</p>	<p style="text-align: center;">SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)</p>	<p style="text-align: center;">REFERECE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.</p>
<p>Soil Survey:</p> <p>Assessment of the impact of sand mining on agricultural potential on the farm Woodlands No 874.</p> <p><i>(See Appendix H for a full copy of the document)</i></p>	<p><u>Conclusion:</u></p> <p>The assessment has found that there is adequate reserves of sand on site for mining and rehabilitation. Soils are sandy and the agricultural potential across the site is low to medium. Due to soil conditions, the land is fairly marginal for cultivation. With mitigation the reduction in agricultural potential is assessed as having low significance. Mining of the site can proceed, subject to the recommended mitigation measures provided. If these measures are followed and effectively implemented, the agricultural potential of the land can be successfully rehabilitated to allow ongoing production.</p> <p><u>Recommendations:</u></p> <p>The highest risk of rehabilitation failure is as a result of erosion of and / or loss of topsoil, both as a result of stripping and stockpiling, as well as after topsoil spreading. These aspects must therefore be well managed in order for rehabilitation to be successful.</p> <ol style="list-style-type: none"> 1. The upper 50 cm of the soil must be stripped and stockpiled before mining. Mining can then be done down to the clay layer (or other depth limiting layer). 	<p>All the recommendations proposed by the specialist were included in the EIA report.</p>	<p>Part A(1)(i) Footprint alternatives</p> <p>Part A(1)(x) Statement motivating the alternative development location</p> <p>Part A(d)(i) Closure objectives</p>

<p style="text-align: center;">LIST OF STUDIES UNDERTAKEN</p>	<p style="text-align: center;">RECOMMENTATIONS OF SPECIALIST REPORTS</p>	<p style="text-align: center;">SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)</p>	<p style="text-align: center;">REFERECE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENTATIONS HAVE BEEN INCLUDED.</p>
	<ol style="list-style-type: none"> 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 stripping, stockpiling and re-spreading must be done in a systematic way. The mining plan should be such that topsoil is stockpiled for the minimum possible time by rehabilitating different mining blocks progressively as the mining process continues. 4. Topsoil stockpiles should be protected against losses by water and wind erosion. The establishment of plants (weeds or a cover crop) on the stockpiles will help to prevent erosion. 5. 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. 6. Run-off water must be controlled via temporary banks during mining, where necessary on the slopes, to ensure that accumulation of run-off does not cause down-slope erosion. 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. 		

<p style="text-align: center;">LIST OF STUDIES UNDERTAKEN</p>	<p style="text-align: center;">RECOMMENTATIONS OF SPECIALIST REPORTS</p>	<p style="text-align: center;">SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)</p>	<p style="text-align: center;">REFERECE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENTATIONS HAVE BEEN INCLUDED.</p>
	<p>8. The stockpiled topsoil must then be evenly spread over the entire mining area, so that there is a depth of 50cm of sandy topsoil above the underlying clay. The depth should be monitored during spreading to ensure that coverage is adequate and even.</p> <p>9. Topsoil spreading should only be done 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 minimised. 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.</p> <p>10. A cover crop must be planted and established immediately after spreading of topsoil, to stabilise the soil and protect it from erosion. The cover crop should be fertilized for optimum production. 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.</p> <p>11. The rehabilitated area must be monitored for erosion, and appropriately stabilised if any erosion occurs.</p> <p>12. On-going alien vegetation control must keep the area free of alien vegetation after mining.</p>		

<p style="text-align: center;">LIST OF STUDIES UNDERTAKEN</p>	<p style="text-align: center;">RECOMMENTATIONS OF SPECIALIST REPORTS</p>	<p style="text-align: center;">SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)</p>	<p style="text-align: center;">REFERECE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENTATIONS HAVE BEEN INCLUDED.</p>
<p>Geohydrological Assessment:</p> <p>Geohydrological assessment of a proposed sand mine, Portion 2 of the farm Woodlands Farm 874, Malmesbury.</p> <p><i>(See Appendix 1 for a full copy of the report)</i></p>	<p><u>Conclusion:</u></p> <p>Groundwater levels are relatively shallow, even though measurements were taken at the end of the low rainfall season. The sand mining will inevitably change infiltration rates and thus runoff rates, however the negative impact of erosion can be decreased greatly if rehabilitation is successful by conducting both mining and rehabilitation in the summer months before any major rainfall events occur. In order to avoid impacting on infiltration, groundwater recharge and flow, the DWS generally stipulates that sand mining not be allowed within 1.5 m of the shallow groundwater level. Based on the site water level measurements, there is potentially little scope for mining.</p> <p><u>Recommendations:</u></p> <p>It is recommended that the DWS investigates the site and the proposed sand mining operations. This would likely require a site investigation during winter months when rainfall and recharge are at a peak. This would be able to establish the rise in groundwater table which will likely be higher than summer levels measured during this geohydrological assessment.</p> <p>If the decision to continue with sand mining is made the following measures are recommended to ensure that successful rehabilitation results during and after the sand</p>	<p>The following recommendations of the geohydrologist were included in the EIA report:</p> <ul style="list-style-type: none"> ◆ The sand mining must not go deeper than the consolidated silt / clay layer. ◆ The strips of soil that are removed should be done so at right angles to the slope, as this will slow down surface runoff and help to prevent erosion. ◆ Rehabilitation by replacing topsoil on the stripped land should take place before the next strip is opened and mined. ◆ All machinery must be in excellent 	<p>Part A(iv)(1)(a) Physical Environment</p> <p>Part A(1)(x) Statement motivating the alternative development location</p>

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERECE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
	<p>mining operations.</p> <ul style="list-style-type: none"> ◆ The sand mining must not go deeper than the consolidated silt / clay layer. ◆ The mining must not take place during or just before the rainfall season. ◆ The strips of soil that are removed should be done so at right angles to the slope, as this will slow down surface runoff and help to prevent erosion. ◆ Rehabilitation by replacing topsoil on the stripped land should take place before the next strip is opened and mined. ◆ All machinery must be in excellent condition and there must be NO oil/fuel leaks whatsoever from equipment. ◆ If a spill does occur, it must be immediately reported to the relevant authorities and immediately remediated. ◆ A short report (with photographs) should be completed prior to and on completion of the mining to the relevant authorities by an Environmental Control Officer (ECO). 	<p>condition and there must be NO oil/fuel leaks whatsoever from equipment.</p> <ul style="list-style-type: none"> ◆ If a spill does occur, it must be immediately reported to the relevant authorities and immediately remediated. ◆ A short report (with photographs) should be completed prior to and on completion of the mining to the relevant authorities by an Environmental Control Officer (ECO). 	

Attach copies of Specialist Reports as appendices

- ◆ Soil survey is attached as Appendix H
- ◆ Geohydrological assessment attached as Appendix I

k) 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 used for grazing purposes. The footprint area of the proposed sand mine was divided into four major areas each consisting of 23 ha. Each major area represents a separate phase of the proposed mining activities. Each major area/phase will be mined through the above mentioned strip mining method by dividing the major area into various minor areas of 480 m² (6m x 80m). Once all the minor areas in a major area has been mined the applicant will move the equipment (including office and toilet) to the next major area upon which the mining of the minor areas will commence again.

Hydrology:

- ◆ The proposed mining area will be more than 100m from any natural water source. The proposed mining area falls within 500 m of a drainage line and artificial wetland to the south and requires Water Use Authorization in terms of Section 21(c) and (i) of the National Water Act, 1998.
- ◆ The groundwater level of the proposed mining area was found to be shallow ± 1.69 m and it was proposed that the applicant mine the area up to the clay level and conduct a monthly geohydrological assessment of the impact of the mine on the groundwater interactions with surface water. At the end of the first year it is proposed that the geohydrological assessment report be submitted to DWS for further consideration. The applicant will comply with the buffer area above the highest water level to be determined by DWS once water level fluctuation data has been obtained.

Vegetation:

- ◆ Historically the area was covered by Atlantis Sand Fynbos (FFd4) with Swartland Granite Renosterveld (FRg2) occurring immediately east of the site. Both of these vegetation types are considered Critically Endangered. Site Alternative 1 will entail the mining of the area from which the natural occurring fynbos was removed in order to allow for pastures. The mining of this area will therefore not have an impact on the fynbos of the surrounding environment. The 20 m buffer area proposed by CapeNature will be demarcated and maintained around all areas with natural vegetation.

- ◆ A weed and invader plant control management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of Conservation of Agricultural Act (Act No 43 1983).

Cultural and Heritage Environment:

- ◆ HWC responded that since there is no reason to believe that the proposed sand mining will impact on heritage resources further processes under Section 38 of the National Heritage Resources Act (Act 25 of 1999) does not apply. However, should any evidence of human burials be discovered during the execution of the activities above, all works must be stopped immediately and HWC be notified without delay.

Socio-Economic Environment:

- ◆ The West Coast District Municipality (WCMD) responded that they support sustainable mining of sand required for the construction industry, as the industry is an important economic sector in the West Coast accounting for a 7.5% contribution towards District GDP
- ◆ The applicant identified, in collaboration with the Swartland local municipality, a Skills Development Training program as the LED project for the operation.

Land Use:

- ◆ Swartland Local Municipality (SLM) stated that the property is zoned agricultural zone 1 in terms of the Swartland Integrated Zoning Scheme Regulations of Ordinance 15 of 1985. An applicable land use application for sand mining needs to be made in terms of the Swartland Integrated Zoning Scheme Regulations of Ordinance 15 of 1985 and no mining activities may commence without all relevant approvals.

Existing Infrastructure:

- ◆ The Malmesbury/Prospect Hill 132kV overhead power line as well as the Klipheuwel 11kV overhead power line cross the property. The requirements of Eskom with regard to their power lines and infrastructure will be implemented by the applicant. This will entail the demarcation and maintenance of buffer areas around the power lines to ensure no mining is done within the servitudes of the two power lines.

Agricultural Potential:

- ◆ The assessment has found that there is adequate reserves of sand on site for mining and rehabilitation. Soils are sandy and the agricultural potential across the site is low to medium. Due to soil conditions, the land is fairly marginal for cultivation. With mitigation the reduction in agricultural potential is assessed as having low significance. Mining of

the site can proceed, subject to the recommended mitigation measures provided. If these measures are followed and effectively implemented, the agricultural potential of the land can be successfully rehabilitated to allow ongoing production.

(ii) Finale Site Map

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structure 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 B.

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

The positive impacts associated with the project include:

- ◆ Work opportunities to three/four workers,
- ◆ Skills development plan for employees,
- ◆ Local economic development plan that entails a skills development training programme to unemployed youth candidates within the Swartland municipal area,
- ◆ Contribution to the construction industry that is an important economic sector in the West Coast.
- ◆ No loss of agricultural land for duration of mining.

Associated Positive Impacts – Strip Mining:

- ◆ Lower visual impact
- ◆ Only a section of the mining area op at a given time
- ◆ Progressive rehabilitation possible
- ◆ Topsoil replacement is faster
- ◆ Re-vegetation of mined-out areas faster
- ◆ Strip mining will minimize the impacts of surface runoff, infiltration and groundwater recharge

Associated Positive Impacts – Temporary Infrastructure:

- ◆ Low intensity site establishment
- ◆ Easy movement of infrastructure as mining progress
- ◆ Complete removal of infrastructure at closure of the mine

DWS and the geohydrologist identified the shallow groundwater level as a potential risk to the proposed mining activities, and hands-on monitoring was proposed by DWS. Upon receipt of the fluctuation data a detailed response will be submitted by DWS.

Additional negative impacts associated with the project that was deemed to have a Low – Medium or higher significance/risk includes:

- ◆ Loss of agricultural land for duration of mining (S1) **Low – Medium**
- ◆ Visual impact may affect the aesthetics of the landscape **Low – Medium**
- ◆ Noise nuisance generated by excavation equipment **Low – Medium**
- ◆ Negative impact on fynbos (S2) **Medium – High**
- ◆ Noise nuisance caused by vehicles transporting the sand from site **Low – Medium**

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

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

Management Objectives	Responsibility	Management Role
Land availability for agricultural use	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> ◆ Allow landowner to utilize areas not yet mined as pasture until mining progress. ◆ Sign rehabilitated mined-out areas back to the landowner.
Visual Aspect	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> ◆ Ensure that the site have a neat appearance and is kept in good condition at all times. ◆ Ensure concurrent rehabilitation is done as strip mining progress to limit the visual impact on the aesthetic value of the area.
Dust Handling	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> ◆ Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. ◆ Assess effectiveness of dust suppression equipment. ◆ Limit speed on the access roads to 40km/h to prevent the generation of excess dust. ◆ Spray gravel roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. ◆ Ensure trucks transporting sand from the site is covered to prevent windblown dust.
Noise Handling	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.	<ul style="list-style-type: none"> ◆ Ensure that employees and staff conduct themselves in an acceptable manner while on site. ◆ No loud music may be permitted at the

Management Objectives	Responsibility	Management Role
	Compliance to be monitored by the Environmental Control Officer.	<p>mining area.</p> <ul style="list-style-type: none"> ◆ Ensure that all mining vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.
Management of weed/invader plants	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ◆ Implement a weed and invader plant control management plan. ◆ Control declared invader or exotic species on the rehabilitated areas. ◆ Keep the temporary topsoil stockpiles free of weeds.
Topsoil management	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ◆ Strip and stockpile the upper 500 mm of the soil and protect as topsoil. ◆ Remove strips of soil at right angles to the slope to slow down surface runoff and prevent erosion. ◆ Conduct topsoil stripping, stockpiling and re-spreading in a systematic way. Ensure topsoil is stockpiled for the minimum possible time by rehabilitating different mining blocks progressively. ◆ Protect topsoil stockpiles against losses by water and wind erosion through the establishment of plants on the stockpiles. ◆ Topsoil heaps should not exceed 1.5 m in order to preserve micro-organism within the topsoil. ◆ Divert storm water around the topsoil heaps and mining areas. ◆ Conduct mining in accordance with the Best Practice Guideline for small scale mining as stipulated by DWS.
Reduction of soil depth	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ◆ Strip and stockpile the upper 500 mm of soil before mining commence. ◆ Mine down to the clay layer. ◆ After mining, reduce any steep slopes at the edges of the excavations to a minimum and profile it to blend with the surrounding topography. ◆ Spread stockpiled topsoil evenly over the entire mining area, so that there is depth of 500 mm of sandy topsoil above the underlying clay.
Protection of fynbos	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ◆ Demarcate, signpost and manage the 20 m buffer area as no-go area around areas with natural vegetation. ◆ Do not remove any plants or trees without the approval of the ECO.
Fauna Management	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ◆ Ensure no fauna is caught, killed, harmed, sold or played with. ◆ Instruct workers to report any animals that may be trapped in the working area. ◆ Ensure no snares are set or nests raided

Management Objectives	Responsibility	Management Role
Soil Drainage Management	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<p>for eggs or young.</p> <ul style="list-style-type: none"> ◆ Ensure no depressions are left in the mining floor. Maintain a surface slope across the mining floor in the drainage direction, so that all excavations are free draining. ◆ Ensure topsoil is managed as stipulated earlier. ◆ Demarcate and protect a 10 m buffer area between mining activities and the edge of the wetland area to the south of the site (even though the wetland is more than 100m from the mining area).
Waste management	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ◆ Ensure regular vehicle maintenance only take place within the service bay area of the off-site workshop. If emergency repairs is needed on site ensure drip trays is present. Ensure all waste products are disposed of in a 200 liter closed container/bin inside the emergency service area. ◆ Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. ◆ Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. ◆ Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. ◆ Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection should take place on a regular basis and disposed of at the recognized landfill site at Malmesbury. Prevent refuse from being dumped on or in the vicinity of the mine area. ◆ Biodegradable refuse to be handled as indicated above.
Storm water runoff and infiltration	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Monitoring to be conducted by geohydrologist</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ◆ Ensure the strip mining method is used as it minimizes the impacts of surface runoff, infiltration and groundwater recharge. ◆ Conduct a geohydrological assessment of potential mining impacts once data for groundwater levels and fluctuations across the site is available. ◆ Establish a monitoring program to measure the water levels at least monthly. Increase frequency during high rainfall winter months as suggested by geohydrologist. Record readings against date and time.

Management Objectives	Responsibility	Management Role
		<ul style="list-style-type: none"> ◆ Submit the monitoring data and report annually to DWS. ◆ Adhere to the buffer to be determined by DWS above the highest water level. ◆ If mining activities go below the water level, apply for a water use license for dewatering from DWS.
Management of access roads	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ◆ Divert storm water around the access roads to prevent erosion. ◆ Restrict vehicular movement to existing access routes to prevent crisscrossing of tracks through undisturbed areas. ◆ Repair rutting and erosion of the access roads caused by the mining activities.
Droogelaagte poultry farm	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ◆ Ensure trucks transporting sand from the mining area is covered to prevent sand blowing from the trucks. ◆ Ensure dust suppression is done on the gravel roads leading up to the tar road to prevent dusty trucks passing the poultry infrastructure of Droogelaagte.
After care on rehabilitated areas	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ◆ Control run-off water via temporary banks, where necessary on the slopes, to ensure that accumulation of run-off does not cause down-slope erosion. ◆ Only do topsoil spreading at a time of year when vegetation cover can be established as quickly as possible afterwards, so that erosion of returned topsoil by both rain and wind is minimized. The best time of year is at the end of the rainy season, when there is moisture in the soil for vegetation establishment and the risk of heavy rainfall events is minimal. ◆ Plant a cover crop immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. Fertilize the cover crop for optimum production. ◆ Ensure rehabilitation be taken up to the point of cover crop stabilization. Rehabilitation shouldn't be considered complete until the first cover crop is well established. ◆ Monitor all rehabilitated areas for erosion, and appropriately stabilized if any erosion occurs.
Elimination of uneven surfaces and slopes	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ◆ Remove any depressions in the mining floor to ensure minimum impact on drainage. Maintain a surface slope (even if minimal) across the mining floor in the drainage direction, so that all excavations are free draining. ◆ After mining, reduce any steep slopes at the edges of excavations to a minimum and profiled it to blend with the surrounding topography.

Management Objectives	Responsibility	Management Role
Health and Safety Risk	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ◆ Ensure workers have access to the correct personal protection equipment (PPE) as required by law. ◆ Manage all operations in compliance with the Occupational Health and Safety Act as well as the Mine Health and Safety Act.
Protection of Eskom Infrastructure	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ◆ Establish and demarcate a 15.5 m no-go area either side of the 132kV power line crossing the site. (31 m no-go area in total) ◆ Establish and demarcate a 9.0 m no-go area either side of the 11kV power line crossing the site. (18 m no-go area in total) ◆ No work may be done nearer than 3.8 m to the conductors of the 132kV and/or 3.0m to the 11kV power line. ◆ Maintain a minimum ground clearance of 7.5 m above ground to the 132kV and 6.3 m to the 11kV power line. ◆ Ensure Eskom has at least a 10 m obstruction free zone around all pylons.
Protection of Cultural or Heritage Artefacts	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ◆ Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. ◆ Notify Heritage Western Cape (HWC) and the ECO immediately. ◆ Work may only commence once the area was cleared by HWC.

m) Final proposed alternatives.

(provide an explanation for the final layout of the infrastructure and activities on the overall site as shown on the final site map together with the reasons why they are the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment)

As explained under point *g) Motivation for preferred development footprint* the initial mining proposal was updated to incorporate the matters raised during the assessment process. This lead to the final layout of infrastructure and activities on the overall site as shown in the final site map attached Appendix B:

- ◆ The strip mining of Site Alternative 1 using temporary infrastructure.

n) Aspects for inclusion as conditions of Authorisation.

Any aspects which have not formed part of the EMPr that must be made conditions of the Environmental Authorisation

The management objectives listed in this report under *Point L Proposed impact management objectives* above should be considered for inclusion in the environmental authorisation.

Additional to those conditions the following must be considered as conditions of the Environmental Authorisation:

- ◆ The applicant needs to submit a land use application for sand mining in terms of the Swartland Integrated Zoning Scheme Regulations of Ordinance 15 of 1985 prior to commencement of the mining activities.

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 the property owner, as well as site inspections, and background information gathering.

Uncertainty with regard to the seasonal groundwater fluctuation of the proposed site was identified by DWS. A geohydrological assessment and monitoring programme were proposed for at least the first year of the mining operations in order to obtain site specific information on level fluctuation data.

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

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

Should the mitigation measures and monitoring programmes proposed in this document be implemented on site, no fatal flaws could at this point and time be identified that were deemed as severe as to prevent the activity continuing.

ii) Conditions that must be included in the authorisation

(1) Specific conditions to be included into the compilation and approval of EMPr

The management objectives listed in this report under *Point L Proposed impact management objectives* and listed below must be included into the compilation and approval of the EMPr:

- ◆ Land availability for agriculture use
- ◆ Visual Aspect
- ◆ Dust Handling
- ◆ Noise Handling
- ◆ Management of weed/invader plants
- ◆ Topsoil Management
- ◆ Reduction of Soil Depth
- ◆ Protection of Fynbos
- ◆ Fauna Management
- ◆ Soil Drainage Management
- ◆ Waste Management

- ◆ Storm water Runoff and Infiltration
- ◆ Management of Access Roads
- ◆ Droogelaagte Poultry Farm
- ◆ After Care on Rehabilitated Areas
- ◆ Elimination of Uneven Surfaces and Slopes
- ◆ Health and Safety Risks
- ◆ Protection of Eskom Infrastructure
- ◆ Protection of Cultural of Heritage Artefacts

(2) Rehabilitation requirements

The following rehabilitation requirements have to be adhered to:

- ◆ Topsoil has to be stockpiled for the minimum possible time through the implementation of progressive rehabilitation throughout the mining process.
- ◆ No depressions may be left in the mining floor to ensure minimum impact on drainage. A surface slope (even if minimal) must 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, must be reduced to a minimum and profiled to blend with the surrounding topography.
- ◆ The stockpiled topsoil must then be evenly spread over the entire mining area, so that there is a depth of 500 mm of sandy topsoil above the underlying clay. The depth should be monitored during spreading to ensure that coverage is adequate and even.
- ◆ Topsoil spreading should only be done 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 the end of the rainy season, when there is moisture in the soil for vegetation establishment and the risk of heavy rainfall events is minimal.
- ◆ A cover crop must be planted and established immediately after spreading of topsoil to stabilize the soil and protect it from erosion. The cover crop should be fertilized for optimum production. It is important that rehabilitation is taken up to the point of 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.
- ◆ On-going alien vegetation control must keep the area free of alien vegetation after mining.

Final rehabilitation must entail the removal of all infrastructure and equipment from the site. Final landscaping, levelling and top dressing must 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 must implement an alien invasive plant management plan during the 12 months aftercare period to address germination of problem plants in the area.

q) Period for which the Environmental Authorisation is required.

The applicant requests the Environmental Authorisation to be valid for a twenty five year period to correspond with the validity of the mining right.

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 Environmental Impact 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 R83 664. Please see the explanation as to how this amount was derived at attached as Appendix K – Financial and Technical Competence.

ii) Confirm that this amount can be provided for from operating expenditure.

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

The mining operation will be self-funded through income generated by sales of the aggregate mined. The project will be financed through group company financing facilities and Interco loans.

t) Deviations from the approved scoping report and plan of study.

i) Deviations from the methodology used in determining the significance of potential environmental impacts and risks.

(Provide a list of activities in respect of which the approved scoping report was deviated from, the reference in this report identifying where the deviation was made, and a brief description of the extent of the deviation).

No deviation from the methodology used in determining the significance of potential environmental impacts and risks were deemed necessary. The methodology described in the Scoping Report was also used in the Environmental Impact Assessment Report.

ii) Motivation for the deviation.

N/A

u) Other 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 **Appendix 219.1** and confirm that the applicable mitigation is reflected in 2.5.3, 2.11.6 and 2.12 herein).

The proposed sand mine will be established in an area that was previously disturbed by agricultural purposes. The proposed mining area will have an impact on the agricultural activities of the landowner as the area will not be available for grazing for the duration of the operational phase. The applicant and landowner however signed a Memorandum of Agreement and the landowner does not have any objection to the proposed sand mining activity. The applicant will also investigate the option of allowing the landowner the use of un-mined areas within the boundaries of the site. Upon closure the mining area will revert back to agriculture.

Due to the small scale of the proposed project and the remote location of the site very little to no negative impacts on the community could be identified that were deemed to be of significant importance. The dust and noise impacts that may emanate from the mining area during the operational phase could have a negative impact on the surrounding landowners if the mitigation measures proposed in this document is not implemented and managed on-site. However due to the distance of the landowners from the mining area (>1 km) these impacts are deemed to be of low-medium significance.

The owner of the poultry farm at Droogelaagte raised a concern that the trucks transporting the sand from the site to the clients will increase the dust and noise levels past his broiler houses. It is again stated that the road passing his property is a tarred provincial road that carries numerous other heavy vehicles. The applicant undertakes to ensure all trucks transporting sand from the mining area are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. It was also proposed that dust suppression be implemented on the gravel road leading up to the tar road to minimise dust generation. The trucks will also be covered to prevent windblown dust from sand loads.

The operation of the sand mine will however also have a number of positive impacts such as job creation for approximately three/four permanent workers that will be exposed to a skills development plan. The Social and Labour Plan associated with this application also includes a Local Economic Development Plan to be implemented at the site that entails a skills development training programme to

unemployed youth candidates within the Swartland municipal area. The proposed sand mine will further contribute to the economic sector in the West Coast region.

(2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act (Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as **Appendix 219.2** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6 and 2.12 herein).

The particular area earmarked for the mining of the sand was transformed from fynbos to pastures and used for the grazing of stock. No potential impact on heritage resources could be identified on-site. Heritage Western Cape also confirmed that there is no reason to believe that the proposed sand mining will affect heritage resources and therefore no further processes under Section 38 of the National Heritage Resources Act (Act 25 of 1999) applies.

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

1. Site alternative 1 – mining from a previously disturbed area (Preferred Alternative) vs. Site alternative 2 – mining from the more pristine area covered by fynbos.
2. Strip mining (Preferred Alternative) vs. Open-pit mining,
3. Temporary Infrastructure (Preferred Alternative) vs. Permanent Infrastructure,
4. No-go Alternative

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme.

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

The details and expertise of Christine Fouche 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 requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required)

The 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 should be avoided, including buffers)

As mentioned under Part A, section (1)(L)(ii) this map has been compiled and is attached as Appendix B 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 closure objectives entail progressive rehabilitation of each strip as mining progress. The following was recommended by the soil scientist with regard to rehabilitation of the mined-out strips:

- ◆ The mining plan should be such that topsoil is stockpiled for the minimum possible time by rehabilitating different mining blocks progressively as the mining process continues.
- ◆ 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.
- ◆ After mining, any steep slopes at the edges of excavations, must be reduced to a minimum and profiled to blend with the surrounding topography.
- ◆ The stockpiled topsoil must then be evenly spread over the entire mining area, so that there is a depth of 500 mm of sandy topsoil above the underlying clay. The depth should be monitored during spreading to ensure that coverage is adequate and even.

- ◆ Topsoil spreading should only be done 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 the end of the rainy season, when there is moisture in the soil for vegetation establishment and the risk of heavy rainfall events is minimal.
- ◆ A cover crop must be planted and established immediately after spreading of topsoil to stabilize the soil and protect it from erosion. The cover crop should be fertilized for optimum production. It is important that rehabilitation is taken up to the point of 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.
- ◆ On-going alien vegetation control must keep the area free of alien vegetation after mining.

Final rehabilitation will entail the removal of all infrastructure and equipment from the site. 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 management plan during the 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) and maintenance, and weed / alien clearing.
- ◆ All infrastructure, equipment, temporary equipment and other items used during the mining period will be removed from the site (section 44 of the MPRDA).
- ◆ Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognized landfill facility. It will not be permitted to be buried or burned on the site.
- ◆ Weed / Alien clearing will be done in a sporadic manner during the life of the mining activities.
- ◆ Species regarded as Category 1 weeds according to CARA (Conservation of Agricultural Recourses Act, 1983 – Act 43; Regulations 15 & 16 (as amended in March 2001) need to be eradicated from the site.
- ◆ Final rehabilitation shall be completed within a period specified by the Regional Manager.

ii) The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity.

Due to the nature of the proposed sand mining activity it is believed that the risk of environmental damage or pollution is of low significance. If site management implement the

mitigation measures as prescribed in this document it is believed that the impact on the receiving environment can be adequately controlled.

iii) Potential risk of Acid Mine Drainage. (Indicate whether or not the mining can result in acid mine drainage).

N/A

iv) Steps taken to investigate, assess, and evaluate the impact of acid mine drainage.

N/A

v) Engineering or mine design solutions to be implemented to avoid or remedy acid mine drainage.

N/A

vi) Measures that will be put in place to remedy any residual or cumulative impact that may result from acid mine drainage.

N/A

vii) Volumes and rate of water use required for the mining, trenching or bulk sampling operation.

N/A

viii) Has a water use license been applied for?

A water use license application was submitted to DWS on 17 February 2015 for authorization in terms of Section 21(c) and (i) of NWA, 1998 as the proposed mining area falls within 500 m of an artificial wetland. See Appendix J for proof of the submission of the water use application.

DWS requested additional information on 14 July 2015 in the form of a wetland delineation map. The wetland specialist has been appointed and the information will be supplied to DWS for their approval.

ix) Impacts to be mitigated in their respective phases

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

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
(as listed in 2.11.1)	of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	(volumes, tonnages and hectares or m ²)	(describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Demarcation of site with visible beacons	Construction / Site Establishment phase	92 ha	Demarcation of the site will ensure that all employees area aware of the boundaries of the mining area and that work stay within approved mining area.	Mining is only allowed within the boundaries of the approved mining area. ◆ MHSA, 1996 ◆ OHSA, 1993	Beacons need to be in place throughout the life of the mine.

Establishment of temporary office and ablution infrastructure within boundaries of site	Construction / Site Establishment phase	15 m ²	Site management must ensure that the office and ablution infrastructure are erected within the boundaries of the approved mining area.	Compliance to standards stipulated in the: <ul style="list-style-type: none"> ◆ MPRDA, 2008 ◆ OHS, 1993 	Throughout operational phase
STRIPPING AND STOCKPILING OF TOPSOIL	Operational phase	6 m x 80 m strips at a time up to 92 ha	<p><u>Loss of agricultural land for duration of mining (Site Alternative 1):</u></p> <ul style="list-style-type: none"> ◆ The major areas not yet mined by the applicant can be made available to the farmer as pasture for his stock. ◆ Mined-out major areas can also be signed back to the farmer once final rehabilitation has been done and the area been vegetated. 	<p><u>Impact on agricultural land:</u></p> <ul style="list-style-type: none"> ◆ CARA, 1983 ◆ Protection against loss of agricultural land and soil 	Throughout operational phase
STRIPPING AND STOCKPILING OF TOPSOIL	Operational phase	6 m x 80 m strips at a time up to 92 ha	<p><u>Visual Mitigation:</u></p> <ul style="list-style-type: none"> ◆ The site needs to have a neat appearance and be kept in good condition at all times. ◆ Concurrent rehabilitation needs to be done as strip mining progress to limit the visual impact on the aesthetic value of the area. 	<p><u>Land use zoning:</u></p> <ul style="list-style-type: none"> ◆ LUPO, 1985 ◆ The property is zoned for agriculture as primary use 	Throughout operational phase
STRIPPING AND STOCKPILING OF TOPSOIL	Operational phase	6 m x 80 m strips at a time up to 92 ha	<p><u>Dust Handling:</u></p> <ul style="list-style-type: none"> ◆ The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. ◆ The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. ◆ Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust. ◆ Roads must be sprayed with water or an 	<p><u>Dust Handling:</u></p> <ul style="list-style-type: none"> ◆ NEM:AQA, 2004 Regulation 6(1) ◆ Monthly fallout dust levels has to comply with the acceptable dust fall rate published for non-residential areas in the National Dust Control Regulations 2013 – 600 < Dust Fall < 1 200 mg/m²/day. ◆ Quarterly gravimetric dust levels has to comply with the standard published in the NIOSH guidelines – Particulates >1/10th of the occupational exposure limit. 	Throughout operational phase

			environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.		
STRIPPING AND STOCKPILING OF TOPSOIL	Operational phase	6 m x 80 m strips at a time up to 92 ha	<p><u>Noise Handling:</u></p> <ul style="list-style-type: none"> ◆ The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. ◆ No loud music may be permitted at the mining area. ◆ All mining vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. 	<p><u>Noise Handling:</u></p> <ul style="list-style-type: none"> ◆ NEM:AQA, 2004 Regulation 6(1) ◆ All mining vehicles should be in a road worthy condition in terms of the Road Transport Act, 1987 ◆ Noise zones needs to be demarcated and personnel should not be allowed to enter high-risk areas without hearing protection if needed. 	Throughout operational phase
STRIPPING AND STOCKPILING OF TOPSOIL	Operational phase	6 m x 80 m strips at a time up to 92 ha	<p><u>Management of weed- or invader plants:</u></p> <ul style="list-style-type: none"> ◆ A weed and invader plant control management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of Conservation of Agricultural Act (Act No 43 1983). ◆ Management must take responsibility to control declared invader or exotic species on the habilitated areas. The following control methods can be used: <ul style="list-style-type: none"> ✓ "The plants can be uprooted, felled or cut off and can be destroyed completely." ✓ "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." ◆ The temporary topsoil stockpiles needs to be kept free of weeds. 	<p><u>Management of weed- or invader plants:</u></p> <ul style="list-style-type: none"> ◆ CARA, 1983 ◆ All species regarded as Category 1 weeds according to CARA need to be eradicated from site. 	Throughout operational phase

<p style="text-align: center;">STRIPPING AND STOCKPILING OF TOPSOIL</p>	<p style="text-align: center;">Operational phase</p>	<p style="text-align: center;">6 m x 80 m strips at a time up to 92 ha</p>	<p><u>Loss of topsoil due to incorrect storm water management</u></p> <ul style="list-style-type: none"> ◆ The strips of soil that are removed should 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. ◆ Mining must be conducted only in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department may impose: <ul style="list-style-type: none"> ✓ Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. ✓ Dirty water must be collected and contained in a system separate from the clean water system. ✓ Dirty water must be prevented from spilling or seeping into clean water systems. ✓ The storm water management plan must apply for the entire life cycle of the mine and over different hydrological cycles 	<p><u>Loss of topsoil due to incorrect storm water management:</u></p> <ul style="list-style-type: none"> ◆ CARA, 1983 ◆ NEMA, 1998 ◆ NWA, 1998 ◆ The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. 	<p style="text-align: center;">Throughout operational phase</p>
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			<p>(rainfall patterns).</p> <ul style="list-style-type: none"> ✓ The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management plan. 		
<p>EXCAVATION AND LOADING OF SAND TO BE SOLD</p>	Operational phase	6 m x 80 m strips at a time up to 92 ha	<p><u>Reduction in soil depth:</u></p> <ul style="list-style-type: none"> ◆ The upper 500 mm of the soil must be stripped and stockpiled before mining. Mining can then be done down to the clay layer (or other depth limiting layer). ◆ After mining, any steep slopes at the edges of excavations, must be reduced to a minimum and profiled to blend with the surrounding topography. ◆ The stockpiled topsoil must then be evenly spread over the entire mining area, so that there is a depth of 500 mm of sandy topsoil above the underlying clay. The depth should be monitored during spreading to ensure that coverage is adequate and even. 	<p><u>Reduction in soil depth:</u></p> <ul style="list-style-type: none"> ◆ CARA, 1983 ◆ MPRDA, 2008 ◆ The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. 	Throughout operational phase
<p>EXCAVATION AND LOADING OF SAND TO BE SOLD</p>	Operational phase	6 m x 80 m strips at a time up to 92 ha	<p><u>Dust Handling:</u></p> <ul style="list-style-type: none"> ◆ The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. ◆ The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. ◆ Speed on the access roads must be limited to 40km/h to prevent the generation of excess 	<p><u>Dust Handling:</u></p> <ul style="list-style-type: none"> ◆ NEM:AQA, 2004 Regulation 6(1) ◆ Monthly fallout dust levels has to comply with the acceptable dust fall rate published for non-residential areas in the National Dust Control Regulations 2013 – 600 < Dust Fall < 1 200 mg/m²/day. ◆ Quarterly gravimetric dust levels has to comply with the standard published in the NIOSH guidelines – 	Throughout operational phase

			<p>dust.</p> <ul style="list-style-type: none"> Roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. Trucks transporting sand from the mining area has to be covered to prevent sand being blown from the trucks. 	<p>Particulates >1/10th of the occupational exposure limit.</p>	
EXCAVATION AND LOADING OF SAND TO BE SOLD	Operational phase	6 m x 80 m strips at a time up to 92 ha	<p><u>Noise Handling:</u></p> <ul style="list-style-type: none"> The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the mining area. All mining vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. 	<p><u>Noise Handling:</u></p> <ul style="list-style-type: none"> NEM:AQA, 2004 Regulation 6(1) All mining vehicles should be in a road worthy condition in terms of the Road Transport Act, 1987 Noise zones needs to be demarcated and personnel should not be allowed to enter high risk areas without hearing protection if needed 	Throughout operational phase
EXCAVATION AND LOADING OF SAND TO BE SOLD	Operational phase	6 m x 80 m strips at a time up to 92 ha	<p><u>Negative impact on the fynbos (Site Alternative 1):</u></p> <ul style="list-style-type: none"> A 20 m buffer area needs to be demarcated, sign posted and managed as no-go areas around areas with natural vegetation. No plants or trees may be removed without the approval of the ECO. 	<p><u>Negative impact on the fynbos (Site Alternative 1):</u></p> <ul style="list-style-type: none"> NEM:BA, 2004 Critical Biodiversity Areas (CBA's) 	Throughout operational phase
EXCAVATION AND LOADING OF SAND TO BE SOLD	Operational phase	6 m x 80 m strips at a time up to 92 ha	<p><u>Negative impact on the fynbos (Site Alternative 2):</u></p> <p>The risk of the proposed mining activities of S2 having a negative impact on the fynbos of the footprint area cannot be reduced and is deemed to be of medium-high significance.</p>	<p><u>Negative impact on the fynbos (Site Alternative 2):</u></p> <ul style="list-style-type: none"> NEM:BA, 2004 Critical Biodiversity Areas (CBA's) Removal permits has to be obtained from CapeNature prior to removal of indigenous vegetation. 	Throughout operational phase

<p>EXCAVATION AND LOADING OF SAND TO BE SOLD</p>	<p>Operational phase</p>	<p>6 m x 80 m strips at a time up to 92 ha</p>	<p><u>Negative impact on fauna that may enter the area:</u></p> <ul style="list-style-type: none"> ◆ The site manager should ensure that no fauna is caught, killed, harmed, sold or played with. ◆ Workers should be instructed to report any animals that may be trapped in the working area. ◆ No snares may be set or nests raided for eggs or young. 	<p><u>Negative impact on fauna that may enter the area:</u></p> <ul style="list-style-type: none"> ◆ NEM:BA, 2004 ◆ The mine has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the mining activities. 	<p>Throughout operational phase</p>
<p>EXCAVATION AND LOADING OF SAND TO BE SOLD</p>	<p>Operational phase</p>	<p>6 m x 80 m strips at a time up to 92 ha</p>	<p><u>Impaired soil drainage resulting in water logging in potential root zone:</u></p> <ul style="list-style-type: none"> ◆ To ensure minimum impact on drainage, it is important that no depressions be 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. 	<p><u>Impaired soil drainage resulting in water logging in potential root zone:</u></p> <ul style="list-style-type: none"> ◆ CARA, 1983 ◆ NWA, 1998 ◆ NEM:BA, 2004 ◆ The replacement of the topsoil and sloping of the area is of utmost importance to ensure the effective future use of the area for agricultural purposes. 	<p>Throughout operational phase</p>
<p>EXCAVATION AND LOADING OF SAND TO BE SOLD</p>	<p>Operational phase</p>	<p>6 m x 80 m strips at a time up to 92 ha</p>	<p><u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u></p> <ul style="list-style-type: none"> ◆ Regular vehicle maintenance may only take place within the service bay area of the applicants off-site workshop. If emergency repairs is 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 liter closed container/bin to be removed from the emergency service 	<p><u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u></p> <ul style="list-style-type: none"> ◆ NWA, 1998 ◆ NEM:WA, 2008 ◆ Every precaution should be taken to prevent groundwater contamination. The precautionary principal must apply. 	<p>Throughout operational phase</p>

			<p>area to the workshop in order to ensure proper disposal.</p> <ul style="list-style-type: none"> ◆ Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. ◆ Spills must be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof should be filed. ◆ Suitable covered receptacles should be available at all times and conveniently placed for the disposal of waste. ◆ Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc, should be stored in a container with a closable lid at a collecting point and collected on a regular basis and disposed of at a recognised landfill site. Specific precautions should be taken to prevent refuse from being dumped on or in the vicinity of the mine area. ◆ Biodegradable refuse generated should be handled as indicated above. 		
EXCAVATION AND LOADING OF SAND TO BE SOLD	Operational phase	6 m x 80 m strips at a time up to 92 ha	<p><u>Management of weed- or invader plants:</u></p> <ul style="list-style-type: none"> ◆ A weed and invader plant control management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of Conservation of Agricultural Act (Act No 43 1983). ◆ Management must take responsibility to 	<p><u>Management of weed- or invader plants:</u></p> <ul style="list-style-type: none"> ◆ CARA, 1983 ◆ All species regarded as Category 1 weeds according to CARA need to be eradicated from site. 	Throughout operational phase

			<p>control declared invader or exotic species on the habilitated areas. The following control methods can be used:</p> <ul style="list-style-type: none"> ✓ "The plants can be uprooted, felled or cut off and can be destroyed completely." ✓ "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." ◆ The temporary topsoil stockpiles needs to be kept free of weeds. 		
<p>EXCAVATION AND LOADING OF SAND TO BE SOLD</p>	<p>Operational phase</p>	<p>6 m x 80 m strips at a time up to 92 ha</p>	<p><u>Potential impact of mining activities on the runoff and infiltration of storm water</u></p> <ul style="list-style-type: none"> ◆ The strip mining method must be used as it minimizes the impacts of surface runoff, infiltration and groundwater recharge. ◆ A geohydrological assessment of potential mining impacts must be done once data for groundwater levels and fluctuations across the site is available. ◆ A monitoring program must be established to measure the water levels at least monthly. The frequency must be increased during high rainfall winter months. The readings must be recorded against date and time. ◆ The monitoring data and report must annually be submitted to DWS. ◆ The buffer to be determined by DWS above the highest water level once water fluctuation data is obtained has to be adhered to by the applicant. 	<p><u>Potential impact of mining activities on the runoff and infiltration of storm water</u></p> <ul style="list-style-type: none"> ◆ NWA, 1998 ◆ CARA, 1983 ◆ Applicant to comply with buffer area and standards to be determined by DWS. 	<p>Throughout operational phase</p>

			<ul style="list-style-type: none"> ◆ If mining activities go below the water level, a water use license for dewatering has to be obtained from DWS. 		
<p>TRANSPORTATION OF SAND FROM MINING AREA TO CLIENTS</p>	Operational phase	6 m x 80 m strips at a time up to 92 ha	<p><u>Dust Handling:</u></p> <ul style="list-style-type: none"> ◆ The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. ◆ The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. ◆ Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust. ◆ Roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. ◆ Trucks transporting sand from the mining area has to be covered to prevent sand being blown from the trucks. 	<p><u>Dust Handling:</u></p> <ul style="list-style-type: none"> ◆ NEM:AQA, 2004 Regulation 6(1) ◆ Monthly fallout dust levels has to comply with the acceptable dust fall rate published for non-residential areas in the National Dust Control Regulations 2013 – 600 < Dust Fall < 1 200 mg/m²/day. ◆ Quarterly gravimetric dust levels has to comply with the standard published in the NIOSH guidelines – Particulates >1/10th of the occupational exposure limit. 	Throughout operational phase
<p>TRANSPORTATION OF SAND FROM MINING AREA TO CLIENTS</p>	Operational phase	6 m x 80 m strips at a time up to 92 ha	<p><u>Noise Handling:</u></p> <ul style="list-style-type: none"> ◆ The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. ◆ No loud music may be permitted at the mining area. ◆ All mining vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. 	<p><u>Noise Handling:</u></p> <ul style="list-style-type: none"> ◆ NEM:AQA, 2004 Regulation 6(1) ◆ All mining vehicles should be in a road worthy condition in terms of the Road Transport Act, 1987 ◆ Noise zones needs to be demarcated and personnel should not be allowed to enter high risk areas without hearing protection if needed 	Throughout operational phase

			<p><u>Degradation of the gravel access road:</u></p> <ul style="list-style-type: none"> ◆ Storm water should be diverted around the access roads to prevent erosion. ◆ Vehicular movement must be restricted to existing access routes to prevent crisscrossing of tracks through undisturbed areas. ◆ The applicant should repair rutting and erosion of the access road caused by the mining activities. 	<p><u>Degradation of the gravel access road:</u></p> <ul style="list-style-type: none"> ◆ NRTA, 1996 ◆ The gravel access road needs to be monitored for signs of degradation. Should any signs become apparent immediate rectification needs to be implemented. 	Throughout operational phase
TRANSPORTATION OF SAND FROM MINING AREA TO CLIENTS	Operational phase	Access road	<p><u>Increase in dust particles and noise levels negatively affecting poultry farming at Droogelaagte:</u></p> <ul style="list-style-type: none"> ◆ Trucks transporting sand from the mining area need to be covered to prevent sand blowing from the trucks. ◆ Dust suppression has to be done on the gravel roads leading up to the tar road. This will prevent dusty trucks passing the poultry infrastructure of Droogelaagte. 	<p><u>Increase in dust particles and noise levels negatively affecting poultry farming at Droogelaagte:</u></p> <ul style="list-style-type: none"> ◆ NEM:AQA, 2004 Regulation 6(1) ◆ All mining vehicles should be in a road worthy condition in terms of the Road Transport Act, 1987 	Throughout operational phase
REPLACEMENT OF TOPSOIL OVER MINED-OUT AREA	Operational phase	6 m x 80 m strips at a time up to 92 ha	<p><u>Erosion of returned topsoil after rehabilitation:</u></p> <ul style="list-style-type: none"> ◆ Run-off water must be controlled via temporary banks during mining, where necessary on the slopes, to ensure that accumulation of run-off does not cause down-slope erosion. ◆ Topsoil spreading should only be done at a time of year when vegetation cover can be established as quickly as possible afterwards, so that erosion of returned topsoil by both 	<p><u>Erosion of returned topsoil after rehabilitation:</u></p> <ul style="list-style-type: none"> ◆ CARA, 1983 ◆ NEM:BA, 2004 ◆ MPRDA, 2008 ◆ The replacement of the topsoil and sloping of the area is of utmost importance to ensure the effective future use of the area for agricultural purposes. 	Throughout operational phase

			<p>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.</p> <ul style="list-style-type: none"> ◆ A cover crop must be planted and established immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. The cover crop should be fertilized for optimum production. It is important that rehabilitation be taken up to the point of cover crop stabilization. Rehabilitation cannot be considered complete until the first cover crop is well established. ◆ The rehabilitated area must be monitored for erosion, and appropriately stabilized if any erosion occurs. 	<ul style="list-style-type: none"> ◆ Rehabilitation cannot be considered complete until the first cover crop is well established. 	
<p>REPLACEMENT OF TOPSOIL OVER MINED-OUT AREA</p>	<p>Operational phase</p>	<p>6 m x 80 m strips at a time up to 92 ha</p>	<p><u>Creation of uneven surfaces or steep slopes:</u></p> <ul style="list-style-type: none"> ◆ To ensure minimum impact on drainage, it is important that no depressions be 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. ◆ After mining, any steep slopes at the edges of excavations must be reduced to a minimum and profiled to blend with the surrounding topography. 	<p><u>Creation of uneven surfaces or steep slopes:</u></p> <ul style="list-style-type: none"> ◆ CARA, 1983 ◆ NEM:BA, 2004 ◆ MPRDA, 2008 ◆ Rehabilitation has to prevent uneven surface slopes in order to prevent hindrance of future cultivation. 	<p>Throughout operational phase</p>

<p>FINAL REHABILITATION</p>	<p>Decommissioning phase</p>	<p>23 ha up to 92 ha</p>	<p><u>Final rehabilitation:</u></p> <ul style="list-style-type: none"> ◆ Rehabilitation of the surface area shall entail landscaping, levelling, top dressing, land preparation, seeding (if required) and maintenance, and weed / alien clearing. ◆ All infrastructure, equipment, temporary equipment and other items used during the mining period will be removed from the site (section 44 of the MPRDA). ◆ Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognized landfill facility. It will not be permitted to be buried or burned on the site. ◆ Weed / Alien clearing will be done in a sporadic manner during the life of the mining activities. ◆ Species regarded as Category 1 weeds according to CARA (Conservation of Agricultural Recourses Act, 1983 – Act 43; Regulations 15 & 16 (as amended in March 2001) need to be eradicated from the site. ◆ Final rehabilitation shall be completed within a period specified by the Regional Manager. 	<p><u>Final Rehabilitation:</u></p> <ul style="list-style-type: none"> ◆ MPRDA, 2008 ◆ Final rehabilitation needs to be done within a period specified by the regional manager of DMR. 	<p>Throughout decommissioning phase</p>
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e) Impact Management Outcomes

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

ACTIVITY whether listed or not listed (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..) E.g. <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring • Remedy through rehabilitation. 	STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
Demarcation of site with visible beacons	No impact could be identified other than the beacons being outside the boundaries of the approved mining right area.	N/A	Construction / Site Establishment phase	Control through management and monitoring	Clearly visible beacons need to be placed at the boundaries of the mining area.
Establishment of temporary office and ablution infrastructure within boundaries of site	If the infrastructure is established within the boundaries of the approved mining area no impact could be identified.	N/A	Construction / Site Establishment phase	Control through management and monitoring	<ul style="list-style-type: none"> ◆ The infrastructure needs to be within the boundaries of the mining area. ◆ The ablution facilities need to be kept clean and in working order. The supplier need to service the ablution facilities weekly.
STRIPPING AND STOCKPILING OF TOPSOIL	Loss of agricultural land for duration of mining (S1)	Agricultural use	Operational phase	<u>Control</u> : Signed use agreement with landowner	Impact mitigated until rehabilitation can be implemented and the area can be returned to agricultural use.

<p>STRIPPING AND STOCKPILING OF TOPSOIL</p>	<p>Visual impact due to removal of topsoil</p>	<p>The visual impact may affect the aesthetics of the landscape.</p>	<p>Operational phase</p>	<p><u>Control:</u> Implementation of proper housekeeping</p>	<p>Impact mitigated until rehabilitation can be implemented and the area can be returned to agricultural use.</p>
<p>STRIPPING AND STOCKPILING OF TOPSOIL</p>	<p>Dust nuisance caused by the disturbance of soil.</p>	<p>Dust will be contained within the property boundaries and will therefore affect only the landowner.</p>	<p>Operational phase</p>	<p><u>Control:</u> Dust suppression</p>	<ul style="list-style-type: none"> ◆ Fallout dust levels has to comply with the acceptable dust fall rate published for non-residential areas in the National Dust Control Regulations 2013 – 600 < Dust Fall < 1 200 mg/m²/day. ◆ Gravimetric dust levels has to comply with the standard published in the NIOSH guidelines – Particulates >1/10th of the occupational exposure limit. ◆ NEM:AQA, 2004 Regulation 6(1)
<p>STRIPPING AND STOCKPILING OF TOPSOIL</p>	<p>Noise nuisance caused by machinery stripping and stockpiling the topsoil.</p>	<p>The noise impact should be contained within the boundaries of the property and will represent the current noise levels of the site.</p>	<p>Operational phase</p>	<p><u>Control:</u> Noise control measures</p>	<ul style="list-style-type: none"> ◆ Noise levels on the site has to be managed and need to comply with the standards stipulated in NEM:AQA, 2004 Regulation 6(1) as well as the noise standards of SANS 10103:2008. ◆ Employees working in areas with noise levels of more than 82dBA need to be issue with hearing protection.
<p>STRIPPING AND STOCKPILING OF TOPSOIL</p>	<p>Infestation of the topsoil heaps by weeds and invader plants.</p>	<p>Biodiversity</p>	<p>Operational phase</p>	<p><u>Control & Remedy:</u> Implementation of weed control and the weed/invader plant management plan</p>	<ul style="list-style-type: none"> ◆ The impact should be avoided through the eradication of Category 1 weeds/invader plants in terms of CARA, 1993 as well as the implementation of the mitigation measures in this document.

<p>STRIPPING AND STOCKPILING OF TOPSOIL</p>	<p>Loss of topsoil due to incorrect storm water management.</p>	<p>Loss of topsoil will affect the rehabilitation of the mining area and the future use of the area.</p>	<p>Operational phase</p>	<p><u>Control:</u> Storm water management</p>	<ul style="list-style-type: none"> ◆ The impact should be avoided through the implementation of storm water and soil management.
<p>EXCAVATION AND LOADING OF SAND TO BE SOLD</p>	<p>Reduction in soil depth</p>	<p>Decrease depth of suitable rooting material will affect the agricultural potential of the site.</p>	<p>Operational phase</p>	<p><u>Control:</u> Implementation of proper topsoil management and rehabilitation</p>	<ul style="list-style-type: none"> ◆ The impact should be avoided through correct replacement of topsoil to ensure the effective rehabilitation of the area.
<p>EXCAVATION AND LOADING OF SAND TO BE SOLD</p>	<p>Dust nuisance due to loading of sand</p>	<p>Dust will be contained within the property boundaries and will therefore affect only the landowner.</p>	<p>Operational phase</p>	<p><u>Control:</u> Dust suppression</p>	<ul style="list-style-type: none"> ◆ Fallout dust levels has to comply with the acceptable dust fall rate published for non-residential areas in the National Dust Control Regulations 2013 – 600 < Dust Fall < 1 200 mg/m²/day. ◆ Gravimetric dust levels has to comply with the standard published in the NIOSH guidelines – Particulates >1/10th of the occupational exposure limit. ◆ NEM:AQA, 2004 Regulation 6(1)
<p>EXCAVATION AND LOADING OF SAND TO BE SOLD</p>	<p>Noise nuisance generated by excavation equipment</p>	<p>The noise impact should be contained within the boundaries of the property, and will relate to the existing equipment operating on-site.</p>	<p>Operational phase</p>	<p><u>Control:</u> Noise management</p>	<ul style="list-style-type: none"> ◆ Noise levels on the site has to be managed and need to comply with the standards stipulated in NEM:AQA, 2004 Regulation 6(1) as well as the noise standards of SANS 10103:2008. ◆ Employees working in areas with noise levels of more than 82dBA need to be issue with hearing protection.

EXCAVATION AND LOADING OF SAND TO BE SOLD	Negative impact on the fynbos (S1)	Biodiversity	Operational phase	<u>Control:</u> Management of buffer areas and demarcation of work areas	<ul style="list-style-type: none"> ◆ The impact should be avoided through the implementation of the mitigation measures stipulated in this document. ◆ NEM:BA, 2004.
EXCAVATION AND LOADING OF SAND TO BE SOLD	Negative impact on the fynbos (S2)	Biodiversity	Operational phase	<u>Modify:</u> Consider use of a less sensitive area	<ul style="list-style-type: none"> ◆ The impact should be avoided through the implementation of the mitigation measures stipulated in this document. ◆ NEM:BA, 2004.
EXCAVATION AND LOADING OF SAND TO BE SOLD	Negative impact on fauna that may enter the area	Biodiversity	Operational phase	<u>Control:</u> Management of employees working on-site and fauna entering the area	<ul style="list-style-type: none"> ◆ The impact should be avoided through the implementation of the mitigation measures stipulated in this document. ◆ NEM:BA, 2004.
EXCAVATION AND LOADING OF SAND TO BE SOLD	Impaired soil drainage resulting in water logging in potential root zone	Agricultural potential	Operational phase	<u>Control:</u> Topsoil management and rehabilitation	<ul style="list-style-type: none"> ◆ The impact should be avoided through the implementation of the mitigation measures stipulated in this document with regard to rehabilitation of the area.
EXCAVATION AND LOADING OF SAND TO BE SOLD	Contamination of surface or groundwater due to hazardous spills not cleaned	Contamination may cause surface or ground water contamination if not addressed	Operational phase	<u>Control:</u> Waste management	<ul style="list-style-type: none"> ◆ The impact should be avoided through the implementation of the precautionary principal. ◆ Should spillage however occur the area needs to be cleaned in accordance with the standards of the NEM:WA, 2008.
EXCAVATION AND LOADING OF SAND TO BE SOLD	Infestation of mining area and soil heaps with weeds/invaders plants	Biodiversity	Operational phase	<u>Control & Remedy:</u> Implementation of weed control	<ul style="list-style-type: none"> ◆ The impact should be avoided through the eradication of Category 1 weeds/invader plants in terms of CARA, 1993 as well as the implementation

					of the mitigation measures in this document.
EXCAVATION AND LOADING OF SAND TO BE SOLD	Potential impact of mining activities on the runoff and infiltration of storm water.	The impact may affect the groundwater	Operational phase	<u>Control:</u> Implementation of geohydrological assessment and the monitoring program proposed by DWS	<ul style="list-style-type: none"> ◆ Applicant to comply with buffer area and standards to be determined by DWS.
TRANSPORTATION OF SAND FROM MINING AREA TO CLIENTS	Dust nuisance due to vehicles transporting the sand from site	Should dust levels become excessive it may have an impact on surrounding landowners.	Operational phase	<u>Control:</u> Dust suppression	<ul style="list-style-type: none"> ◆ Fallout dust levels has to comply with the acceptable dust fall rate published for non-residential areas in the National Dust Control Regulations 2013 – 600 < Dust Fall < 1 200 mg/m²/day. ◆ Gravimetric dust levels has to comply with the standard published in the NIOSH guidelines – Particulates >1/10th of the occupational exposure limit. ◆ NEM:AQA, 2004 Regulation 6(1).
TRANSPORTATION OF SAND FROM MINING AREA TO CLIENTS	Noise nuisance caused by vehicles transporting the sand from site	The noise levels of the surrounding environment may temporarily increase during the operational phase, affecting the ambient noise levels.	Operational phase	<u>Control:</u> Noise management	<ul style="list-style-type: none"> ◆ Noise levels on the site has to be managed and need to comply with the standards stipulated in NEM:AQA, 2004 Regulation 6(1) as well as the noise standards of SANS 10103:2008. ◆ All mining vehicles should be in a road worthy condition in terms of the Road Transport Act, 1987
TRANSPORTATION OF SAND FROM MINING AREA TO CLIENTS	Degradation of access roads.	All road users will be affected.	Operational phase	<u>Control & Remedy:</u> Road management	<ul style="list-style-type: none"> ◆ The impact should be avoided through the implementation of the mitigation measures proposed in this document.

<p>TRANSPORTATION OF SAND FROM MINING AREA TO CLIENTS</p>	<p>Increase in dust particles and noise levels negatively affecting poultry farming at Droogelaagte.</p>	<p>Poultry farming of Droogelaagte</p>	<p>Operational phase</p>	<p><u>Control:</u> Dust and noise management</p>	<p>The impact has to be avoided through compliance with the following standards:</p> <ul style="list-style-type: none"> ◆ NEM:AQA, 2004 Regulation 6(1) ◆ All mining vehicles should be in a road worthy condition in terms of the Road Transport Act, 1987.
<p>REPLACEMENT OF TOPSOIL OVER MINED-OUT AREA AND FINAL REHABILITATION</p>	<p>Erosion of returned topsoil after rehabilitation</p>	<p>Soil erosion will may affect the agricultural potential of the site after closure of the mine.</p>	<p>Operational and Decommissioning phase</p>	<p><u>Control:</u> Soil management</p>	<ul style="list-style-type: none"> ◆ The impact should be avoided through the implementation of the mitigation measures stipulated in this document.
<p>REPLACEMENT OF TOPSOIL OVER MINED-OUT AREA AND FINAL REHABILITATION</p>	<p>Creation of uneven surfaces or steep slopes</p>	<p>Impact will prevent or hinder future cultivation.</p>	<p>Decommissioning phase</p>	<p><u>Control:</u> Effective rehabilitation</p>	<ul style="list-style-type: none"> ◆ The impact should be avoided through the implementation of the mitigation measures stipulated in this document.

f) Impact Management Actions

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

ACTIVITY whether listed or not listed (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: Upon cessation of the individual activity Or . Upon the cessation of mining bulk sampling or alluvial diamond prospecting as the case may be.	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
Demarcation of site with visible beacons	No impact could be identified other than the beacons being outside the boundaries of the approved mining right area.	Control through management and monitoring	Beacons need to be in place throughout the life of the mine.	Mining is only allowed within the boundaries of the approved mining area. ♦ MHPA, 1996 ♦ OHSA, 1993
Establishment of temporary office and ablution infrastructure within boundaries of site	If the infrastructure is established within the boundaries of the approved mining area no impact could be identified.	Control through management and monitoring	Site establishment and operational phase	Compliance to standards stipulated in the: ♦ MPRDA, 2008 ♦ OHSA, 1993

<p>STRIPPING AND STOCKPILING OF TOPSOIL</p>	<p>Loss of agricultural land for duration of mining (S1)</p>	<p><u>Control:</u> Signed use agreement with landowner</p>	<p>Throughout operational phase</p>	<p><u>Impact on agricultural land:</u></p> <ul style="list-style-type: none"> ◆ CARA, 1983 ◆ Protection against loss of agricultural land and soil
<p>STRIPPING AND STOCKPILING OF TOPSOIL</p>	<p>Visual impact due to removal of topsoil.</p>	<p><u>Control:</u> Implementation of proper housekeeping</p>	<p>Throughout operational phase</p>	<p><u>Land use zoning:</u></p> <ul style="list-style-type: none"> ◆ LUPO, 1985 ◆ The property is zoned for agriculture as primary use
<p>STRIPPING AND STOCKPILING OF TOPSOIL</p>	<p>Dust nuisance caused by the disturbance of soil.</p>	<p><u>Control:</u> Dust suppression</p>	<p>Throughout operational phase</p>	<p><u>Dust Handling:</u></p> <ul style="list-style-type: none"> ◆ NEM:AQA, 2004 Regulation 6(1) ◆ Monthly fallout dust levels has to comply with the acceptable dust fall rate published for non-residential areas in the National Dust Control Regulations 2013 – 600 < Dust Fall < 1 200 mg/m²/day. ◆ Quarterly gravimetric dust levels has to comply with the standard published in the NIOSH guidelines – Particulates >1/10th of the occupational exposure limit.
<p>STRIPPING AND STOCKPILING OF TOPSOIL</p>	<p>Noise nuisance caused by machinery stripping and stockpiling the topsoil</p>	<p><u>Control:</u> Noise control measures</p>	<p>Throughout operational phase</p>	<p><u>Noise Handling:</u></p> <ul style="list-style-type: none"> ◆ NEM:AQA, 2004 Regulation 6(1) ◆ All mining vehicles should be in a road worthy condition in terms

				<p>of the Road Transport Act, 1987</p> <ul style="list-style-type: none"> Noise zones needs to be demarcated and personnel should not be allowed to enter high-risk areas without hearing protection if needed.
STRIPPING AND STOCKPILING OF TOPSOIL	Infestation of the topsoil heaps by weeds and invader plants.	<u>Control & Remedy:</u> Implementation of weed control and weed/invader plant management plan	Throughout operational phase	<p><u>Management of weed- or invader plants:</u></p> <ul style="list-style-type: none"> CARA, 1983 All species regarded as Category 1 weeds according to CARA need to be eradicated from site.
STRIPPING AND STOCKPILING OF TOPSOIL	Loss of topsoil due to incorrect storm water management	<u>Control:</u> Storm water management	Throughout operational phase	<p><u>Loss of topsoil due to incorrect storm water management:</u></p> <ul style="list-style-type: none"> CARA, 1983 NEMA, 1998 NWA, 1998 The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes
EXCAVATION AND LOADING OF SAND TO BE SOLD	Reduction in soil depth	<u>Control:</u> Implementation of proper topsoil management and rehabilitation	Throughout operational phase	<p><u>Reduction in soil depth:</u></p> <ul style="list-style-type: none"> CARA, 1983 MPRDA, 2008 The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural

				purposes.
EXCAVATION AND LOADING OF SAND TO BE SOLD	Dust nuisance from denuded areas	<u>Control:</u> Dust suppression	Throughout operational phase	<p><u>Dust Handling:</u></p> <ul style="list-style-type: none"> ◆ NEM:AQA, 2004 Regulation 6(1) ◆ Monthly fallout dust levels has to comply with the acceptable dust fall rate published for non-residential areas in the National Dust Control Regulations 2013 – 600 < Dust Fall < 1 200 mg/m²/day. ◆ Quarterly gravimetric dust levels has to comply with the standard published in the NIOSH guidelines – Particulates >1/10th of the occupational exposure limit.
EXCAVATION AND LOADING OF SAND TO BE SOLD	Noise nuisance generated by excavation equipment	<u>Control:</u> Noise management	Throughout operational phase	<p><u>Noise Handling:</u></p> <ul style="list-style-type: none"> ◆ NEM:AQA, 2004 Regulation 6(1) ◆ All mining vehicles should be in a road worthy condition in terms of the Road Transport Act, 1987 ◆ Noise zones needs to be demarcated and personnel should not be allowed to enter high risk areas without hearing protection if needed

<p>EXCAVATION AND LOADING OF SAND TO BE SOLD</p>	<p>Negative impact on the fynbos (S1)</p>	<p><u>Control:</u> Management of buffer areas and demarcation of work areas</p>	<p>Throughout operational phase</p>	<p><u>Negative impact on the fynbos (Site Alternative 1):</u></p> <ul style="list-style-type: none"> ◆ NEM:BA, 2004 ◆ Critical Biodiversity Areas (CBA's)
<p>EXCAVATION AND LOADING OF SAND TO BE SOLD</p>	<p>Negative impact on the fynbos (S2)</p>	<p><u>Modify:</u> Consider use of a less sensitive area</p>	<p>Throughout operational phase</p>	<p><u>Negative impact on the fynbos (Site Alternative 2):</u></p> <ul style="list-style-type: none"> ◆ NEM:BA, 2004 ◆ Critical Biodiversity Areas (CBA's) ◆ Removal permits has to be obtained from CapeNature prior to removal of indigenous vegetation.
<p>EXCAVATION AND LOADING OF SAND TO BE SOLD</p>	<p>Negative impact on fauna that may enter the area</p>	<p><u>Control:</u> Management of employees working on-site</p>	<p>Throughout operational phase</p>	<p><u>Negative impact on fauna that may enter the area:</u></p> <ul style="list-style-type: none"> ◆ NEM:BA, 2004 ◆ The mine has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the mining activities.
<p>EXCAVATION AND LOADING OF SAND TO BE SOLD</p>	<p>Impaired soil drainage resulting in water logging in potential root zone</p>	<p><u>Control:</u> Topsoil management and rehabilitation</p>	<p>Throughout operational phase</p>	<p><u>Impaired soil drainage resulting in water logging in potential root zone:</u></p> <ul style="list-style-type: none"> ◆ CARA, 1983 ◆ NWA, 1998 ◆ NEM:BA, 2004

				<ul style="list-style-type: none"> ◆ The replacement of the topsoil and sloping of the area is of utmost importance to ensure the effective future use of the area for agricultural purposes.
EXCAVATION AND LOADING OF SAND TO BE SOLD	Contamination of surface or groundwater due to hazardous spills not cleaned	<u>Control:</u> Waste management	Throughout operational phase	<p><u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u></p> <ul style="list-style-type: none"> ◆ NWA, 1998 ◆ NEM:WA, 2008 ◆ Every precaution should be taken to prevent groundwater contamination. The precautionary principal must apply.
EXCAVATION AND LOADING OF SAND TO BE SOLD	Infestation of mining area and soil heaps with weeds/invaders plants	<u>Control & Remedy:</u> Implementation of weed control and weed/invader plant management plan	Throughout operational phase	<p><u>Management of weed- or invader plants:</u></p> <ul style="list-style-type: none"> ◆ CARA, 1983 ◆ All species regarded as Category 1 weeds according to CARA need to be eradicated from site.
EXCAVATION AND LOADING OF SAND TO BE SOLD	Potential impact of mining activities on the runoff and infiltration of storm water.	<u>Control:</u> Implementation of geohydrological assessment and the monitoring program proposed by DWS	Throughout operational phase	<p><u>Potential impact of mining activities on the runoff and infiltration of storm water</u></p> <ul style="list-style-type: none"> ◆ NWA, 1998 ◆ CARA, 1983 ◆ Applicant to comply with buffer area and standards to be determined by DWS.

<p>TRANSPORTATION OF SAND FROM MINING AREA TO CLIENTS</p>	<p>Dust nuisance due to vehicles transporting the sand from site</p>	<p><u>Control:</u> Dust suppression</p>	<p>Throughout operational phase</p>	<p><u>Dust Handling:</u></p> <ul style="list-style-type: none"> ◆ NEM:AQA, 2004 Regulation 6(1) ◆ Monthly fallout dust levels has to comply with the acceptable dust fall rate published for non-residential areas in the National Dust Control Regulations 2013 – 600 < Dust Fall < 1 200 mg/m²/day. ◆ Quarterly gravimetric dust levels has to comply with the standard published in the NIOSH guidelines – Particulates >1/10th of the occupational exposure limit
<p>TRANSPORTATION OF SAND FROM MINING AREA TO CLIENTS</p>	<p>Noise nuisance caused by vehicles transporting the sand from site</p>	<p><u>Control:</u> Noise management</p>	<p>Throughout operational phase</p>	<p><u>Noise Handling:</u></p> <ul style="list-style-type: none"> ◆ NEM:AQA, 2004 Regulation 6(1) ◆ All mining vehicles should be in a road worthy condition in terms of the Road Transport Act, 1987 ◆ Noise zones needs to be demarcated and personnel should not be allowed to enter high risk areas without hearing protection if needed
<p>TRANSPORTATION OF SAND FROM MINING AREA TO CLIENTS</p>	<p>Degradation of gravel access roads</p>	<p><u>Control & Remedy:</u> Road management</p>	<p>Throughout operational phase</p>	<p><u>Degradation of the gravel access road:</u></p> <ul style="list-style-type: none"> ◆ NRTA, 1996 ◆ The gravel access road needs

				to be monitored for signs of degradation. Should any signs become apparent immediate rectification needs to be implemented.
TRANSPORTATION OF SAND FROM MINING AREA TO CLIENTS	Increase in dust particles and noise levels negatively affecting poultry farming at Droogelaagte.	<u>Control:</u> Dust and noise management	Throughout operational phase	<p><u>Increase in dust particles and noise levels negatively affecting poultry farming at Droogelaagte:</u></p> <ul style="list-style-type: none"> ◆ NEM:AQA, 2004 Regulation 6(1) ◆ All mining vehicles should be in a road worthy condition in terms of the Road Transport Act, 1987
REPLACEMENT OF TOPSOIL OVER MINED-OUT AREA AND FINAL REHABILITATION	Erosion of returned topsoil after rehabilitation	<u>Control:</u> Soil management	Throughout decommissioning phase	<p><u>Erosion of returned topsoil after rehabilitation:</u></p> <ul style="list-style-type: none"> ◆ CARA, 1983 ◆ NEM:BA, 2004 ◆ MPRDA, 2008 ◆ The replacement of the topsoil and sloping of the area is of utmost importance to ensure the effective future use of the area for agricultural purposes. ◆ Rehabilitation cannot be considered complete until the first cover crop is well established.
REPLACEMENT OF TOPSOIL OVER MINED-OUT AREA AND FINAL REHABILITATION	Creation of uneven surfaces or steep slopes	<u>Control:</u> Effective rehabilitation	Throughout decommissioning phase	<p><u>Creation of uneven surfaces or steep slopes:</u></p> <ul style="list-style-type: none"> ◆ CARA, 1983 ◆ NEM:BA, 2004

				<ul style="list-style-type: none">◆ MPRDA, 2008◆ Rehabilitation has to prevent uneven surface slopes in order to prevent hindrance of future cultivation.
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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 Regulation 22 (2) (d) as described in 2.4 herein.

As a strip/minor area becomes mined-out the area will be fully rehabilitated prior to the opening of another strip. The stockpiled topsoil will be spread over the mined area to a depth of at least 500 mm.

Final rehabilitation will entail the removal of all infrastructure and equipment from the site. 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 management plan during the 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 EIA Report, includes all the environmental objectives in relation to closure and will be made available for perusal of the landowner, I&AP's and stakeholders. Any additional comments received on the draft report will be incorporated into the Final EIA report.

(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 D.

(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 D will comply with the minimum closure objectives as prescribed by DMR and detailed below, and therefore is deemed to be compatible:

- ◆ The mining plan should be such that topsoil is stockpiled for the minimum possible time by rehabilitating different mining blocks progressively as the mining process continues.
- ◆ 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.
- ◆ After mining, any steep slopes at the edges of excavations, must be reduced to a minimum and profiled to blend with the surrounding topography.
- ◆ The stockpiled topsoil must then be evenly spread over the entire mining area, so that there is a depth of 500 mm of sandy topsoil above the underlying clay. The depth should be monitored during spreading to ensure that coverage is adequate and even.
- ◆ Topsoil spreading should only be done 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 the end of the rainy season, when there is moisture in the soil for vegetation establishment and the risk of heavy rainfall events is minimal.
- ◆ A cover crop must be planted and established immediately after spreading of topsoil to stabilize the soil and protect it from erosion. The cover crop should be fertilized for optimum production. It is important that rehabilitation is taken up to the point of 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.

- ◆ On-going alien vegetation control must keep the area free of alien vegetation after mining.
- ◆ Rehabilitation of the surface area shall entail landscaping, levelling, top dressing, land preparation, seeding (if required) and maintenance, and weed / alien clearing.
- ◆ All infrastructure, equipment, temporary equipment and other items used during the mining period will be removed from the site (section 44 of the MPRDA).
- ◆ Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognized landfill facility. It will not be permitted to be buried or burned on the site.
- ◆ Weed / Alien clearing will be done in a sporadic manner during the life of the mining activities.
- ◆ Species regarded as Category 1 weeds according to CARA (Conservation of Agricultural Recourses Act, 1983 – Act 43; Regulations 15 & 16 (as amended in March 2001) need to be eradicated from the site.
- ◆ Final rehabilitation shall be completed within a period specified by the Regional Manager.

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

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

Mine type and saleable mineral by-product

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

Mine type	Sand
Saleable mineral by-product	None

Risk ranking

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

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

Environmental sensitivity of the mine area

According to Table B.4

Environmental sensitivity of the mine area	Low
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Level of information

According to Step 4.2:

Level of information available	Extensive
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Identify closure components

According to Table B.5 and site-specific conditions

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

11	River diversions		No
12	Fencing		No
13	Water management (Separating clean and dirty water, managing polluted water and managing the impact on groundwater)		No
14	2 to 3 years of maintenance and aftercare	Yes	

Unit rates for closure components

According to Table B.6 master rates and multiplication factors for applicable closure components.

Component No.	Main description	Master rate	Multiplication factor
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)		
2(A)	Demolition of steel buildings and structures		
2(B)	Demolition of reinforced concrete buildings and structures		
3	Rehabilitation of access roads		
4(A)	Demolition and rehabilitation of electrified railway lines		
4(B)	Demolition and rehabilitation of non-electrified railway lines		
5	Demolition of housing and facilities		
6	Opencast rehabilitation including final voids and ramps		
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	99 851	1
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	13 288	1

Determine weighting factors

According to Tables B.7 and B.8

Weighting factor 1: Nature of terrain/accessibility	1.00
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

CALCULATION OF THE QUANTUM							
Mine:	Portion 2 (Remaining Extent) of the farm Woodlands 874			Location:	Malmesbury		
Evaluators:	C Fouche			Date:	2015-08-13		
No	Description	Unit	A Quantity	B Master rate	C Multiplication factor	D Weighting factor 1	E=A *B*C*D Amount (rands)
			Step 4.5	Step 4.3	Step 4.3	Step 4.4	
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	m ³	0	13	1	1	R 0.00
2(A)	Demolition of steel buildings and structures	m ²	0	180	1	1	R 0.00
2(B)	Demolition of reinforced concrete buildings and structures	m ²	0	266	1	1	R 0.00
3	Rehabilitation of access roads	m ²	0	32	1	1	R 0.00
4(A)	Demolition and rehabilitation of electrified railway lines	m	0	313	1	1	R 0.00
4(B)	Demolition and rehabilitations of non-electrified railway lines	m	0	171	1	1	R 0.00
5	Demolition of housing and/or administration facilities	m ²	0	361	1	1	R 0.00
6	Opencast rehabilitation including final voids and ramps	ha	0	189 071	0.04	1	R 0.00
7	Sealing of shaft, audits and inclines	m ³	0	97	1	1	R 0.00
8(A)	Rehabilitation of overburden and spoils	ha	0	126 047	1	1	R 0.00
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	ha	0	156 989	1	1	R 0.00

8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	ha	0	455 971	0.51	1	R 0.00
9	Rehabilitation of subsided areas	ha	0	105 545	1	1	R 0.00
10	General surface rehabilitation	ha	0.1	99 851	1	1	R 9 985.10
11	River diversions	ha	0	99 851	1	1	R 0.00
12	Fencing	m	0	114	1	1	R 0.00
13	Water Management	ha	0	37 966	0.17	1	R 0.00
14	2 to 3 years of maintenance and aftercare	ha	92	13 288	1	1	R 1 222 496.00
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 1 232 481.10
Multiply Sum of 1-15 by Weighting factor 2 (Step 4.4)		1.05		R 1 232 481.10	Sub Total 1		R 1 294 105.16

1	Preliminary and General	6% of Subtotal 1 if Subtotal 1 <R100 000 000.00	R 77 646.31
		12% of Subtotal 1 if Subtotal 1 >R100 000 000.00	-
2	Contingency	10.0% of Subtotal 1	R 129 410.52
Sub Total 2 (Subtotal 1 plus management and contingency)			R 1 501 161.98
Vat (14%)			R 210 162.68
GRAND TOTAL (Subtotal 3 plus VAT)			R 1 711 324.66

The amount that will be necessary for the rehabilitation of damages caused by the operation, both sudden closures during the normal operation of the project and at final, planned closure gives a sum total of **R 1 711 324.66**.

(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 the environmental management programme and reporting thereon, including

g) Monitoring of Impact Management Actions

h) Monitoring and reporting frequency

i) Responsible persons

j) Time period for implementing impact management actions

k) Mechanism for monitoring compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Demarcation of site with visible beacons	Maintenance of beacons	<ul style="list-style-type: none"> ◆ Visible beacons need to be established at the corners of the mining area. ◆ The 20 m buffer areas from the natural areas need to be demarcated. ◆ The 10 m buffer area from the wetland area needs to be demarcated. ◆ The servitude around the power lines needs to be demarcated 	<p>Responsibility:</p> <ul style="list-style-type: none"> ◆ Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. ◆ Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> ◆ Ensure beacons are in place throughout the life of the mine. 	<p>Throughout Operational Phase</p> <ul style="list-style-type: none"> ◆ Daily compliance monitoring by site management. ◆ Quarterly compliance monitoring of site by an Environmental Control Officer.
Establishment of temporary office and ablution infrastructure within boundaries of site	<ul style="list-style-type: none"> ◆ All infrastructure to be established inside the boundaries of the mine. ◆ Waste monitoring programme to be implemented 	<ul style="list-style-type: none"> ◆ Site office and chemical toilet to be placed inside the beacons at the corners of the mining area. ◆ Waste disposal spreadsheets to be completed throughout operational phase and proof of safe disposal filed for auditing purposes. 	<p>Responsibility:</p> <ul style="list-style-type: none"> ◆ Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. ◆ Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> ◆ Contain all mining activities to the approved boundaries of the mining area. ◆ Ensure proper waste management at the site. 	<p>Throughout Construction Phase</p> <ul style="list-style-type: none"> ◆ Daily compliance monitoring by site management. ◆ Quarterly compliance monitoring of site by an Environmental Control Officer.

<p>Stripping and stockpiling of topsoil.</p>	<p>Loss of agricultural land for duration of mining (S1)</p>	<p>Sign a use agreement with landowner.</p>	<p>Responsibility:</p> <ul style="list-style-type: none"> ◆ Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. ◆ Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> ◆ Allow landowner to utilize areas not yet mined as pasture until mining progress. ◆ Sign rehabilitated mined-out areas back to the landowner. 	<p>Throughout Operational Phase</p> <ul style="list-style-type: none"> ◆ Daily compliance monitoring by site management. ◆ Quarterly compliance monitoring of site by an Environmental Control Officer.
<ul style="list-style-type: none"> ◆ Stripping and stockpiling of topsoil. ◆ Excavation and loading of sand to be sold. ◆ Transportation of sand from mining area to clients. 	<p>Dust Monitoring:</p> <ul style="list-style-type: none"> ◆ The dust generated by the mining activities should be continuously monitored, and addressed by the implementation of dust suppression methods. 	<p>Dust Handling and Monitoring:</p> <ul style="list-style-type: none"> ◆ Dust suppression equipment such as a water car and water dispenser. The applicant already has this equipment available. ◆ Fallout dust monitoring units to determine monthly dust levels. ◆ Gravimetric dust measuring equipment to be supplied by an occupational health specialist. ◆ Covers needed to close sand loads of trucks. 	<p>Responsibility:</p> <ul style="list-style-type: none"> ◆ Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. ◆ Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> ◆ Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. ◆ Assess effectiveness of dust suppression equipment. ◆ Limit speed on the access roads to 40km/h to prevent the generation of excess dust. ◆ Spray roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. ◆ Ensure trucks transporting sand from the site is covered to prevent windblown dust. 	<p>Throughout Construction, Operational and Decommissioning Phase</p> <ul style="list-style-type: none"> ◆ Daily compliance monitoring by site management. ◆ Quarterly compliance monitoring of site by an Environmental Control Officer.
<ul style="list-style-type: none"> ◆ Stripping and stockpiling of topsoil. ◆ Excavation and loading of sand to 	<p>Noise Monitoring</p> <ul style="list-style-type: none"> ◆ The noise impact should be contained within the boundaries of the property, as it will represent the 	<p>Noise Handling and Monitoring:</p> <ul style="list-style-type: none"> ◆ Site manager to ensure that the vehicles are equipped with silencers and maintained in a road worthy condition. 	<p>Responsibility:</p> <ul style="list-style-type: none"> ◆ Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. ◆ Compliance to be monitored by the Environmental Control Officer. 	<p>Throughout Construction, Operational and Decommissioning Phase</p> <ul style="list-style-type: none"> ◆ Daily compliance monitoring by site management. ◆ Quarterly compliance monitoring of site by an Environmental

<p>be sold.</p> <ul style="list-style-type: none"> ◆ Transportation of sand from mining area to clients. 	<p>current activities.</p>	<ul style="list-style-type: none"> ◆ Compliance with the appropriate legislation with respect to noise will be mandatory. ◆ Noise monitoring should be done in accordance with the requirements of the Mine Health and Safety Act. 	<p>Role:</p> <ul style="list-style-type: none"> ◆ Ensure that employees and staff conduct themselves in an acceptable manner while on site. ◆ No loud music may be permitted at the mining area. ◆ Ensure that all mining vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. 	<p>Control Officer.</p>
<ul style="list-style-type: none"> ◆ Stripping and stockpiling of topsoil. ◆ Excavation and loading of sand to be sold. ◆ Final Rehabilitation 	<p>Management of weed or invader plants</p> <ul style="list-style-type: none"> ◆ The presence of weed and/or invader plants should be continuously monitored, and any unwanted plants should be removed. 	<p>Management of weed or invader plants:</p> <ul style="list-style-type: none"> ◆ Removal of weeds should be manually or by the use of an approved herbicide. 	<p>Responsibility:</p> <ul style="list-style-type: none"> ◆ Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. ◆ Compliance to be monitored by the Environmental Control Officer. <p>Roel:</p> <ul style="list-style-type: none"> ◆ Implement a weed and invader plant control management plan. ◆ Control declared invader or exotic species on the rehabilitated areas. ◆ Keep the temporary topsoil stockpiles free of weeds. 	<p>Throughout Operational and Decommissioning Phase</p> <ul style="list-style-type: none"> ◆ Daily compliance monitoring by site management. ◆ Quarterly compliance monitoring of site by an Environmental Control Officer.
<ul style="list-style-type: none"> ◆ Stripping and stockpiling of topsoil. ◆ Excavation and loading of sand to be sold. ◆ Replacement of topsoil over mined-out area. ◆ Final Rehabilitation 	<p>Topsoil management</p>	<p>Topsoil Handling:</p> <ul style="list-style-type: none"> ◆ Excavating equipment to remove the first 500 mm of topsoil from the proposed work areas. The applicant already has this equipment available. ◆ Berms to be made to direct storm- and runoff water around the stockpiled topsoil area. 	<p>Responsibility:</p> <ul style="list-style-type: none"> ◆ Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. ◆ Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> ◆ Strip and stockpile the upper 500 mm of the soil and protect as topsoil. ◆ Remove strips of soil at right angles to the slope to slow down surface runoff and prevent erosion. ◆ Conduct topsoil stripping, stockpiling and re-spreading in a systematic way. Ensure topsoil is stockpiled for the minimum possible time by rehabilitating different mining blocks progressively. ◆ Protect topsoil stockpiles against losses by water and wind erosion through the establishment of plants on the stockpiles. 	<p>Throughout Construction, Operational and Decommissioning Phase</p> <ul style="list-style-type: none"> ◆ Daily compliance monitoring by site management. ◆ Quarterly compliance monitoring of site by an Environmental Control Officer.

			<ul style="list-style-type: none"> ◆ Topsoil heaps should not exceed 1.5 m in order to preserve micro-organism within the topsoil. ◆ Divert storm water around the topsoil heaps and mining areas. ◆ Conduct mining in accordance with the Best Practice Guideline for small scale mining as stipulated by DWS. 	
<ul style="list-style-type: none"> ◆ Excavation and loading of sand to be sold. 	Reduction in soil depth	<p>Management of rehabilitated area:</p> <ul style="list-style-type: none"> ◆ Site management has to ensure the topsoil is replaced to depth of 500 mm on rehabilitated areas. 	<p>Responsibility:</p> <ul style="list-style-type: none"> ◆ Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. ◆ Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> ◆ Strip and stockpile the upper 500 mm of the soil and protect as topsoil. ◆ Mine down to the clay layer. ◆ After mining, reduce any steep slopes at the edges of the excavations to a minimum and profile it to blend with the surrounding topography. ◆ Spread stockpiled topsoil evenly over the entire mining area, so that there is depth of 500 mm of sandy topsoil above the underlying clay. ◆ Ensure no depressions are left in the mining floor. Maintain a surface slope across the mining floor in the drainage direction, so that all excavations are free draining. 	<p>Throughout Construction, Operational and Decommissioning Phase</p> <ul style="list-style-type: none"> ◆ Daily compliance monitoring by site management. ◆ Quarterly compliance monitoring of site by an Environmental Control Officer.
<ul style="list-style-type: none"> ◆ Excavation and loading of sand to be sold. 	Protection of fynbos	<p>Management of buffer areas:</p> <ul style="list-style-type: none"> ◆ Site management has to ensure that the buffer area around the natural areas is maintained. 	<p>Responsibility:</p> <ul style="list-style-type: none"> ◆ Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. ◆ Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> ◆ Demarcate, signpost and manage the 20 m buffer area as no-go area around areas with natural vegetation. ◆ Do not remove any plants or trees without the approval of the ECO. 	<p>Throughout Construction, Operational and Decommissioning Phase</p> <ul style="list-style-type: none"> ◆ Daily compliance monitoring by site management. ◆ Quarterly compliance monitoring of site by an Environmental Control Officer.

<ul style="list-style-type: none"> Excavation and loading of sand to be sold. 	<p>Fauna Management</p>	<p>Protection of fauna:</p> <ul style="list-style-type: none"> Site management has to actively protect fauna that enters the mining area. 	<p>Responsibility:</p> <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> Ensure no fauna is caught, killed, harmed, sold or played with. Instruct workers to report any animals that may be trapped in the working area. Ensure no snares are set or nests raided for eggs or young. 	<p>Throughout Construction, Operational and Decommissioning Phase</p> <ul style="list-style-type: none"> Daily compliance monitoring by site management. Quarterly compliance monitoring of site by an Environmental Control Officer.
<ul style="list-style-type: none"> Excavation and loading of sand to be sold. 	<p>Soil Drainage Management</p>	<ul style="list-style-type: none"> Equipment to properly slope the rehabilitated areas. 	<p>Responsibility:</p> <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> Ensure no depressions are left in the mining floor. Maintain a surface slope across the mining floor in the drainage direction, so that all excavations are free draining. Ensure topsoil is managed as stipulated earlier. Demarcate and protect a 10 m buffer area between mining activities and the edge of the wetland area to the south of the site (even though the wetland is more than 100m from the mining area). 	<p>Throughout Construction, Operational and Decommissioning Phase</p> <ul style="list-style-type: none"> Daily compliance monitoring by site management. Quarterly compliance monitoring of site by an Environmental Control Officer.
<ul style="list-style-type: none"> Excavation and loading of sand to be sold. 	<p>Waste Management:</p> <ul style="list-style-type: none"> Management of waste should be a daily monitoring activity. Hydrocarbon spills need to be cleaned immediately and the site manager should 	<p>Waste Management:</p> <ul style="list-style-type: none"> Closed containers for the storage of general of hazardous waste until waste is removed to the appropriate landfill site. A hydrocarbon spill kit to enable sufficient clean-up of contaminated areas. 	<p>Responsibility:</p> <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> Ensure regular vehicle maintenance only take place within the service bay 	<p>Throughout Operational and Decommissioning Phase</p> <ul style="list-style-type: none"> Daily compliance monitoring by site management. Quarterly compliance monitoring of site by an Environmental Control Officer.

	<p>check compliance daily.</p>	<ul style="list-style-type: none"> ◆ Drip trays should be available to place underneath equipment parked for the night. ◆ Should a vehicle have a break down, it should be decommissioned immediately and removed from site to be serviced. ◆ Waste disposal register and file for the keeping of safe disposal records. 	<p>area of the off-site workshop. If emergency repairs is needed on site ensure drip trays is present. Ensure all waste products are disposed of in a 200 liter closed container/bin inside the emergency service area.</p> <ul style="list-style-type: none"> ◆ Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. ◆ Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. ◆ Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. ◆ Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection should take place on a regular basis and disposed of at the recognized landfill site at Malmesbury. Prevent refuse from being dumped on or in the vicinity of the mine area. ◆ Biodegradable refuse to be handled as indicated above. 	
<ul style="list-style-type: none"> ◆ Excavation and loading of sand to be sold. 	<p>Infiltration and runoff of storm water.</p>	<ul style="list-style-type: none"> ◆ Geohydrological equipment will be needed to conduct monitoring. 	<p>Responsibility:</p> <ul style="list-style-type: none"> ◆ Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. ◆ Monitoring to be conducted by geohydrologist. ◆ Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> ◆ Ensure the strip mining method is used as it minimizes the impacts of surface runoff, infiltration and groundwater recharge. ◆ Conduct a geohydrological assessment of potential mining 	<p>Throughout Operational and Decommissioning Phase</p> <ul style="list-style-type: none"> ◆ Daily compliance monitoring by site management. ◆ Monthly monitoring to be conducted by geohydrologist. (Frequency to increase as deemed necessary) ◆ Quarterly compliance monitoring of site by an Environmental Control Officer.

			<p>impacts once data for groundwater levels and fluctuations across the site is available.</p> <ul style="list-style-type: none"> ◆ Establish a monitoring program to measure the water levels at least monthly. Increase frequency during high rainfall winter months as suggested by geohydrologist. Record readings against date and time. ◆ Submit the monitoring data and report annually to DWS. ◆ Adhere to the buffer to be determined by DWS above the highest water level. ◆ If mining activities go below the water level, apply for a water use license for dewatering from DWS. 	
<ul style="list-style-type: none"> ◆ Transportation of sand from mining area to clients. 	<p>Management of Access Roads</p> <ul style="list-style-type: none"> ◆ The condition of the access road should be continuously monitored. 	<p>Management of Access Roads:</p> <ul style="list-style-type: none"> ◆ Dust suppression equipment such as a water car and dispenser. ◆ Grader to restore the road surface when needed. 	<p>Responsibility:</p> <ul style="list-style-type: none"> ◆ Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. ◆ Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> ◆ Divert storm water around the access roads to prevent erosion. ◆ Restrict vehicular movement to existing access routes to prevent crisscrossing of tracks through undisturbed areas. ◆ Repair rutting and erosion of the access roads caused by the mining activities. 	<p>Throughout Construction, Operational and Decommissioning Phase</p> <ul style="list-style-type: none"> ◆ Daily compliance monitoring by site management. ◆ Quarterly compliance monitoring of site by an Environmental Control Officer.
<ul style="list-style-type: none"> ◆ Transportation of sand from mining area to clients. 	<p>Management of impacts on Droogelaagte Poultry Farm</p>	<p>Management of Access Roads:</p> <ul style="list-style-type: none"> ◆ Dust suppression equipment such as a water car and dispenser. ◆ Covers needed to close sand loads of trucks. 	<p>Responsibility:</p> <ul style="list-style-type: none"> ◆ Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. ◆ Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> ◆ Ensure trucks transporting sand from the mining area is covered to prevent sand blowing from the trucks. ◆ Ensure dust suppression is done on the gravel roads leading up to the tar road to prevent dusty trucks passing 	<p>Throughout Construction, Operational and Decommissioning Phase</p> <ul style="list-style-type: none"> ◆ Daily compliance monitoring by site management. ◆ Quarterly compliance monitoring of site by an Environmental Control Officer.

<ul style="list-style-type: none"> ◆ Replacement of topsoil over mined-out area. ◆ Final Rehabilitation 	<p>Soil erosion:</p> <ul style="list-style-type: none"> ◆ Loss of reinstated topsoil after rehabilitation. ◆ Creation of uneven surfaces or steep slopes 	<p>Erosion monitoring:</p> <ul style="list-style-type: none"> ◆ Grader to restore areas prone to soil erosion. ◆ Planting of a cover crop to stabilize reinstated soil ◆ Erosion prevention equipment. 	<p>the poultry infrastructure of Droogelaagte..</p> <p>Responsibility:</p> <ul style="list-style-type: none"> ◆ Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. ◆ Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> ◆ Control run-off water via temporary banks, where necessary on the slopes, to ensure that accumulation of run-off does not cause down-slope erosion. ◆ Only do topsoil spreading at a time of year when vegetation cover can be established as quickly as possible afterwards, so that erosion of returned topsoil by both rain and wind is minimized. The best time of year is at the end of the rainy season, when there is moisture in the soil for vegetation establishment and the risk of heavy rainfall events is minimal. ◆ Plant a cover crop immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. Fertilize the cover crop for optimum production. ◆ Ensure rehabilitation be taken up to the point of cover crop stabilization. Rehabilitation shouldn't be considered complete until the first cover crop is well established. ◆ Monitor all rehabilitated areas for erosion, and appropriately stabilized if any erosion occurs. ◆ Remove any depressions in the mining floor to ensure minimum impact on drainage. Maintain a surface slope (even if minimal) across the mining floor in the drainage direction, so that all excavations are free draining. ◆ After mining, reduce any steep slopes at the edges of excavations to a minimum and profiled it to blend with the surrounding topography. 	<p>Throughout Construction, Operational and Decommissioning Phase</p> <ul style="list-style-type: none"> ◆ Daily compliance monitoring by site management. ◆ Quarterly compliance monitoring of site by an Environmental Control Officer.
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<ul style="list-style-type: none"> ◆ Stripping and stockpiling of topsoil. ◆ Excavation and loading of sand to be sold. ◆ Transportation of sand from mining area to clients. ◆ Replacement of topsoil over mined-out area. ◆ Final Rehabilitation 	<p>Health and safety risk</p>	<p>Health and safety Management:</p> <ul style="list-style-type: none"> ◆ Stocked first aid box. ◆ Level 1 certified first aider ◆ All appointments in terms of the Mine Health and Safety Act. 	<p>Responsibility:</p> <ul style="list-style-type: none"> ◆ Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. ◆ Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> ◆ Ensure workers have access to the correct personal protection equipment (PPE) as required by law. ◆ Manage all operations in compliance with the Occupational Health and Safety Act as well as the Mine Health and Safety Act. 	<p>Throughout Construction, Operational and Decommissioning Phase</p> <ul style="list-style-type: none"> ◆ Daily compliance monitoring by site management. ◆ Quarterly compliance monitoring of site by an Environmental Control Officer.
<ul style="list-style-type: none"> ◆ Stripping and stockpiling of topsoil. ◆ Excavation and loading of sand to be sold. ◆ Transportation of sand from mining area to clients. ◆ Replacement of topsoil over mined-out area. ◆ Final Rehabilitation 	<p>Protection of Eskom Infrastructure</p>	<p>Beacons to be installed to demarcate Eskom servitudes.</p>	<p>Responsibility:</p> <ul style="list-style-type: none"> ◆ Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. ◆ Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> ◆ Establish and demarcate a 15.5 m no-go area either side of the 132kV power line crossing the site. (31 m no-go area in total) ◆ Establish and demarcate a 9.0 m no-go area either side of the 11kV power line crossing the site. (18 m no-go area in total) ◆ No work may be done nearer than 3.8 m to the conductors of the 132kV and/or 3.0m to the 11kV power line. ◆ Maintain a minimum ground clearance of 7.5 m above ground to the 132kV and 6.3 m to the 11kV power line. ◆ Ensure Eskom has at least a 10 m obstruction free zone around all pylons. 	<p>Throughout Construction, Operational and Decommissioning Phase</p> <ul style="list-style-type: none"> ◆ Daily compliance monitoring by site management. ◆ Quarterly compliance monitoring of site by an Environmental Control Officer.
<ul style="list-style-type: none"> ◆ Stripping and stockpiling of 	<p>Protection of Cultural and Heritage Artefacts</p>	<p>Should any artefacts be discovered the area needs to be demarcated and work</p>	<p>Responsibility:</p> <ul style="list-style-type: none"> ◆ Site Manager to ensure compliance 	<p>Throughout Construction, Operational and Decommissioning Phase</p>

<p>topsoil.</p> <ul style="list-style-type: none"> ◆ Excavation and loading of sand to be sold. ◆ 		<p>needs to be stopped.</p>	<p>with the guidelines as stipulated in the EMPr.</p> <ul style="list-style-type: none"> ◆ Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> ◆ Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. ◆ Notify Heritage Western Cape (HWC) and the ECO immediately. ◆ Work may only commence once the area was cleared by HWC. 	<ul style="list-style-type: none"> ◆ Daily compliance monitoring by site management. ◆ Quarterly compliance monitoring of site by an Environmental Control Officer.
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l) Indicate the frequency of the submission of the performance assessment report.

Section 55 of the Mineral and Petroleum Resources Development Regulations stipulates that performance assessment reporting should be done at least every two years. The applicant however commits to submit the performance assessment reports of the proposed sand mining activity annually to DMR for their perusal.

m) Environmental Awareness Plan

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

Once mining of the proposed area starts a copy of the Environmental Management Programme will be handed to the site manager during the site establishment meeting. Issues such as topsoil handling, site clearance, fire principals and hazardous waste handling will be discussed.

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

(2) Manner in which risks 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 activities to the management programmes described in the EMPr.

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

- **Site Management:**
 - ◆ Stay within boundaries of site – do not enter adjacent properties
 - ◆ Keep tools and material properly stored
 - ◆ Smoke only in designated areas
 - ◆ Use toilets provided – report full or leaking toilets
- **Water Management and Erosion:**
 - ◆ Check that rainwater flows around work areas and are not contaminated
 - ◆ Report any erosion

- ◆ Check that dirty water is kept from clean water
- **Waste Management:**
 - ◆ Take care of your own waste
 - ◆ Keep waste separate into labelled containers – report full bins
 - ◆ Place waste in containers and always close lid
 - ◆ Don't burn waste
 - ◆ Pick-up any litter laying around
- **Hazardous Waste Management (Petrol, Oil, Diesel, Grease)**
 - ◆ Never mix general waste with hazardous waste
 - ◆ Use only sealed, non-leaking containers
 - ◆ Keep all containers closed and store only in approved areas
 - ◆ Always put drip trays under vehicles and machinery
 - ◆ Empty drip trays after rain
 - ◆ Stop leaks and spills, if safe
 - ✓ Keep spilled liquids moving away
 - ✓ Immediately report the spill to the site manager/supervision
 - ✓ Locate spill kit/supplies and use to clean-up, if safe
 - ✓ Place spill clean-up wastes in proper containers
 - ✓ Label containers and move to approved storage area
- **Discoveries:**
 - ◆ Stop work immediately
 - ◆ Notify site manager/supervisor
 - ◆ Includes – Archaeological finds, Cultural artefacts, Contaminated water, Pipes, Containers, Tanks and drums, Any buried structures
- **Air Quality:**
 - ◆ Wear protection when working in very dusty areas
 - ◆ Implement dust control measures:
 - ✓ Water all roads and work areas
 - ✓ Minimize handling of material
 - ✓ Obey speed limit and cover trucks
- **Driving and Noise:**
 - ◆ Use only approved access roads
 - ◆ Respect speed limits
 - ◆ Only use turn-around areas – no crisscrossing through undisturbed areas
 - ◆ Avoid unnecessary loud noises
 - ◆ Report or repair noisy vehicles

- **Vegetation and Animal life:**
 - ◆ Do not remove any plants or trees without approval of the site manager
 - ◆ Do not collect fire wood
 - ◆ Do not catch, kill, harm, sell or play with any animal, reptile, bird or amphibian on site
 - ◆ Report any animal trapped in the work area
 - ◆ Do not set snares or raid nests for eggs or young
- **Fire Management:**
 - ◆ Do not light any fires on site, unless contained in a drum at demarcated area
 - ◆ Put cigarette butts in a rubbish bin
 - ◆ Know the position of firefighting equipment
 - ◆ Report all fires
 - ◆ Don't burn waste or vegetation

(3) 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
- b) the inclusion of comments and inputs from stakeholders and I&AP's;
- c) the inclusion of inputs and recommendations from the specialist reports where relevant; and
- d) the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed;

-END-

LIST OF APPENDICES:

Appendix A	Regulation 2.2 Mine Map
Appendix B	Mine Activities Plan
Appendix C	Land Use Map & Satellite View of Surrounding Land Use
Appendix D	Rehabilitation Plan
Appendix E	Landowner Consent
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Appendix G	Supporting Impact Assessment
Appendix H	Soil Survey and Agricultural Potential Report
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Appendix M	CV and Expertise of EAP

APPENDIX A

REGULATION 2.2 MAP



APPENDIX B

MINE ACTIVITIES MAP



APPENDIX C

**LAND USE MAP & SATELITE VIEW OF
SURROUNDING LAND USE**



APPENDIX D

REHABILITATION PLAN



APPENDIX E

LANDOWNER CONSENT



APPENDIX F

COMMENTS AND RESPONSE REPORT



APPENDIX G
SUPPORTING IMPACT ASSESSMENT



ENVIRONMENTAL IMPACT STATEMENT

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

<u>TYPE OF IMPACT</u>	<u>DURATION</u>	<u>LIKELIHOOD</u>	<u>SIGNIFICANCE</u>
<p><u>Stripping and Stockpiling of Topsoil:</u></p> <ul style="list-style-type: none"> ◆ Loss of agricultural land for duration of mining (S1) ◆ Visual impact due to removal of topsoil ◆ Dust nuisance caused by disturbance of soil ◆ Noise nuisance caused by machinery stripping and stockpiling the topsoil ◆ Infestation of the topsoil heaps by weeds and invader plants ◆ Loss of topsoil due to incorrect storm water management 	<p>Duration of operational phase ±25 years</p>	<p style="text-align: center;">Definite</p> <p style="text-align: center;">Possible</p> <p style="text-align: center;">Low Possibility</p> <p style="text-align: center;">Low Possibility</p> <p style="text-align: center;">Low Possibility</p> <p style="text-align: center;">Low Possibility</p>	<p style="text-align: center;">Low-Medium Concern</p> <p style="text-align: center;">Low-Medium Concern</p> <p style="text-align: center;">Low Concern</p> <p style="text-align: center;">Low-Medium Concern</p> <p style="text-align: center;">Low Concern</p> <p style="text-align: center;">Low Concern</p>
<p><u>Excavation and loading of sand to be sold:</u></p> <ul style="list-style-type: none"> ◆ Reduction in soil depth ◆ Dust nuisance from denuded areas ◆ Noise nuisance generated by excavation equipment ◆ Negative impact on the fynbos (S1) ◆ Negative impact on the fynbos (S2) ◆ Negative impact on fauna ◆ Impaired soil drainage resulting in water logging in potential root zone ◆ Contamination of surface or groundwater due to hazardous spills not cleaned ◆ Infestation of mining area and soil heaps with weeds/invader plants ◆ Potential impact of mining activities on the runoff and infiltration of storm water 	<p>Duration of operational phase ±25 years</p>	<p style="text-align: center;">Low Possibility</p> <p style="text-align: center;">Low Possibility</p> <p style="text-align: center;">Low Possibility</p> <p style="text-align: center;">Low Possibility</p> <p style="text-align: center;">Definite</p> <p style="text-align: center;">Low Possibility</p> <p style="text-align: center;">Low Possibility</p> <p style="text-align: center;">Low Possibility</p> <p style="text-align: center;">Low Possibility</p> <p style="text-align: center;">Possible</p>	<p style="text-align: center;">Low Concern</p> <p style="text-align: center;">Low Concern</p> <p style="text-align: center;">Low-Medium Concern</p> <p style="text-align: center;">Low Concern</p> <p style="text-align: center;">Medium-High Concern</p> <p style="text-align: center;">Low Concern</p> <p style="text-align: center;">Low Concern</p> <p style="text-align: center;">Low Concern</p> <p style="text-align: center;">Low Concern</p>
<p><u>Transportation of sand from mining area to clients:</u></p> <ul style="list-style-type: none"> ◆ Dust nuisance due to vehicles transporting the sand from site ◆ Noise nuisance caused by vehicles transporting the sand from site 	<p>Duration of operational phase ±25 years</p>	<p style="text-align: center;">Possible</p> <p style="text-align: center;">Low Possibility</p>	<p style="text-align: center;">Low Concern</p> <p style="text-align: center;">Low-Medium Concern</p>

<ul style="list-style-type: none"> ✚ Degradation of access roads ✚ Increase in dust particles and noise levels negatively affecting poultry farming at Droogelaagte 		<p>Low Possibility</p> <p>Low Possibility</p>	<p>Low Concern</p> <p>Low Concern</p>
<p><u>Replacement of topsoil over mined-out area and final rehabilitation:</u></p> <ul style="list-style-type: none"> ✚ Erosion of returned topsoil after rehabilitation ✚ Creation of uneven surfaces or steep slopes 	<p>Duration of operational phase ±25 years & Decommissioning Phase</p>	<p>Low Possibility</p> <p>Low Possibility</p>	<p>Low Concern</p> <p>Low Concern</p>

APPENDIX H
SOIL SURVEY AND AGRICULTURAL
POTENTIAL REPORT



APPENDIX I

GEOHYDROLOGICAL ASSESSMENT



APPENDIX J
PROOF OF SUBMISSION OF WATER
USE APPLICATION



APPENDIX K
FINANCIAL AND TECHNICAL
COMPETENCE



APPENDIX L

PHOTOGRAPHS OF THE SITE





PROPOSED MINING AREA – SITE ALTERNATIVE 1



SITE ALTERNATIVE 2 – FYNBOS AREA



WETLAND AREA BORDERING THE MINING AREA TO THE SOUTH

APPENDIX M
CV AND EXPERIENCE RECORD OF EAP

