

PROPOSED MINING ON THE REMAINING EXTENT OF THE FARM JAMMERBERGSDRIFT 540, WEPENER, FREE STATE PROVINCE

DRAFT BASIC ASSESSMENT REPORT



JULY 2018

REFERENCE NUMBER: FS 30/5/1/3/2/10232 MP

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ABBREVIATIONS

BID	Background Information Document
BGIS	Biodiversity GIS
CARA	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
DBAR	Draft Basic Assessment Report
DMR	Department of Mineral and Resources
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIA Regulations	Environmental Impact Assessment Regulations, 2014 (as amended 2017)
EMPr	Environmental Management Programme
FAII	Fish Assemblage Integrity Index
FBAR	Final Basic Assessment Report
FEPA	Freshwater Ecosystem Priority Areas
Gh2	Aliwal North Dry Grassland
GI	Geomorphological Index
GN	Government Notice
I&AP's	Interested and Affected Parties
IHA	International Hydropower Association
IHI	Index of Habitat Integrity
MHSA	Mine Health and Safety Act, 1996 (Act No. 29 of 1996)
MMM	Mangaung Metropolitan Municipality
MP	Mining Permit
MPRDA	Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:AQA	National Environmental Management: Air Quality Control Act, 2004 (Act No. 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NHRA	National Heritage Resources Act, 1999 (Act No 25 of 1999)
NRTA	National Road Traffic Act, 1996 (Act No. 93 of 1996)
NWA	National Water Act, 1998 (Act No. 36 of 1998)

PCB's	Polychlorinated Biphenyl
PPE	Personal Protective Equipment
RVI	Riparian Vegetation Index
S1	Site Alternative 1
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SASS	South African Scoring System
WMA	Water Management Area

TABLE OF CONTENTS

PART A.....	10
SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT	10
a) Details of Greenmined Environmental	10
i) Details of the EAP.....	10
ii) Expertise of the EAP.....	10
b) Location of the overall Activity.	11
c) Locality map.....	11
d) Description of the scope of the proposed overall activity.	11
i) Listed and specified activities	12
ii) Description of the activities to be undertaken.....	13
e) Policy and Legislative Context.....	19
f) Need and desirability of the proposed activities.....	21
g) Motivation for the overall preferred site, activities and technology alternative.....	22
h) Full description of the process followed to reach the proposed preferred alternatives within the site.	23
i) Details of the development footprint alternatives considered.	23
ii) Details of the Public Participation Process Followed.....	25
iii) Summary of issues raised by I&APs.....	27
iv) The Environmental attributes associated with the alternatives.....	32
v) Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts	43
vi) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;	46
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. 52	
viii) The possible mitigation measures that could be applied and the level of risk.	53
ix) Motivation where no alternative sites were considered.....	58
x) Statement motivating the alternative development location within the overall site.....	58
i) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity.	59
j) Assessment of each identified potentially significant impact and risk.....	63
k) Summary of specialist reports.	68
l) Environmental impact statement	69
i) Summary of the key findings of the environmental impact assessment;.....	69
ii) Final Site Map.....	71
iii) Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	71

m) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;.....	72
n) Aspects for inclusion as conditions of Authorisation.	76
o) Description of any assumptions, uncertainties and gaps in knowledge.....	76
p) Reasoned opinion as to whether the proposed activity should or should not be authorised..	76
i) Reasons why the activity should be authorised or not.....	76
ii) Conditions that must be included in the authorisation	76
q) Period for which the Environmental Authorisation is required.	76
r) Undertaking.....	77
s) Financial Provision	77
i) Explain how the aforesaid amount was derived	77
ii) Confirm that this amount can be provided from operating expenditure.....	77
t) Specific Information required by the competent Authority	77
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:-	77
u) Other matters required in terms of section 24(4)(a) and (b) of the Act.	80
PART B.....	81
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT	81
a) Details of the EAP,	81
b) Description of the Aspects of the Activity.....	81
c) Composite Map	81
d) Description of impact management objectives including management statements.....	81
i) Determination of closure objectives. (Ensure that the closure objectives are informed by the type of environment described)	81
ii) Volume and rate of water use required for the operation.....	82
iii) Has a water use licence has been applied for?	83
iv) Impacts to be mitigated in their respective phases	84
e) Impact Management Outcomes	101
f) Impact Management Actions	106
i) Financial Provision.....	111

LIST OF FIGURES

Figure 1: Satellite view showing the access road (red line) to the proposed mining area	15
Figure 2: Satellite view showing the position of Site Alternative 1 within the surrounding landscape.	24
Figure 3: Statistical representation of the average rainfall, midday temperatures and night-time temperatures for the Wepener region. Chart obtained from saexplorer.....	32
Figure 4: National vegetation cover map for Gh 2 Aliwal North Dry Grassland (extracted from the BGIS Map Viewer – National Vegetation Map). The GPS coordinate indicates the general location of the site.....	35

Figure 5: Flooding of the R26 prior to the raising of the Jim Fouché bridge (image obtained from <https://www.hydropower.org/case-studies/south-africa-welbedacht>) 40

Figure 6: Summary of the overall health of the Caledon River as reported on in the State-of-Rivers Report, 2003. With the first icon representing the Index of Habitat Integrity (poor-fair), the second icon the Geomorphological Index (fair), the third icon represents the status of the Riparian Vegetation (fair), fourth icon shows the South African Scoring System (fair), and the last icon showing the status of the Fish Assemblage Integrity Index (good). 41

LIST OF TABLES

Table 1: GPS Coordinates of mining area..... 13

Table 2: GPS Coordinates of Site Alternative 1 (preferred and only site alternative) 23

Table 3: Aquatic characteristics of the greater study area..... 34

Table 4: Characteristic features of the Aliwal North Dry Grassland type..... 35



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

NAME OF APPLICANT:	Twin Youth Initiative Trading CC
TEL NO:	079 540 5340
FAX NO:	-
POSTAL ADDRESS:	P.O. Box 8805, Reitz, 9810
PHYSICAL ADDRESS:	400 Motshumi Street, Reitz, 9810
FILE REFERENCE NUMBER SAMRAD:	FS 30/5/1/3/2/10232 MP

1. IMPORTANT NOTICE

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

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

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

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

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

2. OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

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

- (a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- (b) identify the alternatives considered, including the activity, location, and technology alternatives;
- (c) describe the need and desirability of the proposed alternatives,
- (d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:
 - (i) the nature, signification, consequence, extent, duration, and probability of the impacts occurring to; and
 - (ii) the degree to which these impacts –
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources; and
 - (cc) can be managed, avoided or mitigated;
- (e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to –
 - (i) identify and motivate a preferred site, activity and technology alternative;
 - (ii) identify suitable measures to manage, avoid or mitigate identified impacts; and
 - (iii) identify residual risks that need to be managed and monitored.

PART A

SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

3. Contact Person and correspondence address

a) Details of Greenmined Environmental

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

i) Details of the EAP

Name of the Practitioner: Ms Christine Fouche (Senior Environmental Specialist)
Tel No.: 021 851 2673
Fax No.: 086 546 0579
E-mail address: christine.f@greenmined.co.za

ii) Expertise of the EAP.

(1) The qualifications of the EAP

(with evidence).

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

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

(In carrying out the Environmental Impact Assessment Procedure)

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

b) Location of the overall Activity.

Farm Name:	Remaining Extent of the farm Jammerbergsdrift 540 RD
Application area (Ha)	4.9 ha
Magisterial district:	Wepener
Distance and direction from the nearest town	± 7.5 km west of Wepener. Take the R26 in a western direction when leaving Wepener and drive ± 6.5 km to the bridge crossing the Caledon River. The mining area is situated on the right hand side in the riverbed.
21 digit Surveyor General Code for each farm portion	F04000000000054000000

c) Locality map

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

The requested map is attached as Appendix B.

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

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

The Applicant, Twin Youth Initiative Trading CC (“the Applicant”), applied for environmental authorisation to mine sand from the Remaining Extent of the farm Jammerbergsdrift 540 RD, Wepener, Free State Province.

The Applicant intends to:

- ⌘ win sand from the riverbed by means of an excavator and/or sand pump;
- ⌘ stockpile the sand until sold (if necessary);
- ⌘ transport the sand from the mining area to clients;
- ⌘ slope and reinstate the mining area upon closure.

The mining area, when operational, will contain the following:

- ⌘ sand pump to pump the sand to the settling ponds;
- ⌘ minimum of two settling ponds;
- ⌘ earthmoving equipment to load the sand;
- ⌘ stockpile area.

The proposed activity will take place over an area historically used for the winning of sand from the river. The Applicant will either, recover the sand by means of earthmoving machinery and keep it at a stockpile area, or alternatively pump the sand by means of a sand pump into settling ponds. The mined material will then be loaded onto trucks to be transported to clients.

No processing of the mineral is required prior to its removal from site and the Applicant will not establish a workshop/storage facility within the mining area.

From previous experience it is known that the river annually replenishes the sand resource during periods of high flow (approximately October – March). No mining will take place during these high flow periods, and all machinery and equipment will be removed from the riverbed. See attached as Appendix C a copy of the site activities map of the proposed project.

i) Listed and specified activities

NAME OF ACTIVITY (E.g. For prospecting – drill site, site camp, ablution facilities, accommodation, equipment storage, sample storage, site office, access route etc... etc... etc E.g. for mining – excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected	APPLICABLE LISTING NOTICE (GNR 324, GNR 325, GNR 326 OR GNR 327)
Demarcation of site with visible beacons	4.9 ha	N/A	Not listed
Winning of sand	±4 ha	X	GNR 327 Listing Notice 1 Activity 19, 21, 26
Stockpiling and transporting material from site	±0.9 ha	X	GNR 327 Listing Notice 1 Activity 21, 26
Sloping and landscaping upon closure of the mining area	4.9 ha	X	GNR 327 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 the prospected/mined and for a linear activity, a description of the rout of the activity)

The Applicant, Twin Youth Initiative Trading CC, applied for environmental authorisation to mine sand from a 4.9 ha area of the Caledon River, on the Remaining Extent of the farm Jammerbergsdrift 540 RD, Magisterial District of Wepener, Free State Province (“the property”).

Table 1 lists the GPS coordinates of the proposed mining area as shown on the Regulation 2.2 Mine Plan attached as Appendix A.

Table 1: GPS Coordinates of mining area

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	29°43'24.46"	26°57'50.65"	-29.72346°	26.96407°
B	29°43'20.89"	26°57'59.51"	-29.72247°	26.96653°
C	29°43'18.73	26°58'05.45"	-29.72187°	26.96818°
D	29°43'18.01"	26°58'09.62"	-29.72167°	26.96934°
E	29°43'17.44"	26°58'14.30"	-29.72151°	26.97064°
F	29°43'17.22"	26°58'17.90"	-29.72145°	26.97164°
G	29°43'19.16"	26°58'18.01"	-29.72199°	26.97167°
H	29°43'19.74"	26°58'12.86"	-29.72215°	26.97024°
I	29°43'20.21"	26°58'08.11"	-29.72228°	26.96892°
J	29°43'20.93"	26°58'06.20"	-29.72248°	26.96839°
K	29°43'23.92"	26°57'57.64"	-29.72331°	26.96601°
L	29°43'26.37"	26°57'51.77"	-29.72399°	26.96438°

The proposed mining footprint is an area that was extensively used for sand mining over the years. The mining procedure will entail direct excavation of the sand from the permitted mining area, in order to win building and filling sand suitable for the construction and road building industry.

The Applicant will:

- ⌘ either, remove the sand from the permitted mining area with an excavator that will deposit it at a stockpile area (if necessary) from where it will be hauled to the clients;

- ⌘ alternatively, pump the sand by means of a sand pump into settling ponds (within the mining area), from where the water will gravitate back into the river and the sand will be loaded onto trucks to be transported to the clients;
- ⌘ mine approximately 46 368 ton sand per annum that will be transported from site with ± 3 trucks per day;
- ⌘ limit mining activities to daylight hours (07:00 – 17:00 Monday – Saturday);
- ⌘ not mine the area during high flow periods (\pm October – March) of the Caledon River, and all machinery and equipment will be removed from the riverbed;
- ⌘ make use of the existing access road to the mining area and a single access point into the riverbed;
- ⌘ not process the sand prior to removal from site, and no blasting will be required.

The mined material will be sold, to the civil-, building-, construction industries and local authorities within the Free State Province, on demand. The proposed project will involve activities which can be divided into three phases (discussed in more detail below) namely:

- ⌘ *Site establishment phase* which will involve the demarcation of the site, and introduction of machinery and equipment.
- ⌘ *Operational phase* which will involve the removal of the sand with an excavator/sand pump from the permitted area, stockpiling (if necessary), and hauling of sand to the clients.
- ⌘ *Decommissioning phase* which will involve the removal of all equipment and final landscaping of the mining area.

The equipment on site will be of a temporary nature and will include the following:

- ⌘ A sand pump (additional pump to be added during high demand) that will pump to at least two settling ponds;
- ⌘ Earthmoving equipment to load the sand;
- ⌘ Trucks to haul the material to clients.

PHASES OF THE PROJECT:

Site Establishment Phase:

During site establishment the Applicant will demarcate the mining area and introduce the mining machinery and equipment. Details of the activities involved in the site establishment phase are the following:

✂ Demarcation of the site:

Pursuant to receipt of the Environmental Authorisation (EA) and Mining Permit (MP), and prior to site establishment, the boundary of the site will be demarcated with visible beacons.

✂ Access Road:

The Applicant will use the existing gravel farm road, (± 1.8 km) to access the mining area and transport material from the mine. Although the R26 borders the proposed mining area, no direct access onto this road is possible. The Applicant will gain access off the R26 onto the R702, from where the (existing) farm road turns off (see Figure 1). The gravel road is often used by sand miners to transport sand from the Caledon River, and therefore no upgrading of the road is needed prior to commencement. The proposed project will increase the traffic on the farm road with ± 3 trucks /day.



Figure 1: Satellite view showing the access road (red line) to the proposed mining area

⌘ Introduction of Site Equipment:

As stated above, the site equipment to be used within the proposed footprint area will be of temporary nature and consist of:

- A sand pump (additional pump to be added during high demand) with at least two settling ponds;
- Earthmoving equipment to load the sand;
- Trucks to haul the material to clients.

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

Operational Phase:

The operational phase will involve either, the recovery of the sand by means of earthmoving machinery that will stockpile (if necessary) it at a designated area from where it will be loaded and hauled to clients, or alternatively pump the sand by means of a sand pump into the settling ponds from where the water will gravitate back into the river and the sand will be loaded onto trucks to be transported to the clients.

The Applicant will make use of a single access point into the river, and a single haul road from the river to the area where the trucks will be loaded, to limit damage to the riparian zone. The layout of the mining area will be simple, consisting of a sand recovery zone and associated stockpile area, connected by the haul road. The sand recovery zone and stockpile area will be in the Caledon riverbed that becomes inundated during annual flooding events, and naturally rehabilitates itself. No mining will take place during these high flow periods, and all machinery and equipment will be removed from the riverbed. It is proposed that the loading of trucks take place outside the riverbed at a pre-arranged area with the landowner, preferably on the existing access road.

The proposed activity will not require any blasting or processing of the mineral and no servicing of equipment will be allowed in the permitted mining area. Approximately five employees will be appointed at the mine. Mining will be limited to daylight hours from Monday to Saturday (07:00 – 17:00).

⌘ Water Use:

As no sand washing is proposed for this project, the Applicant will exclusively use water for dust suppression purposes on the access road when needed. Approximately 5 000 litre water will be used per month. The Applicant will apply for the relevant water use authorization in terms of the National Water Act, 1998 (Act No 36 of 1998) from the Department of Water and Sanitation should water be extracted from the Caledon River. Alternatively, water will be bought from the landowner. Dust generated on the access road will as far as possible be managed through alternative dust suppression methods in order to restrict water use to the absolute minimum. These measures will include a combination of the following:

- The speed of all mining equipment/vehicles will be restrictions to 20 km/h on the internal farm roads/haul roads to minimize dust generation;
- Trucks leaving the mining area will be covered to minimize windblown dust from the loads;
- Where needed straw or a similar eco-friendly product could be used on the access road to lessen dust generation;

Potable water, for use by employees, will daily be transported to site with the labour force.

⌘ Waste Handling:

All general waste, generated during the operational phase, will be contained in a sealable refuse bin to be kept in one of the site vehicles until it is transported to the Wepener landfill site. No refuse bins will be placed within the riverbed or within the floodplain area.

Due to the nature of the project very little generation of hazardous waste is expected, and will mainly be the result of accidental spillages or breakdowns. Such contaminated areas will be cleaned up immediately (within two hours of the occurrence) and contaminated soil will be contained in designated hazardous waste containers to be removed daily to an off-site workshop (to be secured) from where it will be collected by a registered hazardous waste handling contractor.

⌘ Servicing and Maintenance:

No workshop or servicing area will be established within the boundaries of the permitted area. The Applicant proposes to make use of an off-site workshop (location to be secured) where servicing and maintenance of the mining related equipment and vehicles can be conducted without the danger of polluting the Caledon River. Refuelling of mining equipment and vehicles will be done at the workshop and no refuelling will be allowed at the mining area/in the riverbed, equipment that cannot move to the workshop will be refuelled on the access road and drip trays will be present at all times. The excavator and other site related vehicles will be removed from the mining area at the end of the day, and will either park at the workshop or on the access road where drip trays will be placed under all stationary vehicles.

Decommissioning Phase:

Due to the nature of the project, no buildings/infrastructure will have to be removed upon closure of the mining area. The decommissioning phase will mainly entail the removal of the sand pump, settling ponds and earthmoving equipment from the riverbed. Any stockpiled material will either be flattened or removed from the mining area and the footprint will be landscaped so as to prevent any change in the natural flow of the river. The access into the river will be repaired/rehabilitated if no longer needed by the landowner, with the access road left in the same or better state as found prior to commencement of the activities.

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

⌘ Rehabilitation of the excavated area:

Very little residue will be generated as material is selectively removed to minimize product not suitable for sale. Larger grain material, organic particles and clay that are separated from the saleable product will be used to rehabilitate erosion structures and the excavation area.

⌘ Final rehabilitation:

Rehabilitation of the surface area shall entail landscaping, levelling, maintenance, and clearing of invasive plant species (if necessary).

All equipment, plant, 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.

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

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

e) Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT. (E.g. in terms of the National Water Act a Water Use License has/has not been applied for)
Mineral and Petroleum Resources Development Act, 2002, (Act No. 28 of 2002) read together with applicable amendments and regulations thereto. ∞ Section 27	Part A(3)(d) Description of the scope of the proposed overall activity	Application for a mining permit submitted to DMR-FS. Ref No: FS 30/5/1/3/2/10232 MP
National Environmental Management Act, 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2014 (as amended by GNR 326 effective 7 April 2017) ∞ GNR 327 Listing Notice 1 Activity 19, 21, 22, 26	Part A(3)(d)(i) Listed and specified activities.	Application for environmental authorisation submitted to DMR-FS. Ref No: FS 30/5/1/3/2/10232 MP
National Environmental Management: Air Quality Control Act, 2004 (Act No 39 of 2004) read together with applicable amendments and regulations thereto specifically the National Dust Control Regulations, GN No R827	Part A(3)(h)(iv)(1)(a) Type of environment affected by the proposed activity – <i>Air and Noise Quality</i> .	The mitigation measures proposed for the site take into account the NEM:AQA, 2004 and the National Dust Control Regulations.

	Part A(3)(h)(viii) The possible mitigation measures that could be applied on the level of risk – <i>Dust Handling</i> .	
National Environmental Management Act: Biodiversity Act, 2004 (Act No. 10 of 2004) read together with applicable amendments and regulations thereto.	Part A(3)(h)(iv)(1)(a) Type of environment affected by the proposed activity - <i>Biological Environment</i> Part A(3)(h)(viii) The possible mitigation measures that could be applied on the level of risk – <i>Management of invader plant species</i> .	The mitigation measures proposed for the site includes specifications of the NEM:BA, 2004.
National Water Act, 1998 (Act No 36 of 1998) read together with applicable amendments and regulations thereto.	Part A(3)(h)(iv)(1)(a) Type of environment affected by the proposed activity – <i>Aquatic Features</i> . Part A(3)(h)(viii) The possible mitigation measures that could be applied on the level of risk – <i>Mitigating the impact on the Caledon River and downstream users</i> .	The proposed mining area falls within 100 m of a watercourse and requires Water Use Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998) for water uses as defined in section 21(c) and section 21(j). The process may also require the use of water for dust suppression and authorisation in terms of section 21(a) for the taking and use of water for dust suppression purposes may be required. The Applicant will obtain the necessary water use authorisation prior to commencement.
National Environmental Management: Waste Act, 2008 (Act No 59 of 2008) read together with applicable amendments and regulations thereto. NEM:WA, 2008: National norms and standards for the storage of waste (GN 926)	Part A(3)(d)(ii) Description of the activities to be undertaken: <i>Operational phase – Waste Handling</i>	The mitigation measures proposed for the site take into account the NEM:WA.
National Heritage Resources Act. 1999 (Act No 25 of 1999).	Part A(3)(h)(iv)(1)(a) Type of environment affected by the proposed activity – <i>Human Environment</i>	The mitigation measures proposed for the site includes specifications of the NHRA, 1999.

Mine Health and Safety Act, 1996 (Act No 29 of 1996) read together with applicable amendments and regulations thereto including relevant OHSA regulations.	Part A(3)(h)(viii) The possible mitigation measures that could be applied on the level of risk – <i>Management of Health and Safety Risks.</i>	The mitigation measures proposed for the site includes specifications of the MHSA, 1996
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	Part A(3)(h)(iv)(1)(a) Type of environment affected by the proposed activity: <i>Physical Environment – Geology and Soil.</i> Part A(3)(h)(viii) The possible mitigation measures that could be applied on the level of risk – <i>Management of invader plant species.</i>	The mitigation measures proposed for the site includes specifications of the CARA, 1983.
Public Participation Guideline in terms of the NEMA EIA Regulations	Part A(3)(h)(ii) Details of the Public Participation Process Followed	Public participation was conducted in accordance with the guidelines published in terms of the NEMA EIA Regulations

f) Need and desirability of the proposed activities.

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

The increase in building, construction and road maintenance projects in the vicinity of the property triggered the need of the Applicant to trade with the available sand. As discussed in detail under *c) Description of specific environmental features and infrastructure on the site – Site Specific Geology and Soil*, poor management practices in and around the Caledon River result in high sediment yields that has a severe impact on the dams of the catchment area. The proposed sand mining operation will entail the removal of sand from the Caledon River in a well-known sand mining location that has been utilised by various permit holders, and in doing so indirectly assist with the sedimentation problem experienced in the river, town of Wepener and dams of the catchment area. As the Caledon River replenishes the sand deposit annually the mining of the mineral was identified as a feasible business opportunity. The proposed mining activity also bring about the diversification of activities on the property, extending it from agriculture to include small scale mining.

Approximately five employees will be employed for the duration of the operational phase. The project will contribute to the local economy, both directly and through the multiplier

effect that its presence will create, as equipment and supplies are purchased locally, and wages are spent at local businesses, generating both jobs and income in the area.

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

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

- ⌘ Due to the nature of the application and the presence of sand along the entire Caledon riverbed, the sand mining area can be moved to various alternative sites. However, the proposed mining area entails the winning of sand from an area previously used for sand mining purposes.
- ⌘ The existing farm road to the mining area can be used to gain access to the site and no new roads have to be constructed.
- ⌘ The Applicant can make use of the existing access point into the river and no change to the riverbank or removal of vegetation is needed.
- ⌘ The Caledon River annually replenishes the sand deposit and re-instates the riverbed, thereby eliminating any residual impact that the sand mining activity may have on the visual characteristics of the receiving and/or surrounding environment.

During the impact assessment process the feasibility of the proposed site alternative (S1) was assessed to identify fatal flaws that are deemed as severe as to prevent the activity continuing, or warrant a site or project alternative. The outcome of the assessment showed that should the mitigation measures and monitoring programmes proposed in this document be implemented, no fatal flaws could be identified that prevents the activity continuing. In light of the above, the mining proposal was updated to incorporate the project related mitigation measures and monitoring programmes identified during the assessment process. The preferred development footprint was subsequently finalized and is depicted on the attached site activities plan (Appendix C).

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

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

i) Details of the development footprint alternatives considered.

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

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

Due to the nature of the application and the presence of sand along the entire Caledon riverbed, the sand mining area can be moved to various alternative sites. However, the proposed mining area, as indicated on the Regulation 2.2 Mine Plan (attached as Appendix A), was identified as the preferred and only viable site alternative as it entails the mining of an area previously used for sand mining purposes.

Site Alternative 1 (S1) (Preferred and Only Site Alternative): Site Alternative 1 entails the mining of an area previously used for the winning of sand that falls within the GPS coordinates as listed in Table 2, and displayed in Figure 2 below.

Table 2: GPS Coordinates of Site Alternative 1 (preferred and only site alternative)

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	29°43'24.46"	26°57'50.65"	-29.72346°	26.96407°
B	29°43'20.89"	26°57'59.51"	-29.72247°	26.96653°
C	29°43'18.73"	26°58'05.45"	-29.72187°	26.96818°
D	29°43'18.01"	26°58'09.62"	-29.72167°	26.96934°
E	29°43'17.44"	26°58'14.30"	-29.72151°	26.97064°
F	29°43'17.22"	26°58'17.90"	-29.72145°	26.97164°
G	29°43'19.16"	26°58'18.01"	-29.72199°	26.97167°
H	29°43'19.74"	26°58'12.86"	-29.72215°	26.97024°
I	29°43'20.21"	26°58'08.11"	-29.72228°	26.96892°
J	29°43'20.93"	26°58'06.20"	-29.72248°	26.96839°
K	29°43'23.92"	26°57'57.64"	-29.72331°	26.96601°
L	29°43'26.37"	26°57'51.77"	-29.72399°	26.96438°

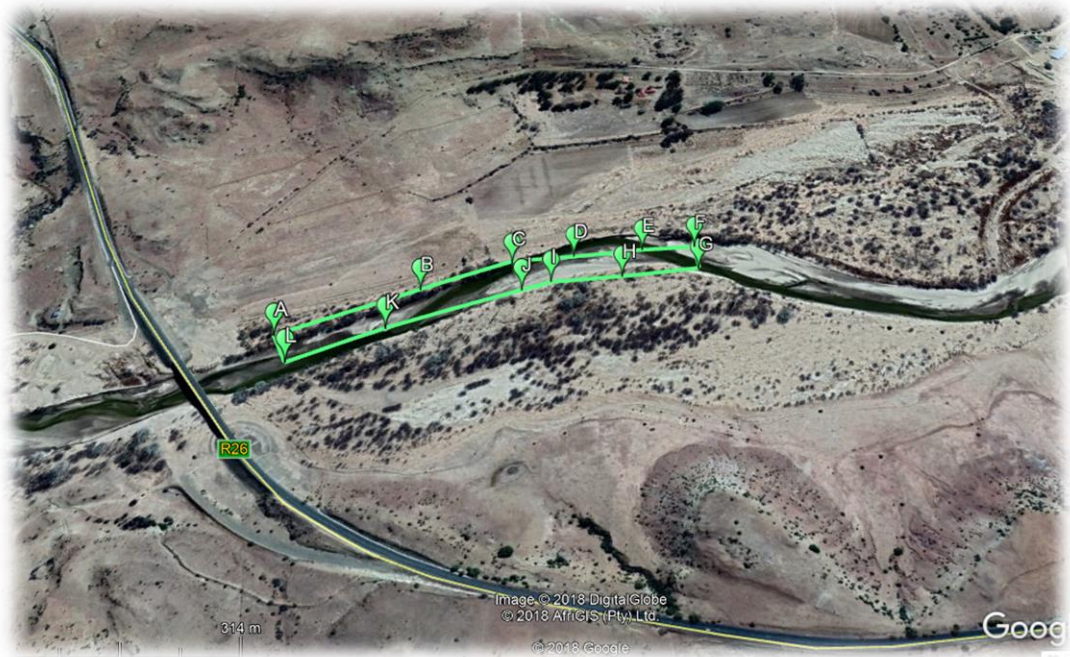


Figure 2: Satellite view showing the position of Site Alternative 1 within the surrounding landscape.

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

- ⌘ Due to the nature of the application and the presence of sand along the entire Caledon riverbed, the sand mining area can be moved to various alternative sites. However, the proposed mining area entails the winning of sand from an area previously used for sand mining purposes.
- ⌘ The existing farm road to the mining area can be used to gain access to the site and no new roads have to be constructed.
- ⌘ The Applicant can make use of the existing access point into the river and no change to the riverbank or removal of vegetation is needed.
- ⌘ The Caledon River annually replenishes the sand deposit and re-instates the riverbed, thereby eliminating any residual impact that the sand mining activity may have on the visual characteristics of the receiving and/or surrounding environment.

Project Alternative: The Applicant will either recover the sand by means of mechanical excavation with earthmoving equipment and keep it at a stockpile area (if necessary), or alternatively pump the sand by means of a sand pump into the settling

ponds within the boundaries of the mining area. Due to the nature of the proposed project, both these alternatives are deemed viable and the recovery method will be determined by the flow level of the river and dryness of the sand. During drier periods mechanical excavation can be employed, while the pumping of sand will be preferred during the higher flow/wetter periods.

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

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

- ∞ the Applicant will not be able to utilize the sand deposit available within the proposed mining area, or supply in the demand of the industry;
- ∞ the application, if approved, would allow the Applicant to legally utilise the available sand as well as provide employment opportunities to local employees. Should the no-go alternative be followed these opportunities will be lost to the Applicant, potential employees and clients;
- ∞ it is believed that the mining of sand from the Caledon River assists with the sedimentation problem experienced in the river, town of Wepener and dams of the catchment area. Should the no-go alternative be followed this opportunity will be lost and the sedimentation problem will persist and or escalate.

ii) Details of the Public Participation Process Followed

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

During the initial public participation process the stakeholders and I&AP's were informed of the project by means of I&AP comment/notification letters that were sent directly to the contact persons. A 30-days commenting period was allowed which expired on 9 July 2018. The following I&AP's and stakeholders were informed of the project:

SURROUNDING LANDOWNERS & INTERESTED AND AFFECTED PARTIES	STAKEHOLDERS
<p><u>Landowner:</u></p> <ul style="list-style-type: none"> ⌘ Marib Beleggings (Pty) Ltd <p><u>Surrounding landowners & lawful occupiers:</u></p> <ul style="list-style-type: none"> ⌘ AJ Swanepoel ⌘ Fritz Ferreira ⌘ Hannes Meyer ⌘ Jaco burger ⌘ Jean Aucamp ⌘ Johan Groenewald ⌘ TP & MR Nosi ⌘ Transnet Ltd ⌘ Willie Lombaard 	<ul style="list-style-type: none"> ⌘ Department of Agriculture and Rural Development ⌘ Department of Economic Small Business Development, Tourism and Environmental Affairs ⌘ Department of Labour ⌘ Department of Police, Roads and Transport ⌘ Department of Public Works and Infrastructure ⌘ Department of Water and Sanitation ⌘ Eskom ⌘ Mangaung Metropolitan Municipality (MMM) ⌘ South African Heritage Resources Agency ⌘ Ward Councillor of Ward 50 (MMM)
I&AP'S AND STAKEHOLDERS THAT REGISTERED DURING THE INITIAL NOTIFICATION PERIOD	
<ul style="list-style-type: none"> ⌘ Only Mr Meyer attended the public meeting (22 June 2018); ⌘ No I&AP's or stakeholders registered during the initial notification period. 	

An advertisement was placed in the Bloemnuus on 7 June 2018 and on-site notices were placed at the boundary of the property along the R26, and the pedestrian bridge crossing the Sandspruit into Wepener on 7 June 2018. The advertisement, background information document (BID) and on-site notices invited the general public to a meeting held on 22 June 2018 where the proposed project was discussed. As mentioned previously, only Mr. Meyer attended the meeting.

In compliance with the timeframes stipulated in the EIA Regulations of December 2014 (amended by GNR 326 effective 7 April 2017) the Draft Basic Assessment Report (DBAR) was compiled and will be distributed for comment and perusal to the I&AP's and stakeholders listed above. A 30-day commenting period, ending 17 August 2018, will be allowed for perusal of the documentation and submission of comments. The comments received on the DBAR will be incorporated into the Final Basic Assessment Report (FBAR) to be submitted for decision making to DMR.

iii) Summary of issues raised by I&APs

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

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
List the name of persons consulted in this column, and					
Mark with an X where those who must be consulted were in fact consulted					
AFFECTED PARTIES	X				
Landowner/s					
Marib Beleggings (Pty) Ltd owns the property earmarked for the proposed mining as well as the following directly adjacent properties: ✎ Portion 0 (Remaining Extent) of the farm Jammerbergsdrift 540; ✎ Portion 5 of the farm Jammerbergsdrift 540; ✎ Portion 0 (Remaining Extent) of the farm Glen Shee 546; ✎ Portion 1 of the farm Glen Shee 546.	X	No comments received	The landowner verbally confirmed that he has no objections to the proposed mining permit application.	Greenmined and the Applicant is in continuous discussions with the landowner.	A signed landowner consent will be added to the final basic assessment report.
Lawful occupier/s of the land					
Mr. Hannes Meyer	X	No comments received	Mr Meyer attended the public meeting but did not raise any issues.	N/A	N/A
Landowners or lawful occupiers on adjacent properties	X				
Mr. Fritz Ferreira adjacent landowner of:	X	No comments received	N/A	N/A	N/A

Interested and Affected Parties List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
⌘ Portion 1 of the farm Hoffman's Rust 173					
Mr. Johan Groenewald leasing the farm Hoffman's Rust 173	X	No comments received	N/A	N/A	N/A
Mr. AJ Swanepoel adjacent landowner of: ⌘ Portion 3 of the farm Jammerbergsdrift 540	X	No comments received	N/A	N/A	N/A
Mrs. L Burger adjacent landowner of: ⌘ Portion 0 (Remaining Extent) of the farm Anniesdale 157	X	No comments received	N/A	N/A	N/A
JR Familie Trust adjacent landowner of: ⌘ Portion 1 (Remaining Extent) of the farm Jammerbergsdrift 540	X	No comments received	N/A	N/A	N/A
Mr. Willie Lombaard / Introdeals 151 (Pty) Ltd adjacent landowner of ⌘ Portion 4 of the farm Jammerbergsdrift 540 ⌘ Portion 6 of the farm Jammerbergsdrift 540	X	No comments received	N/A	N/A	N/A
Transnet Ltd adjacent landowner of: ⌘ Portion 0 of the farm Jammerberg Station 336	X	No comments received	N/A	N/A	N/A

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted					
Cherangani Trade & Invest 118 (Pty) Ltd adjacent landowner of: Portion 0 of the farm Wardington 369	X	No comments received	N/A	N/A	N/A
Mr & Mrs. TP Nosi adjacent landowners of: N Portion 0 (Remaining Extent) of the farm Waterford 99	X	No comments received	N/A	N/A	N/A
Municipal councillor					
Cllr. Phalatse (Ward 50)	X	No comments received	N/A	N/A	N/A
Municipality					
Mangaung Metropolitan Municipality	X	No comments received	N/A	N/A	N/A
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e					
Department of Public Works and Infrastructure	X	No comments received	N/A	N/A	N/A

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
List the name of persons consulted in this column, and					
Mark with an X where those who must be consulted were in fact consulted					
Department of Police, Roads and Transport	X	No comments received	N/A	N/A	N/A
Eskom	X	No comments received	N/A	N/A	N/A
Communities	N/A	N/A	N/A	N/A	N/A
Dept. Land Affairs					
Regional Land Claims Commissioner: Free State Province	X	7 June 2108	The Commission on Restitution of Land Rights confirmed on 7 June 2018 that as at the date of the letter no land claims appear on their database in respect of the property.	N/A	N/A
Traditional Leaders	N/A				
Dept. Environmental Affairs					
Department of Economic Small Business Development, Tourism and Environmental Affairs	X	No comments received	N/A	N/A	N/A

Interested and Affected Parties		Date	Issues raised	EAPs response to issues as mandated by	Section and
List the name of persons consulted in this column, and		Comments Received		the applicant	paragraph reference
Mark with an X where those who must be consulted were in fact consulted					in this report where the issues and or response were incorporated.
Other Competent Authorities affected					
Department of Agriculture and Rural Development	X	No comments received	N/A	N/A	N/A
Department of Labour	X	No comments received	N/A	N/A	N/A
Department of Water and Sanitation	X	No comments received	N/A	N/A	N/A
South African Heritage Resources Agency	X	No comments received	N/A	N/A	N/A
<u>OTHER AFFECTED PARTIES</u>					
N/A					
<u>INTERESTED PARTIES</u>					
N/A					

iv) The Environmental attributes associated with the alternatives.

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

(1) Baseline Environment

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

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

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

PHYSICAL ENVIRONMENT

CLIMATE

According to the saexplorer website, Wepener normally receives about 443 mm of rain per year, with most rainfall occurring mainly during summer. The chart below (lower left) shows the average rainfall values for Wepener per month. It receives the lowest rainfall (4 mm) in June and the highest (71 mm) in February. The monthly distribution of average daily maximum temperatures (centre chart below) shows that the average midday temperatures for Wepener range from 15.4°C in June to 28.8°C in January. The region is the coldest during July when the mercury drops to -0.4°C on average during the night. Consult the chart below (lower right) for an indication of the monthly variation of average minimum daily temperatures.

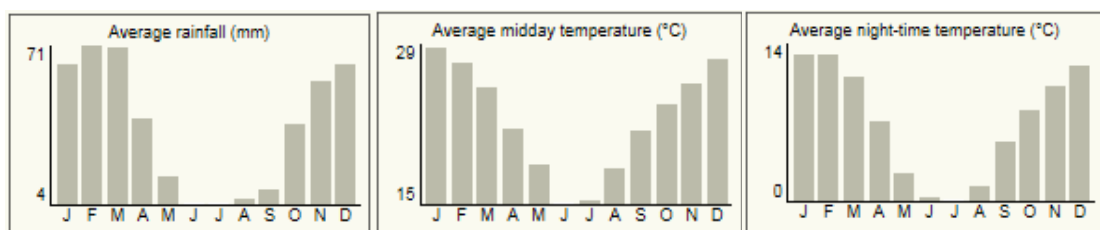


Figure 3: Statistical representation of the average rainfall, midday temperatures and night-time temperatures for the Wepener region. Chart obtained from saexplorer.

The prevailing wind directions within the area range from north-east to north-west in Spring/Summer seasons, whilst in winter months the wind mainly blows from the north-west.

VISUAL CHARACTERISTICS

The study area has a moderate topography, with the Caledon River cutting through the lowest point, flowing in a western direction. The section of the Caledon River, earmarked for the proposed project, has been utilized for sand mining over many years

and the land use is known to the area. The visual character of the surrounding areas mainly comprises of an agricultural setting, intersected by road and electricity infrastructure. The town of Wepener has a low aesthetic value.

AIR AND NOISE QUALITY

The air quality and noise ambiance of the study area was historically representative of an agricultural environment in which farming equipment operated with occasional high dust emissions from denuded areas. The surrounding area has since been transformed with the construction of the R26 and the introduction of gravel and sand mining to the area. The traffic on the R702 and surrounding farm roads also contribute to air and noise emissions.

TOPOGRAPHY

The topography of the area can be described as moderately undulating to flat grassveld plains. The altitude of the proposed mining area is on average 1 420 masl, with the level of the Caledon River staying more or less at the same height in and around the study area. The altitude of the surrounding area steadily rises from the riverbed in north-western and south-eastern directions respectively.

GEOLOGY AND SOIL

According to Mucina and Rutherford (2006) alternating layers of mudstone and sandstone of the Tarkastad Subgroup (Beaufort Group, Karoo Supergroup) dominate the undulating topography. In areas protected from erosion, a sandy layer also covers the clayey subsoils. The soils have a marked clay accumulation, is strongly structured and has a non-reddish colour. About two thirds of the soils of the area is dominated by soils with diagnostic pedocutanic and prisma-cutanic (dark clayey) B-horizons of the Db land type. In this land type the dominant soils forms are Estcourt, Rensburg and Oakleaf forms. Dominant land type Db, followed by Da.

AQUATIC FEATURES

The proposed mining area is situated in the riverbed of the Caledon River that is located within the Caledon RSA sub water management area, part of the Upper Orange water management area. The Caledon is a major river of South Africa that rises in the Drakensberg Mountains on the Lesotho border, flowing south-westward and then westward before joining the Orange River near Bethulie in the southern Free State.

Broad scale wetland mapping conducted by the National Freshwater Ecosystem Priority Areas (FEPA) initiative has mapped the Caledon riparian area, in the vicinity of the mine, as a Mesic Highveld Grassland Group 2 Floodplain wetland, but did not assign a FEPA status to it.

Table 3: Aquatic characteristics of the greater study area

Water Management Area	WMA 6 Orange
Sub Water Management Area	Caledon RSA
Catchment Area	Orange River
Quaternary Catchment	QUAT D23J
FEPA Status	None assigned

BIOLOGICAL ENVIRONMENT

GROUNDCOVER

According to Mucina and Rutherford (2006) the vegetation type of the study area is classified as Aliwal North Dry Grassland (Gh2). The vegetation and landscape features mainly consist of broken terrain and irregular plains supporting open grassland with patches of dwarf karroid shrubs (Mucina & Rutherford, 2006). The vegetation type is dominated by grasses such as *Themeda triandra* and *Tetrachne dregei*. Other important taxa include *Aristida adscensionis*, *A. congesta*, *Cymbopogon pospischilii*, *Cynodon incompletes*, *Elionurus muticus*, *Eragrostis chloromelas*, *E. lehmanniana*, *E. obtusa* and *Heteropogon contortus*. The low shrubs include *Helichrysum dregeanum*, *Pentzia globosa*, *Anthospermum rigidum* subsp *pumilum*, and *Atriplex semibaccata* var. *appendiculata*.

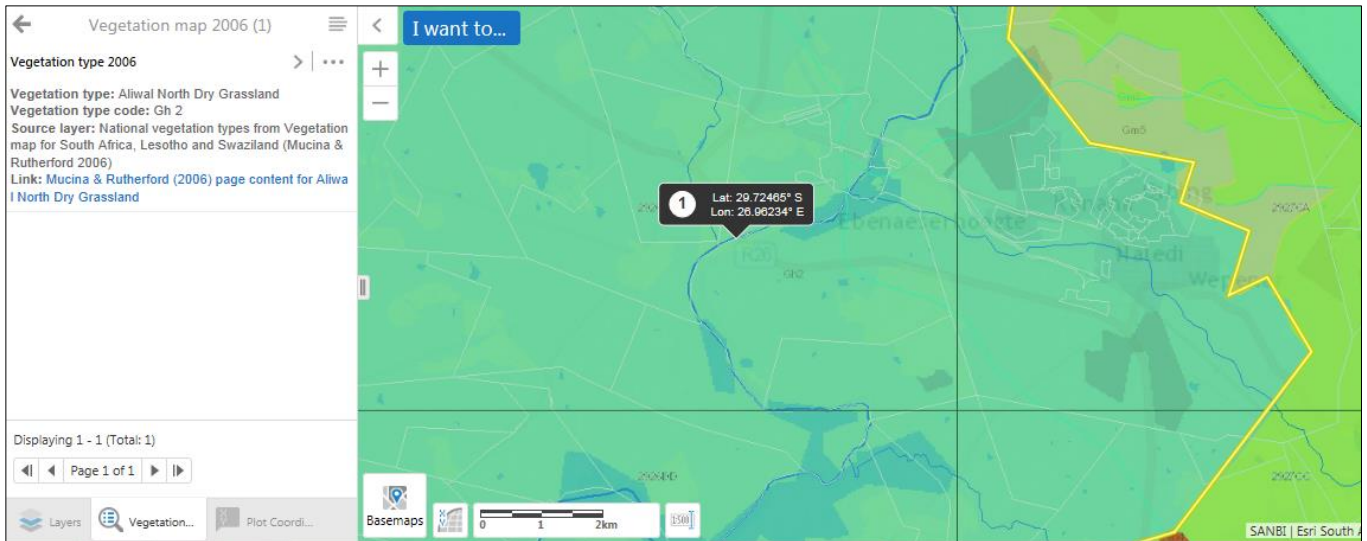


Figure 4: National vegetation cover map for Gh 2 Aliwal North Dry Grassland (extracted from the BGIS Map Viewer – National Vegetation Map). The GPS coordinate indicates the general location of the site.

Table 4: Characteristic features of the Aliwal North Dry Grassland type

GH 2 ALIWAL NORTH DRY GRASSLAND	
Conservation Target (% of area)	24%
Description of the protection status	Hardly protected. Only a small patch conserved in the Caledon Nature Reserve.
Transformed	12% transformed for cultivation and building of dams (Rolandsechk, Smithfield, Welbedacht)
Description of conservation status	Least Threatened

FAUNA

The resident fauna identified during the site inspection mainly comprised of birds such as doves, starlings and sparrows as well as commonly found insects and reptiles. The farmer also keeps cattle for grazing purposes. As the river was flowing at the time of the inspection, no protected or red data species were identified to be resident within the proposed footprint.

HUMAN ENVIRONMENT:

CULTURAL AND HERITAGE ENVIRONMENT

During a desktop study several archaeological impact assessments were found concerning sand mining in the Wepener area. The Phase 1 Archaeological Impact

Assessment (Rossouw 2017) conducted for sand mining on one of the directly adjoining farms, Portion 1 of the farm Hoffman's Rust 173, mentions that the archaeological footprint in the region is primarily represented by Stone Age archaeological localities, rock art sites and an extensive footprint related to the distribution of Iron Age settlements and early history of Sotho-speaking communities along the Caledon River Valley (Rossouw 2017:5). This study further mentioned that the study area is underlain by homogenous and culturally sterile unconsolidated river sand and concluded with a site rating of General Protection (C) (Rossouw 2017:6).

SOCIO-ECONOMIC ENVIRONMENT

The property earmarked for the proposed activity is situated approximately 7.5 km from Wepener that now falls within the Mangaung Metropolitan Municipality as the Naledi Local Municipality was disestablished in 2016.

The 2011 statistics reported Wepener to have a total population of 1 281 people with 63.2% of the inhabitants considered to be within the working age. The figures reveal that Wepener had a total dependency ratio of 58.3% in 2011. Higher dependency ratios imply greater strain on the working age to support their economic dependents (children and aged).

Economically active people (those in the labour force) are those between the ages of 15 and 64 years who chose to participate in the labour market by being willing to supply their labour in exchange for an income. Being economically active does not depend on being employed; as long as there is a desire, willingness and availability to work, even if that desire does not translate into employment, then you are seen as part of the labour force. The differences in participation levels are as a result of discouragement, people who want to work but have given up hope in finding employment and therefore are not taking active steps to look for work is what is typically causing the difference between South Africa's official versus the broad/expanded unemployment definition.

According to the 2011 National Census 24% of the households in Wepener has no income. As mentioned earlier, the Naledi Local Municipality with the Ikgomotseng Local Municipality were merged with the Mangaung Metropolitan Municipality (MMM) in August 2016 to form one Municipality, and all services of Wepener are now handled by MMM.

(b) Description of the current land uses.

The Remaining Extent of the farm Jammerbergsdrift 540 is situated in a rural setting surrounded by other farming properties approximately 7.5 km west of Wepener. The

Caledon River runs along the southern boundary of the property, with the R26 regional road dissecting the south-western corner of the property at the Jim Fouché bridge. The land use of the farm and surrounding properties mainly comprise extensive agricultural practices such as limited irrigation, dry land crop cultivation and grazing. The Caledon riverbed is extensively mined for sand and the areas opposite the Jim Fouché bridge (on the R26 crossing over the Caledon River) carried various mining permits in the past.

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

LAND USE CHARACTER	YES	NO	DESCRIPTION
Natural area	YES		The proposed mining site is surrounded by natural areas used for agricultural purposes.
Low density residential		NO	
Medium density residential		NO	
High density residential		NO	
Informal residential		NO	
Retail commercial & warehousing		NO	
Light industrial		NO	
Medium industrial		NO	
Heavy industrial		NO	
Power station		NO	
High voltage power line		NO	
Office/consulting room		NO	
Military or police base / station / compound		NO	
Spoil heap or slimes dam		NO	
Quarry, sand or borrow pit	YES		The proposed area has previously been used for the mining of sand from the Caledon River.
Dam or reservoir	YES		Various soil dams used by the landowner falls within 500 m of the mining area and a reservoir is present at the farm yard ±450 m to the north.
Hospital/medical centre		NO	
School/ crèche		NO	
Tertiary education facility		NO	
Church		NO	
Old age home		NO	
Sewage treatment plant		NO	
Train station or shunting yard		NO	
Railway line		NO	The railway line is approximately 1 km from the site.
Major road (4 lanes or more)		NO	
Airport		NO	
Harbour		NO	
Sport facilities		NO	
Golf course		NO	
Polo fields		NO	
Filling station		NO	
Landfill or waste treatment site		NO	
Plantation		NO	

Agriculture	YES		As mentioned earlier the proposed mining area is situated within an area used for grazing purposes. Various fallow lands surround the study area.
River, stream or wetland	YES		This application is for the mining of sand from the Caledon River.
Nature conservation area		NO	
Mountain, hill or ridge	YES		The topography of the surrounding area is undulating with the Caledon River cutting through a hilly area within 500 m of the proposed sand mine.
Museum		NO	
Historical building		NO	
Protected Area		NO	
Graveyard		NO	
Archaeological site		NO	
Other land uses (describe)		NO	

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

SPECIFIC ENVIRONMENTAL FEATURES

SITE SPECIFIC VISUAL CHARACTERISTICS

The proposed sand mine will be established in an area extensively used for the winning of sand over the years, and will therefore not entail the development of a greenfield area. The mining activities will be contained to the boundaries of the permitted area and will not impact the surrounding floodplain or agricultural land of the farm. As mentioned earlier, the Caledon River annually replenishes the sand deposit and reinstates the riverbed, thereby eliminating any residual impact that the sand mining activity may have on the visual characteristics of the receiving and/or surrounding environment. The equipment to be used at the mining area are of temporary nature and can easily be removed in the event of unnatural flooding or during the rehabilitation phase.

In light of this, although the proposed activity will be visible to road users on the R26 the impact on the aesthetic ambience of the surrounding area is deemed to be of low-medium significance.

SITE SPECIFIC AIR AND NOISE QUALITY

No residential areas were identified within close proximity to the proposed mining area. The nearest farm dwellings are ±450 m north of the proposed area, with other farm yards ±1 km north-east and ±1.2 km south-east respectively. An additional receptor to consider is the road users on the R26.

Dust will be generated by the proposed activity mainly from stockpile material and vehicles transporting the material on gravel roads. In addition to this, the quarry pit

within ± 1 km to the proposed sand mine also contribute air emissions to the surrounding environment. Should the Applicant however implement the mitigation measures proposed in this document and the EMPr the impact on the air quality of the surrounding environment is deemed to be of low-medium significance.

As with air quality, the current activities on the property and surrounding environment already impact the noise ambiance of the study area. Traffic along the R26 and R702, as well as the mining operations on the adjacent properties increase the natural noise levels of the receiving environment. The noise to be generated at the sand mine will contribute to these daily noise levels. The proposed activity will contribute noise generated by earthmoving equipment and trucks transporting material from site.

Although the sand mine will have a cumulative impact on the noise levels of the surrounding environment, no excessive noise (such as with blasting) will be generated and the impact is deemed compatible with the receiving environment and of low significance. Site management will restrict mining activities to normal workhours (7:00 – 15:00 Mondays – Saturdays) in an attempt to mitigate the noise generation of the site.

SITE SPECIFIC TOPOGRAPHY

Due to the nature of the activity the topography of the study area will not be impacted. The Caledon River replenishes the sand deposits during annual flooding events and no deep excavations will be created as a result of the activity.

SITE SPECIFIC GEOLOGY AND SOIL

(Information extracted from the State-of-Rivers Report Free State Region River Systems – 2003)

According to the State-of-Rivers Report (Free State Region River Systems – 2003), poor management practices in and around the Caledon River result in high sediment yields. The slope as well as the erodability of the soils in the upper Caledon catchment lead to increased sediment deposition that has a severe impact on the dams in the catchment area. The International Hydropower Association (IHA) reports that the Welbedacht Dam (downstream from the proposed sand mining area) lost 50% of its storage capacity due to sedimentation during the first five years of operation, with the present storage loss approaching 95%. The average total sediment load of the Caledon River was estimated (by the IHA) at 15 Mt/yr that equates to a specific sediment yield of 838 t/km²/yr.

In addition to the sedimentation of dams such as the Welbedacht Dam, the sedimentation of the Caledon River causes higher flood levels, that necessitated the

raising of the Jim Fouché bridge (on the R26) by more than 10 m during the last decade, as even during annual floods the bridge deck was submerged.



Figure 5: Flooding of the R26 prior to the raising of the Jim Fouché bridge (image obtained from <https://www.hydropower.org/case-studies/south-africa-welbedacht>)

The proposed sand mining operation will entail the removal of sand from the Caledon riverbed in a well-known sand mine location that has been utilised by various permit holders. In light of the above, it is believed that the proposed sand mining activity would not have a negative impact on the geology/soil of the study area, as the removal of sand will indirectly assist with the sedimentation problem experienced in the river, town of Wepener and dams of the catchment area. The Caledon River will replenish the sand deposits annually and therefore the proposed impact on the geology/soil of the receiving environment is deemed to be insignificant.

SITE SPECIFIC AQUATIC FEATURES

(Information extracted from the State-of-Rivers Report Free State Region River Systems – 2003)

The State-of-Rivers Report (Free State Region River Systems – 2003) report the overall health of the Caledon River to be fair upstream of the Welbedacht Dam and poor downstream. The Caledon catchment has almost 100% grassland cover but as mentioned earlier poor management practices result in high sediment yields.

The availability and diversity of habitats are major determinants of the biota that will be found in a specific ecosystem. Knowledge of habitat quality is important in an overall assessment of ecosystem health. The IHI (Index of Habitat Integrity) assess the impact of disturbances such as water abstraction, flow regulations and river channel modification on the riparian zone and in-stream habitats. The IHI icon shows the river and river bank which are colour-coded according to the state of the in-stream and

riparian habitat respectively. IHI for the Caledon River in the vicinity of the proposed mining area is deemed poor-fair as shown in Figure 6 below.

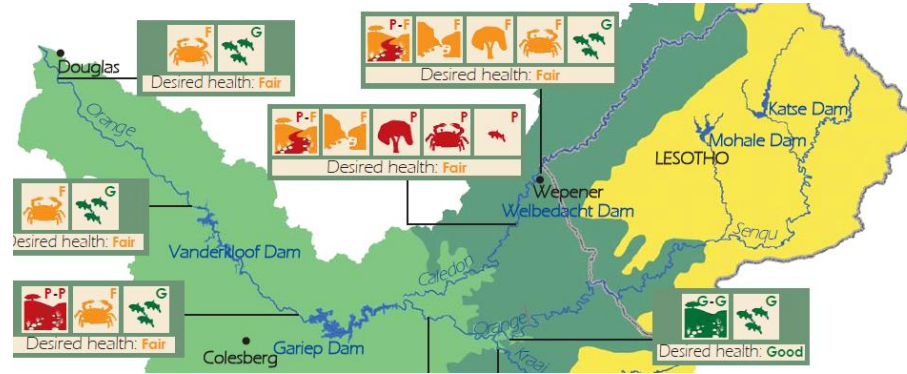


Figure 6: Summary of the overall health of the Caledon River as reported on in the State-of-Rivers Report, 2003. With the first icon representing the Index of Habitat Integrity (poor-fair), the second icon the Geomorphological Index (fair), the third icon represents the status of the Riparian Vegetation (fair), fourth icon shows the South African Scoring System (fair), and the last icon showing the status of the Fish Assemblage Integrity Index (good).

Geomorphological processes determine the size and shape of the river channel, which in turn determine the diversity and quality of habitats for aquatic biota. The GI (geomorphological index) assess the channel condition and channel stability. Channel condition is based on the channel impacts evident in a river reach, e.g. weirs, bridges or dams and the type of channel e.g. bedrock or alluvial. Channel stability is based on the potential for erosion of the river banks and bed. As shown in Figure 6 the GI of the Caledon River is fair.

The Applicant proposes to mine sand from the riverbed during low flow spells when access to the sand deposit is available. As mentioned, the proposed mining area extend over a well-established sand mining area, meaning that the habitat integrity status of the river at this point is largely to seriously modified.

Mining within the riverbed triggers the National Water Act, 1998 in terms of Section 39, and the Applicant has to obtain approval from the Department of Water and Sanitation prior to commencement with the activity. It is proposed that should the Applicant follow the conditions of the water use authorisation the impact of the proposed activity on the aquatic features of the study area has a low-medium significance.

SITE SPECIFIC GROUNDCOVER

(Information extracted from the State-of-Rivers Report Free State Region River Systems – 2003)

Healthy riparian zones maintain the form of the river channel and serve as filters for sediment, nutrients and light. Plant material from the riparian zone is an important

source of food for aquatic fauna. The structure and function of riparian vegetation is altered when vegetation removal, cultivation, construction, inundation, erosion, sedimentation and alien vegetation occur within or close to the riparian zone. RVI (Riparian Vegetation Index) is a measure of the degree of modification of the riparian zone from its natural state. The RVI of the Caledon River in the vicinity of the proposed mining area was estimated to be fair (see Figure 6).

The Applicant will make use of a single access point into the river, and a single haul road from the river to the area where the trucks will be loaded, to limit damage to the riparian zone. It is proposed that should the Applicant implement the mitigation measures proposed in the EMP the impact of the proposed activity on the riparian vegetation and groundcover in general is deemed to be of low-medium significance.

FAUNA

(Information extracted from the State-of-Rivers Report Free State Region River Systems – 2003)

Aquatic invertebrates require specific habitats and water quality conditions for at least part of their life cycle. Accordingly, changes in the invertebrate community composition and structure reflect changes in river conditions, and therefore invertebrates are good indicators of recent localised conditions in a river. The SASS (South African Scoring System) status of the Caledon River, in the vicinity of the proposed mining area is listed as fair (see Figure 6).

Fish are good indicators of long-term influences on a river reach and the general habitat conditions within the reach. The number of fish species, the different size classes and the health of fish, are all indicators of river health. The FAII (Fish Assemblage Integrity Index) is an expression of the degree to which a fish assemblage deviates from its undisturbed condition. The FAII of the Caledon River, upstream from the Welbedacht Dam was reported as good (see Figure 6).

The Applicant propose to mine sand from the riverbed during low flow spells when access to the sand deposit is available. At no time will the flow of the Caledon River be diverted and should the Applicant implement the proposed mitigation measures the impact on terrestrial fauna is deemed insignificant while the impact on aquatic fauna is deemed of low-medium significance.

SITE SPECIFIC CULTURAL AND HERITAGE ENVIRONMENT

No sites of archaeological or cultural importance were identified during the site inspection. Consultation with the interested and affected parties also did not identify

any potential area of concern and therefore the impact of the proposed mining activities on the cultural and/or heritage environment is deemed insignificant.

EXISTING INFRASTRUCTURE

The infrastructure existing within close proximity of the application area mainly consist of the Jim Fouché bridge ±130 m west of the mining area, and the farm yard ±450 m to the north. Should the Applicant contain the mining activities within the boundaries of the authorised area the impact on the existing infrastructure in close proximity to the mining area is deemed to be of low-medium significance.

(d) Environmental and current land use map.

(Show all environmental and current land use features)

The environmental and current land use map is attached as Appendix D.

v) Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated.)

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

WINNING OF SAND:

Visual intrusion associated with the sand mining activities

Rating: Medium

Degree of Mitigation: Partial

Severity	Duration	Extent	Consequence			Likelihood	Significance
				Probability	Frequency		
2	4	2	2.6	5	5	5	13

Noise nuisance generated by excavation equipment

Rating: Medium

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
1	4	2	2.3	4	5	4.5	10.4

Contamination of surface or groundwater with hydrocarbons or hazardous waste materials

Rating: Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
5	4	5	4.6	4	2	3	13.8

Negative impact on the aquatic fauna of the area

Rating: Medium – High

Degree of Mitigation: Partial

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

Impact on the flow regime of the river

Rating: Medium – High

Degree of Mitigation: Partial

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

Impact on downstream water users

Rating: Medium – High

Degree of Mitigation: Fully Mitigated

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

Loss of mining equipment due to unexpected flooding

Rating: Low – Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.6	4	2	3	7.8

STOCKPILING AND TRANSPORTING MATERIAL FROM SITE:

Negative impact on the riparian vegetation and banks of the river

Rating: Medium**Degree of Mitigation: Fully Mitigated**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.6	4	5	4.5	11.7

Dust nuisance from loading and vehicles transporting the material

Rating: Medium**Degree of Mitigation: Fully Mitigated**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.6	4	5	4.5	11.7

Degradation of access road

Rating: Medium**Degree of Mitigation: Fully Mitigated**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	2	3	4	5	4.5	13.5

Negative impact on the fauna (aquatic and terrestrial) of the area

Rating: Medium**Degree of Mitigation: Partial**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	5	4	2	3	2.5	10

Contamination of area with hydrocarbons or hazardous waste materials

Rating: Medium**Degree of Mitigation: Fully Mitigated**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
5	4	5	4.6	3	3	3	13.8

Overloading of trucks having an impact on the public roads

Rating: Medium – High**Degree of Mitigation: Fully Mitigated**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	4	5	4.3	4	5	4.5	19.4

SLOPING AND LANDSCAPING DURING REHABILITATION:

Impact on the flow regime of the Caledon River

Rating: Low – Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	5	4	3	1	2	8

Contamination of area with hydrocarbons or hazardous waste materials

Rating: Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
5	4	5	4.6	3	3	3	13.8

POTENTIAL POSITIVE IMPACTS

- ⌘ Employment opportunities for ±5 local residents;
- ⌘ Contribution to the local economy (both directly and indirectly);
- ⌘ The mining of sand will assist with the sediment problem experienced in the river, town of Wepener and dams within the catchment area;
- ⌘ The Applicant will be able to supply sand to wholesalers and contractors in the building and construction industries.

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

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

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

DEFINITIONS AND CONCEPTS:

Environmental significance:

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

- ⌘ Environmental significance is a value judgement
- ⌘ The degree of environmental significance depends on the nature of the impact

- ⌘ The importance is rated in terms of both biophysical and socio-economic values
- ⌘ Determining significance involves the amount of change to the environment perceived to be acceptable to affected communities.

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

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

Impact

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

Consequence

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

Likelihood

A qualitative term covering both probability and frequency.

Frequency

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

Probability

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

Environment

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

Methodology that will be used

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

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

Determination of Overall Consequence

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

Determination of Severity / Intensity

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

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

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 production, fauna and flora)	Insignificant change / deterioration or disturbance	Moderate change / deterioration or disturbance	Significant change / deterioration or disturbance	Very significant change / deterioration or disturbance	Disastrous change / deterioration or disturbance

Determination of Duration

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

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 summarised 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 prioritisations 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 of little would be required, or both. In case of positive impacts alternative means for achieving this benefit would likely be easier, cheaper, more effective, less time-consuming, or some combination of these.

Low	Impact would be negligible. In the case of negative impacts, almost no mitigation and or remedial activity would be needed, and any minor steps, which might be needed, would be easy, cheap and simple. In the case of positive impacts, alternative means would almost all likely be better, in one or a number of ways, than this means of achieving the benefit
Insignificant	There would be a no impact at all – not even a very low impact on the system or any of its parts.

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

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

Site Alternative 1 (S1) (Preferred Alternative):

Potential Positive Impacts:

- ⌘ Employment opportunities for ±5 local residents;
- ⌘ Contribution to the local economy (both directly and indirectly);
- ⌘ The mining of sand will assist with the sediment problem experienced in the river, town of Wepener and dams within the catchment area;
- ⌘ The Applicant will be able to supply sand to wholesalers and contractors in the building and construction industries.

Potential Negative Impacts:

WINNING OF SAND:

- ⌘ Visual intrusion associated with the sand mining activities
- ⌘ Noise nuisance generated by excavation equipment
- ⌘ Contamination of surface or groundwater with hydrocarbons or hazardous waste material
- ⌘ Negative impact on the aquatic fauna of the area
- ⌘ Impact on the flow regime of the river
- ⌘ Impact on downstream water users
- ⌘ Loss of mining equipment due to unexpected flooding

STOCKPILING AND TRANSPORTING MATERIAL FROM SITE:

- ⌘ Negative impacts on the riparian vegetation and banks of the river
- ⌘ Dust nuisance from loading and vehicles transporting the material
- ⌘ Degradation of access road

- ⌘ Negative impact on the fauna (aquatic and terrestrial) of the area
- ⌘ Contamination of area with hydrocarbons or hazardous waste materials
- ⌘ Overloading of trucks having an impact on the public roads

SLOPING AND LANDSCAPING DURING REHABILITATION:

- ⌘ Impact on the flow regime of the Caledon River
- ⌘ Contamination of area with hydrocarbons or hazardous waste materials

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

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

Visual mitigation:

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

- ⌘ All mining related activities must be contained within the approved footprint of the permitted area.
- ⌘ The site must have a neat appearance and be kept in good condition at all times.
- ⌘ Upon closure the site must be rehabilitated to ensure that the visual impact on the aesthetic value of the area is kept to a minimum.

Noise handling:

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

- ⌘ The Applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site.
- ⌘ No loud music may be permitted at the mining area.
- ⌘ All mining vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996 (Act No 93 of 1996).

Waste management:

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

- ⌘ No waste stockpile area may be established inside or outside the boundaries of the mining area.

- ⌘ Regular vehicle maintenance, repairs and services must be done at an off-site workshop, as none of the above is allowed in the riverbed. When a breakdown occurs in the riverbed, the permit holder must arrange for the removal of the equipment/machinery, within 6 hours, to a recognised workshop where it can be mended.
- ⌘ Drip trays must be used under all stationary machinery and equipment for the duration of the operational phase (including the sand pump).
- ⌘ To prevent loss of machinery during unpredicted flooding, and lower the risk of accidental hydrocarbon spillages, no machinery may overnight in the mining area (riverbed). Unless otherwise arranged with the landowner, the machinery must overnight on the access road outside the mining area. Drip trays must at all times be placed underneath stationary machinery.
- ⌘ If a diesel bowser is used on site, it must be equipped with a drip tray at all times. Refuelling must take place on the access road (outside the riverbed), and drip trays have to be used during each and every refuelling event. The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling.
- ⌘ Site management must ensure drip trays are cleaned after each use. No dirty drip trays may be used on site.
- ⌘ All hazardous waste products must be disposed of in a designated closed container/bin to be kept at the back of one of the site vehicles, and removed daily from the mining area, either for resale or for appropriate disposal at a recognised facility. The safe disposal certificate must be filed for auditing purposes.
- ⌘ Spills must be cleaned up immediately, within two hours of occurrence, to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing it at a recognised facility. Proof must be filed.
- ⌘ It is important that any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities is reported to the Department of Water and Sanitation and other relevant authorities.
- ⌘ All general waste must be contained within the site vehicles and daily be removed from the mining area.
- ⌘ No waste may be buried or burned on the site.
- ⌘ No chemicals or hazardous materials may be stored at the mining area.

Protection of fauna and flora:

The risk resulting from the proposed mining activity on the fauna (aquatic and terrestrial) and the riparian vegetation of the footprint area as well as the surrounding environment, can be reduced to low-medium through the implementation of the mitigation measures listed below:

- ⌘ The site manager must ensure no fauna (aquatic and terrestrial) is caught, killed, harmed, sold or played with.
- ⌘ Workers must be instructed to report any animals that may be trapped in the working area.
- ⌘ No snares may be set or nests raided for eggs or young.
- ⌘ The natural flow of the river may not be dammed or diverted and no fishing may be allowed.
- ⌘ No plants or trees may be removed without the approval of the ECO.
- ⌘ The access point into the river must be clearly demarcated and site management must ensure only one access into the river is used by all mining related machinery and vehicles.

Mitigating the impact on the Caledon River and downstream users:

The risk that the proposed mining activity may have a negative impact on the flow regime of the Caledon River and/or downstream users, can be reduced to low-medium through the implementation of the mitigation measures listed below:

- ⌘ The natural flow of the river may at no point be changed, dammed or diverted without prior authorisation from the Department of Water and Sanitation.
- ⌘ No changes may be made to the banks of the river without prior authorisation from the Department of Water and Sanitation.
- ⌘ The permit holder must at all times adhere to the requirements of the water use authorisation to be obtained prior to the commencement of the mining activities.
- ⌘ Upon closure, the permit holder must remove the sand pump, settling ponds and earthmoving equipment from the riverbed. Any stockpiled material must either be flattened or removed from the mining area and the footprint must be landscaped so as to prevent any change in the natural flow of the river. The access into the river must be repaired/rehabilitated if no longer needed by the landowner, with the access road left in the same or better state as found prior to commencement of the activities.

Loss of mining equipment due to unexpected flooding:

The risk posed by unexpected/unpredicted flooding can be reduced to low through the implementation of the mitigation measures listed below:

- ⌘ To prevent loss of machinery during unpredicted flooding, and lower the risk of accidental hydrocarbon spillages, no machinery may overnight in the mining area (riverbed). Unless otherwise arranged with the landowner, the machinery must overnight on the access road outside the mining area. Drip trays must at all times be placed underneath stationary machinery.

- ⌘ All mining related equipment must be removed from the mining area during high flow periods.

Storm water handling:

- ⌘ Drainage must be controlled to ensure that runoff from the project area does not culminate in off-site pollution, flooding or result in any damage to properties downstream or any storm water discharge points.
- ⌘ Mining must be conducted only in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department may impose:
 - Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems.
 - Dirty water must be collected and contained in a system separate from the clean water system.
 - Dirty water must be prevented from spilling or seeping into clean water systems.
 - The storm water management plan must apply for the entire life cycle of the mining activity and over different hydrological cycles (rainfall patterns).
 - The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management plan.

Dust handling:

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

- ⌘ The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents.
- ⌘ The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression.
- ⌘ Speed on the access roads must be limited to 20 km/h to prevent the generation of excess dust.
- ⌘ Roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.

Management of access road:

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

- ⌘ Storm water must be diverted around the access road 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 activity must be repaired by the Applicant.

Mitigation of overloading:

The risk of overloaded trucks impacting on the public road infrastructure can be reduced to being low-medium through the implementation of the mitigation measures listed below:

- ⌘ A mobile weighing device must be implemented, and prior to leaving the site, all trucks/loads must be weighed to prevent.
- ⌘ Proof of load weights must be filed for auditing purposes.

Management of invasive plant species:

- ⌘ An invasive plant species management plan must be implemented at the site to ensure the management and control of all species regarded as Category 1a and 1b invasive species in terms of NEM:BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto). Weed/alien clearing must be done on an ongoing basis throughout the life of the mining activities.
- ⌘ Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. Due to the mining area being within the riverbed of the Caledon River, no herbicides may be used on site and problem plant species may only be uprooted, felled or cut off through mechanical means.

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 Mine Health and Safety Act, 1996 (Act No 29 of 1996).

Archaeological, heritage and palaeontological aspects:

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

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

ix) Motivation where no alternative sites were considered.

As mentioned previously due to the nature of the application and the presence of sand along the entire Caledon River, the sand mining area can be moved to various alternative sites. However, the proposed mining area, as indicated on the Regulation 2.2 Mine Plan (attached as Appendix A), was identified as the preferred and only viable site alternative as it entails the mining of an area previously used for sand mining purposes, and the use of the existing access road and entrance point into the river. In addition, it is known that the Caledon River annually replenishes the sand deposit and re-instates the riverbed, thereby eliminating any residual impact that sand mining may have on the visual characteristics of the receiving and/or surrounding environment. In light of this no alternative sites were considered during this assessment.

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

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

Site Alternative 1 entails the mining of an area previously used for the winning of sand from the Caledon River. The proposed site was identified as the preferred alternative based on the following:

- ⌘ Due to the nature of the application and the presence of sand along the entire Caledon riverbed, the sand mining area can be moved to various alternative sites. However, the proposed mining area entails the winning of sand from an area previously used for sand mining purposes.

- ⌘ The existing farm road to the mining area can be used to gain access to the site and no new roads have to be constructed.
- ⌘ The Applicant can make use of the existing access point into the river and no change to the riverbank or removal of vegetation is needed.
- ⌘ The Caledon River annually replenishes the sand deposit and re-instates the riverbed, thereby eliminating any residual impact that the sand mining activity may have on the visual characteristics of the receiving and/or surrounding environment.

i) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity.

(Including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures)

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

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

WINNING OF SAND:

Visual intrusion associated with the sand mining activities

Rating: Low – Medium

Degree of Mitigation: Partial

Severity	Duration	Extent	Consequence			Likelihood	Significance
				Probability	Frequency		
2	4	2	2.6	3	1	2	5.2

Noise nuisance generated by excavation equipment

Rating: Low

Degree of Mitigation: Partial

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

Contamination of surface or groundwater with hydrocarbons or hazardous waste materials

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
5	1	2	2.6	2	1	1.5	3.9

Negative impact on the aquatic fauna of the area

Rating: Low – Medium

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.6	3	3	3	7.8

Impact on the flow regime of the river

Rating: Low – Medium

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	4	5	4	2	1	1.5	6

Impact on downstream water users

Rating: Low – Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	4	5	4	2	1	1.5	6

Loss of mining equipment due to unexpected flooding

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.6	2	1	1.5	3.9

STOCKPILING AND TRANSPORTING MATERIAL FROM SITE:

Negative impact on the riparian vegetation and banks of the river

Rating: Low – Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.6	3	3	3	7.8

Dust nuisance from loading and vehicles transporting the material

Rating: Low – Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	1	2.3	2	3	2.5	5.8

Degradation of access road

Rating: Low – Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	2	3	2	3	2.5	7.5

Negative impact on the fauna (aquatic and terrestrial) of the area

Rating: Low

Degree of Mitigation: Partial

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	3	1	2.3	2	2	2	4.6

Contamination of area with hydrocarbons or hazardous waste materials

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
5	1	2	2.6	2	1	1.5	3.9

Overloading of trucks having an impact on the public roads

Rating: Low – Medium

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	1	5	3.3	2	2	2	6.6

SLOPING AND LANDSCAPING DURING REHABILITATION:

Impact on the flow regime of the Caledon River

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	1	5	3	2	1	1.5	4.5

Contamination of area with hydrocarbons or hazardous waste materials

Rating: Low

Degree of Mitigation: Fully Mitigated

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
5	1	2	2.6	2	1	1.5	3.9

j) Assessment of each identified potentially significant impact and risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons and not only those that were raised by registered interested and affected parties).

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
Whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	(E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, air pollution, etc...etc...etc.)		In which impact is anticipated. (E.g. Construction, commissioning, operational Decommissioning closure, post closure.)	If not mitigated.	(modify, remedy, control, or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc etc) E.g. Modify through alternative method Control through noise control Control through management and monitoring through rehabilitation.	If not mitigated.
Demarcation of site with visible beacons.	No impact could be identified other than the beacons being outside the boundaries of the approved mining area.	N/A	Site Establishment phase	N/A	Control through management and monitoring	N/A
WINNING OF SAND	Visual intrusion associated with the sand mining activities	The visual impact may affect the aesthetics of the landscape.	Operational phase	Medium	<u>Control:</u> Implementation proper housekeeping	Low – Medium
	Noise nuisance generated by excavation equipment.	Should noise levels become excessive it may have an impact	Operational phase	Medium	<u>Control:</u> Noise control measures	Low

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
Whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	(E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, air pollution, etc...etc...etc.)		In which impact is anticipated. (E.g. Construction, commissioning, operational Decommissioning closure, post closure.)	If not mitigated.	(modify, remedy, control, or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc etc) E.g. Modify through alternative method Control through noise control Control through management and monitoring through rehabilitation.	If not mitigated.
		on surrounding landowners.				
	Contamination of surface or groundwater with hydrocarbons or hazardous waste material.	Contamination may cause surface or ground water pollution if not addressed.	Operational phase	Medium	<u>Control & Remedy:</u> Implementation of waste management	Low
	Negative impact on the aquatic fauna of the area	This may have a negative impact on the biodiversity of the area.	Operational phase	Medium – High	<u>Control:</u> Implementation of proper housekeeping and site management.	Low – Medium
	Impact on the flow regime of the river.	A negative impact on the flow regime of the river may lead to erosion of banks, and	Operational phase	Medium – High	<u>Control:</u> Implementation of proper housekeeping and site management.	Low – Medium

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
<p>Whether listed or not listed.</p> <p>(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.)</p>	<p>(E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, air pollution, etc...etc...etc.)</p>		<p>In which impact is anticipated.</p> <p>(E.g. Construction, commissioning, operational Decommissioning closure, post closure.)</p>	<p>If not mitigated.</p>	<p>(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)</p> <p>E.g. Modify through alternative method Control through noise control Control through management and monitoring through rehabilitation.</p>	<p>If not mitigated.</p>
<p>STOCKPILING AND TRANSPORTING MATERIAL FROM SITE</p>		<p>impact on the downstream users.</p>				
	<p>Impact on downstream water users.</p>	<p>This impact may lead to complaints from surrounding landowners.</p>	<p>Operational phase</p>	<p>Medium – High</p>	<p><u>Control:</u> Implementation of proper housekeeping and site management.</p>	<p>Low – Medium</p>
	<p>Loss of mining equipment due to unexpected flooding.</p>	<p>This impact may have financial impacts on the Applicant.</p>	<p>Operational phase</p>	<p>Low – Medium</p>	<p><u>Control:</u> Implementation of proper housekeeping and site management.</p>	<p>Low</p>
	<p>Negative impacts on the riparian vegetation and banks of the river.</p>	<p>This may have a negative impact on the biodiversity of the area.</p>	<p>Operational phase</p>	<p>Medium</p>	<p><u>Control:</u> Implementation of proper site management.</p>	<p>Low – Medium</p>
	<p>Dust nuisance from loading and vehicles</p>	<p>An increase in dust levels may lead to</p>	<p>Operational phase</p>	<p>Medium</p>	<p><u>Control:</u> Dust suppression</p>	<p>Low – Medium</p>

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
<p>Whether listed or not listed.</p> <p>(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.)</p>	<p>(E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, air pollution, etc...etc...etc.)</p>		<p>In which impact is anticipated.</p> <p>(E.g. Construction, commissioning, operational Decommissioning closure, post closure.)</p>	<p>If not mitigated.</p>	<p>(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)</p> <p>E.g. Modify through alternative method Control through noise control Control through management and monitoring through rehabilitation.</p>	<p>If not mitigated.</p>
	<p>transporting the material.</p>	<p>complaints received from surrounding landowners and road users.</p>				
	<p>Degradation of access road.</p>	<p>If the road is not maintained it will negatively affect all road users.t only the landowner.</p>	<p>Operational phase</p>	<p>Medium</p>	<p><u>Control & Remedy:</u> Road condition management</p>	<p>Low – Medium</p>
	<p>Negative impact on the fauna (aquatic and terrestrial) of the area.</p>	<p>This may have a negative impact on the biodiversity of the area.</p>	<p>Operational phase</p>	<p>Medium</p>	<p><u>Control:</u> Implementation of proper housekeeping and site management.</p>	<p>Low</p>
	<p>Contamination of area with hydrocarbons or hazardous waste material.</p>	<p>Contamination may cause surface or ground water</p>	<p>Operational phase</p>	<p>Medium</p>	<p><u>Control & Remedy:</u> Implementation of waste management</p>	<p>Low</p>

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
Whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	(E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, air pollution, etc...etc...etc.)		In which impact is anticipated. (E.g. Construction, commissioning, operational Decommissioning closure, post closure.)	If not mitigated.	(modify, remedy, control, or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc etc) E.g. Modify through alternative method Control through noise control Control through management and monitoring through rehabilitation.	If not mitigated.
		pollution if not addressed.				
	Overloading of trucks having an impact on the public roads.	Overloading will negatively affect the roads in the vicinity of the mining area.	Operational phase	Medium – High	<u>Control</u> : Proper site management	Low
SLOPING AND LANDSCAPING UPON CLOSURE OF THE MINING AREA	Impact on the flow regime of the river.	A negative impact on the flow regime of the river may lead to erosion of banks, and impact on the downstream users.	Operational phase	Low – High	<u>Control</u> : Implementation of proper housekeeping and site management.	Low
	Contamination of area with hydrocarbons or hazardous waste material.	Contamination may cause surface or ground water pollution if not addressed.	Operational phase	Medium	<u>Control & Remedy</u> : Implementation of waste management	Low

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

k) Summary of specialist reports.

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

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
<p>No specialist studies were deemed necessary as the project entails the establishment of a mining area within the Caledon River, historically used for the winning of sand.</p>			

I) Environmental impact statement

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

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

Project proposal:

- ⌘ The proposed activity will take place over an area historically used for the winning of sand from the river. The Applicant will either, recover the sand by means of earthmoving machinery and keep it at a stockpile area, or alternatively pump the sand by means of a sand pump into settling ponds. The mined material will then be loaded onto trucks to be transported to clients. No processing of the mineral is required prior to its removal from site and the Applicant will not establish a workshop/storage facility within the mining area.
- ⌘ From previous experience it is known that the river annually replenishes the sand resource during periods of high flow (approximately October – March). No mining will take place during these high flow periods, and all machinery and equipment will be removed from the riverbed.

Nearby Infrastructure:

- ⌘ The infrastructure existing within close proximity of the application area mainly consist of the Jim Fouché bridge ±130 m west of the mining area, and the farm yard ±450 m to the north. Should the Applicant contain the mining activities within the boundaries of the authorised area the impact on the existing infrastructure in close proximity to the mining area is deemed to be of low-medium significance

Site Specific Environmental Features:

- ⌘ The proposed sand mine will be established in an area extensively used for the winning of sand over the years. As mentioned earlier, the Caledon River annually replenishes the sand deposit and re-instates the riverbed, thereby eliminating any residual impact that the sand mining activity may have on the visual characteristics of the receiving and/or surrounding environment. The equipment to be used at the mining area are of temporary nature and can easily be removed in the event of unnatural flooding or during the rehabilitation phase. In light of this, although the proposed activity will be visible to road users on the R26 the impact on the

aesthetic ambience of the surrounding area is deemed to be of low-medium significance.

- ⌘ Dust will be generated by the proposed activity mainly from stockpile material and vehicles transporting the material on gravel roads. Should the Applicant however implement the mitigation measures proposed in this document and the EMPr the impact on the air quality of the surrounding environment is deemed to be of low-medium significance.
- ⌘ The proposed activity will contribute noise generated by earthmoving equipment and trucks transporting material from site. Although the sand mine will have a cumulative impact on the noise levels of the surrounding environment, no excessive noise (such as with blasting) will be generated and the impact is deemed compatible with the receiving environment and of low significance.
- ⌘ Due to the nature of the activity the topography of the study area will not be impacted.
- ⌘ The proposed sand mining operation will entail the removal of sand from the Caledon riverbed in a well-known sand mine location that has been utilised by various permit holders. In light of the above, it is believed that the proposed sand mining activity would not have a negative impact on the geology/soil of the study area, as the removal of sand will indirectly assist with the sedimentation problem experienced in the river, town of Wepener and dams of the catchment area. The Caledon River will replenish the sand deposits annually and therefore the proposed impact on the geology/soil of the receiving environment is deemed to be insignificant.
- ⌘ Mining within the riverbed triggers the National Water Act, 1998 in terms of Section 39, and the Applicant has to obtain approval from the Department of Water and Sanitation prior to commencement with the activity. It is proposed that should the Applicant follow the conditions of the water use authorisation the impact of the proposed activity on the aquatic features of the study area has a low-medium significance.
- ⌘ The Applicant will make use of a single access point into the river, and a single haul road from the river to the area where the trucks will be loaded, to limit damage to the riparian zone. It is proposed that should the Applicant implement the mitigation measures proposed in the EMPr the impact of the proposed activity on

the riparian vegetation and groundcover in general is deemed to be of low-medium significance.

- ⌘ The Applicant propose to mine sand from the riverbed during low flow spells when access to the sand deposit is available. At no time will the flow of the Caledon River be diverted and should the Applicant implement the proposed mitigation measures the impact on terrestrial fauna is deemed insignificant while the impact on aquatic fauna is deemed of low-medium significance.
- ⌘ No sites of archaeological or cultural importance were identified during the site inspection. Consultation with the interested and affected parties also did not identify any potential area of concern and therefore the impact of the proposed mining activities on the cultural and/or heritage environment is deemed insignificant.

ii) Final Site Map

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

See the map indicating site activities attached as Appendix B.

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

The positive impacts associated with the project include:

- ⌘ Employment opportunities for ±5 local residents;
- ⌘ Contribution to the local economy (both directly and indirectly);
- ⌘ The mining of sand will assist with the sediment problem experienced in the river, town of Wepener and dams within the catchment area;
- ⌘ The Applicant will be able to supply sand to wholesalers and contractors in the building and construction industries.

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

- | | |
|---|---------------------|
| ⌘ Visual intrusion associated with the sand mining activities | Low – Medium |
| ⌘ Negative impact on the aquatic fauna of the area | Low – Medium |
| ⌘ Impact on the flow regime of the river | Low – Medium |
| ⌘ Impact on downstream water users | Low – Medium |
| ⌘ Negative impact on the riparian vegetation and banks of the river | Low – Medium |
| ⌘ Dust nuisance from loading and vehicles transporting the material | Low – Medium |

- ⌘ Degradation of access road **Low – Medium**
- ⌘ Overloading of trucks having an impact on the public roads **Low – Medium**

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

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

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT OUTCOMES
Visual mitigation	<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"> ⌘ Contain all mining related activities within the approved footprint of the mining area. ⌘ Ensure that the site have a neat appearance and is kept in good condition at all times. ⌘ Remove all equipment upon rehabilitation of the mining area and return the area to its prior status.
Noise handling	<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 that employees and staff conduct themselves in an acceptable manner while on site. ⌘ No loud music may be permitted at the mining area. ⌘ Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996.
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"> ⌘ Prevent the establishment of a waste stockpile area inside or outside the boundaries of the mining area. ⌘ Ensure regular vehicle maintenance, repairs and services are done at an off-site workshop, as none of the above is allowed in the riverbed. When a breakdown occurs in the riverbed, arrange for the removal of equipment/machinery, within 6 hours, to a recognised workshop where it can be mended. ⌘ Use drip trays under all stationary machinery and equipment of the duration of the operational phase (including the sand pump). ⌘ To prevent loss of machinery during unpredicted flooding, and lower the risk of accidental hydrocarbon spillages, ensure that no machinery overnight in the mining area (riverbed). Park machinery, overnight, on the access road, unless otherwise arranged with the landowner. Ensure drip trays are placed at all times underneath stationary machinery. ⌘ Equip the diesel bowser with a drip tray. Make use of drip trays during each and every refuelling event, and

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT OUTCOMES
		<p>ensure refuelling takes place on the access road (outside the riverbed). Rest the nozzle of the bowser in a sleeve to prevent dripping after refuelling.</p> <ul style="list-style-type: none"> ⌘ Clean drip trays after each use. Do not use dirty drip trays on site. ⌘ Dispose all hazardous waste products in a designated closed container/bin that is kept at the back of one of the site vehicles, and remove it daily from the mining area, either for resale or for appropriate disposal at a recognised facility. ⌘ Clean spills immediately, within 2 hours of occurrence, to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and disposing it at a recognised facility. File proof. ⌘ Report any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities to the Department of Water and Sanitation and other relevant authorities. ⌘ Contain all general waste within the site vehicles and daily remove it from the mining area. ⌘ Prevent the burning or burying of waste on site. ⌘ Prevent the storage of chemicals or hazardous materials at the mining area.
Protection of fauna and flora	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMP.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ⌘ Ensure no fauna (aquatic and terrestrial) 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. ⌘ Do not dam or divert the natural flow of the river and prevent fishing. ⌘ Do not remove plants or trees without the approval of the ECO. ⌘ Demarcate the access point into the river and ensure only one access into the river is used by all mining related machinery and vehicles.
Mitigating the impact on the Caledon River and downstream users.	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMP.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ⌘ Do not change the natural flow of the river, dam or divert it without prior authorisation from DWS. ⌘ Do not change the banks of the river without prior authorisation from DWS. ⌘ Adhere to the requirements of the water use authorisation obtained prior to the commencement of the mining activities.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT OUTCOMES
		<ul style="list-style-type: none"> ⌘ Upon closure, remove the sand pump, settling ponds and earthmoving equipment from the riverbed. Flatten or remove stockpiled material from the mining area and landscape the footprint to prevent changes in the natural flow of the river. Repair/rehabilitate the access point into the river, if no longer needed by the landowner, and leave the access road in the same or better state as found prior to commencement of the activities.
Protecting equipment against unexpected flooding.	<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"> ⌘ To prevent loss of machinery during unpredicted flooding, and lower the risk of accidental hydrocarbon spillages, ensure that no machinery overnight in the mining area (riverbed). Park machinery, overnight, on the access road, unless otherwise arranged with the landowner. Ensure drip trays are placed at all times underneath stationary machinery. ⌘ Remove all mining related equipment form the mining area during high flow periods.
Storm water handling	<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 all drainage from the project area to prevent off-site pollution, flooding or damage to properties downstream of any storm water discharge points. ⌘ Conduct activity in terms of the Best Practice Guidelines for small-scale mining as developed by DWS.
Dust handling	<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 the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. ⌘ Ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. ⌘ Limit speed on the access road to 20 km/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.
Management of access road	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr</p>	<ul style="list-style-type: none"> ⌘ Divert storm water around the access road to prevent erosion.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT OUTCOMES
	Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> ⌘ 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 proposed activities.
Mitigation of overloading	<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 mobile weighing device and weigh all trucks/loads prior to leaving the site. ⌘ File proof of load weights for auditing purposes.
Management of invasive plant species	<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 an invasive plant species management plan to control all invasive plant species on site in terms of NEM:BA, 2004 and CARA, 1983. ⌘ Control declared invader or exotic species on the rehabilitated areas. Do not use herbicides in the riverbed, and rather uproot, fell or cut off the problem plant through mechanical means.
Management of health and safety risks	<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 that workers have access to the correct PPE as required by law. ⌘ Manage all operations in compliance with the Mine Health and Safety Act, 1996 (Act No 29 of 1996).
Archaeological, heritage and palaeontological aspects	<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"> ⌘ Confine all mining to the development footprint area. ⌘ Implement the following change find procedure when discoveries are made on site: <ul style="list-style-type: none"> ▪ If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. ▪ It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT OUTCOMES
		<p>find, and confirm the extent of the work stoppage in that area.</p> <ul style="list-style-type: none"> ▪ The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

n) Aspects for inclusion as conditions of Authorisation.

Any aspects which must be made conditions of the Environmental Authorisation

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

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

(Which relate to the assessment and mitigation measures proposed)

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

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

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

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

ii) Conditions that must be included in the authorisation

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

q) Period for which the Environmental Authorisation is required.

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

r) Undertaking

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

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

s) Financial Provision

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

i) Explain how the aforesaid amount was derived

The annual amount required to manage and rehabilitate the environment was estimated to be R 14 800.00. Please see the explanation as to how this amount was derived at attached as Appendix H – Financial and Technical Competence Report.

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

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

The mining operation will be self-funded through income generated by sales of the sand mined.

t) Specific Information required by the competent Authority

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

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

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

§ **Visual intrusion associated with the sand mining activities:**

The section of the Caledon river, earmarked for the proposed project, has been utilized for sand mining over many years and the land use is known to the area. The mining activities will be contained to the boundaries of the permitted area and will not impact the surrounding floodplain or agricultural land of the farm. The equipment to be used at the mining area are of

temporary nature and can easily be removed during the rehabilitation phase. As mentioned earlier, the Caledon River annually replenishes the sand deposit and re-instates the riverbed, thereby eliminating any residual impact that the sand mining activity may have on the visual characteristics of the receiving and/or surrounding environment.

The visual impact on the surrounding area is deemed to be of low-medium significance with the implementation of the proposed mitigation measures. It is believed that the residual impact of the activity will be low to very low as the river is known to re-instate the area during the first rainy season.

⌘ **Noise nuisance generated by excavation equipment**

The noise ambiance of the study area has been transformed from a purely agricultural area to an area impacted by the provincial road (R26) crossing the Caledon River, and the introduction of gravel and sand mining in the area. Although the sand mine will have a cumulative impact on the noise levels of the surrounding environment, no excessive noise (such as with blasting) will be generated and the impact is deemed compatible with the receiving environment and of low significance. No residual impact will remain upon closure of the mining area.

⌘ **Impact on downstream water users:**

The Applicant propose to mine sand from the riverbed during low flow spells when access to the sand deposit is available. The proposed project does not entail any alterations/changes to the banks of the river, or riverbed and no deviation in the flow of the river is proposed.

Mining within the riverbed trigger the National Water Act, 1998 in terms of Section 39, and the Applicant has to obtain approval from the Department of Water and Sanitation prior to commencement with the activity. It is proposed that should the Applicant follow the mitigation measures as proposed in this document and the conditions of the water use authorisation the impact of the proposed activity on the aquatic features of the study area and the rights of downstream users is of low-medium significance, with no residual impact.

⌘ **Dust nuisance from loading and vehicles transporting the material:**

Dust will be generated by the proposed activity mainly from stockpile material and vehicles transporting the material on gravel roads. Should the Applicant however implement the mitigation measures proposed in this document and the EMPr the impact on the air quality of the surrounding environment is deemed to be of low-medium significance. There will be no residual impact after closure.

⌘ **Degradation of the access road:**

The Applicant will use the existing gravel farm road, (±1.8 km) to access the mining area and transport material from the mine. The gravel road is often used by sand miners to transport sand from the Caledon River, and therefore no upgrading of the road is needed prior to commencement. Rutting and erosion of the access road caused as a direct result of the mining activities will be repaired by the Applicant. The impact on the surrounding area is deemed of low-medium significance with the implementation of the proposed mitigation measures.

⌘ **Employment opportunities and Socio-economic impact:**

The proposed labour component of the activity will be five employees. The operation will contribute to the local economy in the area, both directly and through the multiplier effect that its continued presence will create. Equipment and supplies will be purchased locally, and wages are spent at local businesses, generating both jobs and income in the area. Although the employees are not resident on the site, they were selected from the surrounding community.

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

assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of the Act, attach the investigation report as Appendix 2.19.2 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6 and 2.12 herein).

No sites of significance were identified in terms of the national estate as defined by the NHRA, 1999. The proposed mining area is situated inside the Caledon

riverbed and was previously used for sand mining. The existing access road and entrance point into the river will be used, and no areas of cultural or heritage importance could be identified that will be affected by the proposed activity.

u) Other matters required in terms of section 24(4)(a) and (b) of the Act.

(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as Appendix 4)

Site Alternative 1, as discussed earlier, was identified during the assessment phase of the environmental impact assessment by the Applicant and project team, as the preferred and only viable site alternative.

The Applicant will either recover the sand by means of mechanical excavation with earthmoving equipment and keep it at a stockpile area, or alternatively pump the sand by means of a sand pump into the settling ponds within the boundaries of the mining area. Due to the nature of the proposed project, both these alternatives are deemed viable and the recovery method will be determined by the flow level of the river and dryness of the sand. During drier periods mechanical excavation can be employed, while the pump of sand is preferred during the higher flow/wetter periods.

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

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme.

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

The details and expertise of Christine Fouche of Greenmined Environmental that acts as EAP on this project has been included in Part A Section 1(a) as well as Appendix J as required.

- b) **Description of the Aspects of the Activity** (Confirm that the requirements to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required).

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

c) Composite Map

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

As mentioned under Part A, section (1)(L)(ii) this map has been compiled and is attached as Appendix 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)**

The decommissioning phase will entail the rehabilitation of the mining site. Due to the nature of the project, no buildings/infrastructure will have to be removed. The Applicant will remove the sand pump, settling ponds and earthmoving equipment from the riverbed. Any stockpiled material will either be flattened or removed from the mining area and the footprint will be landscaped so as to prevent any change in the natural flow of the river. The access into the river will be repaired/rehabilitated if no longer needed by the landowner, with the access road left in the same or better state as found prior to commencement of the activities.

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

∞ Rehabilitation of the excavated area:

Very little residue will be generated as material is selectively removed to minimize product not suitable for sale. Larger grain material, organic particles and clay that are separated from the saleable product will be used to rehabilitate erosion structures and the excavation area.

∞ Final rehabilitation:

Rehabilitation of the surface area shall entail landscaping, levelling, maintenance, and clearing of invasive plant species (if necessary). All equipment, plant, 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. The management of invasive plant species will be done in a sporadic manner during the life of the mining activities. Species regarded as Category 1a and 1b invasive species in terms of NEM:BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto) need to be eradicated from the site.

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

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

As no sand washing is proposed for this project, the Applicant will exclusively use water for dust suppression purposes on the access road when needed. Approximately 5 000 litre water will be used per month. The Applicant will apply for the relevant water use authorization in terms of the National Water Act, 1998 (Act No 36 of 1998) from the Department of Water and Sanitation should water be extracted from the Caledon River. Alternatively, water will be bought from the landowner. A water truck will be used to spray the access road to alleviate dust generation when applicable.

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

The Applicant will apply for water use authorisation prior to the commencement of the mining activities.

iv) Impacts to be mitigated in their respective phases

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Demarcation of site with visible beacons.	Site Establishment phase	4.9 ha	Demarcation of the site will ensure that all employees are aware of the boundaries of the mining area, and that work stay within the approved area.	Mining of sand is only allowed within the boundaries of the approved area. ∞ MPRDA, 2008 ∞ NEMA, 1998	Beacons need to be in place throughout the life of the activity.
WINNING OF SAND	Operational phase	±4 ha	<u>Visual Mitigation:</u> ∞ All mining related activities must be contained within the approved footprint of the permitted area. ∞ The site must have a neat appearance and be kept in good condition at all times. ∞ Upon closure the site must to be rehabilitated to ensure that the visual	Management of the mining activities must be in accordance with the: ∞ MPRDA, 2008 ∞ NEMA, 1998	Throughout operational phase

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			impact on the aesthetic value of the area is kept to a minimum.		
WINNING OF SAND	Operational phase	±4 ha	<u>Noise Handling:</u> ⌘ The Applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. ⌘ No loud music may be permitted at the mining area. ⌘ All mining vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996 (Act No 93 of 1996).	Noise generation on site must be managed in accordance with the: ⌘ NEM:AQA, 2004 Regulation 6(1) ⌘ NRTA, 1996	Throughout operational phase

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
WINNING OF SAND & STOCKPIILING AND TRANSPORTING MATERIAL FROM SITE & SLOPING AND LANDSCAPING UPON CLOSURE OF THE MINING AREA	Operational phase Decommissioning phase	4.9 ha	<u>Waste management:</u> ✎ No waste stockpile area may be established inside or outside the boundaries of the mining area. ✎ Regular vehicle maintenance, repairs and services must be done at an off-site workshop, as none of the above is allowed in the riverbed. When a breakdown occurs in the riverbed, the permit holder must arrange for the removal of the equipment/machinery, within 6 hours, to a recognised workshop where it can be mended. ✎ Drip trays must be used under all stationary machinery and equipment for the duration of the operational phase (including the sand pump). ✎ To prevent loss of machinery during unpredicted flooding, and lower the risk	Mining related waste must be managed in accordance with the: ✎ NWA, 1998 ✎ NEM:WA, 2008	Throughout operational and decommissioning phases

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			<p>of accidental hydrocarbon spillages, no machinery may overnight in the mining area (riverbed). Unless otherwise arranged with the landowner, the machinery must overnight on the access road outside the mining area. Drip trays must at all times be placed underneath stationary machinery.</p> <ul style="list-style-type: none"> ⌘ If a diesel bowser is used on site, it must be equipped with a drip tray at all times. Refuelling must take place on the access road (outside the riverbed), and drip trays have to be used during each and every refuelling event. The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling. ⌘ Site management must ensure drip trays are cleaned after each use. No dirty drip trays may be used on site. 		

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			<ul style="list-style-type: none"> ⌘ All hazardous waste products must be disposed of in a designated closed container/bin to be kept at the back of one of the site vehicles, and removed daily from the mining area, either for resale or for appropriate disposal at a recognised facility. The safe disposal certificate must be filed for auditing purposes. ⌘ Spills must be cleaned up immediately, within two hours of occurrence, to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing it at a recognised facility. Proof must be filed. ⌘ It is important that any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities is reported to the Department of Water 		

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			and Sanitation and other relevant authorities. ✎ All general waste must be contained within the site vehicles and daily be removed from the mining area. ✎ No waste may be buried or burned on the site. ✎ No chemicals or hazardous materials may be stored at the mining area		
WINNING OF SAND & STOCKPILING AND TRANSPORTING MATERIAL FROM SITE	Operational phase	4.9 ha	<u>Management of fauna and flora:</u> ✎ The site manager must ensure no fauna is caught, killed, harmed, sold or played with. ✎ Workers must be instructed to report any animals that may be trapped in the working area. ✎ No snares may be set or nests raided for eggs or young.	Site specific fauna and flora must be managed in accordance with the: ✎ NEM:BA, 2004	Throughout operational phase

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			<ul style="list-style-type: none"> ⌘ The natural flow of the river may not be dammed or diverted and no fishing may be allowed. ⌘ No plants may be removed without the approval of the ECO. ⌘ The access point into the river must be clearly demarcated and site management must ensure only one access into the river is used by all mining related machinery and vehicles. 		
WINNING OF SAND & SLOPING AND LANDSCAPING UPON CLOSURE OF THE MINING AREA	Operational phase	4.9 ha	<u>Mitigating the impact on the Caledon River and downstream users:</u> <ul style="list-style-type: none"> ⌘ The natural flow of the river may at no point be changed, dammed or diverted without prior authorisation from the Department of Water and Sanitation. ⌘ No changes may be made to the banks of the river without prior authorisation 	The aquatic aspects at the site and rights of downstream users must be managed in terms of: <ul style="list-style-type: none"> ⌘ NWA, 1998 	Throughout operational phase

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			<p>from the Department of Water and Sanitation.</p> <ul style="list-style-type: none"> ⌘ The permit holder must at all times adhere to the requirements of the water use authorisation to be obtained prior to the commencement of the mining activities. ⌘ Upon closure, the permit holder must remove the sand pump, settling ponds and earthmoving equipment from the riverbed. Any stockpiled material must either be flattened or removed from the mining area and the footprint must be landscaped so as to prevent any change in the natural flow of the river. The access into the river must be repaired/rehabilitated if no longer needed by the landowner, with the access road left in the same or better 		

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			state as found prior to commencement of the activities.		
WINNING OF SAND	Operational phase	±4 ha	<p><u>Managing loss of equipment due to flooding:</u></p> <ul style="list-style-type: none"> ⌘ To prevent loss of machinery during unpredicted flooding, and lower the risk of accidental hydrocarbon spillages, no machinery may overnight in the mining area (riverbed). Unless otherwise arranged with the landowner, the machinery must overnight on the access road outside the mining area. Drip trays must at all times be placed underneath stationary machinery. ⌘ All mining related equipment must be removed from the mining area during high flow periods. 	The mining area must be managed in accordance with the: <ul style="list-style-type: none"> ⌘ MPRDA, 2008 ⌘ NEMA, 1998 ⌘ NWA, 1998 	Throughout operational phase

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
WINNING OF SAND	Operational phase	±4 ha	<p><u>Storm water management:</u></p> <ul style="list-style-type: none"> ⌘ Drainage must be controlled to ensure that runoff from the project area does not culminate in off-site pollution, flooding or result in any damage to properties downstream of any storm water discharge points. ⌘ All activities must be conducted 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 of Mineral Resources 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 	Storm water must be managed in accordance with the: <ul style="list-style-type: none"> ⌘ CARA, 1983 ⌘ NEMA, 1998 ⌘ NWA, 1998 	Throughout operational phase

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			<p>from the dirty water system. You must prevent clean water from running or spilling into dirty water systems.</p> <ul style="list-style-type: none"> ▪ 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. ▪ Storm water management must apply for the entire life cycle of the site 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. 		

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
STOCKPILING AND TRANSPORTING MATERIAL FROM SITE	Operational phase	±0.9 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 gravel access road must be limited to 20 km/h to prevent the generation of dust. ⌘ The road 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. 	Dust generation on site must be managed in accordance with the: <ul style="list-style-type: none"> ⌘ NEM:AQA, 2004 Regulation 6(1) ⌘ National Dust Control Regulations, GN No R827 ⌘ ASTM D1739 (SANS 1137:2012) 	Throughout operational phase

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
STOCKPILING AND TRANSPORTING MATERIAL FROM SITE	Operational phase	± 0.9 ha	<u>Management of access roads:</u> ⌘ Storm water must 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 must be repaired by the Applicant.	The access road must be managed in accordance with the: ⌘ NRTA, 1996	Throughout operational phase
STOCKPILING AND TRANSPORTING MATERIAL FROM SITE	Operational phase	± 0.9 ha	<u>Management of overloading:</u> ⌘ A mobile weighing device must be implemented, and prior to leaving the site, all trucks/loads must be weighed to prevent. ⌘ Proof of load weights must be filed for auditing purposes.	Load weights must be managed in accordance with the: ⌘ NRTA, 1996	Throughout operational phase

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
WINNING OF SAND & STOCKPILING AND TRANSPORTING MATERIAL FROM SITE & SLOPING AND LANDSCAPING UPON CLOSURE OF THE MINING AREA	Operational phase Decommissioning phase	4.9 ha	<p><u>Management of invasive plant species:</u></p> <ul style="list-style-type: none"> ⌘ An invasive plant species management plan must be implemented at the site to ensure the management and control of all species regarded as Category 1a and 1b invasive species in terms of NEM:BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto). Weed/alien clearing must be done on an ongoing basis throughout the life of the mining activities. ⌘ Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. Due to the mining area being within the riverbed of the Caledon River, no herbicides may be used on site and problem plant species may only be 	Weeds and invader plants on site must be managed in accordance with the: <ul style="list-style-type: none"> ⌘ CARA, 1983 ⌘ NEM:BA, 2004 	Throughout operational and decommissioning phases

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			uprooted, felled or cut off through mechanical means.		
WINNING OF SAND & STOCKPILING AND TRANSPORTING MATERIAL FROM SITE & SLOPING AND LANDSCAPING UPON CLOSURE OF THE MINING AREA	Operational phase Decommissioning phase	4.9 ha	<u>Health and safety aspects:</u> ✎ Workers must have access to the correct personal protection equipment (PPE) as required by law. ✎ All operations must comply with the Mine Health and Safety Act, 1996 (Act No 29 of 1996).	Health and safety aspects on site must be managed in accordance with the: ✎ MHSA, 1996 ✎ OHSA, 1993 ✎ OHSAS 18001	Throughout operational and decommissioning phases

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
WINNING OF SAND & STOCKPILING AND TRANSPORTING MATERIAL FROM SITE & SLOPING AND LANDSCAPING UPON CLOSURE OF THE MINING AREA	Operational phase Decommissioning phase	4.9 ha	<p><u>Archaeological, heritage and palaeontological aspects:</u></p> <ul style="list-style-type: none"> ⌘ All mining must be confined to the development footprint area. ⌘ If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. ⌘ It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, 	Cultural/heritage aspects on site must be managed in accordance with the: <ul style="list-style-type: none"> ⌘ NHRA, 1999 	Throughout operational and decommissioning phases

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
			and confirm the extent of the work stoppage in that area. ✎ The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.		

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 processing area.	N/A	Site Establishment phase	Control through management and monitoring	Mining of sand is only allowed within the boundaries of the approved area. ∞ MPRDA, 2008 ∞ NEMA, 1998
WINNING OF SAND	Visual intrusion associated with the sand mining activities	The visual impact may affect the aesthetics of the landscape.	Operational phase	<u>Control:</u> Implementation of proper housekeeping	Management of the mining activities must be in accordance with the: ∞ MPRDA, 2008 ∞ NEMA, 1998
WINNING OF SAND	Noise nuisance generated by excavation equipment.	Should noise levels become excessive it may have an impact on	Operational phase	<u>Control:</u> Noise control measures	Noise generation on site must be managed in accordance with the: ∞ NEM:AQA, 2004 Regulation 6(1) ∞ NRTA, 1996

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.
		surrounding landowners.			
WINNING OF SAND	Contamination of surface or groundwater with hydrocarbons or hazardous waste material.	Contamination may cause surface or ground water pollution if not addressed.	Operational phase	<u>Control & Remedy:</u> Implementation of waste management	Mining related waste must be managed in accordance with the: <ul style="list-style-type: none"> ∞ NWA, 1998 ∞ NEM:WA, 2008
WINNING OF SAND	Negative impact on the aquatic fauna of the area	This may have a negative impact on the biodiversity of the area.	Operational phase	<u>Control:</u> Implementation of proper housekeeping and site management.	Site specific fauna and flora must be managed in accordance with the: <ul style="list-style-type: none"> ∞ NEM:BA, 2004
WINNING OF SAND	Impact on the flow regime of the river.	A negative impact on the flow regime of the river may lead to erosion of banks, and impact on the downstream users.	Operational phase	<u>Control:</u> Implementation of proper housekeeping and site management.	The aquatic aspects at the site and rights of downstream users must be managed in terms of: <ul style="list-style-type: none"> ∞ NWA, 1998

ACTIVITY whether listed or not listed (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..) E.g. <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.
WINNING OF SAND	Impact on downstream water users.	This impact may lead to complaints from surrounding landowners.	Operational phase	<u>Control:</u> Implementation of proper housekeeping and site management.	The aquatic aspects at the site and rights of downstream users must be managed in terms of: ∞ NWA, 1998
WINNING OF SAND	Loss of mining equipment due to unexpected flooding.	This impact may have financial impacts on the Applicant.	Operational phase	<u>Control:</u> Implementation of proper housekeeping and site management.	The mining area must be managed in accordance with the: ∞ MPRDA, 2008 ∞ NEMA, 1998 ∞ NWA, 1998
STOCKPILING AND TRANSPORTING MATERIAL FROM SITE	Negative impacts on the riparian vegetation and banks of the river.	This may have a negative impact on the biodiversity of the area.	Operational phase	<u>Control:</u> Implementation of proper site management.	Site specific flora must be managed in accordance with the: ∞ NEM:BA, 2004
STOCKPILING AND TRANSPORTING MATERIAL FROM SITE	Dust nuisance from loading and vehicles transporting the material.	An increase in dust levels may lead to complaints received from surrounding landowners and road users.	Operational phase	<u>Control:</u> Dust suppression	Dust generation on site must be managed in accordance with the: ∞ NEM:AQA, 2004 Regulation 6(1) ∞ National Dust Control Regulations, GN No R827 ∞ ASTM D1739 (SANS 1137:2012)

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.
STOCKPILING AND TRANSPORTING MATERIAL FROM SITE	Degradation of access road.	If the road is not maintained it will negatively affect all road users.t only the landowner.	Operational phase	<u>Control & Remedy:</u> Road condition management	The access road must be managed in accordance with the: ∞ NRTA, 1996
STOCKPILING AND TRANSPORTING MATERIAL FROM SITE	Negative impact on the fauna (aquatic and terrestrial) of the area.	This may have a negative impact on the biodiversity of the area.	Operational phase	<u>Control:</u> Implementation of proper housekeeping and site management.	Site specific fauna and flora must be managed in accordance with the: ∞ NEM:BA, 2004
STOCKPILING AND TRANSPORTING MATERIAL FROM SITE	Contamination of area with hydrocarbons or hazardous waste material.	Contamination may cause surface or ground water pollution if not addressed.	Operational phase	<u>Control & Remedy:</u> Implementation of waste management	Mining related waste must be managed in accordance with the: ∞ NWA, 1998 ∞ NEM:WA, 2008
STOCKPILING AND TRANSPORTING MATERIAL FROM SITE	Overloading of trucks having an impact on the public roads.	Overloading will negatively affect the roads in the	Operational phase	<u>Control:</u> Proper site management	Load weights must be managed in accordance with the: ∞ NRTA, 1996

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.
		vicinity of the mining area.			
SLOPING AND LANDSCAPING UPON CLOSURE OF THE MINING AREA	Impact on the flow regime of the river.	A negative impact on the flow regime of the river may lead to erosion of banks, and impact on the downstream users.	Operational phase	<u>Control:</u> Implementation of proper housekeeping and site management.	The aquatic aspects at the site and rights of downstream users must be managed in terms of: § NWA, 1998
SLOPING AND LANDSCAPING UPON CLOSURE OF THE MINING AREA	Contamination of area with hydrocarbons or hazardous waste material.	Contamination may cause surface or ground water pollution if not addressed.	Operational phase	<u>Control & Remedy:</u> Implementation of waste management	Mining related waste must be managed in accordance with the: § NWA, 1998 § NEM:WA, 2008

f) Impact Management Actions

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

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
<p>whether listed or not listed</p> <p>(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.)</p>	<p>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)</p>	<p>(modify, remedy, control, or stop) through</p> <p>(e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc... etc.)</p> <p>E.g.</p> <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring • Remedy through rehabilitation. 	<p>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required.</p> <p>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.</p>	<p>(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)</p>
<p>Demarcation of site with visible beacons</p>	<p>No impact could be identified other than the beacons being outside the boundaries of the approved processing area.</p>	<p>Control through management and monitoring</p>	<p>Beacons need to be in place throughout the life of the mine.</p>	<p>Mining of sand is only allowed within the boundaries of the approved area.</p> <p>∞ MPRDA, 2008</p> <p>∞ NEMA, 1998</p>
<p>WINNING OF SAND</p>	<p>Visual intrusion associated with the sand mining activities</p>	<p><u>Control:</u> Implementation of proper housekeeping</p>	<p>Throughout operational phase</p>	<p>Management of the mining activities must be in accordance with the:</p> <p>∞ MPRDA, 2008</p> <p>∞ NEMA, 1998</p>
<p>WINNING OF SAND</p>	<p>Noise nuisance generated by excavation equipment.</p>	<p><u>Control:</u> Noise control measures</p>	<p>Throughout operational phase</p>	<p>Noise generation on site must be managed in accordance with the:</p> <p>∞ NEM:AQA, 2004 Regulation 6(1)</p>

ACTIVITY whether listed or not listed (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc... etc.) E.g. <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring • Remedy through rehabilitation. 	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: Upon cessation of the individual activity Or. Upon the cessation of mining bulk sampling or alluvial diamond prospecting as the case may be.	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
				<p>∞ NRTA, 1996</p>
<p>WINNING OF SAND</p>	<p>Contamination of surface or groundwater with hydrocarbons or hazardous waste material.</p>	<p><u>Control & Remedy:</u> Implementation of waste management</p>	<p>Throughout operational phase</p>	<p>Mining related waste must be managed in accordance with the: ∞ NWA, 1998 ∞ NEM:WA, 2008</p>
<p>WINNING OF SAND</p>	<p>Negative impact on the aquatic fauna of the area</p>	<p><u>Control:</u> Implementation of proper housekeeping and site management.</p>	<p>Throughout operational phase</p>	<p>Site specific fauna and flora must be managed in accordance with the: ∞ NEM:BA, 2004</p>
<p>WINNING OF SAND</p>	<p>Impact on the flow regime of the river.</p>	<p><u>Control:</u> Implementation of proper housekeeping and site management.</p>	<p>Throughout operational phase</p>	<p>The aquatic aspects at the site and rights of downstream users must be managed in terms of: ∞ NWA, 1998</p>
<p>WINNING OF SAND</p>	<p>Impact on downstream water users.</p>	<p><u>Control:</u> Implementation of proper housekeeping and site management.</p>	<p>Throughout operational phase</p>	<p>The aquatic aspects at the site and rights of downstream users must be managed in terms of: ∞ NWA, 1998</p>

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
<p>whether listed or not listed</p> <p>(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.)</p>	<p>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)</p>	<p>(modify, remedy, control, or stop) through</p> <p>(e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc... etc.)</p> <p>E.g.</p> <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring • Remedy through rehabilitation. 	<p>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required.</p> <p>With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either:</p> <p>Upon cessation of the individual activity</p> <p>Or.</p> <p>Upon the cessation of mining bulk sampling or alluvial diamond prospecting as the case may be.</p>	<p>(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)</p>
<p>WINNING OF SAND</p>	<p>Loss of mining equipment due to unexpected flooding.</p>	<p><u>Control:</u> Implementation of proper housekeeping and site management.</p>	<p>Throughout operational phase</p>	<p>The mining area must be managed in accordance with the:</p> <ul style="list-style-type: none"> ∞ MPRDA, 2008 ∞ NEMA, 1998 ∞ NWA, 1998
<p>STOCKPILING AND TRANSPORTING MATERIAL FROM SITE</p>	<p>Negative impacts on the riparian vegetation and banks of the river.</p>	<p><u>Control:</u> Implementation of proper site management.</p>	<p>Throughout operational phase</p>	<p>Site specific flora must be managed in accordance with the:</p> <ul style="list-style-type: none"> ∞ NEM:BA, 2004
<p>STOCKPILING AND TRANSPORTING MATERIAL FROM SITE</p>	<p>Dust nuisance from loading and vehicles transporting the material.</p>	<p><u>Control:</u> Dust suppression</p>	<p>Throughout operational phase</p>	<p>Dust generation on site must be managed in accordance with the:</p> <ul style="list-style-type: none"> ∞ NEM:AQA, 2004 Regulation 6(1) ∞ National Dust Control Regulations, GN No R827 ∞ ASTM D1739 (SANS 1137:2012)

ACTIVITY whether listed or not listed (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc... etc.) E.g. • Modify through alternative method. • Control through noise control • Control through management and monitoring • Remedy through rehabilitation.	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: Upon cessation of the individual activity Or. Upon the cessation of mining bulk sampling or alluvial diamond prospecting as the case may be.	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
STOCKPILING AND TRANSPORTING MATERIAL FROM SITE	Degradation of access road.	<u>Control & Remedy:</u> Road condition management	Throughout Operational phase	The access road must be managed in accordance with the: ∞ NRTA, 1996
STOCKPILING AND TRANSPORTING MATERIAL FROM SITE	Negative impact on the fauna (aquatic and terrestrial) of the area.	<u>Control:</u> Implementation of proper housekeeping and site management.	Throughout Operational phase	Site specific fauna and flora must be managed in accordance with the: ∞ NEM:BA, 2004
STOCKPILING AND TRANSPORTING MATERIAL FROM SITE	Contamination of area with hydrocarbons or hazardous waste material.	<u>Control & Remedy:</u> Implementation of waste management	Throughout Operational phase	Mining related waste must be managed in accordance with the: ∞ NWA, 1998 ∞ NEM:WA, 2008
STOCKPILING AND TRANSPORTING MATERIAL FROM SITE	Overloading of trucks having an impact on the public roads.	<u>Control:</u> Proper site management	Throughout Operational phase	Load weights must be managed in accordance with the: ∞ NRTA, 1996
SLOPING AND LANDSCAPING UPON	Impact on the flow regime of the river.	<u>Control:</u> Implementation of proper housekeeping and site management.	Throughout Operational phase	The aquatic aspects at the site and rights of downstream users must be managed in terms of:

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
<p>whether listed or not listed</p> <p>(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.)</p>	<p>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)</p>	<p>(modify, remedy, control, or stop) through</p> <p>(e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc... etc.)</p> <p>E.g.</p> <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring • Remedy through rehabilitation. 	<p>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required.</p> <p>With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either:</p> <p>Upon cessation of the individual activity</p> <p>Or.</p> <p>Upon the cessation of mining bulk sampling or alluvial diamond prospecting as the case may be.</p>	<p>(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)</p>
<p>CLOSURE OF THE MINING AREA</p>				<p>§ NWA, 1998</p>
<p>SLOPING AND LANDSCAPING UPON CLOSURE OF THE MINING AREA</p>	<p>Contamination of area with hydrocarbons or hazardous waste material.</p>	<p><u>Control & Remedy:</u> Implementation of waste management</p>	<p>Throughout Operational phase</p>	<p>Mining related waste must be managed in accordance with the:</p> <p>§ NWA, 1998</p> <p>§ NEM:WA, 2008</p>

i) Financial Provision

(1) Determination of the amount of Financial Provision.

(a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.

The closure objectives entail the removal of the sand pump, settling ponds and earthmoving equipment from the riverbed. Removal/levelling of all stockpiled material and the landscaping of the footprint area. Rehabilitation of the access point into the river if no longer required by the landowner and the re-instatement of the access road (if necessary) to its pre-mining status.

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

(c) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

The requested rehabilitation plan is attached as Appendix E. Upon closure of the mining activity all equipment will be removed. The affected areas will be levelled and landscaped, and no permanent structures will remain upon closure of the site.

(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 and levelling will be done on all areas to be rehabilitated. The rehabilitation of the mining area as indicated on the rehabilitation plan attached as Appendix E will comply with the minimum closure objectives as prescribed by DMR and detailed below, and therefore is deemed to be compatible:

ℵ Rehabilitation of the excavated area:

Very little residue will be generated as material is selectively removed to minimize product not suitable for sale. Larger grain material, organic particles and clay that are separated from the saleable product will be used to rehabilitate erosion structures and the excavation area.

ℵ Final rehabilitation:

Rehabilitation of the surface area shall entail landscaping, levelling, maintenance, and clearing of invasive plant species (if necessary).

All equipment, plant, 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.

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

According to Table B.5 and site-specific conditions

Component No.	Main description	Applicability of closure components (Circle Yes or No)	
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	-	NO
2(A)	Demolition of steel buildings and structures	-	NO
2(B)	Demolition of reinforced concrete buildings and structures	-	NO
3	Rehabilitation of access roads	-	NO
4(A)	Demolition and rehabilitation of electrified railway lines	-	NO
4(B)	Demolition and rehabilitation of non-electrified railway lines	-	NO
5	Demolition of housing and facilities	-	NO
6	Opencast rehabilitation including final voids and ramps	-	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)	YES	-
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	-	NO

Unit rates for closure components

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

Component No.	Main description	Master rate	Multiplication factor
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	-	-
2(A)	Demolition of steel buildings and structures	-	-
2(B)	Demolition of reinforced concrete buildings and structures	-	-
3	Rehabilitation of access roads	-	-
4(A)	Demolition and rehabilitation of electrified railway lines	-	-
4(B)	Demolition and rehabilitation of non-electrified railway lines	-	-
5	Demolition of housing and facilities	-	-
6	Opencast rehabilitation including final voids and ramps	-	-
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)	186 977	1.00
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	118 924	1.00
11	River diversions	-	-
12	Fencing	-	-
13	Water management (Separating clean and dirty water, managing polluted water and managing the impact on groundwater)	-	-
14	2 to 3 years of maintenance and aftercare	-	-

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:	Remaining Extent of the farm Jammerbergsdrift 540			Location:	Wepener		
Evaluators:	C Fouche			Date:	02 July 2018		
No	Description	Unit	A Quantity Step 4.5	B Master rate Step 4.3	C Multiplication factor Step 4.3	D Weighting factor 1 Step 4.4	E=A *B*C*D Amount (Rand)
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	m ²	0	15	1.00	1.00	R 0.00
2(A)	Demolition of steel buildings and structures	m ²	0	215	1.00	1.00	R 0.00
2(B)	Demolition of reinforced concrete buildings and structures	m ²	0	317	1.00	1.00	R 0.00
3	Rehabilitation of access roads	m ²	0	38	1.00	1.00	R 0.00
4(A)	Demolition and rehabilitation of electrified railway lines	m	0	373	1.00	1.00	R 0.00
4(B)	Demolition and rehabilitations of non-electrified railway lines	m	0	203	1.00	1.00	R 0.00
5	Demolition of housing and/or administration facilities	m ²	0	430	1.00	1.00	R 0.00
6	Opencast rehabilitation including final voids and ramps	ha	0	225 186	0.04	1.00	R 0.00
7	Sealing of shaft, audits and inclines	m ³	0	115	1.00	1.00	R 0.00
8(A)	Rehabilitation of overburden and spoils	ha	0	150 124	1.00	1.00	R 0.00
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	ha	0.004	186 977	1.00	1.00	R 747.91
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	ha	0	543 069	0.51	1.00	R 0.00
9	Rehabilitation of subsided areas	ha	0	125 706	1.00	1.00	R 0.00
10	General surface rehabilitation	ha	0.9	118 924	1.00	1.00	R 107 031.60

11	River diversions	ha	0	118 924	1.00	1.00	R 0.00
12	Fencing	m	0	136	1.00	1.00	R 0.00
13	Water Management	ha	0	45 218	0.17	1.00	R 0.00
14	2 to 3 years of maintenance and aftercare	ha	0	15 826	1.00	1.00	R 0.00
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 107 779.51
Multiply Sum of 1-15 by Weighting factor 2 (Step 4.4)			1.05		R 107 779.51	Sub Total 1	R 113 168.48

1	Preliminary and General	6% of Subtotal 1 if Subtotal 1 <R100 000 000.00	R 6 790.11
		12% of Subtotal 1 if Subtotal 1 >R100 000 000.00	-
2	Contingency	10.0% of Subtotal 1	R 11 316.85
Sub Total 2 (Subtotal 1 plus management and contingency)			R 131 275.44
Vat (15%)			R 19 691.32
GRAND TOTAL (Subtotal 3 plus VAT)			R 150 966.76

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 150 966.76**.

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

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

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

- (g) Monitoring of Impact Management Actions**
- (h) Monitoring and reporting frequency**
- (i) Responsible persons**
- (j) Time period for implementing impact management actions**
- (k) Mechanisms for monitoring compliance**

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. 	<p><u>Responsibility:</u></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><u>Role:</u></p> <ul style="list-style-type: none"> ⌘ Ensure beacons are in place throughout the life of the activity. 	<p>Throughout operational phase.</p> <ul style="list-style-type: none"> ⌘ Daily compliance monitoring by site management. ⌘ Annual compliance monitoring of site by an Environmental Control Officer.
WINNING OF SAND	Monitoring of visual impacts	<ul style="list-style-type: none"> ⌘ Proper site management and implementing good housekeeping practices. 	<p><u>Responsibility:</u></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 operational phase.</p> <ul style="list-style-type: none"> ⌘ Daily compliance monitoring by site management. ⌘ Annual compliance monitoring of site by an

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			<p><u>Role:</u></p> <ul style="list-style-type: none"> ⌘ Contain all mining related activities within the approved footprint of the mining area. ⌘ Ensure that the site have a neat appearance and is kept in good condition at all times. ⌘ Remove all equipment upon rehabilitation of the mining area and return the area to its prior status. 	<p>Environmental Control Officer.</p>
<p>WINNING OF SAND</p>	<p>Noise Monitoring:</p> <ul style="list-style-type: none"> ⌘ The noise generated by the mining activities must quarterly be monitored, and managed through the demarcation of noise zones. 	<ul style="list-style-type: none"> ⌘ Personal noise exposure monitoring equipment. ⌘ Signage indicating noise zones. ⌘ Silencers fitted to all project related vehicles, and the use of vehicles that are in road worthy condition in terms of the National Road Traffic Act, 1996. 	<p><u>Responsibility:</u></p> <ul style="list-style-type: none"> ⌘ Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. ⌘ Personal noise exposure to be reported on by qualified occupational hygienist. ⌘ Compliance to be monitored by the Environmental Control Officer. <p><u>Role:</u></p> <ul style="list-style-type: none"> ⌘ Ensure that employees and staff conduct themselves in an acceptable manner while on site. ⌘ No loud music may be permitted at the mining area. ⌘ Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996. 	<p>Throughout operational phase.</p> <ul style="list-style-type: none"> ⌘ Daily compliance monitoring by site management. ⌘ Quarterly noise monitoring by qualified occupational hygienist. ⌘ Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
<p>WINNING OF SAND</p> <p>&</p> <p>STOCKPIILING AND TRANSPORTING MATERIAL FROM SITE</p> <p>&</p> <p>SLOPING AND LANDSCAPING UPON CLOSURE OF THE MINING AREA</p>	<p>Waste Management</p>	<ul style="list-style-type: none"> ⌘ Oil spill kit. ⌘ Sealed drip trays. ⌘ Bins with sealable lids designated for the storage of respectively general- and hazardous waste. ⌘ Formal waste disposal system with waste registers. 	<p><u>Responsibility:</u></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><u>Role:</u></p> <ul style="list-style-type: none"> ⌘ Prevent the establishment of a waste stockpile area inside or outside the boundaries of the mining area. ⌘ Ensure regular vehicle maintenance, repairs and services are done at an off-site workshop, as none of the above is allowed in the riverbed. When a breakdown occurs in the riverbed, arrange for the removal of equipment/machinery, within 6 hours, to a recognised workshop where it can be mended. ⌘ Use drip trays under all stationary machinery and equipment of the duration of the operational phase (including the sand pump). ⌘ To prevent loss of machinery during unpredicted flooding, and lower the risk of accidental hydrocarbon spillages, ensure that no machinery overnight in the mining area (riverbed). Park machinery, overnight, on the access road, unless otherwise arranged with the landowner. Ensure drip trays are placed at all times underneath stationary machinery. 	<p>Throughout operational and decommissioning phases.</p> <ul style="list-style-type: none"> ⌘ Daily compliance monitoring by site management. ⌘ Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			<ul style="list-style-type: none"> ⌘ Equip the diesel bowser with a drip tray. Make use of drip trays during each and every refuelling event, and ensure refuelling takes place on the access road (outside the riverbed). Rest the nozzle of the bowser in a sleeve to prevent dripping after refuelling. ⌘ Clean drip trays after each use. Do not use dirty drip trays on site. ⌘ Dispose all hazardous waste products in a designated closed container/bin that is kept at the back of one of the site vehicles, and remove it daily from the mining area, either for resale or for appropriate disposal at a recognised facility. ⌘ Clean spills immediately, within 2 hours of occurrence, to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and disposing it at a recognised facility. File proof. ⌘ Report any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities to the Department of Water and Sanitation and other relevant authorities. ⌘ Contain all general waste within the site vehicles and daily remove it from the mining area. ⌘ Prevent the burning or burying of waste on site. ⌘ Prevent the storage of chemicals or hazardous materials at the mining area. 	

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
<p>WINNING OF SAND</p> <p>&</p> <p>STOCKPILING AND TRANSPORTING MATERIAL FROM SITE</p>	<p>Protection of fauna and flora.</p>	<p>∞ Visible beacons indicating the boundary of the mining area.</p>	<p><u>Responsibility:</u></p> <p>∞ Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>∞ Compliance to be monitored by the Environmental Control Officer.</p> <p><u>Role:</u></p> <p>∞ Ensure no fauna (aquatic and terrestrial) is caught, killed, harmed, sold or played with.</p> <p>∞ Instruct workers to report any animals that may be trapped in the working area.</p> <p>∞ Ensure no snares are set or nests raided for eggs or young.</p> <p>∞ Do not dam or divert the natural flow of the river and prevent fishing.</p> <p>∞ Do not remove any plants without the approval of the ECO.</p> <p>∞ Demarcate the access point into the river and ensure only one access into the river is used by all mining related machinery and vehicles.</p>	<p>Throughout operational phase.</p> <p>∞ Daily compliance monitoring by site management.</p> <p>∞ Annual compliance monitoring of site by an Environmental Control Officer.</p>
<p>WINNING OF SAND</p> <p>&</p> <p>SLOPING AND LANDSCAPING UPON CLOSURE OF THE MINING AREA</p>	<p>Mitigating the impact on the Caledon River and downstream users.</p>	<p>∞ Visible beacons indicating the boundary of the mining area.</p> <p>∞ Water use authorisation as issued by the Department of Water and Sanitation.</p>	<p><u>Responsibility:</u></p> <p>∞ Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>∞ Compliance to be monitored by the Environmental Control Officer.</p>	<p>Throughout operational phase.</p> <p>∞ Daily compliance monitoring by site management.</p>

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
		<ul style="list-style-type: none"> ⌘ Approved Closure Plan. 	<p>Role:</p> <ul style="list-style-type: none"> ⌘ Do not change the natural flow of the river, dam or divert it without prior authorisation from DWS. ⌘ Do not change the banks of the river without prior authorisation from DWS. ⌘ Adhere to the requirements of the water use authorisation obtained prior to the commencement of the mining activities. ⌘ Upon closure, remove the sand pump, settling ponds and earthmoving equipment from the riverbed. Flatten or remove stockpiled material from the mining area and landscape the footprint to prevent changes in the natural flow of the river. Repair/rehabilitate the access point into the river, if no longer needed by the landowner, and leave the access road in the same or better state as found prior to commencement of the activities. 	<ul style="list-style-type: none"> ⌘ Annual compliance monitoring of site by an Independent Environmental Control Officer.
WINNING OF SAND	Protecting equipment against unexpected flooding.	<ul style="list-style-type: none"> ⌘ Sealed drip trays to be used under stationary machinery. 	<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"> ⌘ To prevent loss of machinery during unpredicted flooding, and lower the risk of accidental hydrocarbon spillages, ensure that no machinery overnight in the mining area (riverbed). Park machinery, overnight, on the access road, unless otherwise arranged with the landowner. Ensure 	<p>Throughout operational phase</p> <ul style="list-style-type: none"> ⌘ Daily compliance monitoring by site management. ⌘ Annual compliance monitoring of site by an Independent Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			<p>drip trays are placed at all times underneath stationary machinery.</p> <ul style="list-style-type: none"> ⌘ Remove all mining related equipment from the mining area during high flow periods. 	
WINNING OF SAND	Storm Water Management	<ul style="list-style-type: none"> ⌘ Storm water management structures such as berms to direct storm- and runoff water around the stockpiled material (if needed). 	<p><u>Responsibility:</u></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><u>Role:</u></p> <ul style="list-style-type: none"> ⌘ Control all drainage from the project area to prevent off-site pollution, flooding or damage to properties downstream of any storm water discharge points. ⌘ Conduct activity in terms of the Best Practice Guidelines for small-scale mining as developed by DWS. 	<p>Throughout operational phase</p> <ul style="list-style-type: none"> ⌘ Daily compliance monitoring by site management. ⌘ Annual compliance monitoring of site by an Environmental Control Officer.
STOCKPILING AND TRANSPORTING MATERIAL FROM SITE	<p>Dust Monitoring:</p> <ul style="list-style-type: none"> ⌘ The dust generated by the mining activities must continuously be monitored, and addressed through the implementation of dust suppression methods. 	<ul style="list-style-type: none"> ⌘ Gravimetric dust monitoring equipment. ⌘ Dust suppression equipment such as a water car and water dispenser. 	<p><u>Responsibility:</u></p> <ul style="list-style-type: none"> ⌘ Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. ⌘ Gravimetric dust levels to be reported on by qualified occupational hygienist. ⌘ Compliance to be monitored by the Environmental Control Officer. 	<p>Throughout operational phase.</p> <ul style="list-style-type: none"> ⌘ Daily compliance monitoring by site management. ⌘ Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			<p><u>Role:</u></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. ⌘ Ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. ⌘ Limit speed on the access road to 20 km/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. 	
<p>STOCKPILING AND TRANSPORTING MATERIAL FROM SITE</p>	<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><u>Responsibility:</u></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><u>Role:</u></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. 	<p>Throughout operational phase.</p> <ul style="list-style-type: none"> ⌘ Daily compliance monitoring by site management. ⌘ Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			<ul style="list-style-type: none"> ⌘ Repair rutting and erosion of the access roads caused by the proposed activities. 	
<p>STOCKPILING AND TRANSPORTING MATERIAL FROM SITE</p>	<p>Management of load weights to prevent overloading.</p>	<ul style="list-style-type: none"> ⌘ Mobile weighing device. ⌘ Weight slips to be filed. 	<p><u>Responsibility:</u></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><u>Role:</u></p> <ul style="list-style-type: none"> ⌘ Implement a mobile weighing device and weigh all trucks/loads prior to leaving the site. ⌘ File proof of load weights for auditing purposes. 	<p>Throughout operational phase.</p> <ul style="list-style-type: none"> ⌘ Daily compliance monitoring by site management. ⌘ Annual compliance monitoring of site by an Environmental Control Officer.
<p>WINNING OF SAND & STOCKPILING AND TRANSPORTING MATERIAL FROM SITE & SLOPING AND LANDSCAPING</p>	<p>Management of invasive plant species:</p> <ul style="list-style-type: none"> ⌘ The presence of invasive plant species must be continuously monitored, and any unwanted plants must be removed. 	<ul style="list-style-type: none"> ⌘ Designated team to cut or pull out invasive plant species that germinated on site. 	<p><u>Responsibility:</u></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><u>Role:</u></p> <ul style="list-style-type: none"> ⌘ Implement an invasive plant species management plan to control all invasive plant species on site in terms of NEM:BA, 2004 and CARA, 1983. ⌘ Control declared invader or exotic species on the rehabilitated areas. Do not use herbicides in the 	<p>Throughout operational and decommissioning phases.</p> <ul style="list-style-type: none"> ⌘ Daily compliance monitoring by site management. ⌘ Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
UPON CLOSURE OF THE MINING AREA			riverbed, and rather uproot, fell or cut off the problem plant through mechanical means.	
WINNING OF SAND & STOCKPILING AND TRANSPORTING MATERIAL FROM SITE & SLOPING AND LANDSCAPING UPON CLOSURE OF THE MINING AREA	Health and safety monitoring	<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, 1996. 	<p><u>Responsibility:</u></p> <ul style="list-style-type: none"> ⌘ Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. ⌘ Designated health and safety officer to report on HSE compliance of the mine. ⌘ Compliance to be monitored by the Environmental Control Officer. <p><u>Role:</u></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 Mine Health and Safety Act, 1996 (Act No 29 of 1996). 	<p>Throughout operational and decommissioning phases.</p> <ul style="list-style-type: none"> ⌘ Daily compliance monitoring by site management. ⌘ Monthly HSE compliance to be reported on by health and safety officer. ⌘ Annual compliance monitoring of site by an Environmental Control Officer.
WINNING OF SAND & STOCKPILING AND TRANSPORTING MATERIAL FROM SITE & SLOPING AND LANDSCAPING	Archaeological, heritage and/or palaeontological impacts.	<ul style="list-style-type: none"> ⌘ Contact number of an archaeologist that can be contacted when a discovery is made on site. 	<p><u>Responsibility:</u></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><u>Role:</u></p> <ul style="list-style-type: none"> ⌘ Confine all mining to the development footprint area. ⌘ Implement the following change find procedure when discoveries are made on site: 	<p>Throughout operational and decommissioning phases.</p> <ul style="list-style-type: none"> ⌘ Daily compliance monitoring by site management. ⌘ Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
UPON CLOSURE OF THE MINING AREA			<ul style="list-style-type: none"> ▪ If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. ▪ It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area. ▪ The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA. 	

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

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

(m) Environmental Awareness Plan

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

Once the Applicant received the mining permit and may commence with the proposed activity, a copy of the Environmental Management Programme will be handed to the site manager for his perusal. Issues such as the mining boundaries, fire principals and 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 risk will be dealt with in order to avoid pollution or the degradation of the environment.

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

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

⌘ **Site Management:**

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

⌘ **Water Management and Erosion:**

- Check that rainwater flows around work areas and are not contaminated

- Report any erosion
- Check that dirty water is kept from clean water
- Do not swim in or drink from streams

⌘ **Waste Management:**

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

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

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

⌘ **Discoveries:**

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

⌘ **Air Quality:**

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

⌘ **Driving and Noise:**

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

⌘ **Vegetation and Animal life:**

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

⌘ **Fire Management:**

- Do not light any fires on site, unless contained in a drum at demarcated area
- Put cigarette butts in a rubbish bin
- Do not smoke near gas, paints or petrol
- Know the position of firefighting equipment
- Report all fires
- Don't burn waste or vegetation

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

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

2) UNDERTAKING

The EAP herewith confirms

- a) the correctness of the information provided in the reports
- 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, a
- d) that the information provided by the EAP to interested and affected parties and any response by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein



Signature of the environmental assessment practitioner:

Greenmined Environmental

Name of Company:

17 July 2018

Date:

-END-

APPENDIX LIST

Appendix A: Regulation 2.2 Mine Plan

Appendix B: 1:250 000 Locality Map

Appendix C: Site Activities Map

Appendix D: Surrounding Land Use Map

Appendix E: Rehabilitation Plan

Appendix F: Comments and Response Report & Proof of Consultation

Appendix G: Supporting Impact Assessment

Appendix H: Financial and Technical Competence Report

Appendix I: Photographs of the site

Appendix J: CV and Experience Record of EAP

APPENDIX A
REGULATION 2(2) MINE MAP



APPENDIX B
1:250 000 LOCALITY MAP



APPENDIX C

SITE ACTIVITIES PLAN



APPENDIX D

LAND USE MAP



APPENDIX E

REHABILITATION PLAN



APPENDIX F
COMMENTS AND RESPONSE REPORT
&
PROOF OF CONSULTATION



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>Winning of Sand:</u></p> <ul style="list-style-type: none"> ⌘ Visual intrusion associated with the sand mining activities ⌘ Noise nuisance generated by excavation equipment ⌘ Contamination of surface or groundwater with hydrocarbons or hazardous waste material ⌘ Negative impact on the aquatic fauna of the area ⌘ Impact on the flow regime of the river ⌘ Impact on downstream water users ⌘ Loss of mining equipment due to unexpected flooding 	<p>Duration of operational phase (5 years maximum)</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;">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 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-Medium Concern</p> <p style="text-align: center;">Low-Medium Concern</p> <p style="text-align: center;">Low Concern</p>
<p><u>Stockpiling and Transporting Material from Site:</u></p> <ul style="list-style-type: none"> ⌘ Negative impacts on the riparian vegetation and banks of the river ⌘ Dust nuisance from loading and vehicles transporting the material ⌘ Degradation of access road ⌘ Negative impact on the fauna (aquatic and terrestrial) of the area ⌘ Contamination of area with hydrocarbons or hazardous waste materials ⌘ Overloading of trucks having an impact on the public roads 	<p>Duration of operational phase (5 years maximum)</p>	<p style="text-align: center;"><u>LIKELIHOOD</u></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 Possibility</p> <p style="text-align: center;">Low Possibility</p>	<p style="text-align: center;"><u>SIGNIFICANCE</u></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-Medium Concern</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><u>Sloping and Landscaping during Rehabilitation:</u></p> <ul style="list-style-type: none"> ⌘ Impact on the flow regime of the Caledon River ⌘ Contamination of area with hydrocarbons or hazardous waste materials. 	<p>Duration of operational phase (5 years maximum)</p>	<p style="text-align: center;"><u>LIKELIHOOD</u></p> <p style="text-align: center;">Low Possibility</p> <p style="text-align: center;">Low Possibility</p>	<p style="text-align: center;"><u>SIGNIFICANCE</u></p> <p style="text-align: center;">Low Concern</p> <p style="text-align: center;">Low Concern</p>

APPENDIX H
FINANCIAL AND TECHNICAL
COMPETENCE



APPENDIX I

PHOTOGRAPHS OF THE PROPOSED SITE





PICTURE TAKEN TOWARDS THE PROPOSED MINING AREA SHOWING THE NORTHERN BANK OF THE CALEDON RIVER AND SURROUNDINGS



PROPOSED MINING AREA (FLOODED AT THE TIME OF THE INSPECTION)



WESTERN SIDE OF THE CALEDON RIVER BORDERING THE PROPOSED MINING AREA



EXISTING FARM ROAD TO BE USED TO GAIN ACCESS TO THE MINING AREA

APPENDIX J

CV AND EXPERIENCE RECORD OF EAP

