



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DRAFT BASIC ASSESSMENT REPORT And ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORISATIONS IN TERMS OF THE NATIONALENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTALMANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVEBEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUMRESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).



NAME OF APPLICANT	Mafoko Brothers & Logistics
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FILE REFERENCE NUMBER SAMRAD:	NW30/5/1/3/2/10503MP

1. IMPORTANT NOTICE

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

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

In terms of section 16(3) (b) of the EIA 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 uninterpreted 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, significance, 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.

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PART A

1. SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

3. Contact Person and correspondence address

a) Details of

i) DETAILS OF THE EAP

Name of the Practitioner: LesegoSenna

Tel No: 018 011 0002/083 7637854

Fax No: 086 541 6369

e-mail address: lesego@lesekha.co.za

ii) Expertise of EAP.

(1) The qualifications of EAP

(with evidence).

Please refer to appendix 1: EAP CV.

Lesego Senna is a qualified Environmental Practitioner; she managed and coordinated the EIA study of the landfill in discussion. She holds the Bachelor Degree: in Biological Science majoring in Microbiology and Biochemistry. She also holds an Honours Degree: Environmental Sciences, Majoring in Environmental Impact Assessment and Earth Sciences – North West University (Potchefstroom Campus).

Lesego holds a certificate in Environmental Law (NQF level 7) with the following courses: Waste Management, Biodiversity Management, Waste Management, Heritage Assessment, Environmental law & Environmental Impact Assessment obtained from the Centre of Environmental Management at Potchefstroom University). She also holds a certificate in GIS and GPS course (NQF level 5) from the Free State University, with the following Modules: Spatial data Structures; Spatial data symbolisation and analysis and interpretation Map design. Lesego is a registered Environmental Scientist registered with the South African Council of Natural Scientific Profession SACNASP (Reg.No.300029/14). The acquired qualifications and experience demonstrated that we are uniquely qualified to undertake this Environmental Impact Assessment Study.

(2) Summary of EAP's past experience

(In carrying out the Environmental Impact Assessment Procedure)

Lesego compiled the EMPr for obtaining the mining permit for all the roads projects for application of themining permit as contemplated in Section 27 of the Mineral and Petroleum Resources Development Act, 2002MPRDA (Act 28 of 2002).

Please refer to the attached details of a Practitioner attached as Appendix 1

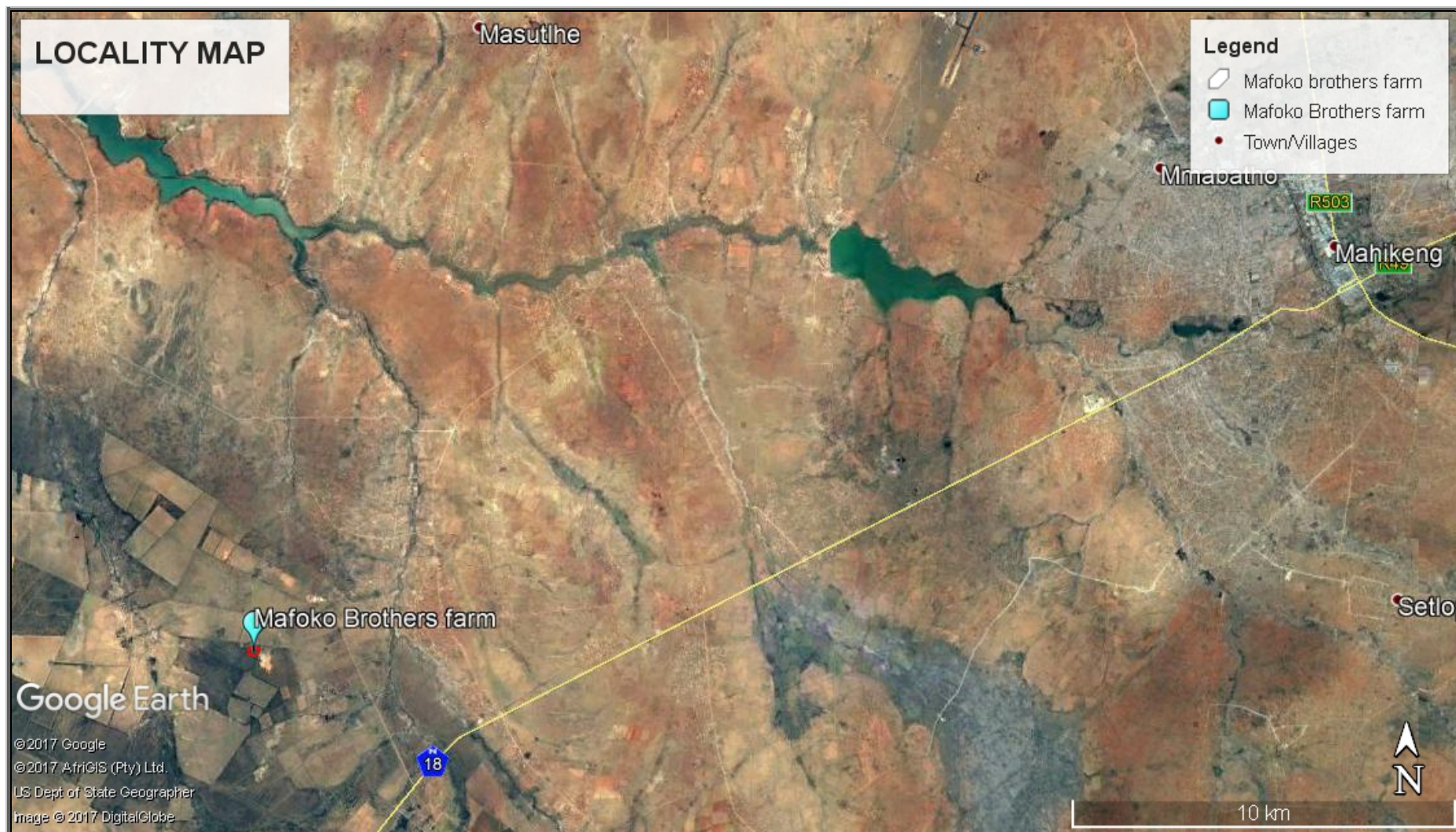
2. LOCATION OF ACTIVITY

b) Location of the overall Activity

Farm Name:	Heath Farm No. 202 JO of Portion 12 (Portion of Portion 1)
Application area (Ha)	4.94ha
Magisterial district	NgakaModiriMolema District Municipality
Distance and direction from nearest town	35km South of Mahikeng
21 digit Surveyor General Code for each farm portion	TOJ0000000000202000000

c) Locality map

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



Source: Google Earth, created August 2017

Figure 1: Locality Map

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

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

Mafoko Brother & Logistics is proposing to establish a building Sand mine at Portion 12 (portion of portion 1) of Heath Farm No.202 JO. The mining area will cover 4.94ha of the footprint. The goal of the project is to provide sand for various construction activities as well as Infrastructural projects or earthworks including linear structures, cut and fill or excavations. The Excavation of building sand will be up to a 3m Depth and area 49 381m². The estimated Volume of sand that can be mined at Heath Farm is about 148 143m³.The neighbouring village to the mining site is Madibe-A Makgabana and it is ideal to offer employment to this community.

No infrastructure will be placed on site; sand will be mined and ready to be transported to various destinations. There is an old house with ablution facilities using septic tank to be used by workers onsite during the mining activity. The site has a fully equipped borehole for provision of portable water to the workers. Sand has become a very important mineral for society due to its many uses mainly in Infrastructural activities. The role of sand is very vital with regards to the protection of the environment. It acts as a buffer against strong storm surges by reducing their impacts as they reach the river



Source: Google Earth, created August 2017

Figure 2: Heath Farm indicating the footprint of the proposed building sand mine in Green boundary

3. DESCRIPTION OF ACTIVITY

(i) Listed and specified activities

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc. E.g. for mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	AERIAL EXTENT OF THE ACTIVITY Ha or m ²	LISTED ACTIVITY Mark with an X where applicable or Affected.	APPLICABLE LISTING NOTICE (GNR 327, GNR 325 or GNR 324)
Any Activity including the operation that activity which requires a mining permit as contemplated in section 27 of the Mineral Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structure and earthworks directly related to the extraction of a mineral resources, including activities for which an exemption has been issued in terms of section 106 of the Mineral Petroleum Resources Development.	4.94ha of vegetation will be cleared where the mining activity will occur.	Listed Activity No.21	Listing Notice 1.GN R. 327, 07 April 2017
The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, excluding where such clearance of indigenous	4.94ha of vegetation will be cleared where the mining activity will occur.	Listed Activity No.27	Listing Notice 1.GN R. 327, 07 April 2017

vegetation is required for – (i) Undertaking of a linear activity; or (ii) Maintenance purpose undertaken in accordance with a maintenance management plan.			
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(ii) Description of the activities to be undertaken

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

Mafoko Brothers & Logistics intends to commence with mining by clearance of vegetation at the proposed site of Heath farm Portion 12 (portion of portion 1). The mining process is opencast semi-mechanized sand mining of minor minerals. Drilling and blasting is not required as the material is soft in nature. The extraction of the building sand should be limited from the surface area. Light weight excavators will be deployed for extraction. Mineral will be loaded in trucks of approximately 40 ton capacity trucks and equipment, earth movers. Mining area will be developed to connect its own approach roads which exist and will be well connected to N18 road. All the mining machinery to be used will belong to the owner. The mining will be done with the help of excavators, tippers/trucks, water tank and pay loaders JCB.

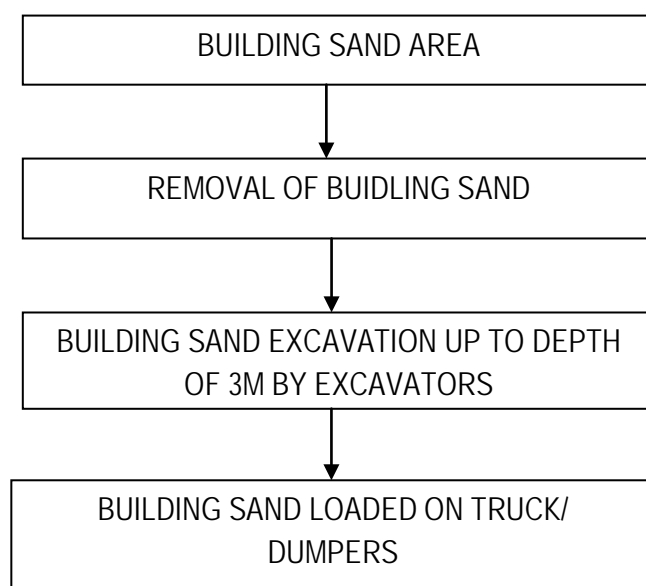


Figure 3: Demonstration of building and mining

4. POLICY AND LEGISLATIVES

e) Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE HERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
(A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.)		(E.g. In terms of the National Water Act. Water Use License has not been applied or)
The constitution of the republic of South Africa	RSA	The Constitution, which is the cornerstone of the democracy in South Africa, lays the foundation of a more just and equitable society. It guarantees everyone the right to an environment that is not harmful to their health or wellbeing and guarantees the right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures.
National Environmental Management Act (No. 107 of 1998).	NW30/5/1/3/2/10 503MP	This Basic Assessment is being undertaken in terms of the National Environmental Management Act (No. 107 of 1998). This is in order to determine any possible impacts on the environment and to propose sufficient mitigation in order to not harm the environment.
Environmental Impact Assessment Regulations: GN R NO 326 to 327 of 07 April 2017	NW30/5/1/3/2/10 503MP	This Basic Assessment is being undertaken in terms of the Environmental Impact Assessment Regulations: GN R 326 to 327 of 07 April 2017. This is in order to determine any possible impacts on the environment and to propose sufficient mitigation in order to not harm the environment.
National Environmental Management: Waste Act (59 of 2008)	NEMA	The applicant must ensure that all activities associated with the quarry address waste related matters in compliance with the requirements of the Act.

The National Heritage Resources Act (No. 25 of 1999)	SAHRA	The National Heritage Resources Act legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 hectares (ha). The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the South African Heritage Resources Agency (SAHRA). Should the proposed activities impact on heritage resources, application to SAHRA would be required to obtain the necessary permits. The proposed opencast mining operations will not have any impact on Heritage resources, as no resources of significance were identified within the footprint of the proposed development.
National Water Act, 1998 (Act 36 of 1998)	Not applicable	Water use licence not required.
National Environmental Management: Biodiversity Act (No. 10 of 2004)	NW30/5/1/3/2/10 503MP	<p>The Biodiversity Act (Act 10 of 2004) falls within the framework of the National Environmental Management Act and provides for:</p> <ul style="list-style-type: none"> • The management and conservation of biological diversity and of the components of such biodiversity • Protection of species and ecosystems that warrant National protection • Sustainable use of indigenous biological resources; • The fair and equitable sharing of benefits arising from bio-prospecting including indigenous biological resources; and • The establishment of a National Biodiversity Institution. <p>Furthermore it gives effect to ratified international agreements relating to biodiversity which are binding on the Republic, it provides for co-operative governance in biodiversity management and conservation, and provides for a South African National Biodiversity Institution to assist in</p>

		<p>achieving the objectives of this Act.</p> <p>Species listed on the NEMA: BA Threatened or Protected Species List/Schedule requires permits to be obtained from the Department of Environmental Affairs should a restricted activity involving the specimen be undertaken.</p> <p>There is a possibility that flora and fauna found on site may be impacted upon. If Protected species are found on site, the Developer will be required to apply for a permit.</p>
National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008)		<p>The Act integrates and systematically approach waste management in order to protect health and the environment for the prevention of pollution and ecological degradation and for securing ecologically sustainable development. According to the National Environmental Management Waste Act "waste" means any substance, whether or not that substance can be reduced, re-used, recycled and recovered that is surplus, unwanted, rejected, discarded, abandoned or disposed of; which the generator has no further use of for the purposes of production; that must be treated or disposed of; or that is identified as a waste by the Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but a by-product is not considered waste; and any portion of waste, once re-used, recycled and recovered, ceases to be waste.</p> <p>In this instance residue sludge and outflow water is seen as waste and should be reduced, re-used, recycled and recovered as far as possible. According to the National Environmental Management Waste Act (16) (1) A holder of waste must, within the holder's power, take all reasonable measures to—</p> <ul style="list-style-type: none"> • avoid the generation of waste and where such generation cannot be avoided, to minimize the toxicity and amounts of waste that are generated; • reduce, re-use, recycle and recover waste; • where waste must be disposed of, ensure that

		<p>the waste is treated and disposed of in an environmentally sound manner;</p> <ul style="list-style-type: none"> • manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts; • Prevent any employee or any person under his or her supervision from contravening this Act; and prevent the waste from being used for an un-authorized purpose. <p>In order to control and manage disposal sites, the Department of Water Affairs published the Minimum Requirements Series of standards and procedures. These guidelines comprise three volumes:</p> <ol style="list-style-type: none"> 1. Minimum Requirements for Waste Disposal by Landfill; 2. Minimum Requirements for the Handling of and Disposal of Hazardous Waste; and 3. Minimum Requirements for Monitoring at Waste Management Facilities.
National Environmental Management: Air Quality Act, 39 of 2004 [NEMAQA] and Relevant Regulations	NW30/5/1/3/2/10 503MP	This Act will be applicable during construction and mining phases of the project. The necessary measures must be taken to ensure compliance.
Minerals and Petroleum Resources Development Act (No 28 of 2002) and National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA] and relevant regulations.	Sections 38 to 47 of MPRDA S24(1) of NEMA S28(1) of NEMA	An application and reports submitted to DMR for Mining Permit and Environmental Authorization
The Minerals and Petroleum Resources Development Act, 2002 (Act No 28 of 2002)	NW30/5/1/3/2/10 503MP	The Minerals and Petroleum Resources Development Act, 2002 (Act No 28 of 2002) was developed to ensure that provision is made for equitable access to, and sustainable development of, South Africa's mineral and petroleum resources and to provide insight, guidance and control for matters connected thereto. It seeks to provide management tools that ensure that all mining operations are undertaken in an environmentally sound manner according to government approved

		documents that hold the applicant responsible for any environmental degradation that their mining actions might cause. It also seeks to expand opportunities for historically disadvantaged South Africans and promote employment and welfare of SA citizens. It ensures that holders of mining and production rights contribute towards the socio-economic development of the areas in which they operate.
The Minerals and Petroleum Resources Development Act, 2002 (Act No 28 of 2002) Regulation	NW30/5/1/3/2/10 503MP	Regulations in terms of Section 107 (1) of the Act were published in Government Notice No, R 526 on the 23rd of April 2004. The regulations provide details of the procedures to be followed in applying for or renewing mining and prospecting rights and permits and for the closure of mining operations as provided and described in the Mineral and Petroleum Resources Development Act (M&PRDA).
National Forest Act (Act no 84 of 1998) Section 7 and 15	DAFF	<p>The principles of the National Forest Act (Act 84 of 1998) (NFA) pertain to;</p> <ul style="list-style-type: none"> • The protection of natural forest (except under exceptional circumstances when the Minister determines that the proposed new land use is preferable in terms of its economic, social or environmental benefits) • The conservation of a minimum area of each woodland type; and • The management of forests to ensure sustainability of resources (wood, soil, biological diversity, etc) <p>No person may cut, disturb, damage or destroy any indigenous living tree in, or remove or receive any such tree from, a natural forest except in terms of-</p> <ul style="list-style-type: none"> (a) A license issued under section 7&15(1); (b) An exemption from the provisions of this subsection published by the Minister in the Gazette on the advice of the Council. <p>The Minister may declare to be a natural forest a group of indigenous trees whose crowns are not largely contiguous, or where there is doubt as to whether or not their crowns are largely contiguous, if he or she is of the opinion based on scientific</p>

		<p>advice, that the trees make up a forest which needs to be in terms of this Part.</p> <p>The Minister declares a forest to be a natural forest by publishing a notice in the Gazette, and publishing a notice in two newspapers circulating in the area; and airing a notice on two radio stations broadcasting to the areas. The Minister may issue a licence to cut damage or destroy any indigenous, living tree in, or remove or receive any such tree from a natural forest.</p>
Conservation of Agricultural Resources	READ	<p>The Conservation of Agricultural Resources Act (Act 13 of 1983) makes provision for the actions required with regard to any plant species depend on the category in which plant appears of the amended regulations, and might differ from province to province in certain cases, special conditions were added that apply only to that specific species.</p>
Category 1 Plants, or Declared Weeds	DAFF	<p>These are prohibited plants that will no longer be tolerated, neither in rural nor urban areas, except with written permission of the executive officer or in an approved biocontrol reserve. These plants may no longer be planted or propagated, and all trade in their seeds.</p> <p>Plant species were included in this list for one or more of the following reasons; they might pose a serious health risk to humans or livestock, cause serious financial losses to land users, be able to invade undisturbed environments and transform or degrade natural plant communities, use more water than the plant communities they replace or be particularly difficult to control. Most of the plants in this category produce copious numbers of seeds, are wind or bird dispersed or have highly efficient means of vegetative reproduction. Whereas some of these plants were introduced inadvertently, have no obvious function to fulfil in South Africa and are generally regarded as undesirable, many of them are popular garden or landscaping plants. What they all have in common, however, is the fact that their harmfulness outweighs any useful properties they might have. Care was taken not to include a plant in this category if part of the population of</p>

		South Africa would suffer because of its absence. The ornamentals in this category ought to be reasonably easy to replace with less invasive substitutes.
Provincial Nature Conservation Ordinance	DAFF	Protected indigenous plants in general are currently controlled under the relevant provincial Ordinances or Acts dealing with nature conservation. The North West falls under the Nature and Environmental Conservation Ordinance (1974). In terms of this Ordinance, a permit must be obtained from Department of Agriculture & Fisheries (DAFF) to remove or destroy and plants listed as 'endangered' and a letter of consent from the landowner must be obtained to remove or destroy any plants listed as 'protected' in the Ordinance.
Occupational Health and Safety Act	RSA	<p>The Occupational Health and Safety Act, 1993 (No 85 of 1993) provides for the health and safety of persons at work; for the health and safety of persons in connection with the use of plant and machinery, and the protection of plant and machinery; and the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work. A number of regulations are published under this Act including:</p> <ul style="list-style-type: none"> • Environmental Regulations for Workplaces (GN R2281 of 1987-10-16) • Regulations for Hazardous Chemical Substances (GN R179 of 1995-08-25) • Asbestos Regulations (GN R109 of 2003-01-17)
Mine Health and Safety Act	NW30/5/1/3/2/10 503MP	<p>The Mine Health and Safety Act, 1996 (No 26 of 1996) provides for the protection of health and safety of employees and other persons at mines and serves-</p> <ul style="list-style-type: none"> • To promote a culture of health and safety; • To provide for the enforcement of health and safety measurements; • To provide for appropriate systems for employee, employer and state participating

		<p>in health and safety matters;</p> <ul style="list-style-type: none"> • To provide effective monitoring systems and inspections, investigations and inquiries to improve health and safety; • To promote training and human resource development; • To regulate employers' and employees' duties to identify hazards and eliminate, control and minimise the risk to health and safety; • To entrench the right to refuse to work in dangerous conditions
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f) Need and desirability of the proposed activities.

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

Need and desirability in terms of the North West Province
<p>The demand of sand in the area is increasing day by day both for private construction activities and infrastructure development by the Government Agencies. The primary reason for the economic growth can be attributed to the growth in infrastructure. Infrastructural growth is directly proportional to the availability of raw materials such as bricks, cement, sand etc., with the growing infrastructural requirement in South Africa, thus the demand of raw materials have increased geometrically. The proposed project will address growing requirement of raw materials for infrastructure. The project activity will help in combating the growing demand of sand in the market & hence will help in the economic growth of the country.</p>
Need and desirability in terms of socio-economic benefits
<p>This project will lead to direct & indirect employment opportunity. Employment is expected during sand excavation, sand transportation, in trade and other ancillary services. Employment in these sectors will be primarily temporary or contractual and involvement of unskilled labour will be more. A major part of this labour force will be mainly from local villagers in this case Madibe – A Makgabana who are expected to engage themselves in project activities. This will enhance their income and lead to overall economic growth of the area. The proposed project is a need.</p>
Need and desirability in terms of the proposed location and accessibility

The proposed facility will be located within a location where other sand mining projects are on-going and the sandy soils have very little agricultural productivity. The land will be used for an economic transformation.

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

Mining is important for economic development, to construct durable, modern structures and employment creation. The proposed site is for sand mining activities, known to provide good quality silica sand to the local building industry. This type of sand is commonly used for building construction. The project site is located within Ngaka Modiri Molema District Municipality.

- The site offers the mineral sought,
- The proposed mining area was defined not to include any wetland or natural riparian ecosystem.
- The portion is covered by trees and grass on the mining area.
- No overburden removal.
- The mining area can be reached by an existing sand/silica. No new road needs to be constructed.
- The open cast mining of the area (using an excavator and front end loader) was identified as the most effective method to obtain the desired sand. Due to the small size of the activity and the remote location of the mining area the potential impacts on the surrounding environment, associated with open cast mining, is deemed to be of low significance.
- No residual waste as a result of the mining activity will be produced that needs to be treated on site.

Any general waste that may be produced on-site will be contained in sealed refuse bins to be transported to the local municipal landfill site. As maintenance and servicing of the equipment will be done at an off-site workshop the amount of hazardous waste to be produced at the site will be minimal and would only be as a result of accidental leakage. Contaminated soil will be removed to the depth of the spillage and contained in sealed bins until removed from site by a hazardous waste handling contractor to be disposed of at a registered hazardous waste handling site.

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 3 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;

The proposed site is situated at Heath Farm No 202 JO which is located approximately 35km south of Mafikeng town, within the jurisdiction of Ngaka Modiri Molema District Municipality in the North West Province. The proposed sand mining will be on private land with approximately 4.94ha. Please refer to appendix 3.

(b) The type of activity to be undertaken;

No project alternatives were considered for this assessment. The reason is forming permit that required for the sole purpose of mining sand is for the trading; the mining site can be access by existing road from N18. No other alternatives were considered seeing sand mining will be the primary source.

(c) The design or layout of the activity;

The Mine does not require any infrastructure such as offices, storage areas. Existing access is from the North-east directly off the N18. Constructing infrastructure would not be feasible and an unnecessary intrusion and not preferred. TLB, trucks, shovels and excavators will be used to mine the sand material and the material will further be hauled by trucks away to the various sectors



Picture 1: Sample of sand mining activity

(d) The technology to be used in the activity;

The preferred mining method (using an excavator, front end loaders and haul trucks) is a proven mining method for this type of mineral and for the small scale of mining. This mining method is also considered to have a low environmental impact if managed correctly. No other mining method will be assessed.

These mining methods are standard practise for opencast mining operations. The reasons for the abovementioned method being implemented are driven by the dimension and size of the proposed sand mining to be mined, and the required amount of sand that has to be produced in order to comply with targets. Technology does not have a bearing on the proposed mine.

(e) The operational aspects of the activity; and

Sand will be transported by truck to and stockpiled for trading/customers. The transportation of sand will be using existing gravel roads as considered due to the existing haul road from the site to N18 road.

(f) The option of not implementing the activity.

This refers to the current status quo and the risks and impacts associated with it. The current land use of the proposed site is rural grazing land. Some portions of the mining site and surrounding areas have been impacted by illegal mining. Should the project not be implemented the area will not be disturbed by the proposed mining operations and there could be less damage to the environment.

There might also not be any job creation or benefits to the local community from the mining activity.

Advantages of the no-go option are a reduced risk of potential environmental degradation (i.e. water pollution, soil erosion, etc.). The No-Go alternative is assessed further in the impact assessment process.

5. PUBLIC PARTICIPATION PROCESS

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.

The following steps were undertaken as part of the public participation process in order to notify interested and affected parties:

1. Landowners, neighbouring landowners, community members, Municipalities, non-governmental organisations (NGOs) and organs of state were notified.
2. I&APs were notified about the project by means of:
 - Letters to surrounding landowners;
 - Media advertisements and site notices; and
 - Written notifications to the Local Municipalities
 - Email was supplied with a notification letter, informing them about the proposed project.
3. Newspaper advertisements were placed in the relevant local newspapers (Mafikeng Mail)
4. A Background Information Document (BID) was circulated to all surrounding Landowners and community. The BID highlighted the proposed project and invited participants to participate in the BA process. A reply form was attached to the BID on which I&APs can provide written comments on the proposed sand mining activity.
5. I&APs will be notified of the environmental authorisation, once received and the appeal process to be followed.

iii) Summary of issues raised by I&APs

(Complete the table summarising comments and issues raised, and reaction to those responses) Comments have been received from Interested and Affected Parties (I&AP's) at the time of the meeting that was held at Madibe- A Makgabana Kgotla (Please refer to the minutes attached as Appendix 4)

Interested and Affected Parties <i>List the names of persons consulted in this column, and mark with an X where those whom must be consulted were in fact consulted.</i>	Date of comments received	Issues raised	EAP's response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
AFFECTED PARTIES				
Landowner/s				
Mr S. Vorster svorster@nwpq.gov.za	No Comments to date	No issues	N/A	
Mr Hendrick Coetzer acoetzer@gmail.com	No Comments to date	No issues	N/A	
DAFF Mr L. Nevhufumba Senior Forester Tel: 018 388 9809 Email: NevhufumbaL@daff.gov.za	No Comments to date.	No issues	N/A	
Kgosi TR. Saane-Tawana Madibe-Makgabana community	17/09/2017	Chief appreciated to being involved (Madibe-Makgabana community) regarding the proposed project and does not have objective against the project.	Appreciated the opportunity to make presentation for the proposed sand mining project. Comments provided.	Appendix 4.
Mr M Leepile	14/09/2017	How about dust and big	The trucks will not going through	Refer to the minutes

Chairperson : Madibe-MakgabanaKgotla		trucks pass in the village.	the village as the village road is far however dust suppression will be implemented on the roads and trucks speed will be 30km/h	
OTHER AFFECTED PARTIES				
Ratlou Local Municipality Mr Paseka mathews@ratlou.gov.za	Requested locality site map. No Comments to date	No issues	N/A	
Mafikeng Local Councillor Cllr Doctor Moseki Cell: 083 983 6191	14/09/2017 No Comments to date	No issues	N/A	
Municipal Manager: NgakaModiriMolema District Municipality Mr. J. Mohlakoana Email:mohlakoanaj@nmmdm.gov.za Tel: 018 381 9400	No Comments to date	No issues	N/A	
Mr Tlhabannyane NgakaModiriMolema District Municipality Cell: 071 857 4982	No Comments to date	No issues	N/A	
INTERESTED PARTIES				
Eskom Mr M. Tshidzumba Email: TshidzDM@eskom.co.za	No Comments to date	No issues	N/A	
Telkom annetteVZ@openserve.co.za	No Comments to date	No issues	N/A	

Department of Public Works jvanwyk@nwpg.gov.za	No Comments to date	No issues	N/A	
Department of Water and Sanitation Names: Thato Mjona Cell: 082 488 0655 Tel: 012 392 1499 Email: mjonat@dws.gov.za	No Comments to date	No issues	N/A	

6. DESCRIPTION OF THE ENVIRONMENT

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).

Introduction

This section provides a general description of the environment in which the proposed sand mining operation is proposed. The purpose of this section is to provide a perspective of the local environment within which the proposed mining operation will be located, with a view to identify sensitive issues/areas, such as wetlands or other ecological aspects, which need to be considered when conducting the impact assessment and designing the various components of the project.

Vegetation

The vegetation of the site is grass layer coverage with shrubs and protected trees. The dominant plant species found on site is the protect trees is the Acacia Erioloba (camel thorn). Changing of land use will affect vegetation species. The vegetation of the site can be described as the central and southern parts mainly comprise of sour mixed bushveld and dry Cymbopogon- Themeda veld. The drier western parts are mainly characterized by Kalahari thornveld and shrub bushveld. The eastern parts are mainly covered by Banken veld and Cymbopogon- Themeda veld (sandy). The extreme northern part is characterized by turf thornveld and mixed bushveld areas.



Picture 1: Camel Thorn tree



Picture 3: Vegetation and Soil type on site



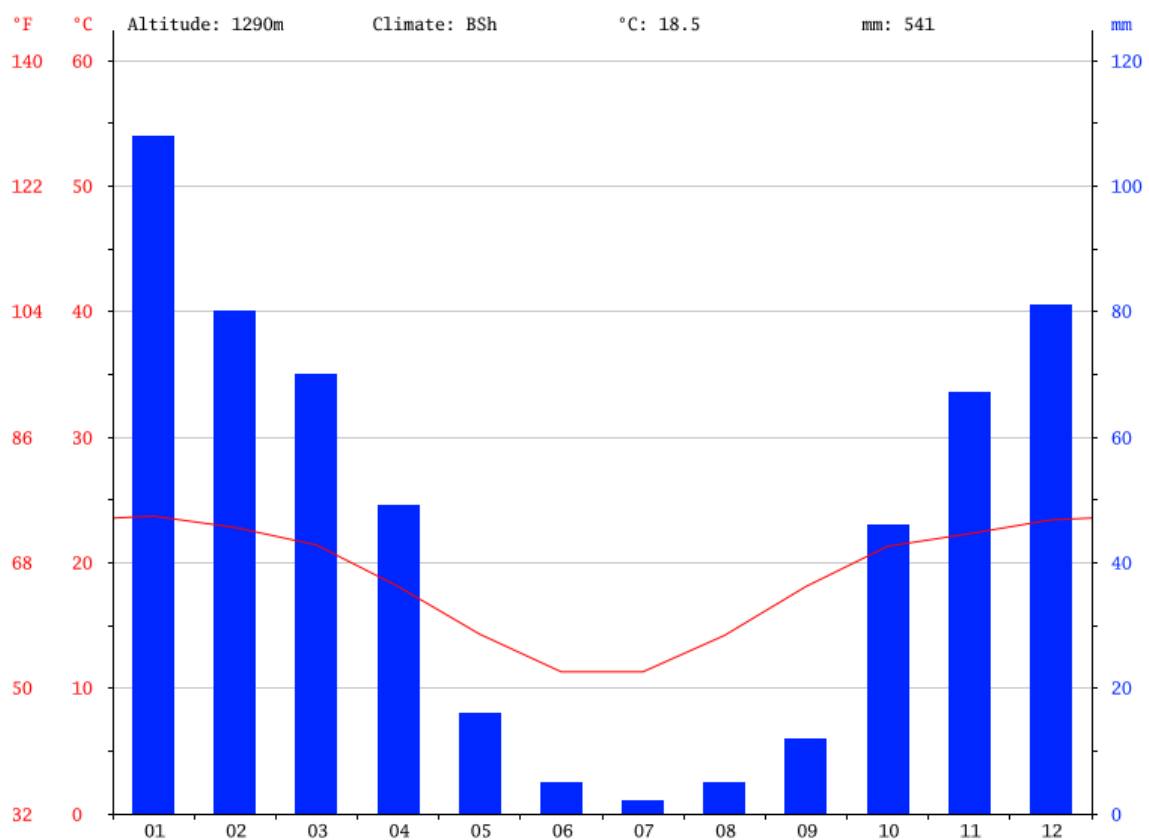
Pictures3: Indigenous trees and grass



Picture 4: Cactus species

Climate

The State of the Environment Report for North West Province (2002) provides detailed data and information on water and climate spatial implications. Rainfall in the study area varies between 400 to 600mm annually. A limited part of the geographical area adjacent to the eastern boundary has slightly higher rainfall averages between 800 to 1000mm per year. The average rainfall per annum is being calculated at 600mm. Thunderstorms and hails do occur but are lower than the figures obtained for the Highveld region. The NMMDM area is distinguished from the Highveld region on the grounds of the difference shown in climatic statistics.



Figures 3: ClimateforMafikeng

	January	February	March	April	May	June	July	August	September	October	November	December	
Avg. Temperature (°C)	23.7	22.8	21.4	18.1	14.3	11.3	11.3	14.2	18.1	21.3	22.3	23.4	
Min. Temperature (°C)	16.8	16.4	14.6	10.5	5.8	2.3	2.4	5	9.3	13.2	15	16.3	
Max. Temperature (°C)	30.6	29.3	28.2	25.8	22.8	20.4	20.2	23.4	26.9	29.5	29.7	30.5	
Avg. Temperature (°F)	74.7	73.0	70.5	64.6	57.7	52.3	52.3	57.6	64.6	70.3	72.1	74.1	
Min. Temperature (°F)	62.2	61.5	58.3	50.9	42.4	36.1	36.3	41.0	48.7	55.8	59.0	61.3	
Max. Temperature (°F)	87.1	84.7	82.8	78.4	73.0	68.7	68.4	74.1	80.4	85.1	85.5	86.9	
Precipitation / Rainfall (mm)	108	80	70	49	16	5	2	5	12	46	67	81	

Figures 4: Temperature for Mafikeng

Wind

The spatial and diurnal variability in the wind field of the Mafikeng Local Municipality region differs between the day and night. Night-times are characterized by an increase in the number of calms and by the predominance of low velocity wind from the south-easterly sector. The impact of the mountainous range results in south-westerly winds reflecting the nocturnal (katabatic) air drainage from the range. Winds speeds within built up areas are generally lower. During the daytime, winds from the south-eastern sector are replaced by airflow with a northerly and westerly component. Increased wind velocities frequently exceed 5m/s.

Air Quality

The air quality of the area is impacted on by dust generated by the unpaved gravel roads in the area. The area is located in an agricultural area and there are no industrial areas located within a 5km radius from the proposed site. The sand mining activities will contribute to the dust pollution in the area, and should be controlled by means of limiting the clearance of vegetation where possible and managing the dust inside the opencast mining area during operations, the sand particles are heavier and less likely to be picked up by wind than very fine clay particles. The heavy vehicles will be used for transporting the sand from the site will also contribute to dust pollution generated by the unpaved gravel roads in the area. The mining permit will not exceed a period of 2 years.

The mine will ensure compliance with the National Dust Control Regulations GN R827 November 2013 and implement a dust-fall monitoring programme.

Surface Water Sources

There are four driving forces affecting surface water resources in the NMMDM area. These include climatic conditions, increased population growth, increases in mining and industrial demand for water, policy and legislation issues. For the purposes of formulating the SDF, pressures impacting on surface water resources should also be identified. An increase in population exerts pressure on the environmental quality and quantity of water resources. It results in greater demand for water as well as an increase in the discharge of used water through sewerage systems and other effluents.

The pressures exerted on the water resources include changed hydrology patterns in the major river. The amount of available surface water decreases from east to west in the NMMDM area. The eastern portions have higher surface water flows than the western portions. The primary and secondary catchments of NMMDM partly fall within the boundaries of the study area. There are 8 large impoundments (dams) within the study area. These impoundments provide water for domestic supply, mining industry, agriculture and recreation. Although the majority of consumers in NMMDM are reliant on groundwater sources, there are however also a number of significant surface water sources that are being utilised. There is no surface water such as streams anywhere close to site they are relying on underground water.

Groundwater Sources

The ground water sources of the site are 2 boreholes and both ground water sources are working efficiently. One borehole supplies water from the main residential house while the other boreholes supplies water for other domestic purposes and animals. Given the fast-paced rate of development and its associated activities, combined with growing numbers of human population in NMMDM, it is evident that there is production of greenhouse gases that have seriously affects climate change. Climate change refers to serious disruptions of the entire world's weather and climate patterns, including impacts on rainfall, extreme weather events and sea level rise rather than just moderate temperature increases - most of which have even been experienced within NMMDM itself.

Wetlands

No wetlands are known to exist on the mining area.

FAUNA

Mammals and Bird

During the site inspection there was no animals found onsite however the below picture indicates the presence of the, Warthogs, Aardvark, porcupines, squirrels and springbok. A porcupine is any of 29 species of rodents belonging to the families Erethizontidae (genera: *Coendou*, *Sphiggurus*, *Erethizon*, *Echinoprocta*, and *Chaetomys*) or Hystricidae (genera: *Atherurus*, *Hystrix*, and *Trichys*). Porcupines vary in size considerably: *Rothschild's porcupine* of South America weighs less than a kilogram (2.2 lb).

Squirrels are members of the family Sciuridae, a family that includes small or medium-size rodents. The squirrel family includes tree squirrels, ground squirrels, chipmunks, marmots, flying squirrels, and prairie dogs amongst other rodents. Scientific name: Sciuridae. Higher classification: Sciuromorpha Height: Alpine marmot: 18 cm Gestation period: Eastern gray squirrel: 44 days, Siberian chipmunk: 28 – 35 days. The region has a rich avifauna with nearly 500 species recorded from the region approximately half of the species recorded from subcontinent.



Picture 5: Indication of Springbok by faeces



Picture 6: Above pictures indicate of Squirrel, Warthog and Aardvark habit.

Endangered or rare species

There are no endangered or rare species on the proposed site.

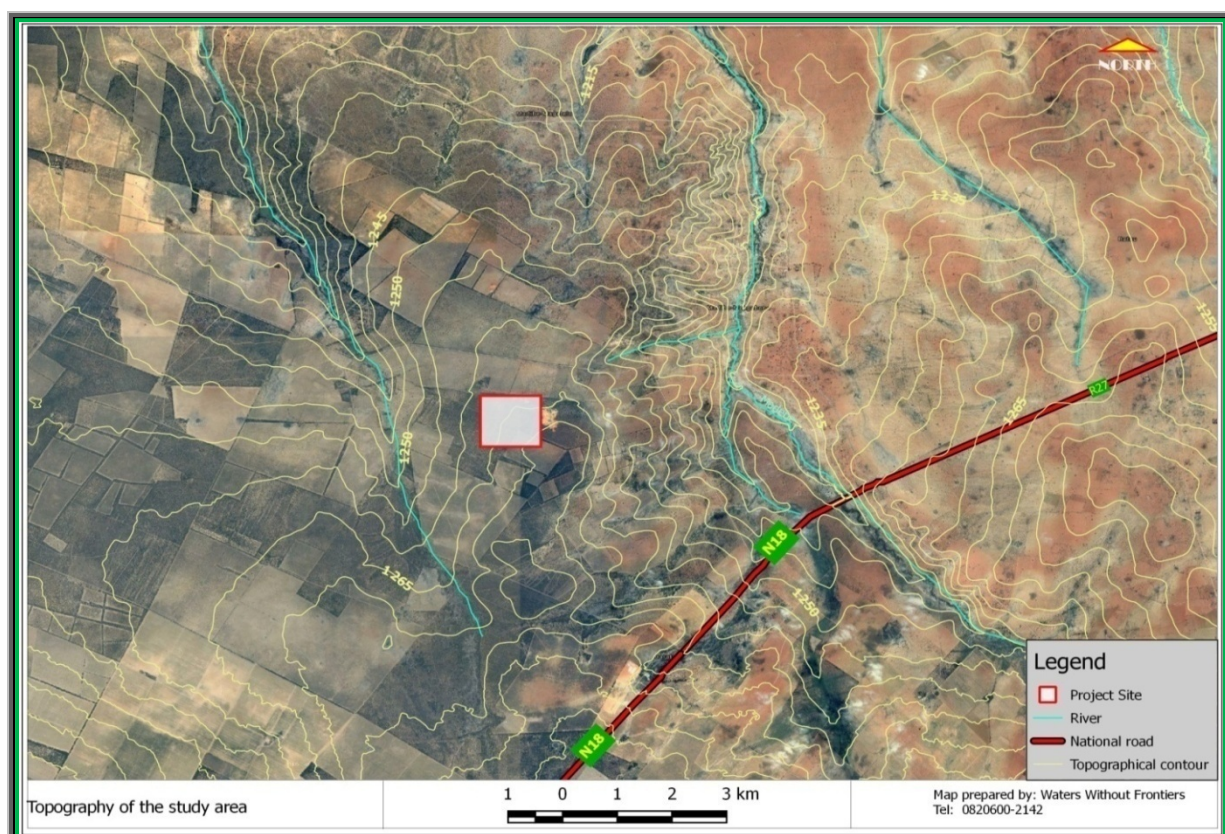
The social environment

The Ngaka Modiri Molema District Municipality has a total population of 788 976, which is equivalent to 24% of the total population in North-West. 34% of the total population is found in the Mafikeng Local

Municipality, thus giving it the largest population density in the district. A mere 14% of the total population is situated in the Ratlou Local Municipality. Ditsobotla local municipality has the highest number of people within the district whereas Tswaing local municipality contributes the lowest. The NgakaModiriMolema District Municipality has a total of 554,668 people living under the minimum living income, which is equivalent to 29% of the total number of minimum living income earners in the North-West province, thus, making it the district with the most underprivileged people in the NW Province. Lichtenburg is the region which has second highest employment opportunities in the region which ranges from 5 000 to 25 000 opportunities within a 20 minutes driving time.

Topography

The topography of the Ngaka Modiri Molema District Municipality can mainly be classified as “flat”, with 15% of the total area described as “mountainous” and 17% as “rolling”. The area classified as mountainous is mainly located in the Ramotshere Moiloa’ Local Municipality, including the study area. Within this municipality, 47% of the area can be classified as mountainous.



Source: Elevation map by Google earth

Figure 5: Topographical map of the site

Soils and Geology of the site

The soil types of the western Central Bushveld are closely linked to the prevalent topography, geology and climate of the area. Soils in semi-arid areas are shallow, stony and low in humus content due to superficial weathering and decomposition of organic matter respectively. Additionally, the low rainfall levels associated with this region produce soils that are only slightly leached, and thus tend to develop high concentrations of salts in the soil, particularly if evaporation rates are high. As a result, the soil characteristics constitute an influential factor for plant growth in the study area governing the vegetation types that are able to grow there. The soil types found include the Eutrophic soils, Dystrophic to Mesotrophic soils, Mesotrophic to Eutrophic soils and Non Calcareous soils. These soil types can directly be related to present and potential spatial distribution of agricultural development. The geological map indicates that the thickness of the soil cover at the site and surrounding area is between 15 and 30 meters thick; rock outcrops were however noticed during the field survey and the soil thicknesses may therefore be much less as indicated on geological maps. The geographical structure of the study area is the result of several phases of deformation with the oldest structures being found in the banded gneisses in the form of tight isoclinal, intrafoliated folds. The study area, the surface deposits consist of unconsolidated, dune free, and orange-yellow aeolian sand belonging to the Gordonia Formation. These beds range up to 3 meters in thickness and make excellent building sand due to the low clay content (<10%). The sand lies on Archaean gneiss with the best example being at the wall of Modimola dam. The granite-gneiss shows alternating bands of grey and white and dark green amphibole rich layers and pale pink granite (consisting mainly of pink orthoclase feldspar and quartz). The geological map of the area indicates that the site is underlain by wind-blown Kalahari sands and medium grained quartz norite from the Kalahari Group.

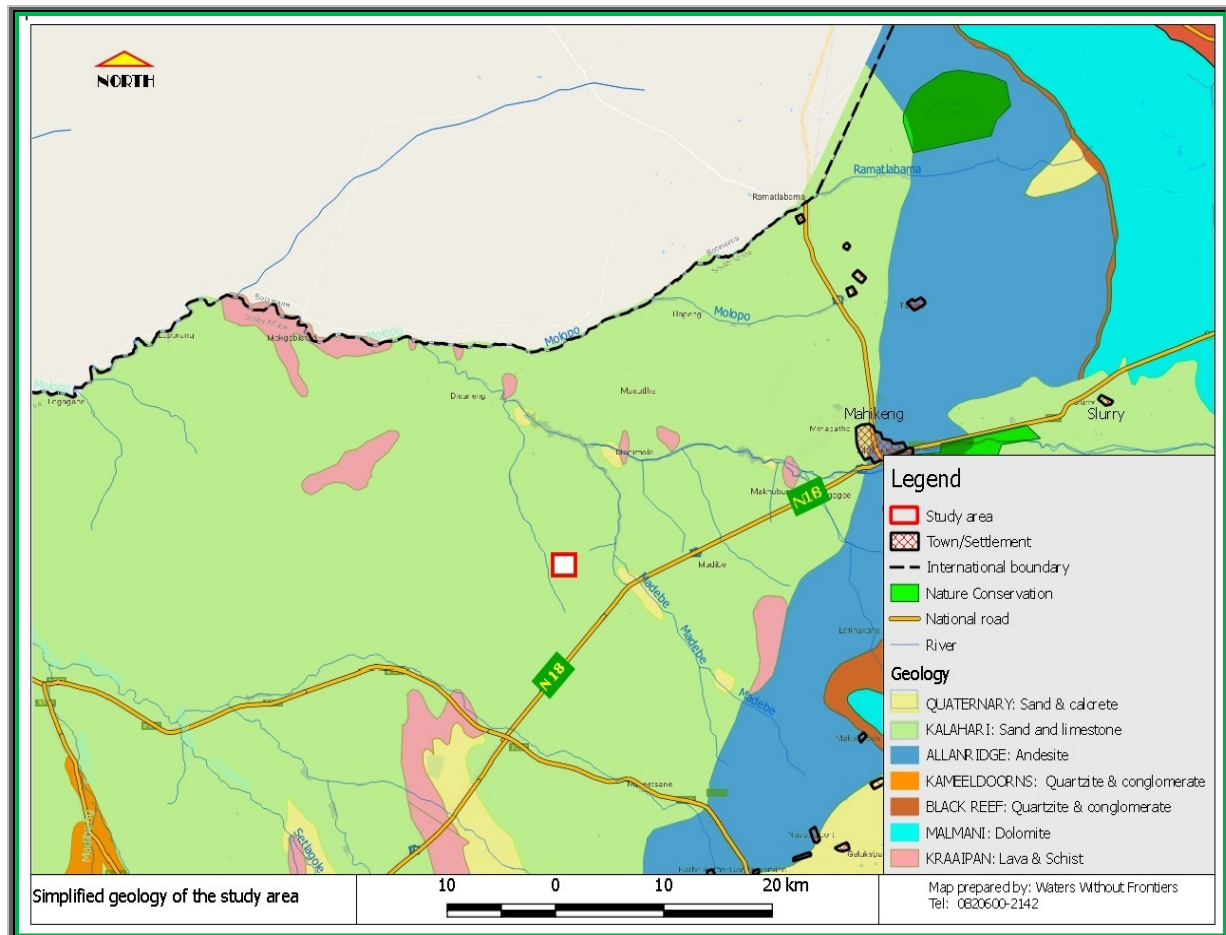
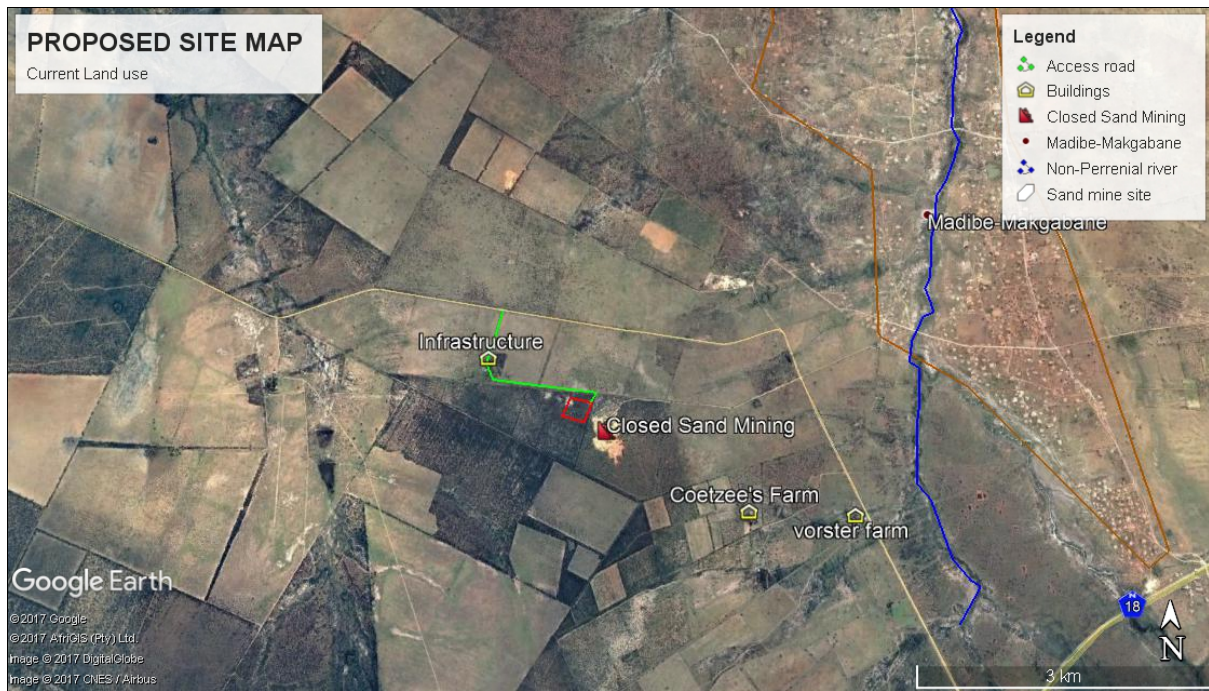


Figure 6: Map showing the Geology of the site

(b) Description of the current land uses.

Land Cover is the physical material at the surface of the earth (it include grass and trees whereas Land use was used for grazing. Land use involves the management and modification of natural environment or wilderness into built environment such as fields, pastures, and settlements. The land use comprises of undisturbed areas with natural regeneration of wattle and some organised woodlots/forestry and vegetation. The mining of the sand on the virgin soil in question will significantly alter the landscape. The natural grasslands and biodiversity will be altered by these activities. The areas infrastructure consists of the buildings which one is the main house, the other house which is in use and 2 dilapidated buildings. The other dilapidated building was used for farming where old tractors are found and other farming material.



Figures 7: Land use features

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

There is no area of any importance near/around the proposed sites that needs any special attention, protection, management or avoidance. The proposed area to be mined is surrounded by thorn bushes which are protected called camel thorn then application for permit must be obtained from DAFF before removing protected trees. There are no any natural feature e.g. stream, river or wetland, no archaeological aspect like graves, artefacts that will be tempered with.

(d) Environmental and current land use map.

The following infrastructure has been established within Heath farm. Roads: The mine is linked to the N18 with a dirt access gravel road through the Uplands farmers running down the northern site to the Sand mine area is leading to the operational areas. No additional roads on the property are limited to service roads for the mining operation. The power line runs through to the farm house which supplies electricity to the farm and the existing farms however no power line is found around the mining area. The mine is served by a 22kV Eskom power line. The area is supplied with a Telkom line communication network.

A storeroom exists in the mining area where all machinery and vehicles will be kept. No ablution facilities will be needed as there is an existing house at the mining area where workers will be able to use the bathroom which includes the bath tub and toilet and kitchen facilities during launch and breaks.

The house is situated 1 kilometre from the proposed mining area with other two buildings of which one building is dilapidated.

There are two water boreholes on site of which one supplies the main house with water and the other supplies the cattle on site which will also be used to supply water for the workers who will be working at the proposed mining area.

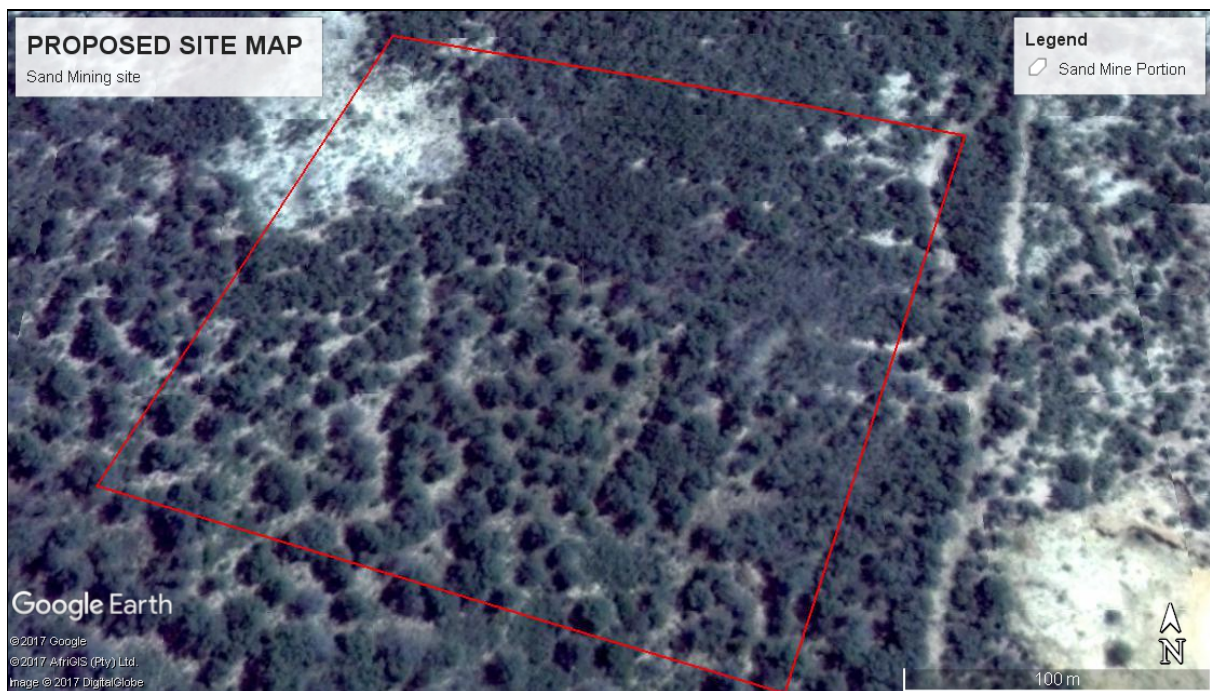


Figure 8: Current land use of propose sitemap

7. IMPACT ASSESSMENT

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

(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).

Nature of potential Impact/risk	Extent of impact	Duration	Consequences	Probability	Significance Rating(Positive or Negative)	Reversibility of impact	Irreplaceability of receiving environment/resource
Impact on ambient air quality as a result of dust and other emissions generated	Site	Medium-term	Moderate	Likely	Low (Negative)	Moderate (rehabilitation after operation)	Moderate
Noise disturbances as a result of sand mining activities.	Site	Short-term	Slight	Likely	Very low (Negative)	High	Low
Topography and visual alteration	Site	Medium-term	Substantial	Likely	High (Negative)	Moderate (Rehabilitation post mine closure)	Low
Generation of waste.	Site	Short-term	Moderate	Likely	Low	High	Low
Alteration to the cultural Landscape	Site	Medium-term	Moderate	Likely	Low	High (with rehabilitation)	Low
Impact on health, and safety of workers.	Site	Medium-term	Moderate	Likely	Low	Non-reversible	Moderate
Impact on Socio-economic development of the area.	Local	Medium-term	Substantial	Likely	Moderate (Positive)	High	Moderate
Soil compactions	Local	Medium-term	Moderate	Likely	Low	low	Moderate
Loss of species	Site and local	Long-term	Substantial	Likely	Moderate	Moderate (rehabilitation during closure)	Moderate
Disturbance of fauna and	Site and	Long-	Substantial	Likely	Moderate	Moderate	Moderate

Nature of potential Impact/risk	Extent of impact	Duration	Consequences	Probability	Significance Rating(Positive or Negative)	Reversibility of impact	Irreplaceability of receiving environment/resource
flora species	local	term				(rehabilitation during closure)	
Poaching/hunting	Site	Short-term	Moderate	Likely	High	Moderate	Moderate
Fire	Site and local	Short-term	Moderate	Likely	High (Negative)	Moderate	Moderate
Collection of fire wood	Site	Short-term	Substantial	Likely	Medium (Negative)	Low	Low
Closure							
Reducing soil compactions of disturbed area	Site	Long-term	Moderate	Likely	Low	Low	Low
Shaping excavations: restoration of land use and capability	Site	Long term	Moderate	Likely	Medium	Low	Low

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 were determined in order to decide the extent to which the initial site layout needs revision).

1) METHODOLOGY OF IMPACT ASSESSMENT

According to the DEA IEM Series guideline on "Impact Significance" (2002), there are a number of quantitative and qualitative methods that can be used to identify the significance of impacts resulting from a development.

The process of determining impact significance should ideally involve a process of determining the acceptability of a predicted impact to society. Making this process explicit and open to public comment and input would be an improvement of the BA process. The approach to determining significance is generally as follows:

- Our approach is more a qualitative approach - we do not have a formal matrix calculation of significance as is sometimes done.

2) CRITERIA FOR IMPACT ASSESSMENT

Assessment of Potential Impacts

The assessment of impact significance is based on the following conventions:

Nature of Impact - this reviews the type of effect that a proposed activity will have on the environment and should include "what will be affected and how?"

Spatial Extent - this should indicate whether the impact will be:

- Site specific;
- Local (<2 km from site);
- Regional (within 30 km of site); or
- National.

Duration - The timeframe during which (lifetime of) the impact will be experienced:

- Temporary (less than 1 year);
- Short term (1 to 6 years);
- Medium term (6 to 15 years);

- Long term (the impact will cease after the operational life of the activity); or
- Permanent (mitigation will not occur in such a way or in such a time span that the impact can be considered transient).

Intensity - it should be established whether the impact is destructive or innocuous and should be described as either:

- High (severe alteration of natural systems, patterns or processes such that they temporarily or permanently cease);
- Medium (notable alteration of natural systems, patterns or processes; where the environment continues to function but in a modified manner); or Low (negligible or no alteration of natural systems, patterns or processes); can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making.

Probability - this considers the likelihood of the impact occurring and should be described as:

- Improbable (little or no chance of occurring);
- Probable (<50% chance of occurring);
- Highly probable (50 – 90% chance of occurring); or
- Definite (>90% chance of occurring).

Reversibility - this considers the degree to which the adverse environmental impacts are reversible or irreversible. For example, an impact will be described as low should the impact have little chance of being rectified to correct environmental impacts. On the other hand, an impact such as the nuisance factor caused by noise impacts from windmill can be considered to be highly reversible at the end of the project lifespan. The assessment of the reversibility of potential impacts is based on the following terms:

- High - impacts on the environment at the end of the operational life cycle are highly reversible;
- Moderate - impacts on the environment at the end of the operational life cycle are reasonably reversible;
- Low - impacts on the environment at the end of the operational life cycle are slightly reversible; or
- Non-reversible - impacts on the environment at the end of the operational life cycle are not reversible and are consequently permanent.

Irreplaceability - this reviews the extent to which an environmental resource is replaceable or irreplaceable.

For example, if the proposed project will be undertaken on land that is already transformed and degraded, this will yield a low irreplaceability score; however, should a proposed development destroy unique wetland systems for example, these may be considered irreplaceable and thus be described as high. The assessment of the degree to which the impact causes irreplaceable loss of resources is based on the following terms:

- High irreplaceability of resources (this is the least favourable assessment for the environment);
- Moderate irreplaceability of resources;
- Low irreplaceability of resources; or
- Resources are replaceable (this is the most favourable assessment for the environment).

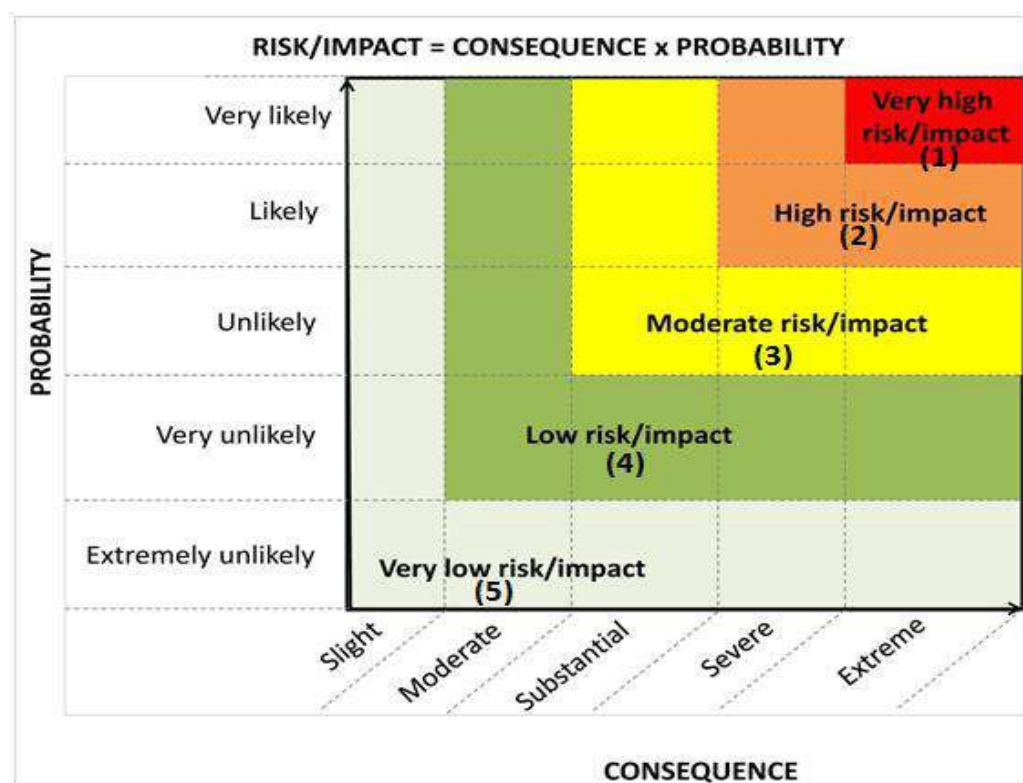


Figure: Guide to assessing risk/impact significance as a result of consequence and probability.

The status of the impacts and degree of confidence with respect to the assessment of the significance is stated as follows:

Status of the impact: A description as to whether the impact will be:

- Positive (environment overall benefits from impact);
- Negative (environment overall adversely affected); or
- Neutral (environment overall not affected).

Degree of confidence in predictions: The degree of confidence in the predictions, based on the availability of information and specialist knowledge. This should be assessed as:

- High;
- Medium; or
- Low.

Based on the above considerations, the specialist provides an overall evaluation of the significance of the potential impact, which should be described as follows:

- **Low to very low:** the impact may result in minor alterations of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated;
- **Medium:** the impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision making if not mitigated; or
- **High:** Where it could have a “no-go” implication for the project unless mitigation or re-design is practically achievable.

Furthermore, the following must be considered:

- Impacts should be described both before and after the proposed mitigation and management measures have been implemented.
- All impacts should be evaluated for the construction, operation and decommissioning phases of the project, where relevant.
- The impact evaluation should take into consideration the cumulative effects associated with this and other facilities which are either developed or in the process of being developed in the region, if relevant.

Management Actions:

- Where negative impacts are identified, mitigatory measures will be identified to avoid or reduce negative impacts. Where no mitigatory measures are possible this will be stated.
- Where positive impacts are identified, augmentation measures will be identified to potentially enhance these.
- Quantifiable standards for measuring and monitoring mitigatory measures and enhancements will be set.

This will include a programme for monitoring and reviewing the recommendations to ensure their ongoing effectiveness.

Monitoring:

Monitoring requirements are to assess the effectiveness of mitigation actions, indicating what actions are required, by whom, and the timing and frequency thereof.

Cumulative Impact:

Consideration is given to the extent of any accumulative impact that may occur due to the proposed development. Such impacts are evaluated with an assessment of similar developments already in the environment. Such impacts will be either positive or negative, and will be graded as being of negligible, low, medium or high impact.

Mitigation:

The objective of mitigation is to firstly avoid and minimise impacts where possible and where these cannot be completely avoided, to compensate for the negative impacts of the development on the receiving environment and to maximise re-vegetation and rehabilitation of disturbed areas. For each impact identified, appropriate mitigation measures to reduce or otherwise avoid the potentially negative impacts are suggested.

All impacts are assessed without mitigation and with the mitigation measures as suggested.

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)

Please refer to the full description of the Impact Assessment Methodology above (v).
--

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

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

Please refer to the full description of the Impact Assessment Methodology above (v).
--

NO-GO ALTERNATIVE

DIRECT IMPACTS:

- None of the impacts mentioned above will occur.
- The status quo of the site will remain, no new clearance will occur which will result in no clearance of vegetation and no clearance of present species.

INDIRECT IMPACTS:

- If the proposed project does not proceed, increased income and economic benefits associated with the project will not be realized.
- No employment opportunities will be created.
- If the proposed project does not proceed, the potential to produce and supply good quality sand to the local building industry for use in the construction of buildings.

ix) Motivation where no alternative sites were considered.

No property alternatives have been considered as the envisaged mining operations will occur in an area of existing mining operations, and also in close proximity to the access road and local markets.

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

The preferred site alternative has been identified based on the availability of the sand resource and proximity to another sand mine which are within a radius of 5km from the site. This will make the site accessible in terms of road facilities. This prevents further disturbance of the environment and allows for all development to occur within the same area where other sand mines are operating.

Preferred site alternative is located within Mahikeng Local Municipality 35km South of Mahikeng town. The site has been selected based on its suitability in terms of the availability of the sand resource, accessibility and its proximity to other sand mines.

Without the development of the proposed sand mine the status quo would remain. The increased demand for sand in Mahikeng will not be met and economic growth won't be realised in Mahikeng. This could, in turn, negatively impact on the potentially improved livelihoods of the local communities through loss of employment opportunities especially the communities from Madibe – A Makgabana who are expected to be engaged in project activities.

The potential impacts associated with the proposed development are of medium to low significance and with the implementation of the proposed mitigation measures, these can be significantly reduced to be

of low to very low significance. The proposed site and layout is considered suitable provided that all the conditions, mitigation measures and environmental impact regulations are implemented.

- 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.)**

The identified risks and impacts for this study, specifically the proposed mining site, were identified in terms of the environmental studies for this site and the socio-economic need of the surrounding area.

Observation and test open casts were dug and the suitability, viability and quantity of possible mining sand deposits were assessed. Possible mining areas were identified. These were assessed against environmental and cultural impacts and the areas that will affect them were excluded and buffer areas were established. The possible visual impacts, erosion mitigation and recommendations from specialist studies and the impact assessment process were used to determine 4.94ha area as well as the mining phases and sizes of the mining blocks.

Impacts associated with the continuation of the sand mining

Nature of impact	Duration	Probability	Extent	Severity	Significance before mitigation	Degree to which the impact can be reversed	Significance after mitigation
Increased emissions from hauling trucks which contributes to poor ambient air quality in Mafikeng	7	10	7	10	High	Low	High
Increased traffic volumes from hauling trucks	7	10	7	5	Medium	Low	Medium
Impact on nearby communities	7	8	5	10	Medium	Low	Low

due to dust generation							
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(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).

NAME OF ACTIVITY	POTENTIAL IMPACT (Including the potential impacts for cumulative impacts) (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)	SIGNIFICANCE if not mitigated	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc.) E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation.	SIGNIFICANCE if mitigated
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.)						
Excavations	Loss of vegetation and	Flora and fauna	Construction phase	Low	Remedy through Rehabilitation Plan,	Low

	Faunal habitat				Conservation Management Plan and Alien Invasive Management Plan.	
Excavations	Dust	Natural Environment, road users and nearby residents	Construction, commissioning, operational Decommissioning and closure	Medium	Reduce drop height of material to a minimum. Area will be mined in phases to reduce the barren areas. Temporarily halt material handling in windy conditions. A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers entering the site will be informed of the speed limit.	Low
Stockpiles	Dust	Natural Environment, road users and nearby residents	Construction, commissioning, operational Decommissioning and closure	Medium	Reduce drop height of material to a minimum. Area will be mined in phases to reduce the barren areas. Temporarily halt material handling in windy conditions. A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers entering	Low

					the site will be informed of the speed limit.	
Emissions	Air quality	Natural resources	Construction, commissioning, operational Decommissioning and closure	medium	<p>Vehicles and machinery on the site will be monitored for excessive emissions.</p> <p>Vehicles and machinery will be maintained to minimize emissions. A log book will be filled in to keep a record of all maintenance problems encountered and mitigation measures implemented to resolve the problem.</p> <p>Vehicles and machinery emitting excessive emissions will be stopped immediately and not allowed to operate until the necessary repairs have been done.</p>	
Waste from chemical toilets and litter	Pollution and nuisance	Natural and agricultural resources	Construction, commissioning, operational Decommissioning and closure	Low	<p>The toilet is serviced when needed and emptied when almost full.</p> <p>If a leak occurs the correct emergency procedure is</p>	Low

					to be followed. Litter will be removed from site by the operator daily.	
Hydrocarbon spill	Surface water contamination and loss of natural and agricultural resources.	Natural and agricultural resources	Construction, commissioning, operational Decommissioning, closure and post-closure	High	Any mine vehicle which is leaking hydrocarbons (e.g. petrol, diesel or oil) will be serviced in a concreted workshop to repair the leak. Hydrocarbon spillages are to be cleaned up immediately. The mine will also maintain a store of suitable absorbent material, suitable bioremediation substance and a spill kit. All incidences/ spillages are to be recorded in an incident log book. Contaminated soil must go to Mafikeng Landfill site.	Low
Fire	There is the potential for fire to occur on the	Natural and agricultural resources	Construction, commissioning, operational	High	All employees will be inducted on fire safety and on how to reduce the	

	<p>site. Veld fires can occur across the vegetated areas of the property.</p>		<p>Decommissioning, closure and post-closure</p>		<p>probability of a fire spreading out of control. Anyone who observes a fire must report it immediately to the fire protection agency/ fire brigade and their supervisor/ mine manager.</p> <p>Fire breaks will be maintained on the boundary of the mine site. No fires or activities that can start a fire will be allowed on site. Vehicles must be parked in an area with no vegetation if a fire occurs.</p>	
<p>Impact on the naturally occurring fauna present in the area</p>	<p>No red data fauna species were identified during the survey. The proposed development will not impact on any known conservation</p>	<p>Natural resources</p>	<p>Construction, commissioning, operational Decommissioning and closure</p>	<p>Low</p>	<p>Rehabilitate the area after mining process is complete and vegetation will return. Use of topsoil with seeds and roots to rehabilitate the site.</p>	<p>Low</p>

	worthy species.					
Impact on the naturally occurring flora present in the area	Camel thorn trees were identified on the proposed mining site.	Natural resources	Construction, commissioning, operational Decommissioning and closure	High	Rehabilitate the area after mining process is complete and vegetation will return. Use of topsoil with seeds and roots to rehabilitate the site.	Medium
Socio-Economic	Job creation	Jobs will be created. Local residents will be employed.	Construction, commissioning, operational Decommissioning and closure	Positive	Local contractors, employing or seeking to employ local (historically disadvantaged individuals (HDIs) from the region who are suitably qualified, should get preference. The municipality, local community and local community organizations should be informed of the project and potential job opportunities by the developer.	Positive
Loading, hauling and transport	Increased traffic due to the construction activities requiring various vehicles to come	Socio Economic Impacts	Construction, commissioning, operational Decommissioning and closure	Medium	A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers will be informed of the speed	Low

	onto and leave the site.				limit. Speed limit will be applicable when delivery trucks drive through residential areas Access road will be maintained while mine is in operation and haul road is used.	
Excavations, operations, loading, hauling and transport	Socio Economic impacts	Noise due to mining machinery, trucks and people on site	Construction, commissioning, operational Decommissioning and closure	Low	No activities that may generate noise levels above the legal limit in terms of the Environmental Conservation Act, Western Cape Noise regulations will be conducted. Machinery and vehicles should be regularly maintained to prevent excessive noise. All machinery and work activities must adhere to the requirements of the noise regulations.	Low
Sand extraction	Impact on the biota and habitat	Environment and NaturalResources Biota	Construction Phase Operation Phase Decommissioning	Medium (negative)	Remedy and Minimize through Rehabilitation Plan,Conservation	Low (negative)

			Phase		Management Plan. Monitor and control through Mine Abstraction Plan.	
Rehabilitation and restoration of disturbed Areas	Topography and visual alteration.	Topography and visual environment	Decommissioning Phase	Low (negative)	Remedy through Rehabilitation and Closure Plan.	Low (negative)
	Noise generation.	Noise receptors	Decommissioning Phase	Very low	Manage through Noise Reduction Measures and Regular Vehicle Inspections.	Very low
	Air quality and dust emissions.	Air quality	Decommissioning Phase	Very low	Monitor and manage through Dust Management Plan and Measures.	Very low
	Land capability reduction.	Soils	Decommissioning Phase	Moderate	Manage, minimise through Post-closure Management Plan and Rehabilitation Plan.	Low (negative)
	Destruction of vegetation.	Fauna and flora	Decommissioning Phase	Moderate	Manage and Minimise through Management Plan and Rehabilitation	Low

					Plan.	
	Soil contamination.	Soil	Decommissioning Phase	Low	Monitor and remedy through Emergency ResponsePlan.	Low

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):-*specialist's studies were conducted for sand mine was geology. Appendix 6*

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIAREPORT (Mark with an Xwhere applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONSHAVE BEEN INCLUDED.
Biodiversity (Ecological Study) will be undertaken	Not received as yet	To be provided later	To be provided later

I) Environmental impact statement

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

This Basic Assessment illustrates that there are various potential negative and positive impacts that may arise as a result of the proposed sand mining at Heath farm which will have an effect on the following environmental components:

- Terrestrial ecology;
- Air quality;
- Noise generation;
- Soils and land capability;
- Social environment; and
- Topography and Visual aesthetics

The project entails the open cast excavation of sand from Heath Farm. The area is dominated by vegetation, the mine procedure will only entail the mechanical excavation of the sand by means of an excavator, after which it will be loaded onto trucks and transported from site. No blasting, crushing or screening will be necessary on site.

No alternative activity was assessed. The method of sand mining is singular.

The No-Go option will result in the site remaining as it is presently, vacant land. The benefits of the project can be divided into social and economic classifications. The mine will provide direct employment to local persons. Of more importance is the supply of economic viable building material to ensure that the local business can construct vital infrastructure. The operation further creates indirect employment opportunities in equipment supply industries, transport and sand mining, and the construction environment.

The objective of Basic Assessment and Environmental management programme, in this case a basic assessment is to find the alternative having the least negative environmental impact and which best benefits society. The assessment and evaluation of potential impacts associated with the proposed development was undertaken in an iterative manner, to inform proactively the 'shaping' of the most favourable development proposal.

The proposed site is considered suitable provided that all the mitigation measures contained in this report are applied.

The construction phase and operational phase have very similar negative impacts. However, the potential impacts identified will be adequately managed and effectively mitigated through the implementation of the recommendations outlined in this report as well as the proposed Environmental Management Programme (EMPr).

Major environmental findings

The following aspects require attention from an environmental management point of view were identified, and are addressed in this document:

Fire

- Fire is a real threat thus no open space fires are to be permitted or indeed necessary on site.

Animals

- No introduced animals of any kind are permitted on site. Hunting or trapping or interfering with any wildlife is again contractually prohibited.
- There are holes that indicate of Aardvark and warthog animal habitat on site. No hunting will be allowed.

A monitoring programme will be implemented for the duration of the construction phase of the project.

This programme will include:

- Audits during first month where after monthly audits will be conducted by the Environmental Control Officer, which are according to the EMP and conditions of the Environmental Authorisation.
- These audits can be conducted randomly and do not require prior arrangement with the project manager.
- Compilation of an audit report with a rating of the compliance with the EMP. This report will be submitted to the relevant authorities (DMR).
- Proper and continuous liaison between developer, the Contractor and other stakeholders and members of the public to ensure all parties are appropriately informed at all times.
- The impact will not have an influence on the decision for the mitigation.

(ii) Final Site Map

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers. Attach as an Appendix 3

No environmental constraints which would prevent the proposed mining associated mining from being authorised have been identified within the proposed development footprint from an environmental sensitivity point. Please refer to Appendix 3. The mine will not require the construction of any infrastructure. The existing house and shed on the property will be used.

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

Positive impacts associated with the project include:

- Job opportunity
- The proposed mine has the potential to contribute to the maintenance of infrastructure in and around the local area.
- Sand will not be mined from a river bed

Negative Impact associated with the project

- The mining activities will cause noise and dust issues, however this is easily mitigated
- Negative impacts with regards to the biophysical environment include potential contamination of the area due to spillage by hydrocarbon products
- Loss of soil resources
- Change of current land use
- The proposed mine area was used for livestock grazing.

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 conditions of authorisation.

The EMPr addresses the environmental impacts associated with the project during Construction, Operation, Decommissioning and Post Closure Phases of the proposed project. The objectives of the

EMPr will be to provide detailed information that will advise the planning design of sand mining activities in order to avoid and/or reduce impacts that may be detrimental to the environment. The following environmental management objectives are recommended for the proposed mining development.

- Development planning must restrict the area of impact to a minimum and designated area only.
- Closely monitor the sand extraction volumes
- Monitor and prevent contamination, and undertake appropriate remedial actions.
- Limit the visual and noise impact on receptors.
- Avoid impact on possible heritage finds.
- Promote health and safety of workers.
- Limit dust and other emissions to within allowable limits.
- Manage soils to prevent erosion.

Impact	Responsibility and Phase	mitigation
Compliance with relevant environmental legislation and policy	Applicant	All relevant legislation and policy must be consulted and the proponent must ensure that the project is compliant with such legislation and policy. These should include (but are not restricted to): MPRDA, NWA, NEMA)
Visual intrusion associated with mining activities	Site Manager (operation)	Mining activities should only take place during normal work hours (7am to 5pm). Mining activities must be limited to the designated area and not encroach into surrounding areas.
Demarcation of mining site	Site Manager(Operation)	The boundaries of the mining site must be adequately demarcated to restrict mining and other activities. All plant, equipment and other materials must remain within the demarcated boundaries.
Spillage of hazardous substances	Site Manager(Operation)	All oils, fuel and other maintenance equipment and

		<p>supplies must be stored in a secure area offsite with a compacted surface.</p> <p>Spill kits must be kept on-site and maintained.</p> <p>All hazardous material must be stored more than 50m away from any water course.</p> <p>Vehicles must be maintained to an acceptable standard to prevent any fuel, oil or lubricant leaks etc).</p>
Dust control	Site manager(Operation)	<p>Only take place during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighboring areas.</p> <p>A speed limit of 30km/h must not be exceeded on dirt roads.</p> <p>Any complaints or claims emanating from dust issues must be attended to immediately.</p> <p>During windy periods un-surfaced and un-vegetated areas should be dampened</p>
Noise	Site manager(Operation)	<p>Movement of heavy machinery should be limited to normal working hours (7 AM to 5 PM).</p> <p>Ensure there is a facility for nearby residents to make complaints. These must be addressed and recorded.</p>
Waste management	Site manager(Operation)	<p>Sufficient waste containers must be available.</p> <p>No waste must be buried or burned on site.</p> <p>Waste must be collected on a regular basis and disposed of at</p>

		a licensed landfill site.
Final rehabilitation and decommissioning	Decommissioning and Closure	<p>Any remaining sand stockpiles must be removed or levelled.</p> <p>Site clean-up must be done. Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a registered landfill site. It will not be permitted to be buried or burned on the site.</p> <p>Mined out areas must be stabilised and profiled (if necessary).</p> <p>The post rehabilitation topography should result in the same slope as prior to mining.</p> <p>Weeds/alien plants growing on site must be manually removed and deposited at a registered landfill site.</p> <p>All equipment and other items used during the mining period must be removed from site.</p> <p>At closure the internal haul road must be left in a good and non-eroded state (as it was prior to mining activities).</p> <p>Rehabilitation must be completed in such a manner that the land can be optimally used post-mining.</p> <p>Final rehabilitation shall be completed within a period specified by the Regional Manager.</p>

Closure	Site Manager (Decommissioning and Closure)	<p>Closure must comply with the MPRDA (Act 28 of 2002), NEMA (Act 107 of 1998) and the NEMA Regulations (2017) requirements for mine closure.</p> <p>The closed site must pose no safety risks.</p> <p>A closure plan must be compiled using the guidelines described in Appendix 5 of the NEMA Regulations (2017) and submitted to DMR.</p> <p>A closure certificate must be obtained from the Minister of Mineral Resources.</p>
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n) Aspects for inclusion as conditions of Authorisation.

Any aspects which must be made conditions of the Environmental Authorisation

The following aspects are proposed to be included as conditions in the Environmental Authorisation:

- Vegetation clearing should be restricted to the footprint of the site under construction as far as
- Possible;
- All construction areas should be demarcated prior to construction, to ensure that the footprint of the impacts is limited;
- Movement of construction vehicles and workers is to be restricted from areas outside of the boundaries of the demarcated construction areas;
- The construction staff should be educated about the value of environmental sensitivity;
- Stockpiling of topsoil should be according to the ECO recommendations;
- Should a grave or any other historically significant feature be identified in the construction footprint, the feature may not be removed and a heritage specialist must be contacted immediately;
- Appropriate dust abatement measures must be implemented in areas where required;
- A network of dustfall monitoring units should be installed for monitoring during the construction and operational periods for unpaved roads;

- A spraying programme should be instituted on the construction sites and unpaved roads used by construction vehicles;
- Invasive or exotic plant species should not be allowed to establish during and after the construction phase and
- It is imperative that an effective management plan is implemented to ensure that all mitigation measures discussed in the report are adhered to. The project proposal will be permissible if all the conditions, mitigation measures and environmental impact regulations are implemented.
- The Contractor shall nominate a suitably qualified staff member as Environmental Control Officer (ECO) to supervise the site and to ensure that all the suggested mitigation measures are implemented.
- The contractor must appoint an environmental control officer who will be responsible for monitoring, reviewing and verifying compliance with the EMP (submitted to the engineer) by the Contractor and to ensure that the conditions of the environmental assessment mitigation are abided with. He/she will verify that environmental impacts are kept to a minimum and assist the Contractor in finding environmentally responsible solutions to problem.

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 related to the assessment and mitigation measures proposed, stem from site specific information gathered from the applicant, local community, 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 authorized or not.

A mining permit will ensure that the sand mined legally and provisions will be made for the rehabilitation of the disturbed area after sand mining has been completed. The applicant is applying for a mining permit and it will be a small scale operation.

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 from continuing.

ii) Conditions that must be included in the authorisation

The management objectives listed in this report under m) should be considered for inclusion in the environmental authorisation.

The EMPr of this proposed project must form part of the contractual agreement and be adhered to by both the contractors and the applicant. The applicant must also ascertain that there is representation of the applicant on site, at all times of the project, ensuring compliance with the conditions of the EMPr.

Collection of fire wood will not be allowed except for those authorized by DAFF that would be recommended to be donated to nearest local community.

Speed limits must be maintained on gravel roads

q) Period for which the Environmental Authorisation is required.

The proposed sand mine will have a period of approximately two (2) years. The usual period for

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 is provided at the end of the EMPr.

s) Financial Provision

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

The closure liability was calculated at R 31 812.00 .The financial provision for the mining operations was determined based on information currently available. An assessment was conducted of all the activities taking place on site that fall within the properties associated to the mining permit application. R 31 812.00 (including VAT) for the biophysical components associated with the current activities.

i) Explain how the aforesaid amount was derived.

The amount was calculated according to the methodology in the Guideline Documents for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mineas published by the DMR.

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

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

It is confirmed that this amount can be provided for from the operating expenditure. Closure liability for Heath farm sand pit will be funded from. Please refer to Appendix 6: Financial and Technical Competence

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 proposed mining is within private landowner, sand mining operation is normally a short to medium term in duration, creating job opportunity, contributes to improve building infrastructures and local economy.

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

There is no significant heritage resources present on the site and significant impacts are thus not expected.

u) Other matters required in terms of sections 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).

Alternatives considered for the proposed sand mining is limited to an alternative alignment for the mine. The reason for this is that the mining permit will be obtained for the sole purpose of mining sand as in this report.

The mining method to be excavating an open cast (truck and shovel) was assessed for the mine, and no alternatives were considered as part of the application process. Sand will be transported by truck and drove away from the site.

PART B:

8. ENVIRONMENTAL MANAGEMENT PROGRAMME

1) Draft environmental management programme.

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

Details of the EAP are included in Part A of this report. CV's are attached in Appendix 1.

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

The aspects of the activity are covered by the Environmental management programme in Part A of this report.

c) **Composite Map**

(Provide a map (Attached as an Appendix 2) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers)

Please refer to appendix 2.

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 overall goal for closure of the 4.94ha sand mining site is to shape the excavations to avoid damming of water, ensuring that the land is stable and safe in the long-term. For post closure, the opencast will be shaped and rehabilitated and proposed future use after mining will be grazing area.

The closure will involve removal of all machinery/equipment from site. All material stockpiles will be removed from the site or levelled. Since no vegetation or topsoil will be stored at the site, the site will not be seeded. All alien vegetation will be removed, if any establish.

All material stockpiles will be removed from the site or levelled. Since no vegetation or topsoil will be stored at the site, the site will not be seeded. Available alien species will be removed, if any establish.

The applicant will comply with the minimum closure objectives as prescribed by DMR and detailed below.

Closure:

In compliance to GN R. 1147 of 20 November 2015, a number of closure objectives have been determined. The closure objectives, identified in the river sand Mine Rehabilitation and Closure and which will drive the closure criteria and which have been developed to support the closure vision are:

- Haul roads: Dependent of future landholder desires. Planned to be ripped and rehabilitated to grasslands
- Any remaining sand stockpiles must be removed or levelled.
- Site clean-up must be done.
- No erosion must be allowed on the mine site or haul road.
- Waste material of any description, including receptacles, scrap, rubble, etc. must be removed from the mining area and disposed of at a registered landfill site. It will not be permitted to be buried or burned on site.
- Mined out areas must be stabilized and profiled (if necessary).
- The post rehabilitation topography should result in the same slope as prior to mining.
- Weeds/alien plants growing on site must be manually removed and deposited at a registered landfill site.
- All equipment and other items used during the mining period must be removed from site.
- At closure the internal haul road must be left in a good and non-eroded state (as it was prior to mining activities).
- The closed site must pose no safety risks.
- Rehabilitation must be completed in such a manner that the land can be optimally used post-mining.
- Closure must comply with the MPRDA (Act 28 of 2002), NEMA (Act 107 of 1998) and the NEMA Regulations (2017) requirements for mine closure.

- A closure plan must be compiled using the guidelines described in Appendix 5 of the NEMA Regulations (2017) and submitted to DMR.
- A closure certificate must be obtained from the Minister of Mineral Resources.

Environmental Management Approach

Globally, there are a number of tools or guideline documents available to assist or describe environmental management. The purpose of an EMP (Part B of this report) is to describe the process of managing the identified potential environmental impacts or risks described in Part A of this report (EIR) throughout the entire life cycle (from design, to implementation, operation, and decommissioning) of the proposed river sand mining project. The IEM (Integrated Environmental Management) tool used for managing the identified environmental impacts by the EAP in this document is the Environmental Management System (EMS). This approach will assist the river sand mining project to achieve continual improvement in environmental performance.

The EMP in essence will be adopting the approach of the internationally recognised ISO 14001 Environmental Management System (EMS) standard that is essentially based on the Deming Cycle rationale which is a simplified continuous improvement model consisting of four main iterative steps. These steps are described as follows:

- Plan – Establish objectives and processes necessary to deliver results in accordance with the developed organisational environmental policy.
- Do – Implement the process.
- Check – Monitor and measure processes against environmental policy, objectives, legal and other requirements and report the results.
- Act – Take action to continually improve environmental performance.

Continual improvement is achieved by periodically monitoring and reviewing the EMP and the subsequent implementation of corrective actions when required. Therefore this document should be considered as a living document which should be continuously updated and possibly improved. This approach taken in the development of the EMP is in line with the requirements stipulated in GN R. 327 (2017 EIA regulations).

ii) Volumes and rate of water use required for the operation.

Water will be used for dust suppression. No sand washing activities will be required for this proposed operation. Sand will be mined, stockpiled and sold as building sand, no sand washing required.

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

No water use licence required: The proposed sand mine will not extract water from a water source as no sand washing will be required.

iv) Impacts to be mitigated in their respective phases

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

ACTIVITIES	PHASE	SIZE AND SCALE of Disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
<p>(E.g. For prospecting - site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route e.t.c.</p> <p>E.g. For mining, excavations, stockpiles, Loading, hauling and transport, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)</p>	<p>(Of operation in which activity will take place. State; Planning and design, Pre Construction, Construction, Operational, Rehabilitation, Closure, Post closure).</p>	<p>(volumes, tonnages and hectares or m²)</p>	<p>(Describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)</p>	<p>(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)</p>	<p>Describe the time period when the measures in the environmental management programme must be implemented</p> <p>Measures must be implemented when required.</p> <p>With regard to Rehabilitation Specifically this must take place at the earliest opportunity.</p> <p>With regards to Rehabilitation, therefore state either:-...</p> <p>Upon cessation of the individual activity or.</p> <p>Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the</p>

					case may be.
Haul Road	Operational	4.94ha	<ul style="list-style-type: none"> • Dust suppression • Minimisation of vehicle movement • Monitoring of dust fall to determine if measures are effective 	Conduct dust suppression techniques to ensure that applicable standards for PM ₁₀ and PM _{2.5} are not exceeded.	During construction
			<ul style="list-style-type: none"> • Restrict the disturbed area • Restrict spillage from haulage vehicles • Removal of all utilizable soil and storage of the same • Implement of storm water management measures • Treat contaminated soils 	Meet rehabilitation standards/objectives	During construction
Vegetation of clearance for establishment of proposed mine site.	Operational	4.94ha	<ul style="list-style-type: none"> • Access tracks will be located in areas that will result in minimal ground disturbance. • Concurrent rehabilitation • Indigenous vegetation for 	Concurrent rehabilitation in line with sustainable development practices	During site establishment

			rehabilitation		
Vegetation clearance for establishment of proposed mine site. (Topsoil stockpile and Product stockpile)	Operational	4.94ha	<ul style="list-style-type: none"> • During the planning phase, specific controls will be identified and implemented, based on site conditions. • Concurrent rehabilitation • Berms will be graded to shape and profile the open cast opencast to ensure that water will be free draining. 	Sand mining and excavations stipulated in Mine Plan	During mining operations
Dust	Operational	4.94.ha	<ul style="list-style-type: none"> • Concurrent rehabilitation • Dust fall monitoring programme will be implemented • Topsoil will be covered with vegetation • Opencast area will be below surface area, berms to be vegetated. 	National Dust Control Regulations GN 827 (2013)	During mining operations

			<ul style="list-style-type: none"> The sand particles are bigger and less likely to be picked up by wind than small clay particles. 		
Vegetation clearance, Site establishment , sand mining activities & movement of people and equipment on site	Operational	4.94ha	<ul style="list-style-type: none"> No heritage resources identified onsite Should any heritage resource be uncovered during excavations it must immediately be reported to SAHRA 	Avoidance in line with National Heritage Resources Act (No. 25 of 1999)	Prior to mine site establishment
Fire control	Operational	4.94ha	<ul style="list-style-type: none"> Vegetation around proposed site will be kept short to create a fire management zone. Open fire will be prohibited to people involved in mining. No burning cigarettes or matches may be thrown down within mining area. Collection of fire 	National Veldfire and Forest Act (101 of 1998)	During mining activity

			<p>wood will not be allowed.</p> <ul style="list-style-type: none"> • Rubbish or vegetation may under no circumstances be burnt. • Training of staff will include awareness regarding the rules of the site. 		
Induction to the workers	Operational	4.94ha	<ul style="list-style-type: none"> • Aids awareness talks • No employees will be permitted to stay on site • Environmental education awareness 		During mining activity
Use of heavymachinery & vehicles on site for sand mining MaintainVehicles	Operational	4.94ha	Vehicles and equipment to be serviced regularly and maintained in good working condition	Maintenance of vehicles and equipment in line with responsible environmental management practice	During mining activity
Use of heavymachinery & vehicles	Operational	4.94ha	<ul style="list-style-type: none"> • No chemicals, fuels and oils to be stored on site • Precautions will be taken to prevent 	Prevention of soil pollution in line with Regulation 70 of GN 527	For duration of mining activities on site.

			spills and soil contamination, by maintaining vehicles. <ul style="list-style-type: none"> Any contaminated soil will be collected and disposed of to an approved landfill site. 		
Use of heavy machinery & vehicles on site for sand mining – Prevent spills	Operational	4.94ha	<ul style="list-style-type: none"> Run-off from the mining area will be contained by berms Any run-off will be diverted from entering the opencast with a berm Any contaminated soil will be cleaned and disposed of to an approved landfill site. 	NEMA EIA regulation 2017	For duration of mining activities on site
Use of heavy machinery & vehicles on site for sand mining - Clean up spills	Operational	4.94ha	<ul style="list-style-type: none"> No vehicle will be extensively repaired on site. Material Safety Data Sheets for the item(s) spilled will be consulted for information 	Prevention of groundwater pollution in line with National Water Act (36 of 1998)	For duration of mining activities on site

			<p>concerning clean-up requirements to ensure correct clean-up procedure.</p> <ul style="list-style-type: none"> Any contaminated soil will be collected and disposed of to an approved landfill site. 		
Use of heavymachinery & vehicles on site for sand mining–Soil compaction	Operational	4.94ha	<ul style="list-style-type: none"> Stay on predefined areas and routes. Scarify access roads and stockpile areas to a depth of 500 mm and restore topsoil cover. Re-seed or plant vegetation indigenous to the area. 	Concurrent rehabilitation in line with sustainable development practices	Concurrently on completion of mining activities at mine site
Use of heavy machinery & vehicles on site for sand mining – Remain on road	Operational	4.94ha	<ul style="list-style-type: none"> Vehicles will only stay on dedicated roads. No movement of heavy machinery outside dedicated routes. 	Concurrent rehabilitation in line with sustainable developmentpractices	Concurrently on completion of mining activities at mine site
Use of heavymachinery & vehicles on site for sand mining	Operational	4.94ha	<ul style="list-style-type: none"> Vehicles and equipment will be maintained in a good working order. 	Maintenance of vehicles and equipment in line with responsible environmental management practice	For duration of mining activities on site

Dust control	Operational	4.94ha	<ul style="list-style-type: none"> • Speed limits on gravel roads will be 30 km/hr to minimize dust and noise generation. • Dust will be effectively controlled in all disturbed areas • Dust fall monitoring programme will be implemented 	National Dust Control Regulations GN 827 (2013)	During mine site establishment & mining operations
Noise impact	Operational	4.94ha	<ul style="list-style-type: none"> • Speed limits on gravel roads will be 30 km/hr to minimise dust and noise generation. • Mining activities will be restricted to day light hours and only 5 working week days. No activities on weekends or at night • Noise monitoring to ensure compliance with noise regulations will be implemented 	Noise Standards- SANS 10103:2008	For duration of mining activities on site
Visual impact	Operational	4.94ha	<ul style="list-style-type: none"> • A specific mining area will be identified and mined at a time • Concurrent rehabilitation 		For duration of mining activities on site

			<ul style="list-style-type: none"> • One excavator or one front-end loader will be used and one truck onsite during mining • Excavation will be reshaped 		
Management animals	Operational	4.94ha	<ul style="list-style-type: none"> • Mining activities will be fenced to prevent access of animals to mining area • Concurrent rehabilitation. • Indigenous vegetation will be used for rehabilitation 	Mining activities stipulated in mine Work Programme	During mining operations.
Use of heavy machinery & vehicles on site for sand mining (Water impact)	Operational	4.94ha	Sand will not be mined deeper than 3meters	Responsible use of groundwaterresources in line with Regulation 68 of GN 527 (2004) and with the National Water Act (36 of 1998)	For duration of mining activities on site
Rehabilitation (Weed control)	Operational	4.94ha	Concurrent rehabilitation will be done with indigenous vegetation	Prevention of proliferation of invasive plant species in line with National Environmental	For duration of mining activities on site
Management of neighbours	Operational	4.94ha	Complaints and outcomes of subsequent investigations will be recorded in a Complaints Register kept by the mining manager or site		For duration of mining activities on site

			supervisor.		
CLOSURE					
Concurrent rehabilitation	Closure	4.94ha	<ul style="list-style-type: none"> • Remaining refuse and waste materials will be removed from the site following the completion of the mine programme. Such waste will be disposed of to an approved landfill. • Erosion and sediment controls as well as the disturbed area will be rehabilitated • An inspection on whether there is evidence of weeds or pest invasion as a result of mining activities will be undertaken and appropriate remediation actions will be implemented as required. 	Concurrent rehabilitation in line with sustainable development practices	During mining operations and after site has been rehabilitated
Concurrent rehabilitation. Shaping excavations	Closure	4.94ha	Reshaping excavations.	Re-shape excavations in line with sustainable management principles	For duration of mining activities on site and during rehabilitation

e) Impact Management Outcomes

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

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
(Whether listed or not listed). (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)		In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post closure	(modify, remedy, control, or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. Etc.) E.g. <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring • Remedy through rehabilitation 	(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
Vegetation clearance for establishment of proposed mine site.	Removal of / damage to natural vegetation	Vegetation	Operational	Control through limiting area. Revegetation encouraged during spring.	Rehabilitate impacted area to be in line with current land use

Construction of a wide Haul Road	Dust pollution	Air quality	Construction	<ul style="list-style-type: none"> • Control through dust suppression • Control through minimisation of vehicle movement • Control through monitoring of dustfall to determine if measures are effective. 	Conduct dust suppression techniques to ensure that applicable standards for PM10 and PM2.5 are not exceeded
Vegetation clearance for establishment of proposed mine site. (Dust)	Air quality impact (Dust)	Air Quality	Operational	Control through dust suppression and management options	Dust suppression and management options to ensure dust fall out is below thresholds stipulated in Dust Control Regulations
Vegetation clearance for establishment of proposed mine site. (Create berms)	Storm water run-off from cleared areas could lead to siltation of surface water.	Surface Water	Operational	Control through implementation of sediment and erosion controls	Implementation of sediment controls in line with GN 704 and National Water Act (36 of 1998)
Management of Animals –No Poaching	Poaching	Fauna	Operational	Control through supervision, training and operational hours on site	No loss of cattle and/ or wildlife

Fire control	Fire	Social and Economic & Ecology Environment	Operational	Avoid through Training, Code of Conduct & Control through Fire Breaks	No fires
Prevent collection of firewood	Collection of fire wood	Vegetation	Operational	Control through supervision, training and operational hours on site	No complaints from land owners, no collection of fire wood
Use of heavy machinery & vehicles on site for sand mining- Maintain vehicles	Resources consumption (Diesel-Non-renewable)	Fossil fuels	Operational	Control through maintenance	Well maintained equipment & vehicles (annually)
Use of heavy machinery & vehicles on site for sand mining (Noise)	Increase in ambient noise Levels	Social and Economic Environment	Operational	Control through speed limit & operational times	Ambient noise levels to be below thresholds stipulated in SANS 10103:2008 for sub-urban sound environment.
Use of heavy machinery & vehicles on site for sand mining (Visual)	Visual intrusion	Social and Economic Environment	Operational	Control through clearly demarcating mining area	No complaints from land owners.
			Operational		
Excavation sand mining	Dust pollution	Air quality	Operational	<ul style="list-style-type: none"> Control through dust suppression Control through minimisation of vehicle movement 	Conduct dust suppression techniques to ensure that applicable standards for PM ₁₀ and

				<ul style="list-style-type: none"> Control through monitoring of dustfall to determine if measures are effective. 	PM _{2.5} are not exceeded
	Soil erosion, Compaction and contamination	Soil	Operational	<ul style="list-style-type: none"> Prevent through restricting the disturbed area Prevent through restricting spillage from haulage vehicles Control through removal of all utilisable soil and storage of the same Control through implementation of storm water management measures Remedy through treatment of contaminated soils 	Rehabilitation standards/objectives
	Loss of Vegetation	Vegetation	Operational	<ul style="list-style-type: none"> Modify by vegetating soil stockpiles 	Rehabilitation standards/objectives
	Visual impact	Visual receptors	Operational	<ul style="list-style-type: none"> Avoid/prevent leaving any building material or waste onsite 	Rehabilitation standards/objectives
	Social impact	<ul style="list-style-type: none"> Noise and visual Health, 	Operational	<ul style="list-style-type: none"> Control through appropriate management measures; 	Objectives of Social & Labour Plan

		safety and security		<ul style="list-style-type: none"> • Prevent through HSEC management measures 	
Clearing of vegetation within the footprint of the topsoil stockpile and the proposed sand mining	• Dust pollution	Air quality	Operational	<ul style="list-style-type: none"> • Control through dust suppression • Control through minimisation of vehicle movement • Control through monitoring of dustfall to determine if measures are effective 	Conduct dust suppression techniques to ensure that applicable standards for PM ₁₀ and PM _{2.5} are not exceeded
	Soil erosion, Compaction and contamination	Soil	Operational	<ul style="list-style-type: none"> • Prevent through restricting the disturbed area • Prevent through restricting spillage from haulage vehicles • Control through removal of all utilisable soil and storage of the same. • Control through implementation of storm water management Measures • Remedy through treatment of contaminated soils 	Rehabilitation standards/objectives
	Loss of	Vegetation	Operational	<ul style="list-style-type: none"> • Control through restricting 	Rehabilitation

	vegetation			the footprint to be cleared	standards/objectives
	Visual impact	Visual receptors	Operational	Avoid/prevent leaving any building material or waste on site	Rehabilitation standards/objectives
	Heritage	Archaeological or heritage features	Operational	<ul style="list-style-type: none"> Prevent through reporting and evaluation of any archaeological or heritage features found 	Impact avoided
	Social impact	<ul style="list-style-type: none"> Noise and visual Health, safety and security 	Operational	<ul style="list-style-type: none"> Control through appropriate management measures; Prevent through HSEC management measures 	Objectives of Social & Labour Plan
Excavation (Mining)	Dust pollution	Air quality	Operational	<ul style="list-style-type: none"> Control through dust suppression Control through minimisation of vehicle movement Control through monitoring of dustfall to determine if measures are effective 	Conduct dust suppression techniques to ensure that applicable standards for PM ₁₀ and PM _{2.5} are not exceeded
	Soil erosion, Compaction and contamination	Soil		<ul style="list-style-type: none"> Prevent through restricting the disturbed area Prevent through restricting spillage from haulage vehicles Control through removal 	Rehabilitation standards/objectives

				of all utilisable soil and storage of the same <ul style="list-style-type: none"> • Control through implementation of storm water management measures • Remedy through treatment of contaminated soils 	
Closure					
Concurrent rehabilitation	Reducing soil compaction of disturbed area and access roads to improve drainage and control erosion	Land Use & Land Capability	Closure	Remedy through concurrent rehabilitation	Rehabilitate impacted area to be in line with current land use
Concurrent rehabilitation. Shaping excavations	Restoration of land use and land capability	Land Use & Land Capability	Closure	Control through levelling and /or shaping excavations to prevent damming	Reshape excavations

f) Impact Management Actions

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

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
Whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, accommodation, offices, ablution, stores, workshops, control, berms, roads, etc...etc...etc.).	(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, Groundwater contamination, air pollution etc....etc...)	(modify, remedy, control, or stop) through (e.g. noise control measures, stormwater 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.	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	(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 authority.

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
			diamond prospecting as the case may be.	
Vegetation clearance for establishment of proposed mine site.	Removal of / damage to natural vegetation	Control through limiting area. Revegetation encouraged during spring.	During site establishment	Concurrent rehabilitation in line with sustainable development practices
Vegetation clearance for establishment of proposed mine site. (Dust)	Air quality impact (Dust)	Control through dust suppression and management options	During mine site establishment & mine operations	National Dust Control Regulations GN 827 (2013)

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
Hauling and transport of during operations	Dust pollution	<ul style="list-style-type: none"> Control through dust suppression Control through minimisation of vehicle movement Control through monitoring of dustfall to determine if measures are effective. 	During mine site establishment & mine operations	Conduct dust suppression techniques to ensure that applicable standards for PM10 and PM2.5 are not exceeded
Vegetation clearance for establishment of proposed mine site. (Biodiversity impact)	Permanently alter biodiversity areas (ecological support area)	Avoid through identification of areas and remedied through rehabilitation as required	Prior to mine site establishment	Avoidance in line with National Biodiversity Act (10 of 2004)
Vegetation clearance for establishment of proposed mine site. (Dust)	Air quality impact (Dust)	Control through dust suppression and management options	During mine site establishment & mine operations	National Dust Control Regulations GN 827 (2013)
Vegetation clearance for establishment of proposed mine site. (Create berms)	Storm water run-off from cleared areas could lead to siltation of surface water	Control through implementation of sediment and erosion	Control through implementation of sediment and	Implementation of sediment controls in line with GN 704 and National Water Act (36

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		controls	erosion controls	of 1998)
Waste management	Contamination of soils through spills from sanitation facilities & litter	Control through placement of facility and regular maintenance. Collection and safe disposal of waste	For duration of mining activities on site	Waste collection and disposal in terms of Regulation 69 of GN 527 of 2004 of National Environmental Management: Waste Act (59 of 2008)
Faunal Species-No poaching	Poaching	Control through supervision, training and operational hours on site	For duration of mining activities on site	No poaching in line with Animals Protection Act (No. 71 of 1962)
Fire control	Fire	Avoid through Training, Code of Conduct & Control through Fire Breaks	For duration of mining activities on site	Fire prevention in line with Regulation 65 of GN 527 (2004) and National Veld and Forest Fire Act (Act no 101 of 1998)
Prevent fire wood collection	Collection of firewood	Control supervision through supervision, training and operational	For duration of mining activities on site	Conditions stipulated in Access Agreement

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		hours on site.		
Employment	Contribution to the economy through employment	Employment of local people and businesses where possible	For duration of mining activities on site	Contractual agreements between the service provider and the applicant
Employees induction	Spread of HIV/Aids to farm workers and local community	Control through awareness	For duration of mining activities on site	National Strategic Plan on HIV, STIs and TB 2012-2016
Traffic impact	Workers travel to site- traffic impact.	Control through speed limit on gravel road	For duration of mining activities on site	
Use of heavy machinery & vehicles on site for sand mining - Maintain vehicles	Resource consumption (diesel - non-renewable resource)	Control through maintenance	For duration of mining activities on site	Maintenance of vehicles and equipment in line with responsible environmental management practice
Use of heavy machinery & vehicles on site for sand mining–no storage of chemicals	Contamination of soils through hydrocarbon leaks and spills from machinery & equipment.	Avoid through engineering controls. Remedy through clean-up	For duration of mining activities on site	Prevention of soil pollution in line with Regulation 70 of GN 527 (2004)

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
Use of heavy machinery & vehicles on site for sand mining - Clean upspills	Contamination of groundwater through hydrocarbon leaks and spills from machinery & equipment	Avoidance through engineering controls and clean-up	For duration of mining activities on site	Prevention of groundwater pollution in line with National Water Act (36 of 1998)
Use of heavy machinery & vehicles on site for sand mining – Soil compaction	Compaction of soils through movement of heavy vehicles and machinery on site	Avoid through limiting area. Remedy through concurrent rehabilitation	Concurrently on completion of mining activities at mine site	Concurrent rehabilitation in line with sustainable development practices
Use of heavy machinery & vehicles on site for sand mining	Release of gaseous emissions	Control through maintenance	For duration of mining activities onsite	Maintenance of vehicles and equipment in line with responsible environmental management practice
Dust	Dust fallout	Control through speed limit & dust suppression	During mine site establishment & mining operations	National Dust Control Regulations GN 827 (2013)
Use of heavy machinery & vehicles main gravel road(Dust)	Dust nuisance - use of gravel roads	Control through speed limit	For duration of mining activities on site	National Dust Control Regulations GN 827 (2013)
Road impact	Damage gravel roads	Control through speed	For duration of	

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		limit and maintenance of gravel road	mining activities on site	
Noise	Increase in ambient noise levels	Control through speed limit & operational times	For duration of mining activities on site	Noise Standards- SANS10103:2008
Faunal species	Disturbance of fauna species in the vicinity	Remedy through concurrent rehabilitation	During mining operations	Mining activities stipulated in mine Work Programme
Closure				
Concurrent rehabilitation	Reducing soil compaction of disturbed area and access roads to improve drainage and control erosion	Remedy through concurrent rehabilitation	During mining operations and after site has been rehabilitated	Concurrent rehabilitation in line with sustainable development practices
Concurrent rehabilitation. Shaping excavations	Restoration of land use and land capability	Control through leveling and /or shaping excavations to prevent damming	For duration of mining activities on site and during rehabilitation	Re-shape excavations in line with sustainable management principles.

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.

Indigenous trees and grasses will be sown in the area as part of the rehabilitation. Mafoko Brothers will rehabilitate areas impacted on by its prospecting activities to allow the land use to return to livestock grazing

The closure objectives and rehabilitation measures for the excavation will include the following:

- The main closure objective of the contractor's planned prospecting operation is to restore the site.
- To prevent the sterilization of any ore reserves.
- To manage and limit the impact to the surface and groundwater aquifers in such a way that an acceptable water quality and yield can still be obtained, when a closure certificate is issued.
- The prospecting operation also has the objective to establish a stable and self-sustainable vegetation cover in areas affected by the prospecting activities.
- To limit and rehabilitate any erosion features caused by the prospecting activities and prevent any permanent impact to the soil capability thereof.
- To limit and manage the visual impact of the prospecting activities.
- To safeguard the safety and health of humans and animals on the site.
- To close the mining operation efficiently, cost effectively and in accordance with Government Policy.
- The closure objectives are to minimise disturbance wherever possible so that normal land use can continue after closure.

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

The applicant is the landowner, as the proposed land use was for grazing however I&AP's have been communicated.

(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.

During rehabilitation, the topography would be finished off so that the sides of the mine area are no steeper than 1:5. The slope changes should be finished off so that flowing curves that blend with the surrounding landscape and hill are formed in preference to sharp angles. Unused boulders would be placed back in the deepest areas of the excavated area and the topsoil and vegetation stripped during site clearance would be spread evenly across the mining area. Introduction of seed of species such as *Sporobolus fimbriatus* (dropseed grass) and *Eriocephalusericoides* (kapokbos) should also be considered. The site will be re-vegetated as follows:

Re-vegetation

Contractor shall appoint a suitably experienced Landscaping Contractor/Horticulturist who is familiar with the local vegetation. The Landscaping Contractor/Horticulturist shall compile a vegetation rehabilitation plan that shall detail search and rescue, seed collection, seed mixing, seeding methods, planting and vegetation establishment in open cast mine. For very disturbed areas, the soil can be reseeded with a commercially available reseed mixture.

The vegetation rehabilitation plan shall include the following:

- Seed requirements, harvesting methods and locations, seed storage methods;
- Search and rescue;
- Handling of plant material rescued (translocation areas, propagation, etc.);
- Establishment and maintenance of a project-specific nursery, if required;
- Topsoil, mulch, fertilizer, soil stabilizer and irrigation requirements and application;
- Landscaping and revegetation methods for each area, i.e. hydroseeding / hydromulching, planting, including locations and timing;
- Procurement requirements and a list of species of plants to be procured, if any;
- Vegetation establishment and maintenance requirements (irrigation, etc.) for all re-vegetated areas; and
- The use of any herbicides, pesticides and other poisonous substances, if required.

The following general recommendations for rehabilitation should be considered by the appointed horticulturist:

- Proposed site should be fenced off to exclude grazing and allow for seed production for as long as possible for the start of sand activities;
- Stripped topsoil should be evenly spread across disturbed areas after decommissioning;
- Branches rocks or any other coarse organic material should be scattered over the area to create favorable microclimates for seed germination and seedling establishment;
- Reseeding of cleared areas should take place during autumn or spring when temperatures are not too high and the probability for rainfall is high;
- Rehabilitated areas should be protected from grazing for at least 12 to 18 months to allow for proper re-vegetation;

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

Closure happens only when the mining process ceases. This is the stage wherein the area will be cleared of any machines, chemical toilets, waste bins to make way for the rehabilitation stage. The main objective of rehabilitation after mining process is to ensure that the disturbed area is back at the state it was before any mining activity.

All the stockpile materials (soil, rocks) will be put back into the open opencasts. These will be done using the very same front end-loader to push back all stockpiles into the opencasts. Other foreign soil materials will be brought into the site to ensure that the opencasts are fully covered.

The end-result of the rehabilitation process will be to take the mined area back to its original state/condition before mining. When all the opencasts are backfilled, indigenous vegetation will be introduced to these sites to stabilise the soil and prevent erosion by wind and water. The main closure objective will be to get the area back to its before mined state. When the disturbed areas are fully vegetated and soil in the stability state that is when the project is deemed closed.

Closure objectives:

- The main closure objective of the contractor 's planned prospecting operation is to restore the site to its current land capability in a sustainable manner.
- To prevent the sterilization of any ore reserves.
- To manage and limit the impact to the surface and groundwater aquifers in such a way that an acceptable water quality and yield can still be obtained, when a closure certificate is issued.
- The prospecting operation also has the objective to establish a stable and self-sustainable vegetation cover in areas affected by the prospecting activities.
- To limit and rehabilitate any erosion features caused by the prospecting activities and prevent any permanent impact to the soil capability thereof.
- To limit and manage the visual impact of the prospecting activities.
- To safeguard the safety and health of humans and animals on the site.
- To close the mining operation efficiently, cost effectively and in accordance with Government Policy.

Long term stability and safety:

It will be the objective of prospecting management to ensure the long term stability of all rehabilitated areas including the backfilled excavations. This will be done by the monitoring of all areas until a closure certificate has been issued. Final rehabilitation in respect of erosion and dust control self-sustaining vegetation will result in the control of erosion and dust and no further rehabilitation is planned.

Rehabilitation of dangerous excavations

Due to excavating sand will be created that can be classified as dangerous. All available material will be used during backfilling to avoid the existence of dangerous open excavations.

- Maintenance after closure will mainly concern the regular inspection and monitoring and/or completion of the re-vegetation programme. The aim of this Environmental Management Plan is for rehabilitation to be stable and self-sufficient, so that the least possible aftercare is required. The aim with the closure of the prospecting operation will be to create an acceptable post-prospecting environment and land-use.

One of the main aims of any rehabilitated ground will be to obtain a self-sustaining and stable end result. As the open excavations will be backfilled these areas will have long term stability. The closure plan will assist the holder of the licence to achieve the following objectives:

- protect and enhance the reputation of the client as a responsible corporate citizen;
- ensure shareholder value is preserved;
- establish the client management accountability and ownership of closure activity;
- ensure that stakeholders' needs, concerns and aspirations are taken into account when considering closure;
- comply with relevant or applicable legislative requirements;
- ensure the health, safety and welfare of all humans and animals are safeguarded from hazards resulting from mining operations that have been terminated;
- limit or mitigate adverse environmental effects to an extent that it is acceptable by all parties;
- mitigate socio-economic impacts in relation to a particular area in which an operation is located following decommissioning and subsequent closure as far as reasonably possible;
- help protect indigenous values;
- provide a reasonable basis on which the financial consequences of closure can be estimated, recognised and managed including any tax consequences so that mines are closed efficiently and cost effectively;
- avoid or minimise costs and long term liabilities to the company and to the government and public;

- ensure land is rehabilitated to, as far as is practicable, its natural state, or to a predetermined and agreed standard or land use which conforms with the concept of sustainable development;
- Ensure investment decisions include appropriate consideration of closure, including both quantitative and qualitative impacts of closure.

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

Please refer to Quantum calculation appendix 5.

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

The financial provision will be provided as determined.

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) Mechanism for monitoring compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Vegetation clearance for establishment of proposed mine site.	Removal of / damage to natural vegetation	Visual checks indigenous vegetation removed and kept for rehabilitation	Site supervisor	Annual Performance Assessment & Reporting Application for Closure Certificate
Vegetation clearance for establishment of proposed mine site. (Biodiversity impact)	Permanently alter biodiversity areas (ecological support area)	Remove indigenous grassland vegetation and keep for rehabilitation	Site supervisor	Annual Performance Assessment & Reporting
Dust	Air Quality impact (dust)	Dust suppression and management options-dry season; Dust fall-out bucket	Site supervisor	Annual Performance Assessment & Reporting
Waste management	Contamination of soils through spills from sanitation facilities & litter	Regular maintenance of chemical toilets. Replacement if required. Collection and disposal of waste	Site supervisor	Annual Performance Assessment & Reporting

No Poaching	Poaching	Daily attendance checks and Register	Site supervisor	Annual Performance Assessment & Reporting
Fire control	Fire	Visual checks to ensure fire breaks is in place and Code of Conduct is adhered to	Site supervisor	Annual Performance Assessment & Reporting
Prevent collection of Fire wood	Collection of fire wood	Complaints register & daily attendance register	Site supervisor	
Employment	Contribution to the economy through employment	Contractual agreement	Site supervisor	Invoicing Annual Performance Assessment & Reporting
Induction/training	Spread of HIV/Aids to farm workers and local community	Toolbox talks	Site supervisor	Annual Performance Assessment & Reporting
Use of heavy machinery & vehicles on site for sand mining Maintain vehicles	Resource consumption (diesel-non-renewable resource)	Maintenance records	Site supervisor	Annual Performance Assessment & Reporting
Use of heavy machinery & vehicles on site for sand mining-No storage of chemicals	Contamination of soils through hydrocarbon leaks and spills from machinery & equipment	No storage areas. Material Safety Data Sheets	Site supervisor	Annual Performance Assessment & Reporting
Use of heavy machinery & vehicles on site for sand mining – Soil compaction	Compaction of soils through movement of heavy vehicles and machinery on site	Determination of access routes Rehabilitation of mine sites & access routes	Site supervisor	Annual Performance Assessment & Reporting
(Dust)	Dust Fallout	Dust suppression monitoring - dry season	Site supervisor	Annual Performance Assessment & Reporting
Noise	Increase in ambient noise levels	Complaints register	Site supervisor	Annual Performance Assessment & Reporting

Visual	Visual intrusion	Mine Plan	Site supervisor	Annual Performance Assessment & Reporting
Use of heavy machinery & vehicles main gravel road	Dust nuisance -use of gravel Roads	Works Instruction	Site supervisor	Annual Performance Assessment & Reporting
Management of neighbours	Social impacts	Complaints register, investigations	Site supervisor	Annual Performance Assessment & Reporting Application for Closure Certificate
Closure				
Concurrent rehabilitation	<ul style="list-style-type: none"> Reducing soil compaction of disturbed area and access roads to improve drainage and control erosion Use stockpiled top soil to shape excavations 	Visual checks to determine level of rehabilitation	Site supervisor	Annual Performance Assessment & Reporting Application for Closure Certificate
Concurrent rehabilitation. Shaping excavations	Restoration of land use and land capability	Visual checks to ensure shaping Excavations	Site supervisor	Annual Performance Assessment & Reporting Closure Application

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

A performance assessment on this EMP will be conducted every year by an external independent auditor and the results of the audit will be provided to the Regional Manager. Please note this is an application for a mining permit which is only granted for two years.

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.

Before commencement of any mining on site, all the workers will be inducted, trained and made aware of the environmental risks together with the contents of this EMP. All the employees will sign a contract which binds them with the EMP, ensuring that they all understand the environmental risks of their actions and the consequences thereof.

- An environmental, health and safety induction programme will be provided to all employees prior to commencing work, and they will sign acknowledgement of the induction.

A monthly "toolbox talk" will be held prior to commencing work, which will include discussions on health, safety and environmental considerations. The toolbox talks should be led by the site manager.

(3) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.

All the risks will be reported to the Environmental Control Officer (ECO) immediately. The ECO will report it to the relevant personnel within 24 hours who are able to control the situation i.e. the spills will be reported to the contractors who deals with spills.

- Establish the context
 - Strategic
 - Organisational
 - Risk management
- Identify risks
- Analyse risks
 - Consequences
 - Likelihood
- Assess and prioritise risks
 - Acceptability

- Priorities for treatment
- Treat risks
- Eliminate
- Reduce
- Transfer
- Manage

Monitor and review. In addition to the above Please refer to the impact assessment.

n) Specific information required by the competent authority

(Among others, confirm that the financial provision will be reviewed annually).

No specific information requirements have been stated by the competent authority to date.

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&APs ; To be included in Final BAR ☒
- c) the inclusion of inputs and recommendations from the specialist reports where relevant; and ☒
- d) that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected. Parties are correctly reflected herein. ☒

Signature of the environmental assessment practitioner:

Lesekha Consulting

Name of company:

29 September 2017

Date:

REFERENCE

<https://images.climate-data.org/location/1023/climate-graph.png>(accessed by 25 September 2017 11:50)

APPENDICE

APPENDIX 1: DETAILS OF EAP

APPENDIX 2: LOCALITY MAPS

APPENDIX 3: PROPOSED SITE MAP

APPENDIX 4: PUBLIC PARTICIPATION INFORMATION

APPENDIX 5: FINANCIAL PROVISION

APPENDIX 6: FINANCIAL AND TECHINICAL COMPETENCE

APPENDIX 7: PHOTOGRAPHS