MAKHANDA MINING (PTY) LTD
REMAINING EXTENT OF THE FARM BRAKKEFONTEIN NO 243, ALBANY MAGISTERIAL DISTRICT, EASTERN CAPE PROVINCE

SECTION 102 APPLICATION
FINAL BASIC ASSESSMENT REPORT
ADDENDUM TO THE APPROVED 2014 EMPR OF THE MINE

JUNE 2022

REFERENCE NUMBER: EC 30/5/1/2/2/0056 MR

PREPARED FOR:

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EXECUTIVE SUMMARY

The Applicant, Makhanda Mining (Pty) Ltd, submitted a Section 102 amendment application in terms of the MPRDA, 2002 to add aggregate as an additional commodity to the mining right held over the Remaining Extent of the farm Brakkefontein No. 243, in the Albany District of the Eastern Cape Province. In addition to the S102 application, the Applicant also applied for environmental authorisation (EA) for the development and related operation of three dangerous goods storage tanks (above ground) within the footprint of the mining right. The EA application is also combined with a NEM:WA basic assessment application for the chipping and burning of wood (general waste), and the burning of used oil (hazardous waste) as substitute fuel sources at the tunnel kiln of the brick factory in an effort to reduce the commercial fuel need of the site.

The S102 necessitates an application for a Part 2 amendment of the mine's EMPR in terms of GNR 326 Section 31. The S102 application further constitute listed/specified activities in terms of the NEMA: EIA Regulations, 2014 (as amended) as well as the NEM:WA, 2008 and therefore requires an environmental impact assessment (basic assessment process).

This document, the Final Basic Assessment Report (FBAR), refers to the Section 102 amendment application submitted by Makhanda Mining (Pty) Ltd in terms of the MPRDA, 2002 and must serve (upon approval) as an addendum to the approved Environmental Management Programme of the mine as amended in 2014.

SECTION 102 APPLICATION – ADDITION OF AGGREGATE TO THE MINING RIGHT:

Should the S102 application (including EA) be approved, the Right Holder intends to sell the unwanted overburden removed from the clay quarry as commercial aggregate. The aggregate will be processed through a mobile crushing and screening plant (if necessary) to reduce it to various sized stockpiles, from where it will be transported to clients via trucks and trailers. The aggregate will be sold from the existing stockpile area on the farm.

ENVIRONMENTAL AUTHORISATION – STORAGE OF DANGEROUS GOODS:

The Applicant would like to increase the number of above ground storage tanks on site with the addition of three more tanks that will have a combined capacity of 82 m^3 (two 25 m^3 tanks, and one 32 m^3 tank). The tanks will be developed in the vicinity of the existing brick factory at an already surfaced area.

WASTE LICENCE APPLICATION – CHIPPING OF WOOD:

The Applicant will convert an existing warehouse on the property for the chipping of discarded wooden pallets and wood that is bought from the local community. The resulting wood chips/sawdust will then be used as a substitute fuel source at the tunnel kiln of the brick factory to reduce the commercial fuel need of the site.

WASTE LICENCE APPLICATION – BURNING OF USED OIL:

The Applicant intends to collect used oil from suppliers in and around the municipal area, that will be burned as an additional fuel source at one burner group on the tunnel kiln. The used oil will be collected in sealed containers with trucks from the suppliers, transported to the site where it will be poured/pumped into the above mentioned dangerous goods storage tanks (to be established on site) until it is burned to heat the kiln.

NEED AND DESIRABILITY

The stockpiled overburden has a commercial value if sold by the Applicant as aggregate to clients in and around the mine. Should the selling of the proposed aggregates be approved, it will generate an additional source of income to the Right Holder, reduce the areas needed for the stockpiling of overburden material as the material stockpiles will constantly be depleted, and indirectly contribute to the conservation of intact vegetation cover on the property (around the current stockpile areas).

The proposed burning of wood chips/sawdust and used oil submitted by the Applicant as part of this application directly links with the objectives of the National Waste Management Strategy 2020 (NWMS), as the company will contribute to the reusing/recycling of materials that would otherwise have ended up at landfill sites. The proposed use of the waste materials as renewable fuel resource at the brick plant, further excellently supports the “circular economy” concept as it directly reduces the fossil fuel (furnace oil and coal) need of the operation.

PUBLIC PARTICIPATION PROCESS

Regulation 32(1)(a)(aa) of the NEMA: EIA Regulations, 2017 (as amended) stipulates that an Applicant must submit a report reflecting the changes to the EMPR that has been subjected to a public participation process. During the public participation process the relevant stakeholders and I&AP’s were informed of the project by means of an advertisement in the Daily Dispatch and The Herald, and on-site notices that were placed at the property boundary as well as the Makana Library in town. A notification letter inviting comments on the DBAR over a 30-days commenting period (ending 06 June 2022) was sent to the landowner, neighbouring landowners, stakeholders, and any other I&AP that

may be interested in the project. The comments received on the DBAR were incorporated into the final Basic Assessment Report (FBAR) to be submitted to the DMRE for consideration.

Basic Assessment Report

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

Topography:

- None of the proposed activities, will have an impact on the topography of the receiving environment, and upon closure there will be no residual impacts.

Visual Characteristics:

- The viewshed analysis showed that the potential visual impact of the proposed activities will be of very low concern, and therefore the visual impact is deemed to be of low significance.

Air and Noise Quality:

- The DEDEAT-EC issued a Full Atmospheric Emissions Licence (EC/CAR/MAK/021/2016) for the activities at the site.
- Neither the selling of aggregates, nor the chipping of wood will trigger an application in terms of the said Act.
- The proposed burning of the chipped wood/sawdust and/or used oil will take place at the existing brick factory and will be controlled, and reported on, in accordance with the existing Atmospheric Emissions Licence.
- The proposed crushing/screening of the overburden will be intermittent, while the chipping of the wood will be contained in a warehouse. Considering this, none of the proposed activities is expected to generate excessive noise levels that isn't compatible with the current operations at the property.
- Although the proposed activities may have a slight cumulative impact on the air quality and ambient noise levels, the development will not take place in a pristine environment, and the impact is therefore deemed compatible with the current operations and of low significance.

Hydrology:

- There are no natural streams on or near the proposed development areas that could be affected; neither will the proposed activities affect the groundwater.
- Therefore, should the mitigation measures proposed in this document, be implemented, the potential impact on the hydrology will be negligible.

Terrestrial Biodiversity, Conservation Areas, and Groundcover:

- The Critical Biodiversity Area (CBA) does not extend across the already disturbed/altered areas of the quarry pit and brick plant. The proposed activities will take place on already disturbed areas that will not necessitate the removal of any natural occurring vegetation and does therefore not pose any risk to the conservation status of the CBA or broad-scale ecological processes.

Cultural and Heritage Environment:

- The palaeontologist did not identify any significant palaeontological material at the areas of interest. The potential impact of the proposed activities on the cultural and/or heritage environment is therefore deemed insignificant.

Existing Infrastructure:

- No infrastructure exists at the overburden stockpile area that could be affected by the proposed activity. Further to this, the wood sorting area is removed from any sensitive site infrastructure.

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

Environmental Management Programme (EMPR)

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

The financial provision amount that will be necessary for the rehabilitation of damages caused by the operation, both sudden closures during the normal operation of the project and at final, planned closure gives a sum of R 567 003.36.

LIST OF ABBREVIATIONS

AEL	Atmospheric Emission Licence
ASTM	American Standard Test Method
BGIS	Biodiversity GIS
CARA	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
CES	Coastal & Environmental Services
CBA	Critical Biodiversity Area
DBAR	Draft Basic Assessment Report
DEDTEA	Department of Economic Development, Tourism and Environmental Affairs
DEFF	Department of Environment, Forestry and Fisheries
DMRE	Department of Mineral and Resources and Energy
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIA Regulations	Environmental Impact Assessment Regulations, 2014 (as amended)
EMPR	Environmental Management Programme
FBAR	Final Basic Assessment Report
GDP	Gross Domestic Product
GNR	Government Notice
GPS	Global Positioning System
HDSA	Historically Disadvantaged South Africans
HSA	Hazardous Substances Act, 1973 (Act No. 15 of 1973)
I&AP's	Interested and Affected Parties
IDP	Integrated Development Plan
MHSA	Mine Health and Safety Act, 1996 (Act No. 29 of 1996)
MLM	Makana Local Municipality
MPRDA	Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MR	Mining Right
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:AQA	National Environmental Management: Air Quality Control Act, 2004 (Act No. 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)

NEM:PAA	National Environmental Management: Protected Areas Amendment Act, 2014 (Act No. 21 of 2014)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NRTA	National Road Traffic Act, 1996 (Act No. 93 of 1996)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
NWMS	National Waste Management Strategy 2020
OHSA	Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)
OHSAS	Occupational Health and Safety Management Systems
PCB's	Polychlorinated Biphenyl
PCO	Pest Control Officer
PPE	Personal Protective Equipment
PSM	Palaeontological Sensitivity Map
S102	Section 102 Amendment Application in terms of the MPRDA, 2002
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SAMBF	South African Mining and Biodiversity Forum
SANS	South African National Standards
SBDM	Sarah Baartman District Municipality
SDS	Safety Data Sheet
WMA	Water Management Area

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ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

NAME OF APPLICANT:	Makhanda Mining (Pty) Ltd
TEL NO:	046 603 6300
FAX NO:	086 729 4076
POSTAL ADDRESS:	243 Cemetery Road, Brakkefontein Farm, Makhanda, 6139
PHYSICAL ADDRESS:	Same as above
FILE REFERENCE NUMBER SAMRAD:	EC 30/5/1/2/2/0056 MR

IMPORTANT NOTICE

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

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

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

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

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

OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

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

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

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

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

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

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

  (ii) the degree to which these impacts –

    (aa) can be reversed;

    (bb) may cause irreplaceable loss of resources; and

    (cc) can be managed, avoided or mitigated;

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

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

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

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

This document refers to the Section 102 amendment application submitted by Makhanda Mining (Pty) Ltd in terms of the MPRDA, 2002 and must serve (upon approval) as an addendum to the approved Environmental Management Programme of the mine as amended in 2014.

PART A

SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

1. CONTACT PERSON AND CORRESPONDENCE ADDRESS

a) Details of: Greenmined Environmental (Pty) Ltd

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) the proponent must appoint an independent Environmental Assessment Practitioner (EAP) to undertake the environmental impact assessment (EIA) of any activities regulated in terms of the Act. Makhanda Mining (Pty) Ltd (hereafter referred to as the "Right Holder") appointed Greenmined Environmental (Pty) Ltd (hereafter referred to as "Greenmined") to undertake the study needed. Greenmined has no vested interest in the Right Holder or the proposed project and declares its independence as required by the Environmental Impact Assessment Regulations, 2014 (as amended) (EIA Regulations).

i) Details of the EAP

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

ii) Expertise of the EAP.

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

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

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

Ms Fouché has seventeen years' experience in doing Environmental Impact Assessments and Mining Applications in South Africa. See a list of past projects attached as Appendix L.

b) Location of the overall Activity.

Table 1: Location of the proposed project.

Farm Name:	Remaining Extent of the farm Brakkefontein No 243
Application area (Ha)	The proposed development/activities will take place inside the already approved mining footprint of 644.9686 ha. ❖ Aggregate stockpile area: ±3 ha; ❖ Dangerous goods storage tanks: ±200 m²; and ❖ Sorting, shredding, and chipping of wood: ±2 ha.
Magisterial district:	Albany Magisterial District
Distance and direction from the nearest town	Makhanda Mining is located ±5 km to the northeast of Makhanda along Mayfield Cemetery Road on the Brakkefontein farm.
21 digit Surveyor General Code for each farm portion	C00200000000024300000

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

The requested map is attached as Appendix B.

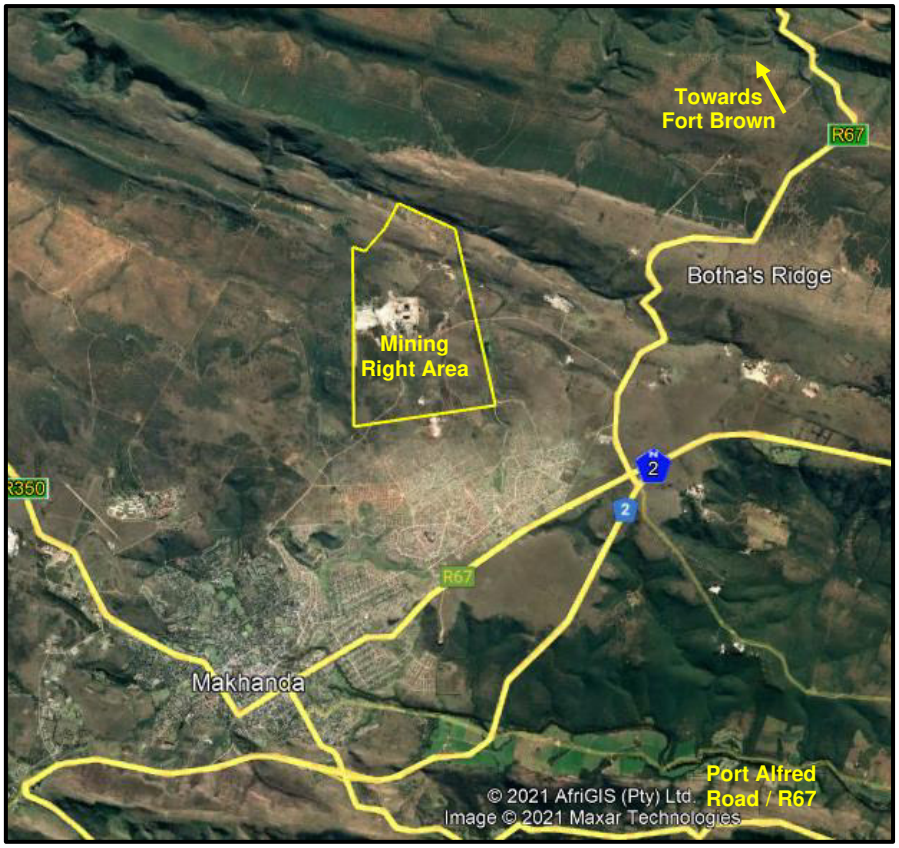

Figure 1: Satellite view showing the mining right area (yellow polygon) in relation to the surroundings (image obtained from Google Earth).

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

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

1. **<u>SECTION 102 APPLICATION IN TERMS OF THE MPRDA, 2002, AND EA APPLICATION IN TERMS OF THE NEMA EIA REGULATIONS, 2014 (AS AMENDED):</u>**

   Makhanda Mining (Pty) Ltd, submitted a Section 102 (S102) amendment application in terms of the MPRDA, 2002 to:

   - ❖ align the mining documentation with the Section 11 approval,
   - ❖ comply with the latest departmental and legislative requirements, and
   - ❖ add aggregate as additional commodities to the mining right.

2. **<u>EA APPLICATION IN TERMS OF THE NEMA EIA REGULATIONS, 2014 (AS AMENDED):</u>**

   In addition to the abovementioned S102 amendment application, the Applicant would also like to apply for the development and related operation of facilities for the storage of dangerous goods within the footprint of the mining right in support of the brick factory.

3. WASTE LICENCE APPLICATION IN TERMS OF THE NEM:WA, 2008 (AS AMENDED):

The EA application is also combined with a NEM:WA (National Environmental Management: Waste Act, 2008) basic assessment application for waste related activities in terms of Category A of the Act (as discussed in more detail later in the report).

SCOPE OF THE OVERALL ACTIVITY:

The S102 application, EA- and NEM:WA applications necessitate an application for a Part 2 amendment of the mine's EMPR in terms of GNR 326 Section 31 (NEMA). The applications further constitute listed/specified activities in terms of the NEMA: EIA Regulations, 2014 (as amended) and therefore requires an environmental impact assessment (basic assessment process) that assess project specific environmental impacts and alternatives, consider public input, and propose mitigation measures, to ultimately culminate in an environmental management programme that informs the competent authority (Department of Mineral Resources and Energy (DMRE)) when considering the environmental authorisation.

See attached as Appendix C a copy of the site activities map of the operation.

i) Listed and specified activities

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

NAME OF ACTIVITY (E.g. For prospecting – drill site, site camp, ablution facilities, accommodation, equipment storage, sample storage, site office, access route etc... etc... etc E.g. for mining – excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	**Aerial extent of the activity** Ha or m^2	**LISTED ACTIVITY** Mark with an X where applicable or affected	**APPLICABLE LISTING NOTICE** (GNR 324, GNR 325, GNR 326 OR GNR 327)
Application for a Section 102 MPRDA, 2002 amendment of the mining right to add an additional commodity.	644.9686 ha	X	GNR 327 LN 1 Activity 21D, 26

NAME OF ACTIVITY	Aerial extent of the activity	LISTED ACTIVITY	APPLICABLE LISTING NOTICE
GNR 327 Listing Notice 1 Activity 21D: *Any activity including the operation of the that activity which requires an amendment or variation to a right or permit in terms of section 102 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity contained in this Listing Notice or in Listing Notice 3 of 2014, required for such amendment.*			
GNR 327 Listing Notice 1 Activity 26: *Residential, retail, recreational, tourism, commercial or institutional developments of 1 000 square metres or more, on land previously used for mining or heavy industrial purposes.*			
Processing, loading, and hauling, of aggregate.	±3 ha	X	GNR 327 LN 1 Activity 26
Development and operation of dangerous goods storage tanks.	±200 m²	X	GNR 327 LN 1 Activity 14, 51
GNR 327 Listing Notice 1 Activity 14: *The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.*			
GNR 327 Listing Notice 1 Activity 51: *The expansion and related operation of facilities for the storage, or storage and handling, of a dangerous good, where the capacity of such storage facility will be expanded by more than 80 cubic metres.*			
Sorting, shredding, and chipping of discarded wood (general waste).	±2 ha	X	Category A Activity 2
Category A Activity 2: *The sorting, shredding, grinding, crushing, screening, or bailing of general waste at a facility that has an operation area in excess of 1 000 m².*			
Burning of used oil (<1 ton/day) as fuel source at the brick factory.	±200 m²	X	Category A Activity 4
Category A Activity 4: *The recycling of hazardous waste in excess of 500 kg but less than 1 ton per day calculated as a monthly average, excluding recycling that takes places as an integral part of an internal manufacturing process within the same premises.*			

ii) Description of the activities to be undertaken

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

(Information obtained from the Environmental Management Programme Report, Amended 2014)

1. BACKGROUND INFORMATION

Makhanda Mining (Pty) Ltd holds a mining right over 644.9686 ha of the Remaining Extent of the farm Brakkefontein No 243 in the Albany District of the Eastern Cape Province.

In August 1996, authorisation was granted by the DMRE (then DME) to Grahamstown Brick (Pty) Ltd t/a Makana Brick to mine clay from the clay quarry on the property. At that time, DMRE requested that Parts 4 and 5 of the Aide Memoire be completed for the clay quarry, which was completed in 2001. In 2007 an application was submitted to the DMRE for the conversion of the old order mining right to a mining right in terms of Item 7 in Schedule II (Transitional Arrangements) of the MPRDA, 2002. The converted mining right was executed on 05 March 2008 and is valid until 04 March 2038. The protocol number of the mining right is 119/2008 and the file reference number is EC 30/5/1/2/2/0056 MR. In 2014, Coastal & Environmental Services (CES) updated the 2007 EMPR of the mine that was subsequently approved by the DMRE. In June 2021, the DMRE granted consent in terms of Section 11(1) of the MPRDA, to cede the mining right from Grahamstown Brick (Pty) Ltd to Makhanda Mining (Pty) Ltd.

The table below lists the GPS coordinates of the approved mining footprint (644.9686 ha).

Table 3: GPS Coordinates of the approved mining right area.

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	33º14'18.97"	26º33'11.77"	-33.238603º	26.553268º
B	33º14'34.05"	26º33'47.79"	-33.242792º	26.563274º
C	33º16'09.21"	26º34'13.03"	-33.269224º	26.570285º
D	33º16'20.86"	26º32'43.33"	-33.272461º	26.545368º
E	33º14'44.47"	26º32'41.92"	-33.245687º	26.544979º
F	33º14'46.28"	26º32'49.71"	-33.246190º	26.547142º
G	33º14'33.88"	26º33'01.94"	-33.242746º	26.550538º

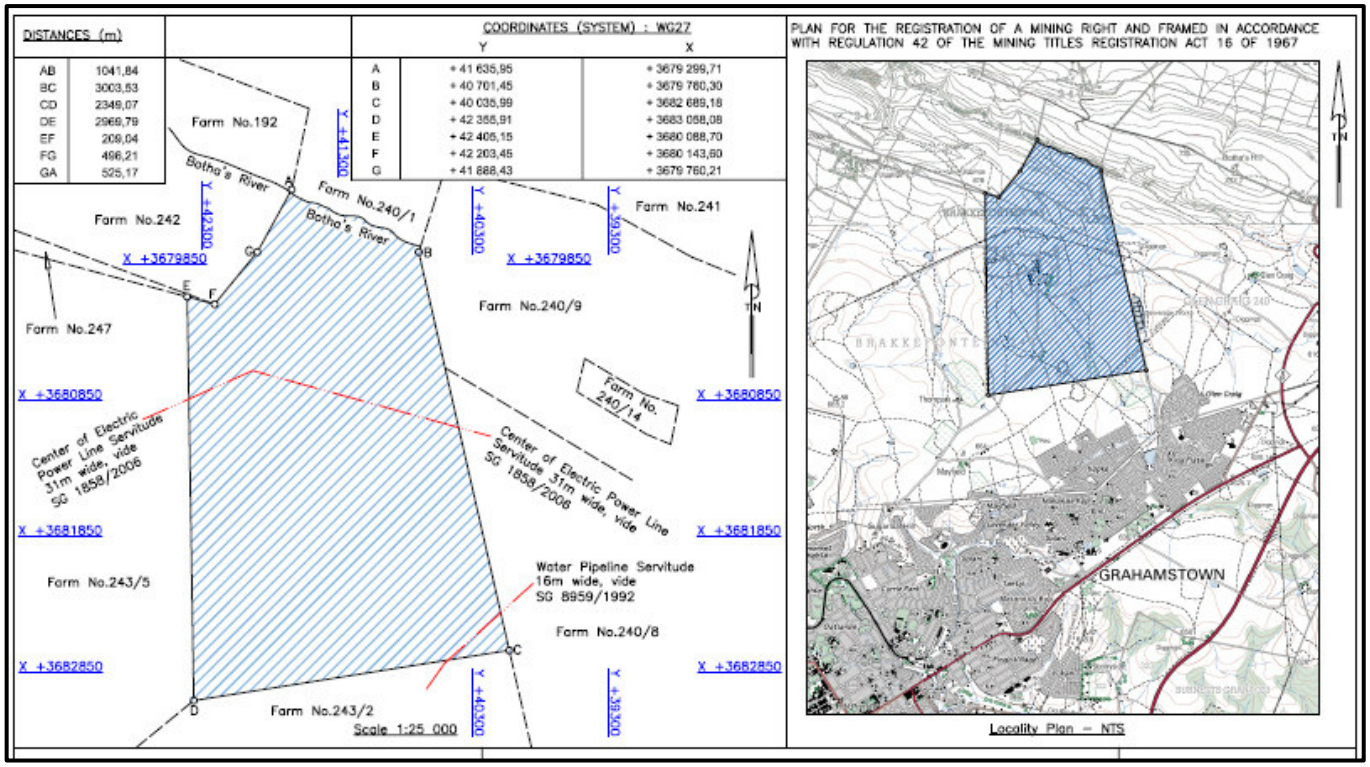

Figure 2: Mine plan showing the approved footprint of Makhanda Mining (Pty) Ltd (M.E.H Sulter & Son Inc.)

2. EXISTING PROJECT DESCRIPTION

The Makhanda mining right is located on the Remaining Extent of the farm Brakkefontein No 243 in the Albany District. The farm is ±645 ha and contains four quarries referred to as the Clay-, Sand-, Shale-, and Old Kaolin Quarry. A brick factory (operated by an independent entity) was established adjacent to the clay quarry.

Figure 3: Satellite view showing the location of the different quarries within the mining right footprint (yellow polygon).

2.1 CLAY QUARRY

The clay quarry is situated on the western boundary of the farm. All clay extracted from this quarry is used for the manufacturing of bricks on the property. Presently (2022), the quarry is ±10 ha with a planned extension of ±4 ha over the next 11 years. The clay is extracted using an opencast method. The deposit occurs from just below the surface to a depth varying from between 10 – 24 m, at an average depth of ±18 m below the soil cover.

The clay is mined by a sub-contractor using an excavator to dig and load dumper trucks. The clay is then transported to the brick factory where it is stored in layered stockpiles until used in the manufacturing of clay bricks (by the independent brick making entity). The contractor mines various types of clay from different sections of the quarry as shown in the following figure to improve the quality of the bricks.

Figure 4: Satellite view showing the clay quarry in relation to the brick factory, where the yellow line shows the mining boundary (image obtained from Google Earth).

Slopes are mined at an angle of 15°, thus reducing the cost of shaping the slopes when a section is mined out. Shaping the slopes concurrently with mining also provides a longer period for the slopes to gather seeds and re-vegetation occurring through succession. The topsoil and overburden are stripped off each new section to be mined. The topsoil is stored to be used during the rehabilitation of the quarry and the overburden is transported to a designated stockpile area, from where the Right Holder now proposes to sell the unwanted material (refer to *3. Section 102 Application*).

2.2 SITE INFRASTRUCTURE

The main infrastructure constructed within the MR footprint relates to the brick making operation such as the factory, office buildings, workshop, storerooms, ablution facilities etc. Apart from the access roads on the property, no permanent infrastructure was established at the clay quarry.

There are six existing dams on the farm. Dam 1 was built in 1997 and has a storage capacity of 75 000 m^3. Permission for the use of the water from this dam was issued by the DWS and since receipt of the water quality results, a new water filtration- and chlorination system was installed at the pump station (2021). All the water used at the mine and/or brick plant is filtrated through this system before it is used on site. Surface water from the south-east, drains into two dams, with storage capacities of 750 m^3 and 1 500 m^3 respectively. Surface runoff from the clay quarry is channelled into the dam at the northern end of the quarry. This dam has a storage capacity of 1 000 m^3. Runoff from the coal storage area is channelled to another small holding dam, with a storage capacity of 150 m^3. Remaining runoff generated on the factory site is channelled to another settling dam with a storage capacity of 1 500 m^3. As with the extraction of water, the Department of Water and Sanitation (DWS), also authorised the storing of water on the property under Water Registration Certificate No 28024307.

Solar panels were erected to the west of the entrance gate that presently generates ±22% of the electricity needed on site.

Adjacent to the solar panels, a warehouse was erected that site management would like to convert for the chipping and crushing of wood. The wood is bought from the locals removing alien invader plant, such as Wattles and *Eucalyptus* trees, in and surrounding Makhanda. The machinery at the warehouse will be powered by solar energy (from the nearby solar plant), and the sawdust will be used as an alternative fuel source at the brick factory that will reduce the commercial fuel need of the site.

The remaining infrastructure on the site is connected to the national electricity grid, and where/when applicable electricity supply is supported by generators.

2.3 WASTE MANAGEMENT

The mining of clay generates very little general- and/or hazardous waste. The Right Holder has an integrated waste management policy, and the company strives to become a zero waste generator.

Presently, waste is separated into waste that can be re-used, recycled, incinerated (in accordance with the atmospheric emission licence (AEL) of the site), and those that must be removed from the site. General waste (that cannot be reused on site) is removed by a general waste handling contractor to the municipal landfill site. Hazardous waste handling is discussed in more detail under *3. Section 102 Application.*

3. SECTION 102 APPLICATION

3.1 S102 PROJECT PROPOSAL – ADDITION OF AGGREGATE

As mentioned earlier, the Right Holder applied for consent of the Minister to:

- align the mining documentation with the Section 11 approval,
- comply with the latest departmental and legislative requirements, and
- add aggregate as additional commodity to the mining right

, in terms of Section 102 of the MPRDA, 2002.

Should the S102 application (including EA) be approved, the Right Holder intends to sell the unwanted overburden removed from the clay quarry as commercial aggregate.

As mentioned earlier, bulldozers and/or excavators are used to strip the overburden from the clay layer. The overburden is loaded onto dumper trucks that transport it to the stockpile area (see following figure). The Right Holder proposes to either sell the unwanted overburden (not required for rehabilitation of the clay quarry) to clients as is, or if needed, the aggregate will be processed through a mobile crushing and screening plant to reduce it to various sized stockpiles, from where it will be transported to clients via trucks and trailers.

The plant will be powered with generators. At the primary crusher the aggregate will be fed through a grizzly into the crusher. From the primary crusher the material is conveyed to the respective secondary processing plants for size separation before moving on conveyor belts to the various stockpiles. Deliveries will be made

from the stockpiles. All activities will be contained within the boundaries of the mining footprint.

Figure 5: Satellite view showing the areas (brown polygons) currently used for the stockpiling of overburden from where the proposed aggregate products will be sourced (image obtained from Google Earth).

3.2 EA APPLICATION – STORAGE OF DANGEROUS GOODS (OPERATIONAL PHASE)

In addition to the S102 amendment application, in terms of the MPRDA, to add aggregate to the mining right, the Applicant also applied for the development and related operation of facilities for the storage of dangerous goods within the footprint of the mining right in support of the brick factory.

In 2008, the Department of Economic Development and Environmental Affairs granted an Environmental Authorisation (reference number: EC06/386/7/07-104)

for the installation of two above ground fuel storage tanks with capacities of 23 m^3 and 83 m^3 respectively.

The Applicant would now like to increase the number of above ground storage tanks with the addition of three more tanks with a combined capacity of 82 m^3 (two 25 m^3 tanks, and one 32 m^3 tank). The tanks will be developed in the vicinity of the existing brick factory as indicated in the following figure at an area that is already surfaced. The tanks will be placed in bunded areas with impermeable floors, that has the capacity to contain 110% of the tank's maximum capacity. The distance and height of the bund wall relative to that of the tank will be taken into consideration to prevent any substances spouting beyond the confines of the bund.

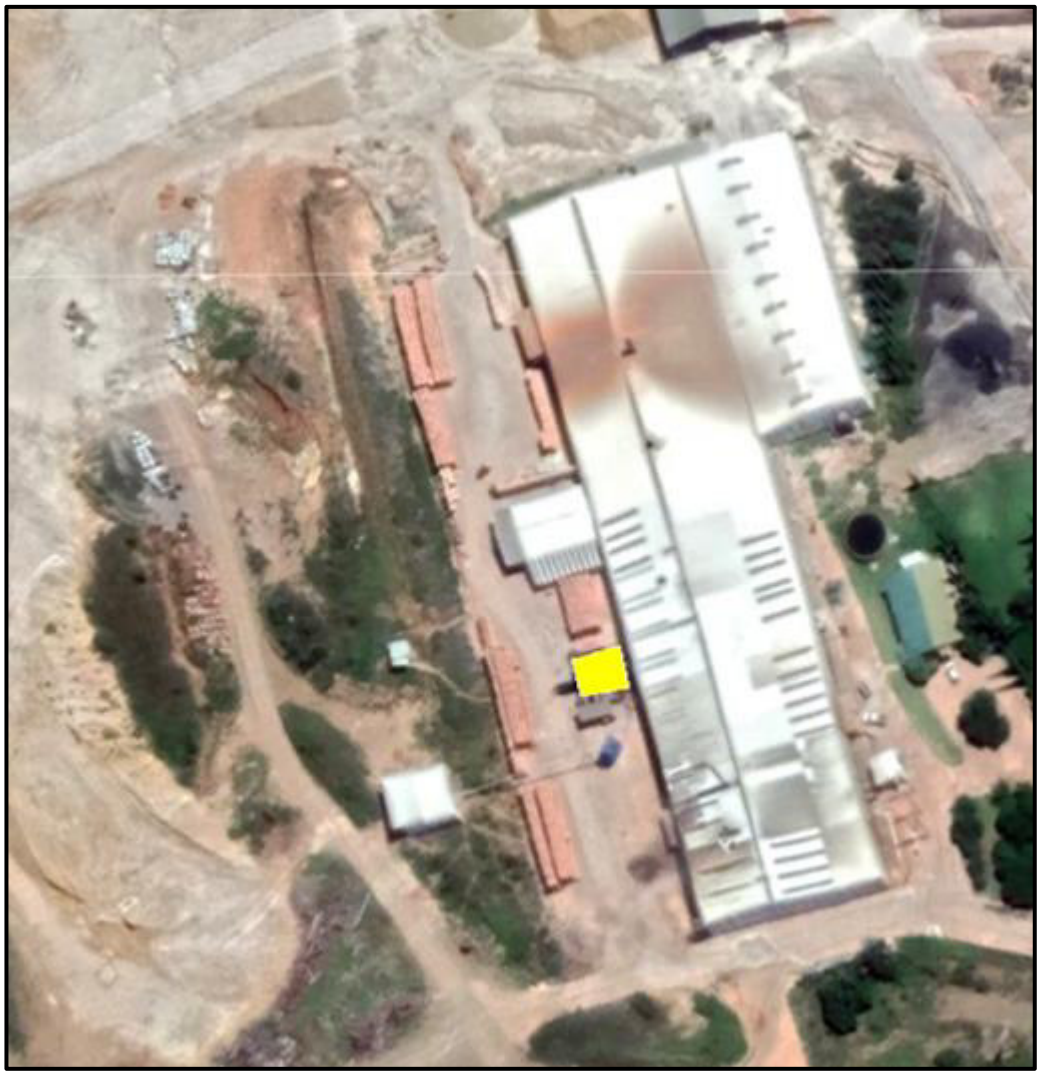

Figure 6: Figure showing the proposed location (yellow polygon) of the new dangerous goods tanks in relation to the existing infrastructure on site (image obtained from Google Earth).

Figure 7: The proposed tanks will be installed and managed in the same manner as the existing tanks at the site shown in these photographs.

3.3 WASTE LICENCE APPLICATION – CHIPPING OF WOOD (OPERATIONAL PHASE)

3.3.1 Chipping of Wood

As mentioned earlier, a warehouse was erected at the property that the Applicant would now like to convert for the chipping of discarded wooden pallets, and wood that is bought from the locals removing alien invader plants, such as Wattles (*Acacia* spp) and *Eucalyptus* trees, in and surrounding Makhanda. The resulting wood chips/sawdust will then be used as a substitute fuel source at the tunnel kiln of the brick factory to reduce the commercial fuel need of the site.

Once received on site, the pallets will be taken apart, and the wood (from alien plants) will be sorted at a designated sorting area of ±2 ha on the property as shown in the following figure. From the sorting area (of which the vegetation cover was previously disturbed), the wood will be taken to the abovementioned warehouse where it will be chipped and stockpiled until the resulting wood chips/sawdust is burned to heat the kiln.

On the tunnel kiln of the brick factory there are eight burner zones comprising of nine burners each. Currently, all eight burner zones are fired using furnace oil, that requires ±260 tonnes of furnace oil per month. The Applicant proposed to reduce the need for furnace oil at the tunnel kiln by using the wood chips/sawdust as alternative fuel source. It is proposed that approximately 30-ton wood

chips/sawdust will be burned per day once the project is fully operational. Phase 1 of the sawdust project is to convert two burner zones from furnace oil (fossil fuel) to sawdust (renewable energy). This will reduce the oil usage by 25%. Subsequent phases will reduce the fossil fuel usage by 50%, then 75% and, if possible 100%. As mentioned earlier, the wood chipping machinery at the warehouse will be solar powered.

Figure 8: Satellite view showing the sorting area (yellow polygon) from where the wood will be taken to the warehouse to be chipped (image obtained from Google Earth).

3.3.2 Burning of Used Oil

Further to the above, the Applicant intends to collect used oil from suppliers in and around the municipal area, that will also be burned as an additional fuel source at one burner group on the tunnel kiln. The used oil will be collected in sealed containers with trucks from the suppliers, transported to the site where it will be poured/pumped into the above mentioned dangerous goods storage tanks (to be established on site) until it is burned to heat the kiln.

When fully operational, the burning of used oil will amount to ± 992 kg/day (31 000 l/month) that will result in a reduction of ±31 000 l furnace oil per month, and ±15.5 ton less coal needed on site per month. The burning of the used oil (and wood

chips/sawdust) to heat the kiln will take place in accordance with the atmospheric emission licence of the brick plant.

3.4 CONSTRUCTION PHASE

3.4.1 Commercial Mining of Aggregates

The commercial use of the aggregates from the property will not require any construction of permanent infrastructure. As mentioned earlier, the use of a mobile processing plant (of temporary nature) may be required from time to time. The plant will be placed at the stockpile area and removed when no longer needed. Further to this, the existing infrastructure at the property will be used by the mining contractor to, for instance service the machinery, dispose of waste, or obtain water.

3.4.2 Storage of Dangerous Goods

The construction phase will require the placement of the three proposed dangerous goods storage tanks within the abovementioned bunded areas. The placement of the tanks will not require the removal of any vegetation or topsoil as the tanks will be placed in an already surfaced area. The tanks will be placed in accordance with the standard requirements for the aboveground storage of dangerous goods by an appropriately qualified contractor.

3.4.3 Waste Related Activities

The proposed sorting, shredding, and/or chipping of the wood does not require the construction of any additional infrastructure, as the sorting area was historically established on the farm, and the warehouse is an existing structure that will be converted to allow for the proposed activity.

The used oil will be stored in the abovementioned dangerous goods tanks, and therefore does not require any additional infrastructure to be constructed.

3.5 OPERATIONAL PHASE

3.5.1 Commercial Mining Aggregates

Thus far, the operational phase of the mine involved the removal of clay to produce bricks. Should the S102 application be approved, the Right Holder intends to also sell the unwanted aggregate from the clay quarry as commercial products. The minerals will be mined as described under *3.1 S102 Project Proposal – Adding of Aggregate*. The mining contractor will continue to make use of the supporting infrastructure of the property such as workshops and storerooms.

Mining related equipment/machinery that currently operates/will operate within the mining footprint consist of at least the following:

- Crushing and screening plant (mobile);
- Dumper trucks;
- Earthmoving machinery;
- Excavation equipment;
- Generator; and
- Water cart/s.

3.5.2 Chipping of Wood & Burning of Use Oil

Refer to *3.3.1 Chipping of Wood*, and *3.3.2 Burning of Used Oil* as discussed earlier.

3.6 DECOMISSIONGIN PHASE

3.6.1 Commercial Mining Aggregates

The decommissioning phase will entail the reinstatement of the stockpile area by removing the stockpiled material, and mobile crusher plant (if present). The decommissioning activities will therefore consist of the following:

- Removing all stockpiled material;
- Removing all mining machinery and equipment from site;
- Landscaping all disturbed areas and replacing the topsoil;
- Vegetating the reinstated area; and
- Controlling/monitoring the invasive plant species.

The future land use of the proposed area will be agriculture. Upon replacement of the topsoil, the area will once again be available for grazing purposes, and the planting of the cover crop (to protect the topsoil) will tie in with the proposed land use.

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

Once the mining area was rehabilitated the Right Holder is required to submit a closure application to the Department of Mineral Resources and Energy in accordance with section 43(4) of the MPRDA, 2002 that states: *"An application for a closure certificate must be made to the Regional Manager in whose region the land in question is situated within 180 days of the occurrence of the lapsing, abandonment, cancellation, cessation, relinquishment or completion contemplated in subsection (3) and must be accompanied by the prescribed environmental risk report".* The Closure Application will be submitted in terms of Regulation 62 of the MPRDA, 2002, and Government Notice 940 of NEMA, 1998 (as amended).

3.6.2 Storage of Dangerous Goods

The decommissioning of the dangerous goods storage tanks will entail the removal of the tanks once empty of all contents by an appropriately qualified contractor. The Applicant will responsibly dispose of the discarded tanks and proof of safe disposal will be filed on site for auditing purposes. If no longer needed, the bunded areas will be removed to allow the use of the space. Uncontaminated building rubble will be used as fill material in the rehabilitation of the quarry pit. Any contaminated material will be discarded as hazardous waste at an appropriately registered waste handling facility.

3.6.3 Waste Related Activities

Decommissioning activities are not applicable to the wood project, as the sorting area, and warehouse will remain on site if the project is no longer viable, to be used for alternative purposes by the landowner. If no longer needed, the chipping infrastructure will be removed from site.

Refer to *3.6.2 Storage of Dangerous Goods* (above) for detail regarding the decommissioning phase related to the burning of used oil on site.

e) Policy and Legislative Context

Table 4: Policy and Legislative Context.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	**REFERENCE WHERE APPLIED**	**HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.** (E.g. in terms of the National Water Act a Water Use License has/has not been applied for)
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983).	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity: *Physical Environment – Geology and Soil.* Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Management of invader plant species*.	The mitigation measures proposed for the site includes specifications of the CARA, 1983.
Eastern Cape Nature and Environmental Ordinance 19 of 1974 (as amended).	Part A(1)(g)(iv)(1)(a) Type of environment affected by the proposed activity - *Biological Environment* Part A(1)(g)(viii) The possible mitigation measures that could be applied on the level of risk – *Mining, Biodiversity Conservation Area, and Vegetation*.	The mitigation measures proposed for the site includes specifications of the ECNEO, 1974.
Hazardous Substances Act, 1973 (Act 15 of 1973)	Part A(1)(g)(viii) The possible mitigation measures that could be applied on the level of risk – *Storage/Handling of Hazardous Substances/Chemicals.*	The mitigation measures proposed for the site includes specifications of the HSA, 1973
Integrated Environmental Management Guideline: Guideline on Need and Desirability (2017).	Part A(1)(f) Need and desirability of the proposed activity.	The need and desirability of the proposed project was assessed in terms of this guideline.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
Mine Health and Safety Act, 1996 (Act No 29 of 1996) read together with applicable amendments and regulations thereto including relevant OHSA regulations.	Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Management of Health and Safety Risks.*	The mitigation measures proposed for the site includes specifications of the MHSA, 1996
Mineral and Petroleum Resources Development Act, 2002, (Act No. 28 of 2002) read together with applicable amendments and regulations thereto. ❖ Section 102 amendment application	Part A(1)(d) Description of the scope of the proposed overall activity	Application for a S102 amendment of the mining right submitted to DMRE-EC. Ref No: EC 30/5/1/2/2/0056 MR
National Environmental Management Act,1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2014 (as amended) ❖ GNR 327 Listing Notice 1 Activity 14 ❖ GNR 327 Listing Notice 1 Activity 21D ❖ GNR 327 Listing Notice 1 Activity 26	Part A(1)(d)(i) Listed and specified activities.	Application for a Part 2 amendment of the EMPR as well as an EA submitted to DMRE-EC. Ref No: EC 30/5/1/2/2/0056 MR.
National Environmental Management: Air Quality Control Act, 2004 (Act No 39 of 2004) read together with applicable amendments and regulations thereto specifically the National Dust Control Regulations, GN No R893	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – *Air and Noise Quality.* Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Fugitive Dust Emission Mitigation Measures.*	The mitigation measures proposed for the site consider the NEM:AQA, 2004 and the National Dust Control Regulations.
National Environmental Management Act: Biodiversity Act, 2004 (Act No. 10 of 2004) read together with applicable amendments and regulations thereto.	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity - *Biological Environment* Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Management of Vegetation Removal & Management of invader plant species*.	The mitigation measures proposed for the site includes specifications of the NEM:BA, 2004.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
National Environmental Management: Waste Act, 2008 (Act No 59 of 2008) read together with applicable amendments and regulations thereto. NEM:WA, 2008: National norms and standards for the storage of waste (GN 926) ❖ Category A Activity 2 ❖ Category A Activity 4	Part A(1)(d)(ii) Description of the activities to be undertaken. Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Waste Management*.	Application for a Waste Licence submitted to DMRE-EC. Ref No: EC 30/5/1/2/2/0056 MR.
National Heritage Resources Act. 1999 (Act No 25 of 1999).	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – *Human Environment.* Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Archaeological, Heritage and Palaeontological Aspects*.	The mitigation measures proposed for the site includes specifications of the NHRA, 1999.
National Road Traffic Act, 1996 (Act No. 93 of 1996)	Part A(ii) Description of the activities to be undertaken: *2.2.5 Access Roads.* Part A(1)(g)(viii) The possible mitigation measures that could be applied on the level of risk – *Management of the Access Road.*	The mitigation measures proposed for the project consider the NRTA, 1996.
National Water Act, 1998 (Act No 36 of 1998) read together with applicable amendments and regulations thereto. Department of Water Affairs and Forestry Best Practice Guideline Series (2007).	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – *Hydrology.* Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Erosion Control and Storm Water Management.* Part B(1)(d)(iii) Has a water use licence been applied for?	The mitigation measures proposed for the site includes specifications of the NWA, 1998.
National Waste Management Strategy 2020	Part A(1)(f) Need and Desirability of the Proposed Activities.	The contents of the NWMS, 2020 was considered in the compilation of this document with special

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
		reference to the proposed waste related activities.
Public Participation Guideline in terms of the NEMA EIA Regulations	Part A(1)(h)(ii) Details of the Public Participation Process Followed	Public participation was conducted in accordance with the guidelines published in terms of the NEMA EIA Regulations.
Makana Municipality Integrated Development Plan 2021 - 2022 (IDP)	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – *Socio-economic Environment.*	The description of the study area's socio-economic status is in accordance with that of the IDP.

f) Need and desirability of the proposed activities.

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

AGGREGATE AS ADDITIONAL COMMODITY

As mentioned earlier, the Applicant removes the overburden from the underlying clay resources, upon which it is transported to a designated stockpile area within the MR boundary. Presently, the overburden is merely stockpiled at the said area. This material however has a commercial value if sold by the Applicant as aggregate to clients in and around the mine. Should the selling of the proposed aggregates be approved, it will generate an additional source of income to the Right Holder, reduce the areas needed for the stockpiling of overburden material as the material stockpiles will constantly be depleted, and indirectly contribute to the conservation of intact vegetation cover on the property (around the current stockpile areas).

STORAGE OF DANGEROUS GOODS AND WASTE RELATED ACTIVITIES

(Information extracted from the National Waste Management Strategy 2020, DEFF)

The Department of Environment, Forestry and Fisheries (DEFF) introduced the National Waste Management Strategy (NWMS) of South Africa in 2020 that is centred around the concept of "circular economy". Circular economy is an approach to minimising the environmental impact of economic activity by reusing and recycling processed materials to minimise: (a) the need to extract raw materials from the environment; and (b) the need to dispose of waste. According to the 2018 State of Waste Report, in 2017 South Africa generated 55 million tonnes of general waste, with only 11% being diverted from landfill.

For these reasons, diverting waste from landfill is a key imperative for the country's NWMS. South Africa's strategy for diversion of waste from landfill is based on building a secondary resources economy around the beneficiation of waste as part of the circular economy. This is through among others, the recycling of paper, glass, plastics, metals, tyres, power generation waste, waste oils, pesticides, batteries, lighting equipment, WEEE, and recovery of construction and demolition waste to substitute recycled content for virgin materials.

Further to this, the NWMS reports that South Africa generated almost 67 million tonnes of hazardous waste in 2017 and over 93% of that was landfilled. Waste prevention is therefore a priority in relation to hazardous waste, both in terms of amount and toxicity of waste that is disposed to landfill (NWMS, 2020). "*There is no waste in a circular economy – when we have finished with something it becomes the raw material for something else*" Minister Barbara Creecy, DEFF Budget Policy Statement 2019/20.

The NWMS notes that the two (2) strategic entry points of the waste sector into waste minimisation and the circular economy is waste prevention and waste as a resource. Waste as a Resource focuses on stimulating a secondary resources economy based on recycling and recovery of materials and energy from waste i.e. interventions that take place after a product or material has become waste. Circularity can deliver substantial material savings throughout value chains and production processes, generate extra value, transformation of industry towards climate-neutrality, long-term competitiveness and unlock economic opportunities. In terms of the waste management hierarchy practices, recycling of waste for reuse and recovery of materials is prioritised over recovery of energy from waste. The main economic driver lies in exploiting the full potential value of waste.

Having these entry points as part of South Africa's strategy for waste minimisation and implementing the circular economy will result in the diversion of waste from landfill and the displacing of demand for virgin materials. The private sector is involved throughout the waste sector as generators of waste, providers of waste related services, recyclers of waste and consumers of recycled materials – as well as providing an important interface to consumers. The involvement of the private sector is therefore critical to the implementation of the NWMS (NWMS, 2020).

The proposed burning of wood chips/sawdust and used oil submitted by the Applicant as part of this application directly links with the objectives of the NWMS as the company will contribute to the reusing/recycling of materials that would otherwise have ended up at landfill sites. The proposed use of the waste materials as renewable fuel resources at the

brick plant, further excellently supports the “circular economy” concept as it directly reduces the fossil fuel (furnace oil and coal) need of the operation.

The need and desirability of the proposed project was assessed in terms of the National Department of Environmental Affairs’ Guideline on Need and Desirability (first version published in terms of section 24J of the NEMA in 2014, and second version in 2017)). The following table shows the questions that were considered in this regard.

Table 5: Need and desirability determination.

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
<u>How will this development impact on the ecological integrity of the area?</u>		
Question	**Response**	**Level of Desirability**
How were ecological integrity considerations taken into account?	As discussed under Part A(1)(g)(iv)(1)(a) *Type of environment affected by the proposed activity*, the Mining and Biodiversity Map shows that the northern part of the mining area extends across an area of highest biodiversity importance with a corresponding rating of highest risk for mining to the north. The rest of the property (towards the south) is classified as being of high importance with a corresponding high risk rating. According to the 2019 Eastern Cape Biodiversity Conservation Plan there is a Critical Biodiversity Area (CBA) registered over the northern part of the property. The CBA does however not extend across the already disturbed/altered areas of the quarry pit and brick plant. As mentioned earlier, the proposed activities will take place on already disturbed areas that will not necessitate the removal of natural occurring vegetation and does therefore not pose any risk to the conservation status of the CBA or broad-scale ecological processes, nor the ecosystems/ecology of the property. Further to this, the wood to be chipped on site originates from (amongst others) alien vegetation clearing projects, and the project therefor contributes to the reusing/recycling of waste materials as a substitute fuel resource while supporting local alien vegetation removal contractors.	Highly Desirable
How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity?		
How will this development pollute and/or degrade the biophysical environment?	The proposed activities do not require the alteration of naturally vegetated areas and will therefore not degrade the biophysical environment. Should the mitigation measures proposed in this document be implemented on site, it is believed that the operation could be managed without polluting to the surroundings.	Highly Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
	Should the Applicant be allowed to burn the wood chips/sawdust and used oil as an alternative fuel resource, the project will further contribute to the reduction of waste materials that would otherwise have ended at landfill sites.	
What waste will be generated by this development?	As mentioned earlier, the mining of clay generates very little general- and/or hazardous waste. The Right Holder has an integrated waste management policy, and the company strives to become a zero waste generator. The mining of aggregate will not generate waste other than possible oversize material that may be unpopular with clients. Such material could be reused at the clay quarry as part of the rehabilitation activities. Hazardous waste may occasionally result from accidental spillages/breakdowns. Such contaminated areas will immediately (within two hours of occurrence) be cleaned, and the contaminated soil will be contained in a designated hazardous waste container that will be kept in a bunded area with impermeable surface until it is removed from site by a registered hazardous waste handling contractor to an approved facility.	Highly Desirable
How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage?	The proposed development does not require the alteration of any virgin areas, and therefore does not pose a risk to any landscapes and/or sites that constitute the nation's cultural heritage. Neither did the palaeontologist identify any areas of concern on the property.	Highly Desirable
How will this development use and/or impact on non-renewable natural resources?	The proposed development does not require the use of non-renewable resources as the aggregate will originate from overburden removed from the clay quarry (already authorised), the wood chips/sawdust is produced from	Highly Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part?	broken pallets and alien vegetation, and the used oil is bought from clients in and around the site. The infrastructure at the warehouse will be solar powered.	
How were a risk-averse and cautious approach applied in terms of ecological impacts?	The proposed development will be contained to the already altered/surfaced areas on the farm.	Highly Desirable
How will the ecological impacts resulting from this development impact on people's environmental right?	The main ecological impacts stemming from the proposed project are deemed to be positive as it supports the circular economy concept proposed by the NWMS. Therefore, should the mitigation measures proposed in this document be implemented the potential impacts associated with the proposed operation will be of low significance. If the monitoring programs, proposed in this document, are implemented it is believed that no environmental rights of the surrounding residents/public will be affected by the proposed activity.	Highly Desirable
Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts.	If the S102 application is approved, the mine will generate income from the selling of aggregates, that were to date merely stockpiled on the property. The betterment of the company directly contributes to a prolonged lifespan of the operation and job security to employees. As mentioned earlier, the wood will be bought from local contractors removing alien vegetation in the vicinity of the site providing them with a sustainable income source. Further to this, the use of old oil at the site will directly assist the generators of the oil to responsibly and environmentally friendly disposal of their waste products. This application also fits neatly into the goals and objectives of the NWMS.	Highly Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area? Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified, resulted in the selection of the "best practicable environmental option" in terms of ecological considerations	If the mitigation measures proposed in this document are adhered to, the proposed project could operate without influencing the status of the ecosystem type, red data species or the conservation targets set out for a CBA. Also refer to: ❖ Part A(1)(d)(ii) Description of the activities to be undertaken; ❖ Part A(1)(h)(i) Details of the development footprint alternatives considered; ❖ Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity; ❖ Part A(1)(h)(iv)(1)(c) Description of specific environmental features and infrastructure on the site.	Highly Desirable

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
What is the socio-economic context of the area?	Please refer to Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – Socio-Economic Environment.	Highly Desirable
Considering the socio-economic context, what will the socio-economic impacts be of the development, and specifically also on the socio-economic objectives of the area?	If the S102 application is approved, the mine will generate income from the selling of aggregates, that were to date merely stockpiled on the property. The betterment of the company directly contributes to a prolonged lifespan of the operation and job security to employees. As mentioned earlier, the wood will be bought from local contractors removing alien vegetation in the vicinity of the site providing them with a sustainable income source. Further to this, the use of used oil at the site will directly assist the producers to responsibly and environmentally friendly disposal of their waste products. This application also fits neatly into the goals and objectives of the NWMS.	
How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?		
Will the development result in equitable impact distribution, in the short- and long-term?	The proposed activities will be operated in a socially and economically sustainable manner during both the short- and long term. The procurement progression plan of the Applicant entails the support of local enterprises, of which preference will be given to HDSA & women owned local suppliers.	Highly Desirable
In terms of location, describe how the placement of the proposed development will contribute to the area.	The proposed activities will be located within the boundaries of the existing mining right, and if allowed to continue, will directly contribute to the improvement and progression of the operation.	Highly Desirable

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
How were a risk-averse and cautious approach applied in terms of socio-economic impacts?	No negative socio-economic impacts could, at this stage, be identified that cannot be managed through the implementation of mitigation measures included in this report.	Highly Desirable
How will the socio-economic impacts resulting from this development impact on people's environmental right?	If the monitoring programs, proposed in this document, are implemented it is believed that no environmental rights of the surrounding residents/public will be affected by any potential ecological impacts associated with the proposed activity.	Highly Desirable
Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts?	If the S102 application is approved, the mine will generate income from the selling of aggregates, that were to date merely stockpiled on the property. The betterment of the company directly contributes to a prolonged lifespan of the operation and job security to employees. As mentioned earlier, the wood will be bought from local contractors removing alien vegetation in the vicinity of the site providing them with a sustainable income source. Further to this, the use of old oil at the site will directly assist the producers to responsibly and environmentally friendly disposal of their waste products. This application also fits neatly into the goals and objectives of the NWMS.	Highly Desirable
What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	If the mitigation measures proposed in this document is adhered to, the proposed project can continue without influencing the status of the ecosystem type, red data species or the conservation targets set out for a CBA. Should the S102 application be approved, the project will directly contribute to the socio-economic status of the receiving	Highly Desirable

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons?	environment through the responsible reuse/recycling of general- and hazardous waste products, as provided for in the NWMS. Also refer to: ❖ Part A(1)(h)(vii) The positive and negative impacts that the proposed activity and alternatives will have on the environmental and the community that may be affected.	
What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination? What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	The mine operates in accordance with, amongst others, the following: ❖ CARA, 1983 – to ensure agriculture related compliance; ❖ Financial Provision Regulations, 2015 – to ensure compliance in terms of rehabilitation; ❖ Mine Health and Safety Act, 1996 (as amended) – to ensure employee safety; ❖ MPRDA, 2002 (as amended) – to ensure mining related compliance; ❖ NEM:AQA, 2004 – to ensure air quality related compliance; ❖ NEM:BA, 2004 – to ensure biodiversity related compliance; ❖ NEM:WA, 2008 – to ensure waste related compliance; ❖ NEMA, 1998 (as amended) – to ensure environmental related compliance; As mentioned earlier, the procurement progression plan of the Applicant entails the support of local enterprises, of which preference will be given to HDSA & women owned local suppliers.	Highly Desirable

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community that is consistent with the priority needs of the local area.	❖ The aggregate will be sold to building- and road contractors in and around the mine. ❖ The wood will be bought from community members of the local municipal area, generating an income source for the immediate surrounding community. ❖ The used oil will be bought from producers in and around the mine that will also provide them with an additional income, as well as a responsible manner to discard their hazardous waste. ❖ The Applicant would be able to reduce the fossil fuel need of the site by using renewal resources.	Highly Desirable
What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected.	The mine will operate in accordance with the specifications of the Mine Health and Safety Act, 1996 as well as the Occupational Health and Safety Act, 1993. Site management will arrange regular toolbox talks with the site personnel regarding the work to be performed and the environment in which the work will take place. Grievances/concerns can be lodged during the toolbox sessions and site meetings.	Highly Desirable
Describe how the development will impact on job creation in terms of, amongst other aspects?	As this is a S102 amendment application for an existing operation the project itself will not generate additional work opportunities. It will however indirectly generate work opportunities in the local community (wood sellers). The diversification of the existing operation will contribute to the lifespan of the operation providing the existing employees with job security.	Highly Desirable

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage.	The mine operates under a valid environmental authorisation and mining right. Should the S102 application be approved, compliance of the site with the approved EMPR, EA- and Waste Licence conditions will be reported on as per departmental specifications. In light of this, the proposed activity will take place in an environmentally sustainable manner with the least possible impact on the receiving environment.	Highly Desirable
Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	It is believed that the mitigation measures proposed in this document are realistic and can be implemented (when applicable) by the mine. As mentioned earlier, during the decommissioning phase all structures will be removed from the applicable footprints, except those that can still be used by the landowner. Any stockpiled aggregate, not sold by that time, will be used in the rehabilitation of the clay quarry when applicable. If the disturbed areas are successfully rehabilitated no long-term management burden will be left behind.	Highly Desirable
What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution environmental damage or adverse health	In terms of Section 41 of the MPRDA, 2002 a mining right holder must submit a financial provision to the DMRE that is sufficient to rehabilitate or manage the negative environmental impacts related to the mining activity. The Applicant already has a financial guarantee lodged with the DMRE that are deemed sufficient to cover the financial provision amount needed to rehabilitate the mining footprint. The environmental liability of the operation will annually be reviewed and if a shortfall is indicated, the guarantee will be accordingly adjusted.	Highly Desirable

2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
effects will be paid for by those responsible for harming the environment.		
Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified, resulted in the selection of the best practicable environmental option in terms of socio-economic considerations	If the mitigation measures proposed in this document are adhered to, the proposed activity can take place without influencing the status of the ecosystem type, red data species or the conservation targets set out for a CBA. Also refer to: ❖ Part A(1)(h)(vii) The positive and negative impacts that the proposed activity and alternatives will have on the environmental and the community that may be affected.	Highly Desirable
Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area.	Refer to Part A(1)(t)(i)(1) *Impact on the socio-economic conditions of any directly affected person*.	Highly Desirable

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

The preferred project-, layout- and technology alternatives regarding this application entails the:

1. commercial selling of unwanted overburden, removed from the clay quarry, as aggregate to interested clients;
2. addition of three (aboveground) dangerous goods storage tanks near the brick factory;
3. chipping of wood that originates from (amongst others) discarded pallets and alien vegetation clearing programmes as a substitute fuel source at the tunnel kiln of the brick factory to reduce the commercial fuel need of the site;
4. application of used oil, collected from clients in and around the municipal area, as an alternative fuel source at one burner group on the tunnel kiln.

The proposed activities (as listed above) constitute the preferred and only viable development option as:

- the selling of the overburden as aggregate will generate an additional income source for the Right Holder. Further to this, the constant removal of stockpiled overburden from the property will reduce the areas needed for stockpiling, and in doing so contribute to the conservation of intact vegetation cover on the property (around the current stockpile areas). As the Applicant proposes to make use of a mobile crushing plant (when needed), this application does not require the construction of any permanent infrastructure on site. The use of temporary equipment will also lessen the rehabilitation actions to be taken upon the decommissioning of the site. Should the Applicant be allowed to continue with this activity, there will be no residual impacts on the receiving environmental once the mine closes.

- As mentioned earlier, the proposed reuse of the wood and used oil as fuel resources at the brick factory directly links with the objectives of the NWMS and the “circular economy” concept. Considering this, the proposal will not merely contribute to the responsible reuse of waste products, but also reduce the fossil fuel need of the site that will directly lower the financial costs of the operation. The projects will further generate income for wood sellers in the surrounding community, as well as provide used oil generators with an environmentally responsible option of hazardous waste (used oil) disposal, while also earning an income rather than it being a cost. This project therefore does not only provide the Applicant with cost savings, but also contributes to the local economy in more than one sector. Further to this, the

assessment (as part of the S102 application) showed that if the proposed mitigation measures are implemented, the impacts significance is deemed to be Low.

- The reuse of used oil as an alternative fuel source at the brick factory will increase the storage capacity needs of the site, and therefore the Applicant identified the need for three additional dangerous goods storage tanks at the property. Should the Applicant not be allowed to install the additional tanks, it would mean that less used oil can be stored at a time. That would directly increase the number of trips the Applicant would need to make to collect the oil. An increase in collection trips will directly increase the cost for the Applicant, and indirectly affect the cost offered to the clients for the oil. It is therefore imperative that the Applicant can collect full loads of used oil with every trip in order to make the project cost effective. This will however only be possible if the site has adequate storage capacity.

- The proposed project (selling of aggregate, placement of dangerous goods tanks, and the burning of wood and used oil on site) will take place (if approved) in already altered/surfaced areas on the property and will not require the removal of any intact vegetation cover. Moving any of the activities from the proposed footprints, will however necessitate the clearance of vegetation and the stripping of topsoil that was not deemed to be the preferred or most environmentally friendly option.

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

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

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

i) Details of the development footprint alternatives considered.

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

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

1. SECTION 102 APPLICATION

1.1 PROJECT ALTERNATIVES

1.1.1 Commercial Mining of Aggregate

As mentioned earlier, bulldozers and/or excavators are used to strip the overburden from the clay layer. The overburden is loaded onto dumper trucks that transport it to the stockpile area from where the Applicant now proposes to sell the material as an additional income source of the mine. Considering this, no other project related alternative, other than the no-go option (not selling the aggregate) could be identified.

1.1.2 Storage of Dangerous Goods and Waste Related Activities

The addition of dangerous goods storage tanks on the property will supply the containment facilities needed to house the old oil to be purchased and used as alternative fuel source on the property. As with the mining of aggregate, no other project related alternative, other than the no-go option (not burning the wood and used oil) could be identified.

1.2 LAYOUT ALTERNATIVES

Layout alternatives are not deemed applicable to this application, as the aggregate will be sold from the existing stockpile area on the farm. The wood will be sorted at an existing area and chipped at an existing warehouse on the property; and the dangerous goods storage tanks have to be placed within close proximity of the brick factory at an already surfaced area. Moving any of these activities from the proposed footprints, will necessitate the clearance of

vegetation and the stripping of topsoil that was not deemed the preferred, or most environmentally friendly option.

1.3 TECHNOLOGY ALTERNATIVES

The processing of the aggregate (when needed) will be by means of a mobile crushing and screening plant that makes use of the latest technology.

Further to this, the chipping of the wood, and the burning of the waste materials is proposed to fuel the burner zones on the tunnel kiln of the brick plant as part of the existing technology of the plant. Considering this, no viable technology alternatives were identified.

1.4 NO-GO ALTERNATIVE

Should the aggregate not be approved as a commercial source, the Right Holder will lose the opportunity to generate income from the unwanted overburden removed to access the clay.

Further to this, the opportunity to reduce the use of commercial fuels at the brick factory will be lost should the Applicant not be allowed to burn the wood and used oil as alternative sources. The proposed project also offers generators of used oil an environmentally friendly option to dispose of their hazardous waste, while earning an income from it instead of paying for its removal to one of the few hazardous waste landfill sites in the country. This opportunity will however be lost should the no-go option/status quo be implemented. Considering this, the no-go option was not deemed to be a preferred development option.

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.

S102 APPLICATION

During the public participation process the relevant stakeholders and I&AP's were informed of the project by means of an advertisement in the Daily Dispatch and The Herald, and on-site notices that were placed at the property boundary as well as the Makana Library in town. A notification letter inviting comments on the DBAR over a 30-days commenting period (ending 06 June 2022) was also sent to the landowner, neighbouring landowners, stakeholders, and any other I&AP that may be interested in

the project. The comments received on the DBAR were incorporated into the final Basic Assessment Report (FBAR) to be submitted to the DMRE for consideration. The following I&AP's and stakeholders were informed of the project:

Table 6: List of the I&AP's and stakeholders that were notified of the proposed application.

SURROUNDING LANDOWNERS & INTERESTED AND AFFECTED PARTIES	STAKEHOLDERS
Landowner: ❖ Grahamstown Brick (Pty) Ltd Remaining Extent of the farm Brakkefontein No 243. **Surrounding landowners:** ❖ Eastern Cape Provincial Government Portion 0 of Farm No 242; Portion 8 of Tempe No 240; Portion 5 of Brakkefontein No 243; Portion 0 of Annex Thorn Park No 247; ❖ National Government of RSA Portion 0 of Farm No 192; Portion 1 of Tempe No 240; Portion 9 of Tempe No 240; ❖ Provincial Housing Development Board – Eastern Cape Portion 2 of Brakkefontein No 243	❖ Department of Economic Development, Environmental Affairs and Tourism (DEDEAT); ❖ Department of Labour; ❖ Department of Public Works; ❖ Department of Rural Development and Agrarian Reform; ❖ Department of Rural Development and Land Reform; ❖ Department of Transport; ❖ Department of Water and Sanitation; ❖ Eskom Ltd; ❖ Makana Local Municipality Ward 01 Councillor; ❖ Makana Local Municipality; ❖ Sarah Baartman District Municipality; and ❖ South African Heritage Resources Agency.
PARTIES THAT COMMENTED ON OR RESPONDED TO THE DBAR & EMPR	
❖ Department of Economic Development, Environmental Affairs and Tourism - Sarah Baartman/Nelson Mandela Bay Region; and ❖ Sarah Baartman District Municipality.	

iii) Summary of issues raised by I&APs

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

Table 7: Summary of issues raised by IAPs

Interested and Affected Parties **List the name of persons consulted in this column, and** **Mark with an X where those who must be consulted were in fact consulted**		**Date Comments Received**	**Issues raised**	**EAPs response to issues as mandated by the applicant**	**Section and paragraph reference in this report where the issues and or response were incorporated.**
AFFECTED PARTIES	**X**				
Landowner/s					
Grahamstown Brick (Pty) Ltd ❖ Remaining Extent of the farm Brakkefontein No 243.	X	Makhanda Mining (Pty) Ltd entered into a usage agreement with Grahamstown Brick (Pty) Ltd, who in principle supports the application.			
Lawful occupier/s of the land					
N/A	-	No lawful occupiers of the land are applicable to this project.			
Landowners or lawful occupiers on adjacent properties	**X**				
Eastern Cape Provincial Government ❖ Portion 0 of Farm No 242 ❖ Portion 8 of Tempe No 240 ❖ Portion 5 of Brakkefontein No 243 ❖ Portion 0 of Annex Thorn Park No 247	X	No comments were received on the DBAR that could be incorporated into the final BAR.			
National Government of RSA ❖ Portion 0 of Farm No 192 ❖ Portion 1 of Tempe No 240 ❖ Portion 9 of Tempe No 240	X	No comments were received on the DBAR that could be incorporated into the final BAR.			

Interested and Affected Parties List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
Provincial Housing Development Board – Eastern Cape ❖ Portion 2 of Brakkefontein No 243	X	No comments were received on the DBAR that could be incorporated into the final BAR.			
Municipal councillor					
Cllr. Peter Phumelele (Ward 01)	X	No comments were received on the DBAR that could be incorporated into the final BAR.			
Municipality					
Makana Local Municipality	X	No comments were received on the DBAR that could be incorporated into the final BAR.			
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e					
Department of Transport	X	No comments were received on the DBAR that could be incorporated into the final BAR.			
Department of Water and Sanitation	X	No comments were received on the DBAR that could be incorporated into the final BAR.			
Eskom Ltd	X	No comments were received on the DBAR that could be incorporated into the final BAR.			

Interested and Affected Parties List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
Communities	No communities were identified within the study area.				
Dept. Land Affairs	X	No comments were received on the DBAR that could be incorporated into the final BAR.			
Traditional Leaders	N/A	-	-	-	-
Dept. Environmental Affairs	-	-	-	-	-
Department of Economic Development, Environmental Affairs and Tourism (DEDEAT)	X	06 May 2022	Mr Govender registered DEDEAT as a commenting authority on the project, requested a dropbox link to the documents, and asked whether the Provincial Air Quality Official was contacted.	Greenmined registered the DEDEAT as commenting authority on the project. Provided Mr Govender with a dropbox link on 10 May 2022, and Mr Lyndon Mardon (Provincial Air Quality Official) was copied into the project related correspondence for his records. To date no additional comments were received that could be incorporated into the FBAR.	See Appendix K for proof of public participation process.
Other Competent Authorities affected	-	-	-	-	-
Department of Rural Development and Agrarian Reform (DRDAR)	X	No comments were received on the DBAR that could be incorporated into the final BAR.			

Interested and Affected Parties List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
Department of Rural Development and Land Reform	X	No comments were received on the DBAR that could be incorporated into the final BAR.			
Department of Labour	X	No comments were received on the DBAR that could be incorporated into the final BAR.			
Department of Public Works	X	No comments were received on the DBAR that could be incorporated into the final BAR.			
Sarah Baartman District Municipality	X	06 June 2022	Me Nelisa Nama submitted the following comments on the DBAR.	Greenmined acknowledged receipt of the comments on 14 June 2022 and responded as listed below.	See Appendix K for proof of public participation process.

Comments received from SBDM on the DBAR:

"…**Tank Maintenance**

Figure 7 as it appears on page 20 of the DBAR indicates that the proposed tanks will be installed and managed in the same manner as the exiting tanks at the site are managed. But, from the picture on the left it is so evident that the tanks need attention as there is an indication of oil spillages. A maintenance and or caution and management when using them is recommended. The Applicant is requested to conduct ongoing improvements on oil storage operation for all the tanks. The Applicant is requested to instal a secondary containment around the storage tanks and a constant maintenance thereof is advised.

Risk Analysis

The Applicant is advised to thorough analyse all risks associated with the tank installations more-so the bund to adhere to the bund specifications as outline on page 28 of the DBAR to contain spillages and incidents that can emerge.

Interested and Affected Parties List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
Environmental Authorisation The Applicant is advised to consider including the following listed activity: GNR 327 Listing Notice 1 Activity 51: The expansion and related operation of facilities for the storage, or storage and handling, of a dangerous good, where the capacity of such storage facility will be expanded by more than 80 cubic metres. The Applicant is further advised to note and adhere to the conditions as outlined in the Environmental Authorisation as issued in 2008 by the Department of Economic Development and Environmental Affairs with a reference number: EC06/386/7/07-104. **Waste Management** The applicant is advised to carefully take due diligence in handling hazardous waste on-site and dispose thereof. The waste generated onsite needs to be disposed of at a registered municipal landfill site not at the dumping site as indicated in the DBAR. The applicant needs to dispose all general waste at a registered general landfill site and the hazardous waste to be disposed of at municipality registered hazardous waste landfill site. The applicant is advised to adhere to the conditions of the waste license to be issued as per the outcome of this application."				
Greenmined's response to the comments received on the DBAR: **Tank Maintenance:** The use of a maintenance programme for the dangerous goods storage tanks was added to the mitigation measures proposed in this report. It must be noted that the spot perceived to be an oil spill, was in fact dirt/debris that was broomed from the surrounding paved area. However, the comment is noted, and all the dangerous goods tanks will be installed in areas with secondary containment.				

Interested and Affected Parties List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
Risk Analysis: A thorough risk analysis will be conducted before the installation of the proposed tanks on site, and the outcome of this analysis will be filed on site for auditing purposes. **Environmental Authorisation:** GNR 327 Listing Notice 1 Activity 51 was added to the application as suggested, and the adherence of the Applicant to the current EA issued by the DEDEAT was also added to the mitigation measures in this report. **Waste Management:** The DBAR was amended to stipulate the disposal of waste at a registered general/hazardous waste municipal landfill site. **Reference where applied:** ❖ Part A(1)(h)(viii) The possible mitigation measures that could be applied and the level of risk – Storage/Handling of Hazardous Substances/Chemicals.					
South African Heritage Resources Agency	X	No comments were received on the DBAR that could be incorporated into the final BAR.			
OTHER AFFECTED PARTIES					
N/A					
INTERESTED PARTIES					
N/A					

iv) The Environmental attributes associated with the alternatives.

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

(1) Baseline Environment

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

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

This section describes the biophysical-, cultural- and socio-economic environment of the greater study area. It is important to note that the mine has been operational for ±27 years, and through the years the clay quarry and factory developed into landscape features. The following discussion of the type of environment to be affected therefore includes the *status quo* associated with the activities of the mine.

PHYSICAL ENVIRONMENT

CLIMATE

The following chart shows the maximum, minimum and average temperatures (21°C daytime, 15°C nighttime) of the Makhanda region. Makhanda experiences its highest temperatures during the summer months (December – February) with peaks of up to 27°C; thereafter the mercury drops to lows of 13°C during July/August.

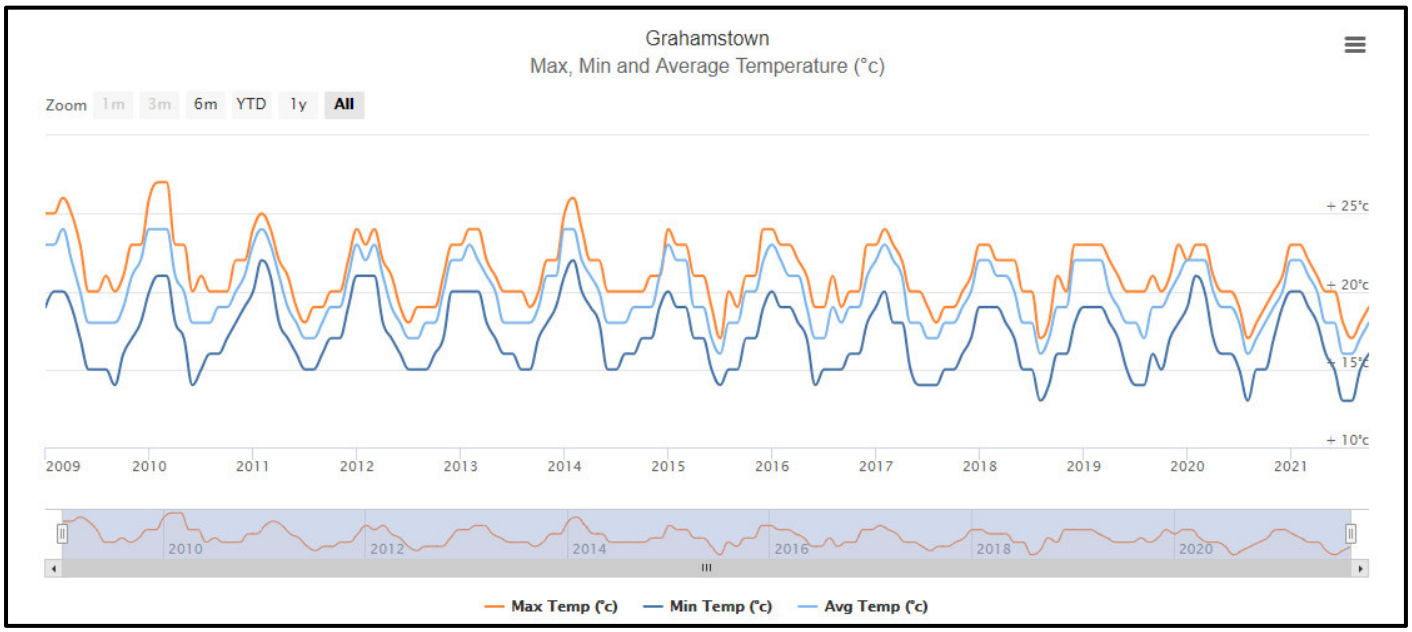

Figure 9: Chart showing the maximum, minimum, and average temperatures of the Makhanda region over a period of 12 years (chart obtained from http://www.worldweatheronline.com)

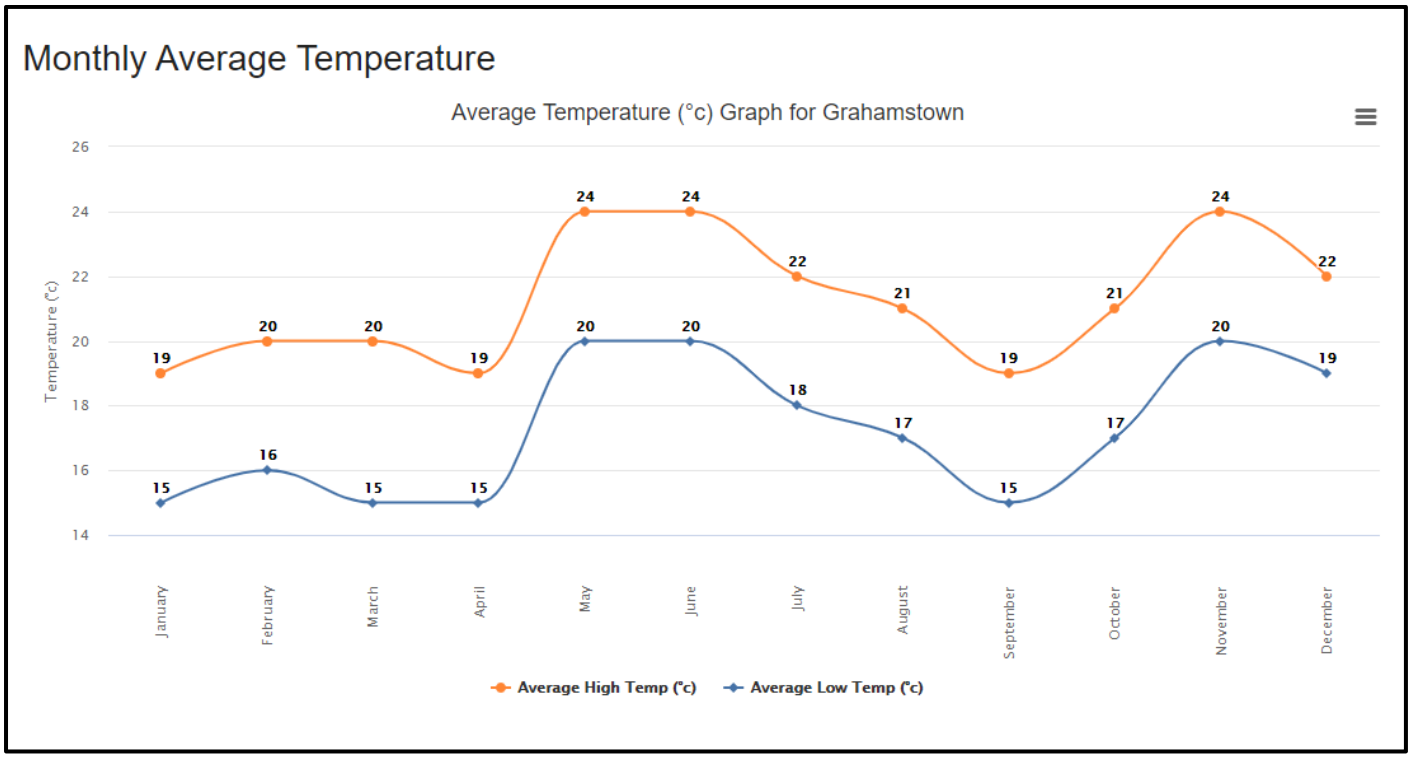

Figure 10: Chart showing the monthly average temperature of the Makhanda region (chart obtained from http://www.worldweatheronline.com)

According to Clima-Data.org the average rainfall of the Makhanda area is 590 mm/year. The following chart, obtained from World Weather Online, shows that the measured rainfall for the period October 2020 to October 2021 was ±654 mm, while the area received the lowest rainfall during September 2021 and the highest in October 2020.

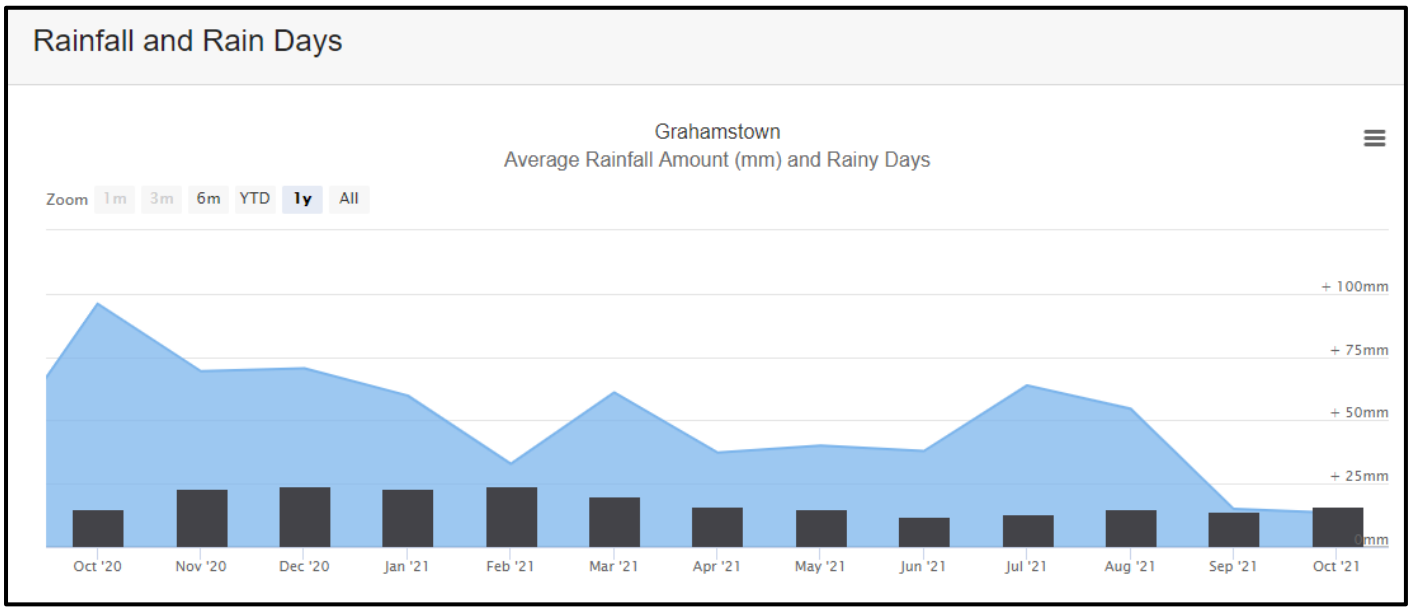

Figure 11: Chart showing the average rainfall amount and rainy days for the Makhanda region (chart obtained from http://www.worldweatheronline.com)

The dominant wind direction of the Makhanda region is south-west, with an average wind speed of ±10 knots (±18.52 km/h) as shown in the figure below.

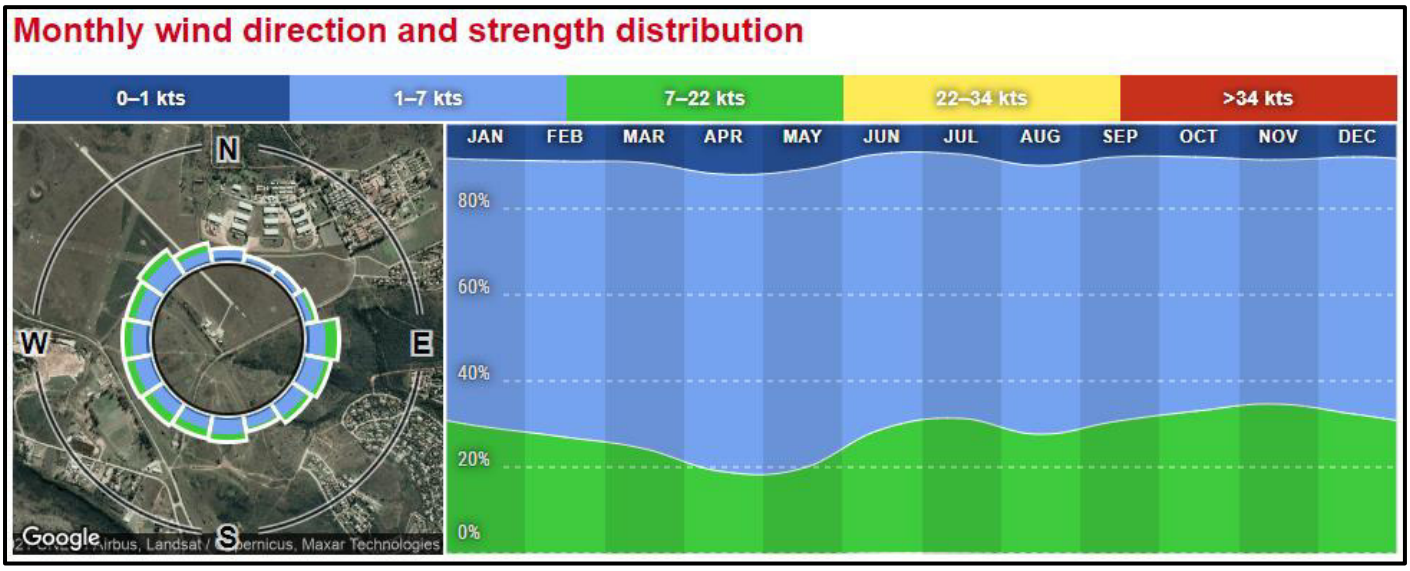

Figure 12: Image showing the dominant wind direction (first panel) and average wind speed over a 12 month period for the Makhanda area (image obtained from http://www.windfinder.com/windstatistics/grahamstown).

TOPOGRAPHY

The topography of the greater study area is highly undulating as shown in the figure below. The area has elevations ranging between ±534 – ±633 mamsl.

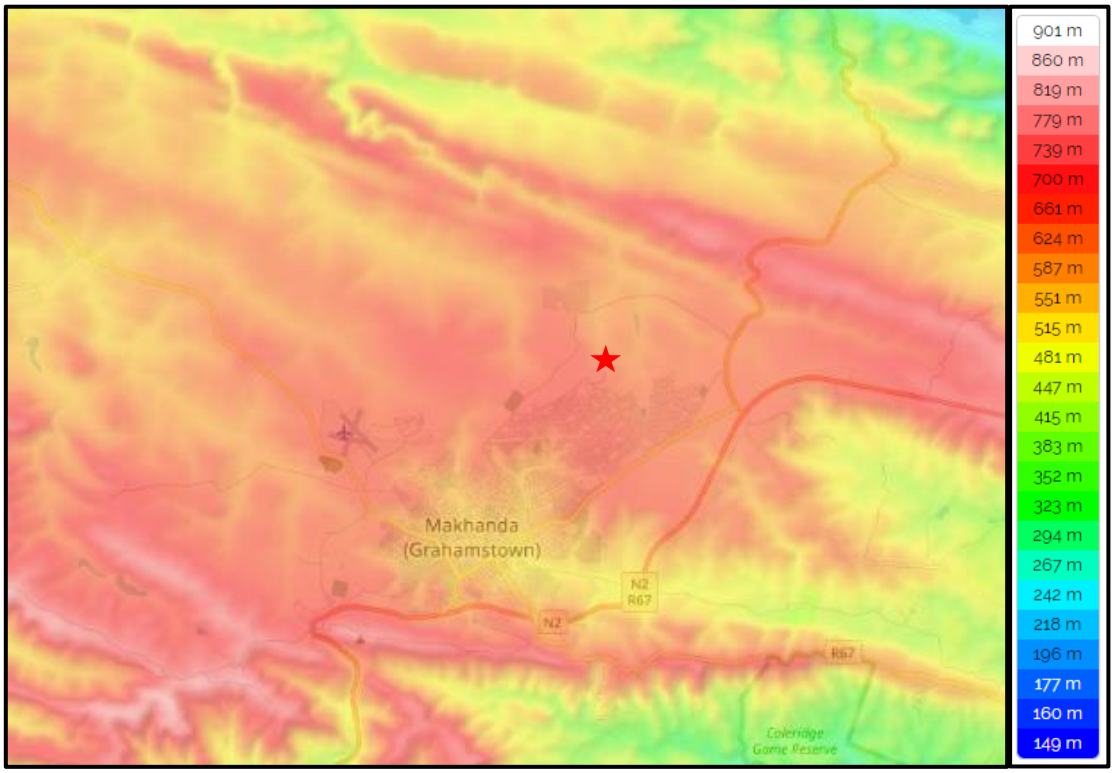

Figure 13: Map showing the topography of the greater Makhanda area (image obtained from http://www.en-za.topographic-map.com/maps/gwpq/South-Africa/).

The earmarked farm has an undulating topography that gradually rises from the lower laying northern boundary (±567 mamsl) towards the southern boundary (±660 mamsl) of the property as shown in the figure below.

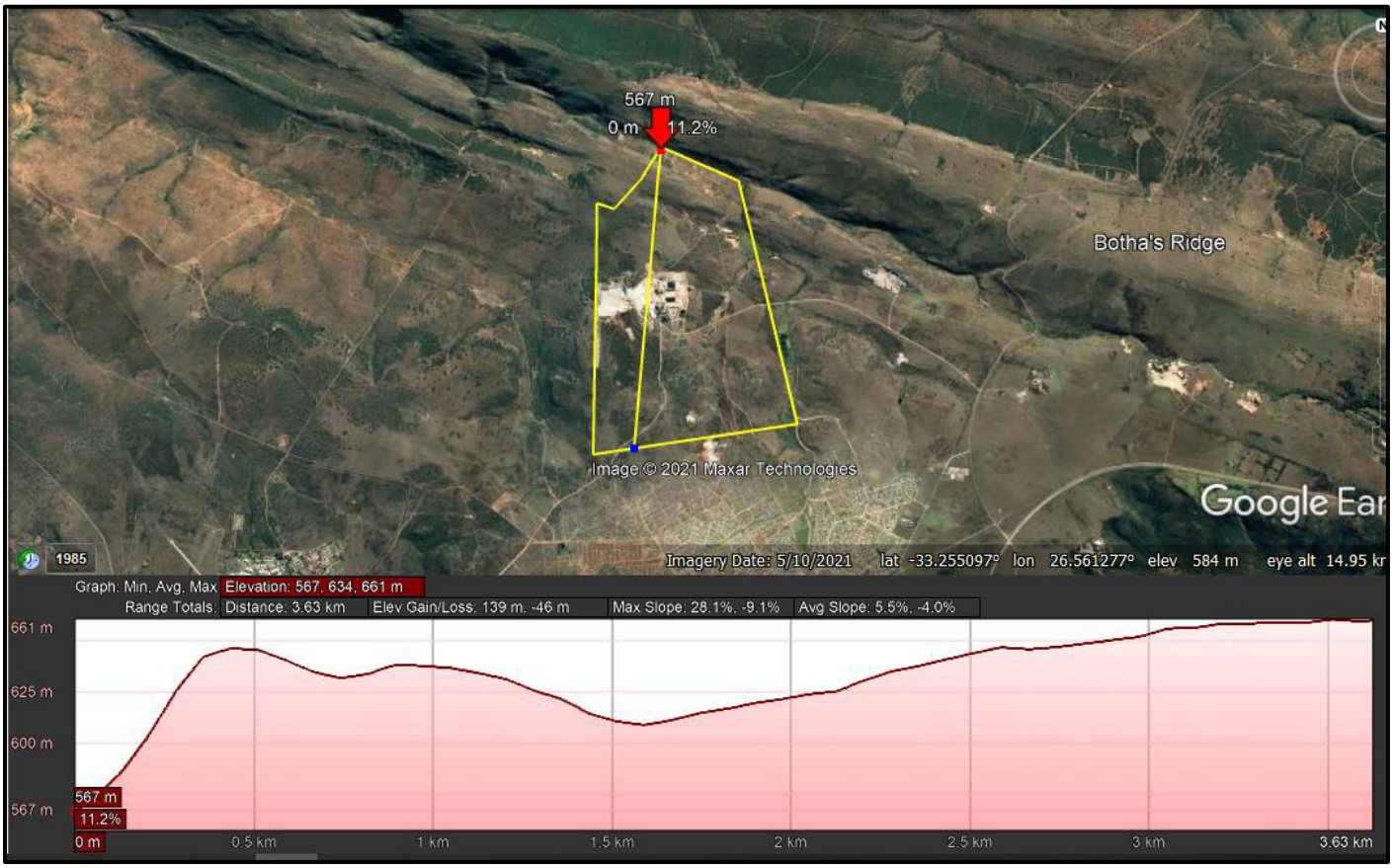

Figure 14: Satellite view of the earmarked property that shows the rise in altitude from the northern boundary towards the south (image obtained from Google Earth).

Also refer to Part A(1)(h)(iv)(1)(c) Description of specific environmental features and infrastructure on the site – Site Specific Topography.

VISUAL CHARACTERISTICS

The visual character of the surrounding areas mainly comprises of an agricultural setting, intersected by road- and electricity infrastructure, and transformed by the nearby Rini township (south of the farm).

The 2014 EMPR notes that the site is not visible from any scenic views or tourist routes, is partly visible from the Rini Township and from one location on the Grahamstown – Fort Beaufort Road (at a distance of approximately 4.2 km) from where only smoke is visible.

Also refer to Part A(1)(h)(iv)(1)(c) Description of specific environmental features and infrastructure on the site – Site Specific Visual Characteristics.

AIR AND NOISE QUALITY

The air quality and noise ambiance of the study area was historically representative of an agricultural environment in which farming equipment operated with occasional high dust emissions from denuded areas. The surrounding area has since been transformed with the encroachment of Makhanda (Grahamstown) towards the southern border of the farm, as well as the development of the Rini and other townships.

According to the 2014 EMPR, the activities at the farm also contribute air emissions from mainly the following five sources:

- White Clay Quarry: Air quality is affected by mining, as dust is generated. This occurs on a localised scale and represents a short to medium term impact of low significance, since dust is only generated during very windy conditions.
- Storage Depot/Site: Dust is generated here due to the storage piles of dry, pulverised clay and coal waiting to be processed. Vehicles depositing and loading clay in this area generate dust, and during windy conditions dust is also generated. After mitigation, which consists of using sprinklers, the impact is moderate.
- Mineral Processing: Clay is milled and generates dust. Wind also exacerbates the effect on air quality. After mitigation the significance of this impact is moderate.
- Unsurfaced roads: Unsurfaced roads generate dust, which is caused by vehicle traffic. This is a localised impact of low significance, after mitigation.
- Furnaces: Smoke results from the furnaces, where the bricks are fired. The impact from this is of moderate significance after mitigation.

Air quality levels, at the farm, are monitored by the Department of Health under the auspices of the Department of Environment Affairs and Tourism and air pollution does not affect any neighbours. Air pollution resulting from quarrying is primarily from dust and exhaust fumes from the machinery used for mining.

The 2014 EMPR notes that little noise is generated because of mining and processing, and therefore has no significant impact on the surrounding environment.

Also refer to Part A(1)(h)(iv)(1)(c) Description of specific environmental features and infrastructure on the site – Site Air and Noise Quality.

GEOLOGY AND SOIL

(Information extrapolated from the current Mining Work Programme, 2006)

The clay deposits occur below the Grahamstown Formation silcrete, which forms a remnant of an extensive peneplain that developed on the African erosion surface

during the Cretaceous-Tertiary period. The clays are developed in both the Witteberg Group and Dwyka Group tillite. The thickness of the kaolin horizon in this area varies considerably but reaches 35 meters in places. It generally occurs under a silcrete cover of up to 8 meters thick but is found close to the surface on the slopes below the peneplain. The region is underlain mainly by rocks of the Witteberg Group of the Cape Supergroup, and the Dwyka and Ecca groups of the Karoo Supergroup.

The sand quarry produces alluvial residual sand that is underlain by rocks of the Witteberg Group of the Cape Supergroup. These rocks consist of resistant quartz arenites (quartzite) of the Witpoort Formation, weathered to shallow sand deposits gathered in valley floors, overlain by shale remnants (shale deposit) of the Lake Mentz Subgroup (Perold, 2007). The residual kaolinite deposit is the result of in-situ weathering of the shales of the Lake Mentz Subgroup. The alluvial residual sand deposit is from the surface to an average depth of ±2 m.

Further to this, research done by Rhodes University showed that the northern parts of the farm is underlain by grey, fine-grained Witteberg Group shale, characterized by distinct bedding laminations. Further north, towards the Botha's River the shale is very fine-grained and structurally folded and thrusted with quartzites of the Witpoort Formation.

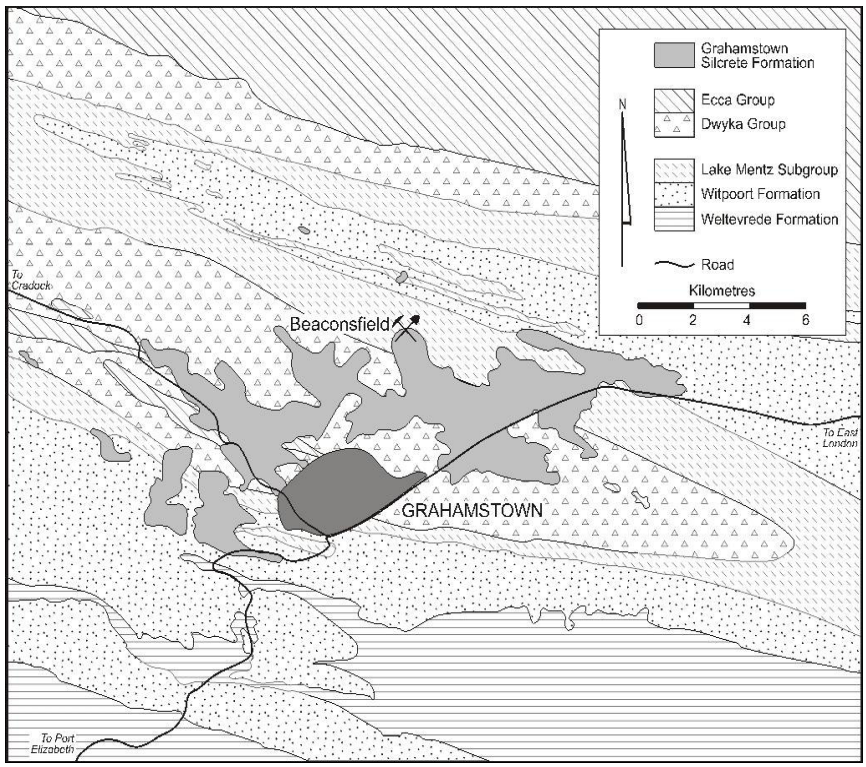

Figure 15: Map showing the geology of the Makhanda area. (Image obtained from the 2006 MWP)

HYDROLOGY

The mining area is situated in the Fish sub-water management area that forms part of the Fish to Tsitsikama Water Management Area (ID 16). According to the National Freshwater Ecosystem Priority Areas (NFEPA) map as presented by SANBI, the study area does not fall within a NFEPA in terms of wetlands and/or rivers.

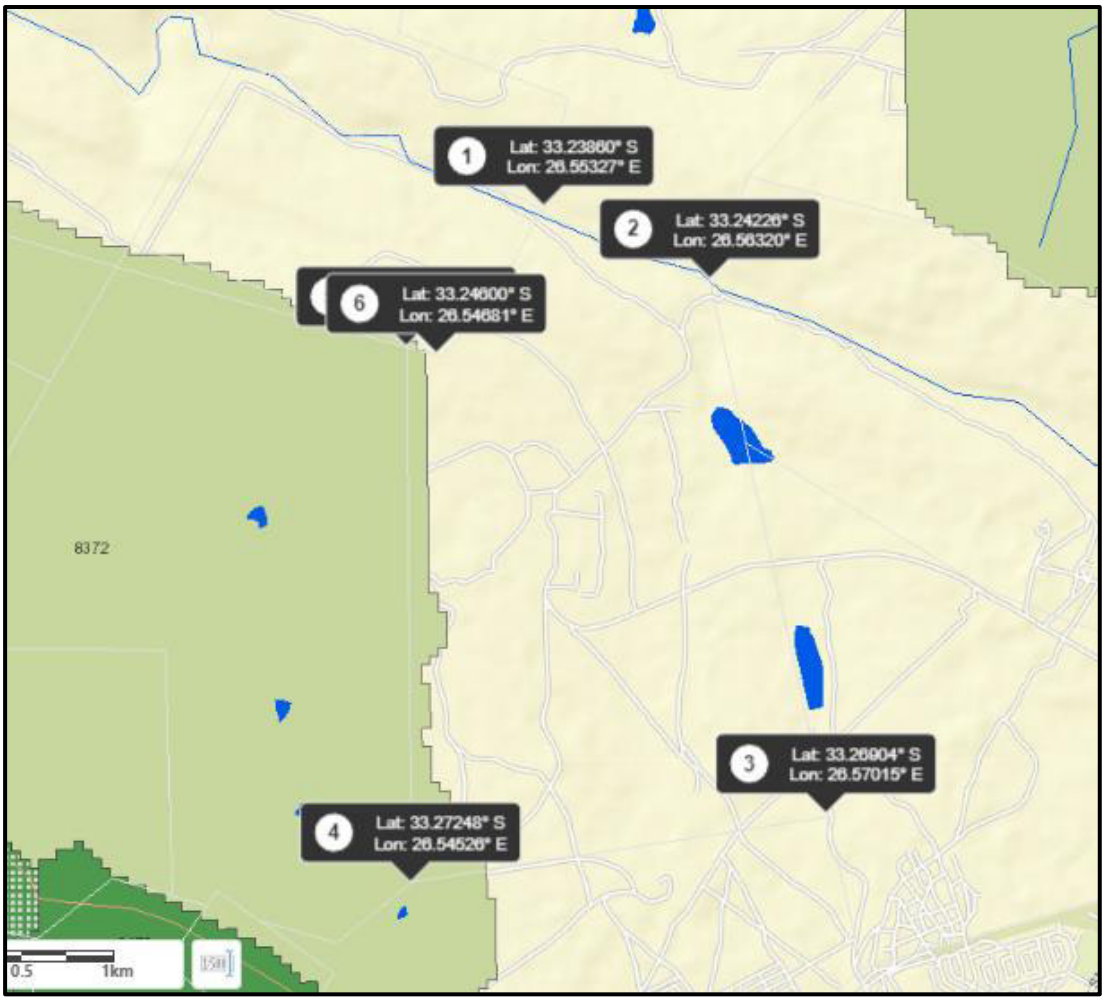

Figure 16: NFEPA BGIS Map Viewer confirming that the study area does not fall within a NFEPA area (image obtained from the BGIS Map Viewer – National Wetlands and NFEPA).

The 2014 EMPR reports that there are no natural streams on the farm. The Botha's River does however border the farm along the north-western boundary. An unnamed stream runs from the Rini township, on the northern end of the property, at 700-800 m from the factory and drains into the dam to the east of the shale quarry. This stream receives overflow from the sewage works, and now runs almost permanently. This water is being used for dust control. As mentioned earlier, there are six existing dams on the farm (refer to *Part A(1)(d)(ii) Description of the activities to be undertaken - 2.4 Site Infrastructure*). The 2014 EMPR notes that there is no impact on water quality, since all pollutants are contained in a series of channels and dams, so the impact on catchments yield and surface water is permanent, but of low-moderate significance.

The depth of the ground water, according to the 2014 EMPR, is more than 40 m in the factory area, and known to be 100 m at an old borehole on the farm. Therefore, the mining and processing activities has no impact on the ground water quality and/or quantity of the farm.

Also refer to Part A(1)(h)(iv)(1)(c) Description of specific environmental features and infrastructure on the site – Site Specific Hydrology.

BIOLOGICAL ENVIRONMENT

MINING AND BIODIVERSITY

(Information extracted from the Mining and Biodiversity Guideline: Mainstreaming Biodiversity into the Mining Sector, Department of Environmental Affairs, Department of Mineral Resources, Chamber of Mines, 2013)

The Mining and Biodiversity Guideline, compiled by the South African Mining and Biodiversity Forum (SAMBF) provides the mining sector with a practical, user-friendly manual for integrating biodiversity considerations into planning processes and managing biodiversity during the developmental and operational phases of a mine, from exploration through to closure.

When the mining right footprint is layered over the Mining and Biodiversity Map (following figure), the northern part extends across an area of highest biodiversity importance (dark brown) with a corresponding rating of highest risk for mining to the north. The rest of the property (towards the south) is classified as being of high importance (lighter brown) with a corresponding high risk rating.

The Mining and Biodiversity Guideline's definition for areas of highest biodiversity importance stipulates that: "*these areas are viewed as necessary to ensure protection of biodiversity, environmental sustainability, and human well-being*". An area of high biodiversity importance is defined as: "*important for conserving biodiversity, for supporting or buffering other biodiversity priority areas, and for maintaining important ecosystem services for particular communities or the country as a whole*." The guidelines note that environmental screening, the EIA and specialists should focus on confirming the presence and significance of biodiversity features and provide a site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision-making.

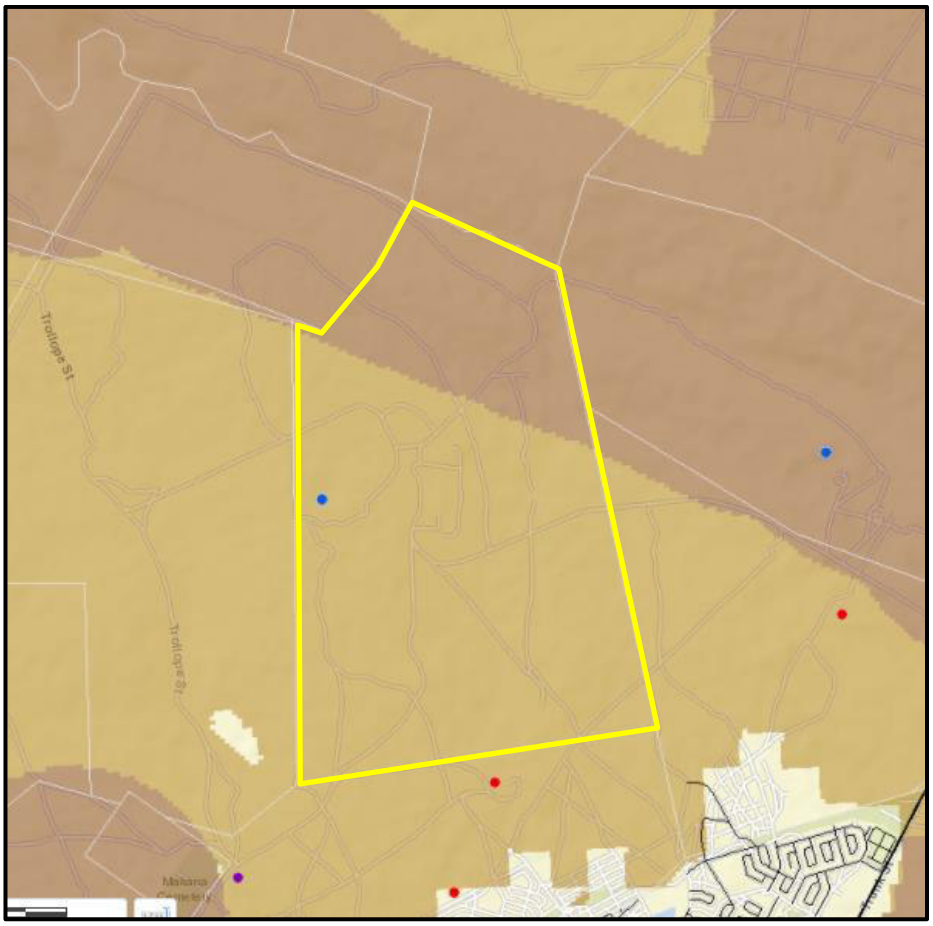

Figure 17: The Mining Guidelines map shows that the mining footprint (yellow polygon) extends across an area of highest biodiversity importance with a highest risk for mining (dark brown), and high importance with a high risk (lighter brown). (Image obtained from the BGIS Map Viewer: Mining Guidelines).

Also refer to Part A(1)(h)(iv)(1)(c) Description of specific environmental features and infrastructure on the site – Site Specific Site Specific Terrestrial Biodiversity, Conservation Areas, and Groundcover.

BIODIVERSITY CONSERVATION AREAS

According to the 2019 Eastern Cape Biodiversity Conservation Plan there is a Critical Biodiversity Area (CBA) registered over the northern part of the property as presented in the following figure.

The Lexicon of Biodiversity Planning in South Africa provides the following definition of a CBA:

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

Figure 18: 2019 Eastern Cape Biodiversity Conservation Plan showing the position of the mining footprint (yellow polygon) within the CBA area (green shaded area), where the blue shading indicates the Aquatic CBA areas (image obtained from BGIS Map Viewer – 2019 Eastern Cape Biodiversity Conservation Plan).

Also refer to Part A(1)(h)(iv)(1)(c) Description of specific environmental features and infrastructure on the site – Site Specific Terrestrial Biodiversity, Conservation Areas and Groundcover.

GROUNDCOVER

According to Mucina and Rutherford (2012) the natural vegetation type of the study area is classified as Bisho Thornveld (SVs70), with a small section of Albany Broken Veld (NKl4) protruding into the western part of the farm as indicated in the following figure.

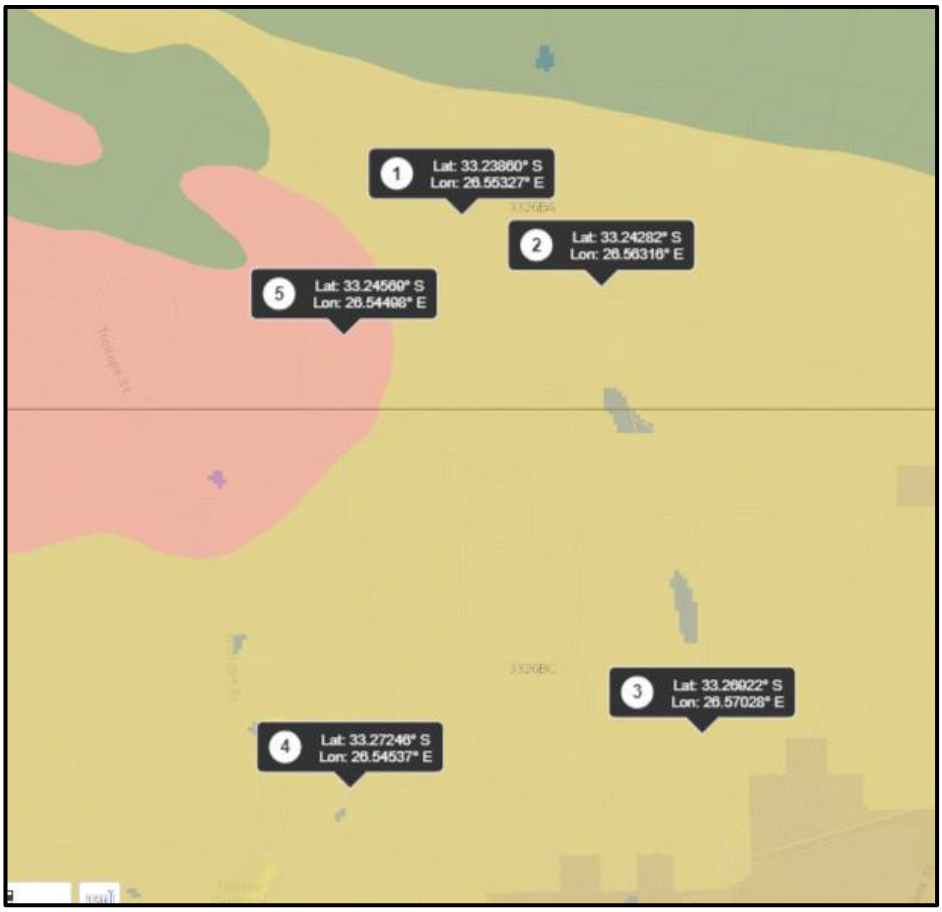

Figure 19: BGIS National Vegetation Map showing the various vegetation types extending into the property, where the brown shaded area indicates the Bisho Thornveld (SVs7), and the pink area shows the Albany Broken Veld (NKl4). (Image obtained from the BGIS Map Viewers website).

Bisho Thornveld (SVs7):

The vegetation and landscape features of the Bisho Thornveld (SVs7) vegetation type is characterised by undulating to moderately steep slopes, sometimes in shallow incised drainage valleys. Open savanna characterized by small trees of *Acacia natalitia* with a short to medium, dense, sour grassy understorey, usually dominated by *Themeda triandra* when in good condition. A diversity of other woody species also occurs, often increasing under conditions of overgrazing (Mucina & Rutherford, 2012).

Some of the important taxa found in this vegetation type include (amongst others) the following *Acacia natalitia*. Tall Shrub: *Tephrosia capensis*. Low Shrubs: *Anthospermum rigidum* subsp. *pumilum*, *Chrysocoma ciliata*, *Felicia muricata*. Graminoids: *Eragrostis plana*, *Heteropogon contortus*, *Hyparrhenia hirta*, *Sporobolus africanus*, *Themeda triandra*, *Aristida junciformis* subsp. *junciformis*, *Bulbostylis humilis*, *Cynodon dactylon*, *Digitaria diagonalis* Herbs*: Centella asiatica, Commelina africana, Gazania linearis, Gerbera ambigua, Helichrysum miconiifolium, H. nudifolium var. pilosellum, H. rugulosum, Senecio retrorsus, Spermacoce natalensis,*

Wahlenbergia stellarioides, Zornia capensis. Geophytic Herbs*: Hypoxis argentea, Moraea polystachya, Pellaea calomelanos.*

The vegetation type is classified as Least Threatened and according to Mucina and Rutherford (2012) only 0.2% of the unit is statutorily conserved in the Doubledrift and Thomas Baines Nature Reserves. About 2% is conserved in private reserves. Approximately 20% of the vegetation type has already undergone transformation for cultivation, urban development, or plantations. A conservation target of 25% was set for the vegetation type.

Albany Broken Veld (NKl4):

The Albany Broken Veld (NKl4) is characterised by low mountain ridges and hills with an open grassy karroid dwarf shrubland with scattered low trees (*Boscia oleoides*, *Euclea undulata, Pappea capensis*, *Schotia afra* var. *afra*) with a matrix of dwarf shrubs (*Becium burchellianum*, *Chrysocoma ciliata*) and grasses (*Eragrostis obtusa*) (Mucina & Rutherford, 2012).

Some of the important taxa found in this vegetation type include (amongst others) the following Succulent Tree: *Aloe ferox*. Small Trees: *Acacia natalitia* (d), *Euclea undulata* (d), *Pappea capensis* (d), *Schotia afra* var. *afra* (d), *Boscia oleoides*, *Cussonia spicata*. Tall Shrubs: *Grewia robusta*, *Lycium cinereum*, *Putterlickia pyracantha*, *Rhigozum obovatum*, *Rhus incisa* var. *effusa*. Low Shrubs: *Asparagus striatus* (d), *A. suaveolens* (d), *Becium burchellianum* (d), *Chrysocoma ciliata* (d), *Selago fruticosa* (d), Succulent Shrubs: *Cotyledon campanulata*, *Drosanthemum lique*, *Euphorbia meloformis*, *E. rectirama*, *Faucaria britteniae*, *F. tigrina, Mestoklema tuberosum*. Herbs: *Gazania krebsiana*, *Hermannia pulverata*, *Hibiscus pusillus*. Geophytic Herbs: *Bulbine frutescens*, *Drimia anomala*, *Eriospermum dregei*, *Ornithogalum dyeri*. Succulent Herbs: *Gasteria bicolor*, *Ophionella arcuata* subsp. *arctuata, Platythyra hackeliana*, *Senecio radicans, Stapeliopsis pillansii*. Graminoids: *Aristida congesta* (d), *Eragrostis obtusa* (d), *Sporobolus fimbriatus* (d), *Tragus berteronianus* (d), *Cynodon incompletus*, *Digitaria eriantha*,

The vegetation type is classified as Least Threatened and according to Mucina and Rutherford (2012) only a small percentage of the unit is statutorily conserved in the Greater Addo Elephant National Park, but a considerable share (12%) enjoys protection in private nature reserves. Approximately 3% of the vegetation type has already undergone transformation for cultivation. A conservation target of 16% was set for the vegetation type.

2018 SANBI Vegetation Map:

According to the latest vegetation map provided for South Africa (SANBI, 2018), the project site is situated within the Grahamstown Grassland Thicket, the Saltaire Karroid Thicket, and the Albany Bontveld (see following figure). Within the new SANBI map, the Bisho Thornveld (SVs7) was split into the Grahamstown Grassland Thicket, and the Saltaire Karroid Thicket. The Albany Broken Veld (NKl4) was changed to the Albany Bontveld. As no formal description exist for the 2018 SANBI vegetation types, the description provided by Mucina and Rutherford (2012) was used in this report to describe the characteristics of the applicable vegetation types.

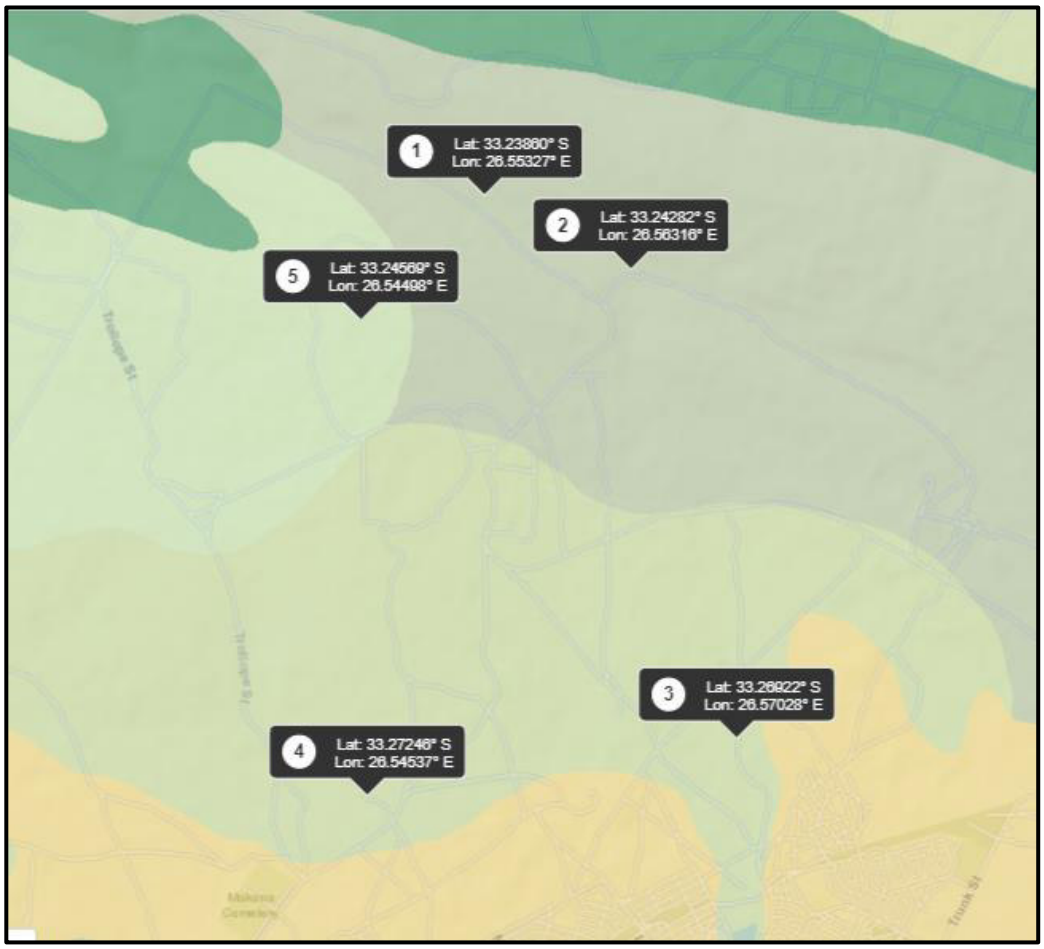

Figure 20: BGIS 2018 National Vegetation Map showing the various vegetation types extending into the property, where the grey shaded area indicates the Grahamstown Grassland Thicket, the olive green shows the Saltaire Karroid Thicket, and the light green indicates the extend of the Albany Bontvled. (Image obtained from the BGIS Map Viewers website).

Also refer to Part A(1)(h)(iv)(1)(c) Description of specific environmental features and infrastructure on the site – Site Specific Terrestrial Biodiversity, Conservation Areas, and Groundcover.

FAUNA

Although the land use of the Remaining Extent of the farm Brakkefontein No 243 has been extended to include commercial activities, some sections of the farm is still used for livestock grazing. Apart from the domestic animals, faunal action is mainly contained to the natural vegetated areas of the farm that provides shelter to the animals, however the natural occurring fauna is very sparse because of human activities in the general areas.

The Screening Report (for an EA as required by the 2014 EIA Regulations) lists the following species that may be present or enter the site at various intervals:

- African Marsh Harrier *Circus ranivorus* (LC)
- Black Harrier *Circus maurus* (EN)
- Stanley's Bustard *Neotis denhami* (NT)
- Cheetah *Acinonyx jubatus* (VU)
- Oribi *Ourebia ourebi ourebi* (LC)

HUMAN ENVIRONMENT:

CULTURAL AND HERITAGE ENVIRONMENT

(Information extracted from the Palaeontological Heritage Impact Assessment for Brakkefontein farm and quarries, east of Makhanda/Grahamstown, 2022)

The South African Heritage Resources Agency (SAHRA) compiled the Palaeontological (fossil) Sensitivity Map (PSM) to guide developers, heritage officers and practitioners in screening palaeontologically sensitive areas at the onset of a project. When the footprint of the mining area is placed on the PSM, it shows the study area to extend over areas that vary from Low (blue) to Very High (red) as presented in the figure below.

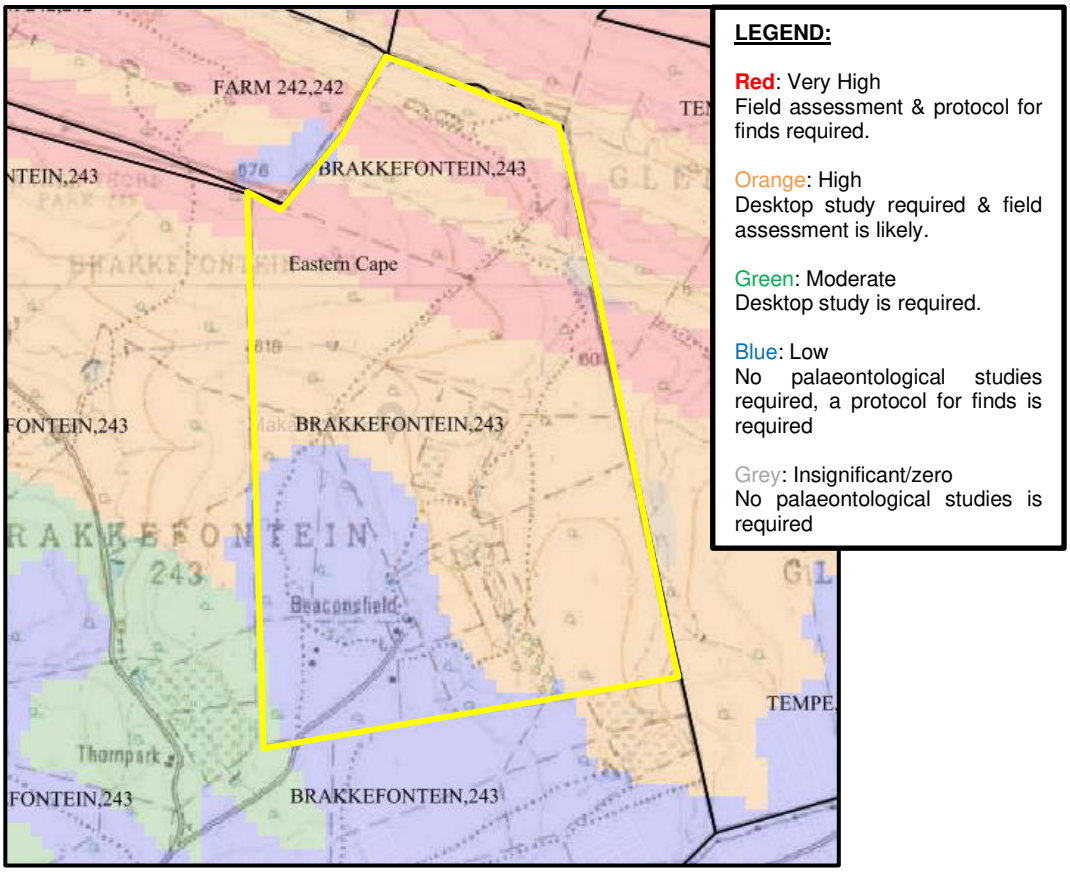

Figure 21: The SAHRA palaeontological sensitivity map shows the mining footprint (yellow star) extends over areas of low (blue), high (orange) and very high (red) concern.

Dr Robert Gess was subsequently appointed to assess the palaeontological significance of the site (see Appendix F for a copy of the full report).

Palaeontology of Affected Strata:

The Witpoort Formation is Famennian (uppermost Devonian) in age. That is approximately 359 to 372 million years old. It is a largely quatzitic unit representing mature sandy strata deposited along a linear barrier island type coast. The lower portion of the Witpoort Formation tends to have a brownish weathering character, whereas the upper portion (sometimes referred to as the Perdepoort Member) tends to comprise much cleaner whiter weathering quartzites. Particularly around Makhanda/Grahamstown black shale lenses are interbedded within the Witpoort Formation quartzites. These are interpreted as estuarine deposits preserved during brief transgressive events and have proven remarkably fossiliferous.

A series of lenses at Waterloo Farm, to the south of Grahamstown, have provided southern Africa's most important Late Devonian locality, representing an entire coastal estuarine ecosystem and adjacent terrestrial environment. It has yielded fragmentary remains of Africa's earliest known four legged animals, the aquatic tetrapods, *Tutusius umlambo* and *Umzantsia amazana* and at least 20 taxa of fossil fish (including jawless

fish (Agnatha), armoured fish (Placodermi), spiny sharks (Acanthodii), sharks (Chondrichthyes), ray finned fish (Actinopterygii) and lobe finned fishes (Sarcopterygii) including Coelacanths (Actinistia), lungfish (Dipnoi) and Osteolepiformes. Of these nine have as yet been described including the world's oldest lamprey fossil, *Priscomyzon riniensis*, and Africa's earliest coelacanth from the world's oldest known coelacanth nursery, *Serenichthys kowiensis*. Seaweeds, brack water charophytes and fresh to brack water bivalves have been described and a giant *Eurypterid* identified. The terrestrial realm is represented by the remains of a scorpion, *Gondwanascorpio emzantsiensis*, the oldest known terrestrial animal from the supercontinent Gondwana, Dozens of land plant taxa have been revealed, including zosterophylls, lycopods (eg. *Kowieria alveofolis, Colpodexylon pullumpedes* and *Leptophloem rhombicum*), iridopteralian-like plants (*Flabellopteris lococannensis*), sphenophytes (eg *Rinistachya hilleri*) and early progymnosperms, such as *Archaeopteris notosaria*, southern Africa's earliest known fossil tree. Abundant trace fossils have also been collected. Witpoort Formation quartzites have yielded a range of plant stem taxa and trace fossils. Lag deposits of bone have not, yet, been discovered, but may be expected.

In 2015 roadworks to the south-east of Brakkefontein, on the Governor's Kop section of the adjacent ridge at Coombs Hill and Rabbit Ridge, uncovered a number of palaeontologically important black shale lenses. Those along Rabbit Ridge (Green Hills) represented exposure of an extensive vertically tilted black shale horizon that yielded evidence for a monotaxic assemblage of lingulid brachiopods (Dignomia sp.) in a back-barrier tidal flats environment. This represented the first record of predominantly marine invertebrate shells within the Witpoort Formation. These sites also produced fragmentary plant remains, an arthrodire placoderm skull roof and extensive trace fossils.6

The roadworks at Coombs Hill, slightly further to the east revealed a number of black shale horizons, which contained more than one species of bivalve, in addition to a wealth of plant fossils, some of which are remarkable well preserved. Plant fossils included lycopod taxa new to science and the best preserved fronds of the progymnosperm tree, *Archaeopteris notosaria* known. Study of these is ongoing with, yet one species of lycopod, *Colpodexylon mergae*, having been formerly described.

Fossil black shales (commonly fossiliferous) are interbedded with quartzites all along the ridge though these are generally reduced to soil or clay near surface. They are normally revealed where quarrying or roadworks cut into the land surface, for example in the hardrock quarry 1.7 kilometres east of Brakkefontein. Black shales here were protected from leaching by overlying quartzitic strata which have been penetrated by

quarrying. Preliminary investigation revealed these to contain silvery white plant fossil fragments.

The top of the Witpoort Formation coincides with the end of the Devonian and is similar in age to the end-Devonian extinction event. It is overlain by rocks of the early Carboniferous aged Lake Mentz Subgroup. The End Devonian Mass Extinction Event completely changed diversity patterns of life on Earth, wiping out all placoderm (armoured fish) as well as most acanthodians (spiny finned fish) and lobe finned fish groups. Thereafter, ray-finned fish and sharks dominated the waters, and tetrapods (animals with four legs) went on to populate the land. Although there are yet no tetrapods known from South Africa's early Carboniferous rocks, there are a number of fish fossil sites that well illustrate this change in fish diversity. Most famous of these is the 'Lake Mentz' site from near the Darlington Dam in the Addo National Park.

In the later part of the Carboniferous and early part of the Permian period, during the breakup of Gondwana, the Agulhas Sea floor was folded up into a chain of high mountains that separated the Karoo Basin from the Sea. The area thereafter became an erosional environment and largely ceased to accumulate sediments. Around 200 million years later, during the Cretaceous and early Tertiary Periods much of Africa was weathered down to a number of level horizons collectively known as the African Surface. The area in the vicinity of Grahamstown was reduced to a flat plain close to sea level, remnants of which are referred to as the Grahamstown Peneplane. During the Tertiary, mudstones, shales and diamictites were leached to considerable depth, transforming them into soft white kaolin clay. Silica, iron, and magnesium from these rocks was carried in solution by groundwater and deposited near the ground surface due to steady evaporation of mineral rich waters. This led to the formation of a hard mineralised capping layer, often consisting of silicified soil. Resultant silcretes are referred to as the Grahamstown Formation. Though occasional occurrences of root and stem impressions have been recorded from the Grahamstown Formation it is generally considered unfossiliferous.

Also refer to Part A(1)(h)(iv)(1)(c) Description of specific environmental features and infrastructure on the site – Site Specific Cultural and Heritage Environment.

SOCIO-ECONOMIC ENVIRONMENT

(Information extracted from the Social and Labour Plan of Makhanda Mining (Pty) Ltd, 2022)

The mining area is in ward 01 of the Makana Local Municipality (MLM). The MLM is is a category B Municipality approximately halfway between East London and Gqeberha that forms part of the seven local municipalities of the Sarah Baartman (formerly Cacadu) District Municipality in the Eastern Cape Province.

With 91 400 people, the Makana Local Municipality housed 0.2% of South Africa's total population in 2020. Between 2010 and 2020 the population growth averaged 1.03% per annum which is close to half than the growth rate of South Africa as a whole (1.59%). Compared to Sarah Baartman's average annual growth rate (1.54%), the growth rate in Makana's population at 1.03% was close to half than that of the district municipality.

Population Group, Gender, and Age Profile

Total population can be categorised according to the population group, as well as the sub-categories of age and gender. The population groups include African, White, Coloured and Asian, where the Asian group includes all people originating from Asia, India, and China. The age subcategory divides the population into 5-year cohorts, e.g. 0-4, 5-9, 10-13, etc.

	Male	Female	Total
Makana	44,284	47,104	91,388
Dr Beyers Naude	43,511	44,961	88,472
Blue Crane Route	19,480	19,858	39,338
Ndlambe	34,729	37,577	72,306
Sundays River Valley	35,990	31,902	67,891
Kouga	63,562	62,658	126,220
Kou-Kamma	24,267	23,476	47,743
Sarah Baartman	**265,823**	**267,536**	**533,359**

Figure 22: Gender profile for Makana and the rest of the Sarah Baartman District Municipality, 2020.

Makana Local Municipality's male/female split in population was 94.0 males per 100 females in 2020. The Makana Local Municipality appears to be a fairly stable population with the share of female population (51.54%) being very similar to the national average of (51.03%). In total there were 47 100 (51.54%) females and 44 300 (48.46%) males. This is different from the Sarah Baartman District Municipality where the female population counted 268 000 which constitutes 50.16% of the total population of 533 000.

In 2020, the Makana Local Municipality's population consisted of 80.47% African (73 500), 7.27% White (6 640), 11.68% Coloured (10 700) and 0.58% Asian (531) people. The largest share of population is within the young working age (25-44 years) age category with a total number of 32 600 or 35.7% of the total population. The age

category with the second largest number of people is the babies and kids (0-14 years) age category with a total share of 22.4%, followed by the older working age (45-64 years) age category with 17 100 people. The age category with the least number of people is the retired / old age (65 years and older) age category with only 5 720 people, as reflected in the population pyramids below.

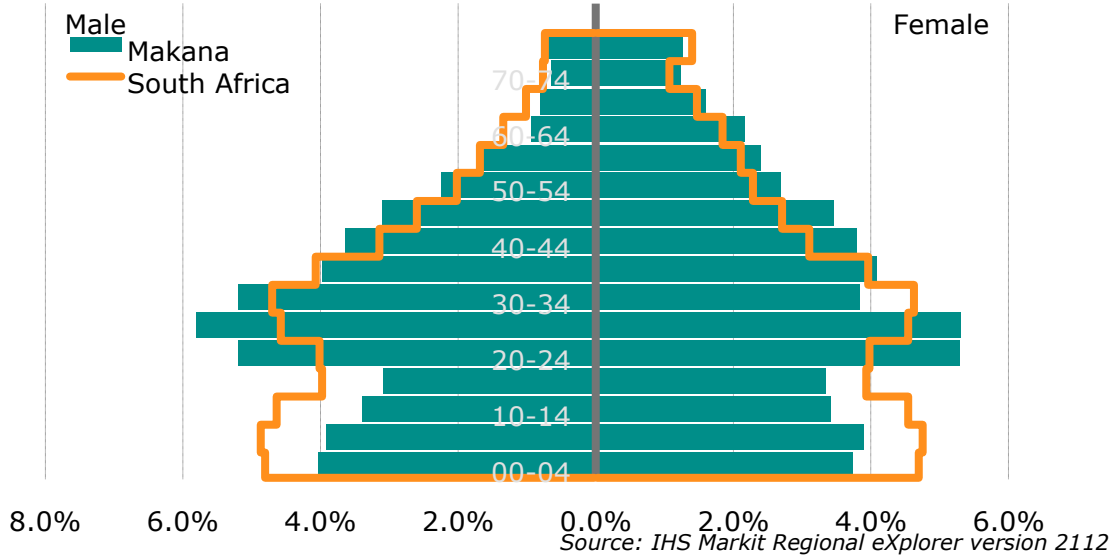

Figure 23: Population pyramid – Makana Local Municipality vs. South Africa, 2020 (percentage).

Economic Profile

The Gross Domestic Product (GDP), an important indicator of economic performance, is used to compare economies and economic states. With a GDP of R 6.72 billion in 2020 (up from R 3.83 billion in 2010), the Makana Local Municipality contributed 17.45% to the Sarah Baartman District Municipality GDP of R 38.5 billion in 2020 increasing in the share of the Sarah Baartman from 18.09% in 2010. The Makana Local Municipality contributes 1.78% to the GDP of Eastern Cape Province and 0.14% the GDP of South Africa which had a total GDP of R 4.97 trillion in 2020 (as measured in nominal or current prices). It's contribution to the national economy stayed similar in importance from 2010 when it contributed 0.14% to South Africa, but it is lower than the peak of 0.14% in 2010.

In 2020, the Makana Local Municipality achieved an annual growth rate of -4.69% which is a significantly higher GDP growth than the Eastern Cape Province's -6.71%, but is higher than that of South Africa, where the 2020 GDP growth rate was -6.96%. Contrary to the short-term growth rate of 2020, the longer-term average growth rate for Makana (0.30%) is slightly lower than that of South Africa (0.64%). The economic growth in Makana peaked in 2017 at 2.09%.

It is expected that MLM will grow at an average annual rate of 0.61% from 2020 to 2025. The average annual growth rate in the GDP of Sarah Baartman District Municipality and Eastern Cape Province is expected to be 4.00% and 2.39% respectively. South Africa is forecasted to grow at an average annual growth rate of 2.55%, which is higher than that of the Makana Local Municipality.

Employment

In 2020, Makana employed 24 800 people which is 15.82% of the total employment in Sarah Baartman District Municipality (157 000), 1.79% of total employment in Eastern Cape Province (1.39 million), and 0.16% of the total employment of 15.7 million in South Africa. Employment within Makana increased annually at an average rate of 0.72% from 2010 to 2020. In Makana Local Municipality the economic sectors that recorded the largest number of employment in 2020 were the community services sector with a total of 6 500 employed people or 26.2% of total employment in the local municipality. The trade sector with a total of 5 090 (20.5%) employs the second highest number of people relative to the rest of the sectors. The mining sector with 1.44 (0.0%) is the sector that employs the least number of people in Makana Local Municipality, followed by the electricity sector with 32.4 (0.1%) people employed.

In 2020, there were a total number of 15 200 people unemployed in Makana, which is an increase of 7 610 from 7 590 in 2010. The total number of unemployed people within Makana constitutes 22.59% of the total number of unemployed people in Sarah Baartman District Municipality. The Makana Local Municipality experienced an average annual increase of 7.19% in the number of unemployed people, which is better than that of the Sarah Baartman District Municipality which had an average annual increase in unemployment of 8.18%.

(b) Description of the current land uses.

The Remaining Extent of the farm Brakkefontein No 243 is situated in a rural setting intersected by road-, and electricity infrastructure and transformed by the encroaching town developments (south of the farm). As mentioned earlier the operational activities of the property was extended from agriculture to include mining and brick making.

The main land use of the surrounding properties to the north, east and west is agricultural, while the southern part has been developed for residential purposes.

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

Table 8: Land uses and/or prominent features that occur within 500 m radius of the study area.

LAND USE CHARACTER	YES	NO	DESCRIPTION
Natural area	**YES**	-	The study area is surrounded by natural areas used for agricultural purposes.
Low density residential	-	**NO**	-
Medium density residential	-	**NO**	-
High density residential	**YES**	-	Rini township borders the property to the south.
Informal residential	**YES**	-	
Retail commercial & warehousing	**YES**	-	As mentioned earlier Rini township is near the southern border of the property, while the offices of Makana Brick operate from the farm.
Light industrial	**YES**	-	The brick factory is an integral part of the operations on the farm.
Medium industrial	-	**NO**	-
Heavy industrial	-	**NO**	-
Power station	-	**NO**	-
High voltage power line	-	**NO**	-
Office/consulting room	**YES**	-	The sales office of Makana Brick operates from the farm.
Military or police base / station / compound	-	**NO**	-
Spoil heap or slimes dam	-	**NO**	-
Quarry, sand or borrow pit	**YES**	**-**	There are quarries on the property as mentioned earlier.
Dam or reservoir	**YES**	-	There are at least six dams on the property.
Hospital/medical centre	-	**NO**	-
School/ crèche	-	**NO**	-
Tertiary education facility	-	**NO**	-
Church	-	**NO**	-
Old age home	-	**NO**	-
Sewage treatment plant	**YES**	-	The Rini wastewater works borders the property to the east.
Train station or shunting yard	-	**NO**	-
Railway line	-	**NO**	-
Major road (4 lanes or more)	-	**NO**	-
Airport	-	**NO**	-
Harbour	-	**NO**	-
Sport facilities	-	**NO**	-
Golf course	-	**NO**	-
Polo fields	-	**NO**	-
Filling station	-	**NO**	-
Landfill or waste treatment site	-	**NO**	-
Plantation	-	**NO**	-
Agriculture	**YES**	-	Some areas of the property are used for agricultural purposes.
River, stream or wetland	**YES**	-	The Botha's River passes the site to the north.
Nature conservation area	-	**NO**	-
Mountain, hill or ridge	**YES**	-	Various hills are present within the footprint of the property.
Museum	-	**NO**	-

LAND USE CHARACTER	YES	NO	DESCRIPTION
Historical building	-	**NO**	-
Protected Area	-	**NO**	-
Graveyard	**-**	**NO**	-
Archaeological site	-	**NO**	-
Other land uses (describe)	-	**NO**	-

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

SPECIFIC ENVIRONMENTAL FEATURES

SITE SPECIFIC TOPOGRAPHY

The topography of the overburden stockpile area is relatively flat with a gradual rise in elevation from the north towards the southern part as indicated in the following figure. The area has an average slope of 2.6% over 594 m.

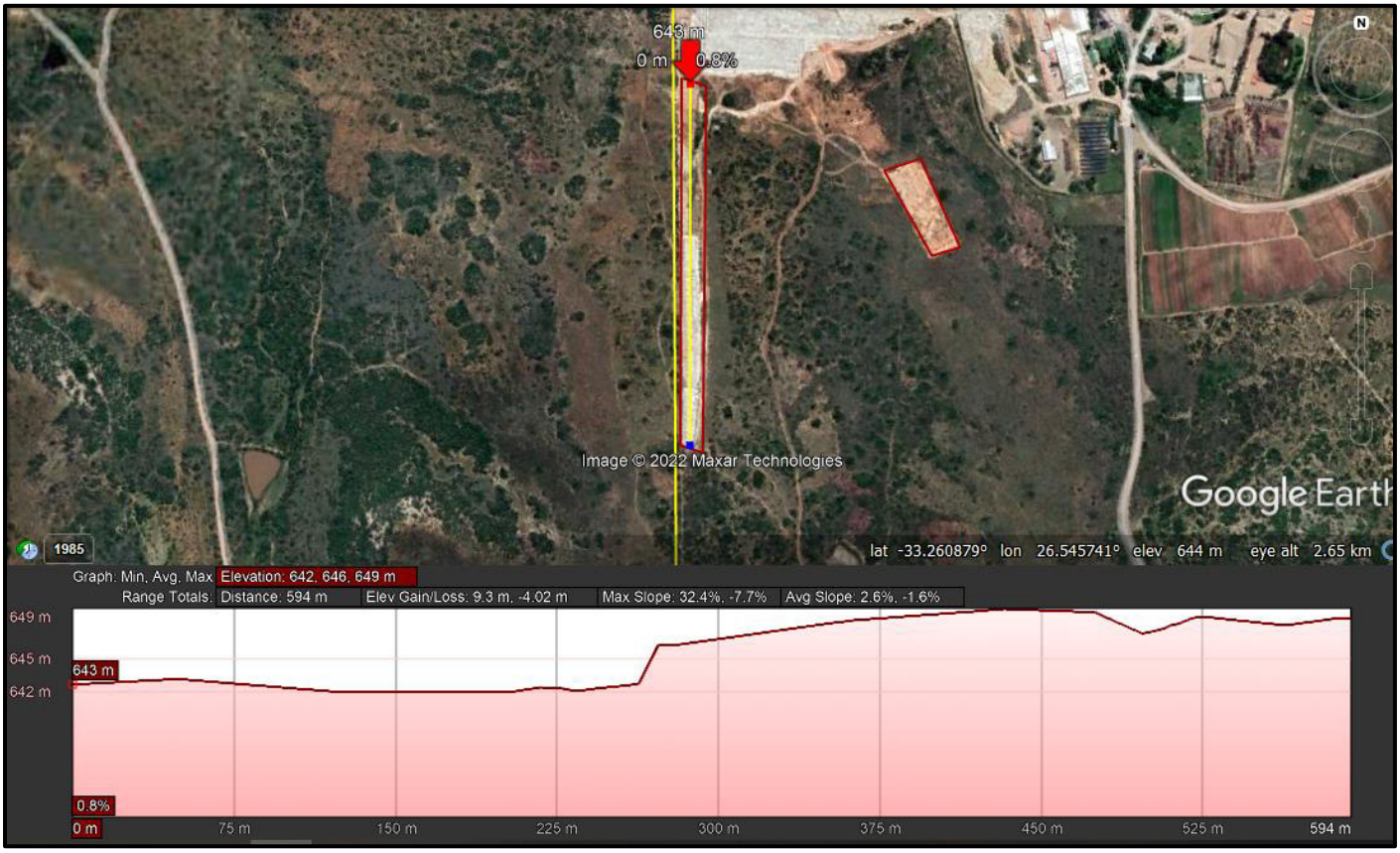

Figure 24: Elevation profile of the aggregate/overburden stockpile area (Image obtained from Google Earth).

The topography of the area where the wood will be stockpiled, as well as the areas where the chipping will take place, and the dangerous goods storage tanks will be erected is flat with no significant topographical features to be reported on.

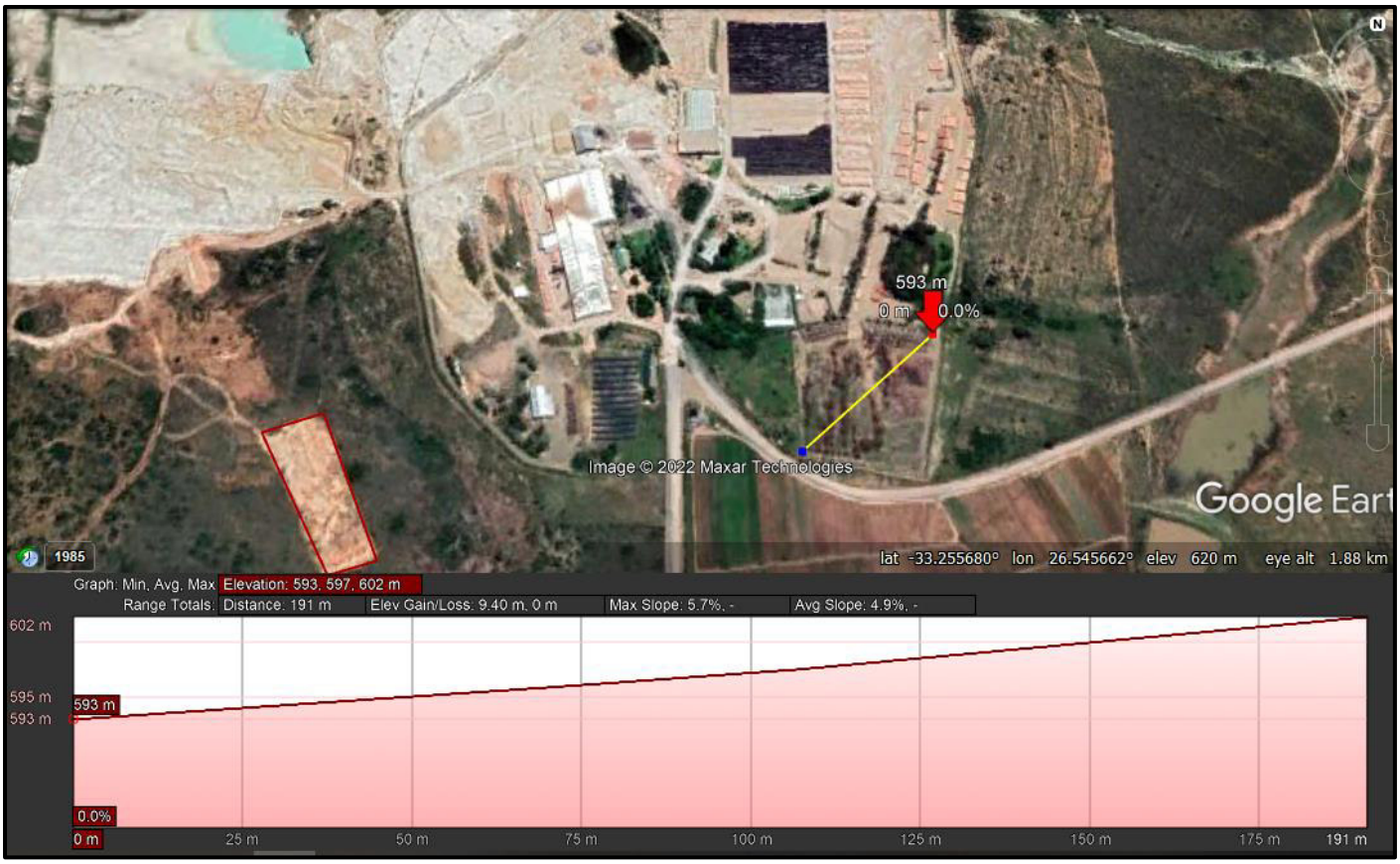

Figure 25: Elevation profile of the wood sorting area (Image obtained from Google Earth).

None of the proposed activities, will have an impact on the topography of the receiving environment, and upon closure there will be no residual impacts.

SITE SPECIFIC VISUAL CHARACTERISTICS

The following figures show the viewshed analysis for the area used for the stockpiling of the overburden, as well as the wood stockpiling area, and the warehouse where the chipping will take place respectively. As the dangerous goods storage tanks will be placed between the existing building of the brick plant, the proposed infrastructure will not have a visual impact on the surrounding areas. The green shaded areas indicate the positions from where the various areas will be visible.

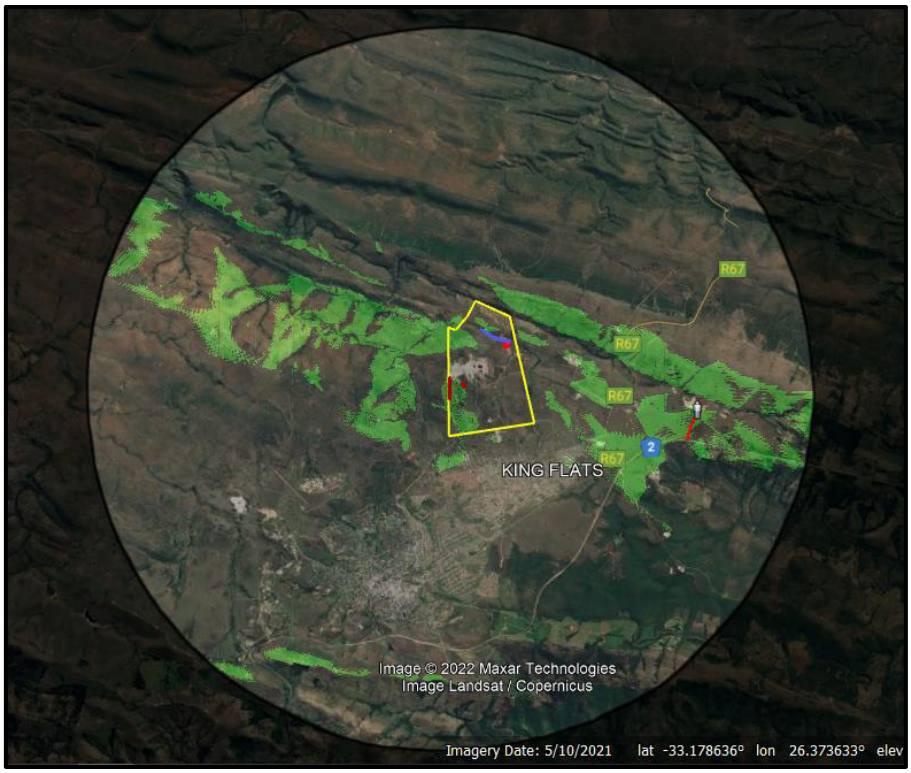

Figure 26: Viewshed analysis of the overburden stockpile area where the green shaded areas indicate the positions from where the earmarked area (brown polygon) will be visible. (Image obtained from Google Earth).

Figure 27: Viewshed analysis of the proposed wood stockpiling area where the green shaded areas indicate the positions from where the earmarked area will be visible. (Image obtained from Google Earth).

Figure 28: Viewshed analysis of the proposed wood chipping area where the green shaded areas indicate the positions from where the earmarked area will be visible. (Image obtained from Google Earth).

The above analysis shows that the potential visual impact of the proposed activities will be of very low concern, and therefore the visual impact is deemed to be of low significance.

SITE SPECIFIC AIR AND NOISE QUALITY

Emission into the atmosphere is controlled by the National Environmental Management: Air Quality Act, 2004. The Department of Economic Development, Environmental Affairs and Tourism – Eastern Cape Province issued a Full Atmospheric Emissions Licence (EC/CAR/MAK/021/2016) on 03 November 2016 for the activities at the site.

The nearest residential dwellings (outside the mine boundary) to the overburden stockpile area are ±1.2 km to the south-west, while the first residents from the wood sorting area and warehouse are ±1.7 km to the south. As mentioned earlier, the prevalent wind direction of the study area is in a south-western direction for most of the year.

Neither the selling of aggregates, nor the chipping of wood will trigger an application in terms of the said Act, as emissions to be generated because of these activities are

expected to mainly entail dust due to the crushing/screening of the overburden material, and the transport of material on gravel roads. As mentioned previously, the chipping of wood will take place in an existing warehouse and will therefore not generate any significant air emissions. The proposed burning of the chipped wood/sawdust and/or used oil will take place at the existing brick factory and will be controlled, and reported on, in accordance with the existing Atmospheric Emissions Licence.

The proposed crushing/screening of the overburden will be intermittent, while the chipping of the wood will be contained in a warehouse. Considering this, none of the proposed activities is expected to generate excessive noise levels that isn't compatible with the current operations at the property.

Subsequently, it is proposed that although the proposed activities may will have a slight cumulative impact on the air quality and ambient noise levels, the development will not take place in a pristine environment, and the impact is therefore deemed compatible with the current operations and of low significance.

SITE SPECIFIC GEOLOGY AND SOIL

The site specific geology resembles the geology as described under *Part A(h)(iv)(1)(a) Type of Environment Affected by the Proposed Activity – Geology and Soil*. As mentioned earlier, the aggregate to be sold should the application be approved will originate from the unwanted overburden removed from the clay quarry to access the clay. None of the proposed activities will have a cumulative impact on the geology of the property.

SITE SPECIFIC HYDROLOGY

As mentioned earlier, there are no natural streams on or near the proposed development areas that could be affected; neither will the proposed activities affect the groundwater. When needed, water for dust suppression purposes will be extracted from the existing dams on the property under the auspices of the existing water use licence of the company.

Therefore, should the mitigation measures proposed in this document, be implemented, the potential impact on the hydrology will be negligible.

SITE SPECIFIC TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS, AND GROUNDCOVER

As mentioned earlier, when the footprint of the farm is layered over the Mining and Biodiversity Map, the northern part extends across an area of highest biodiversity importance with a corresponding rating of highest risk for mining to the north. The rest of the property (towards the south) is classified as being of high importance with a corresponding high risk rating. The 2019 Eastern Cape Biodiversity Conservation Plan reports that there is a CBA registered over the northern part of the property.

The CBA does however not extend across the already disturbed/altered areas of the quarry pit and brick plant. As mentioned earlier, the proposed activities will take place on already disturbed areas that will not necessitate the removal of any natural occurring vegetation and does therefore not pose any risk to the conservation status of the CBA or broad-scale ecological processes.

SITE SPECIFIC CULTURAL AND HERITAGE ENVIRONMENT

(Information extracted from the Palaeontological Heritage Impact Assessment for Brakkefontein farm and quarries, east of Makhanda/Grahamstown, 2022)

Dr Gess reported that within the northernmost valley of the farm, adjacent to the Botha's Spruit most of the low lying strata is covered in sandy alluvium. Underlying shaly strata were only located at one point, on the southern slopes of the valley where exposed in the roadbed. These comprised somewhat degraded, extremely fine grained Mudstones lithologically consistent with the Kweekvlei Formation.

More extensive outcrops of Kweekvlei Formation mudstone were examined in a borrow pit in the next valley. These in places exhibited varving and interbedded sandstone bodies. Although the borrow pit was meticulously examined virtually no palaeontological material was observed, and this limited to rare small burrow traces in the mudstone. Along the northern flank of this second valley the underlying strata are mantled by geologically recent river terrace deposits.

The higher ground towards the north of Brakkefontein, which flanks the two valleys, is all defined by overturned anticlinal (upwardly bent) folds of resilient quartzite of the Witpoort Formation. This varies from orangish weathering impure quartzite, possibly equivalent to the 'Rooirand Member' to superficially more massive clean white quartzite reminiscent of the 'Perdepoort Member'. Within overturned quartzitic strata a number of narrow fossil lycopod plant stems were discovered cross-cutting bedding, possibly indicative of in situ preservation. These were less than a metre

stratigraphically below a mud chip conglomerate layer, indicative of a high energy depositional event.

The southern portion of Brakkefontein is underlain by sediments of the Lake Mentz Subgroup, which have been leached to a great depth, degrading their original sedimentological character. Throughout most of the area they have been reduced to kaolin clay, which would originally have been capped by a layer of silcrete. This silcrete capping currently remains largely in the very south of the area, though small relict patches are also encountered. Non kaolinized Lake Mentz Subgroup strata were almost exclusively encountered in Brakkefonteins main clay quarry where mining has removed the overlying kaolin. Although these were carefully examined no sign of body fossils were encountered and palaeontological material was restricted to vertical burrow casts observed in sandstone interbeds.

Conclusion and Recommendations

The southern 60% of Brakkefontein is deeply underlain by highly kaolinized sediments of the Lake Mentz Subgroup, exposed by partial geomorphological removal of the overlying Grahamstown Formation silcrete. In the south the edge of the main remaining body of silcrete capping is encountered, where it defines the northern edge of the Grahamstown Peneplane surface. A small outlier of silcrete also occurs further to the north, maintaining an erosion resistant ridge.

Throughout this area the underlying strata are generally so degraded by leaching during and following the Cretaceous Period, that their palaeontological legacy has been entirely obliterated to a depth that would only be encountered in fairly deep excavations.

In the northern part of Brakkefontein the landscape is defined by a series of north-west to south-east trending parallel folds that are overturned towards the north-west. Erosion of the landscape has revealed the crests of upward folds in the Witpoort Formation which are more resistant than the overlying mudstones of the Lake Mentz Subgroup. These define parallel ridges, the troughs between which have been carved into two parallel valleys. Overlying mudstones in this region are less deeply leached relative to the current land surface. Those in the most northerly area belong to the Kweekvlei Formation.

Kweekvlei Formation shale includes that exposed in the small borrow pit that is proposed for expansion, despite it having originally been mapped as belonging to the more palaeontologically sensitive Witpoort Formation. Careful examination of a large amount of shale currently exposed in this excavation site revealed no significant

palaeontological material. Likewise, Waaipoort Formation strata encountered in deep excavations in the main brick clay quarry were not observed to be notably fossiliferous.

The only interesting palaeontological material was observed in the Witpoort Formation quartzites. It is also to be expected, based on previous excavations into the Botha's Hill – Governors Kop Ridge, that fossiliferous black shale horisons occur beneath the protective capping of overlying quartzites. As the client's principal interest is the extraction of clay it is unlikely that the Witpoort Formation will be seriously impacted. Should however a quartz quarry at any time be proposed on Brakkefontein recommendations in this regard should be obtained from a palaeontologist.

Further mining of clay will have no palaeontological impact, as its formative leaching has degraded any original palaeontological record. Should mines penetrate through the kaolin clay to bedrock a palaeontologist should be informed to evaluate its scientific interest. Should any suspected palaeontological material be at any time encountered during mining of Kweekvlei Formation mudstones, a palaeontologist should likewise be immediately contacted to sample and record such occurrence.

SITE SPECIFIC INFRASTRUCTURE

No infrastructure exists at the overburden stockpile area that could be affected by the proposed activity. Further to this, the wood sorting area is removed from any sensitive site infrastructure.

Neither the chipping of the wood at the existing warehouse, nor the installation of the additional dangerous goods storage tanks is expected to impact on the existing infrastructure of the site other than enhancing the value thereof.

(d) Environmental and current land use map.

(Show all environmental and current land use features)

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

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

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

The following potential impacts were identified of each main activity in each phase of the proposed project. The significance rating was determined using the methodology as explained under *vi) Methodology Used in Determining and Ranking the Significance*. The impact rating listed below was determined for each impact **prior** to bringing the proposed mitigation

measures into consideration. The degree of mitigation indicates the possibility of partial, full or no mitigation of the identified impact.

1. AGGREGATE MINING

PROCESSING, LOADING, AND HAULING OF AGGREGATE

Visual intrusion as a result of the activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Partial**		
1	5	1	2.3	2	2	2	**4.6**

Infestation of the stockpile area with invader plant species

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

Dust nuisance as a result of the processing of aggregates

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Full**		
2	3	1	2	3	3	3	**6**

Noise nuisance as a result of the mining activities

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

Soil contamination from hydrocarbon spills

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

Potential impact associated with littering at the area

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium					**Degree of Mitigation: Full**		
3	4	2	3	3	4	3.5	**10.5**

Deterioration of the access road to the mining area

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

Facilitation of erosion due to mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Full**		
2	4	1	2.3	3	2	3.5	**8.0**

SLOPING AND LANDSCAPING DURING REHABILITATION:

Erosion of returned topsoil after rehabilitation

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Full**		
3	5	1	3	3	2	2.5	**7.5**

Infestation of the reinstated area with invader plant species

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Full**		
3	3	2	2.6	4	2	3	**7.8**

Potential impact associated with litter left at the mining area

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Full**		
2	5	2	3	3	2	2.5	**7.5**

2. DANGEROUS GOODS STORAGE TANKS & BURNING OF USED OIL

SITE ESTABLISHMENT & INFRASTRUCTURE DEVELOPMENT

Visual intrusion as a result of site establishment

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Partial**		
1	4	1	2	1	4	2.5	**5**

Pollution of environment with construction waste

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

Potential damage to the existing infrastructure on site

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

Noise nuisance generated as a result of construction activities

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

Safety risk posed by construction workers' presence on the property

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Full**		
2	2	2	2	3	5	4	**8**

OPERATIONAL PHASE

Seeping of dangerous goods from defective storage tanks and bund walls

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

Spillage of dangerous goods when filling the tanks

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Full**		
2	2	1	1.6	4	3	3.5	**5.6**

Safety risk posed by the operation of the dangerous goods tanks

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Full**		
2	4	1	2.3	3	1	2	**4.6**

Non-compliance with the conditions of the atmospheric emissions licence

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Full**		
4	4	2	3.3	4	1	2.5	**8.3**

Responsible use of old oil as alternative fuel source (Positive Impact)

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: High (+)						**Degree of Mitigation: N/A**	
5	4	5	4.6	5	5	5	**23**

Reduced need for commercial fuels on site (Positive Impact)

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: High (+)						**Degree of Mitigation: N/A**	
5	4	4	4.3	5	5	5	**21.5**

DECOMMISSIONING PHASE

Dilapidated infrastructure left upon decommissioning of the activity

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

Contamination of soil with hydrocarbons

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

Noise nuisance as a result of the decommissioning activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Low-Medium						**Degree of Mitigation: Partial**	
2	1	2	1.6	3	4	3.5	**7.2**

Pollution of the environment with waste and building rubble not removed from site

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Medium						**Degree of Mitigation: Full**	
2	4	1	2.3	4	5	4.5	**10.4**

3. SORTING, SHREDDING, CHIPPING AND BURNING OF DISCARDED WOOD

OPERATIONAL PHASE

Infestation of the sorting area with weeds/invader plants

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Low-Medium						**Degree of Mitigation: Full**	
2	4	2	2.6	4	2	3	**7.8**

Sprawling of the sorting area impacting natural vegetated areas

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

Contamination of the area with litter or other waste materials

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

Dust nuisance resulting from stockpiled wood chips/sawdust

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium					**Degree of Mitigation: Full**		
3	4	2	3	4	5	4.5	**13.5**

Noise nuisance due to the operation of the chipper

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

Non-compliance with the conditions of the atmospheric emissions licence

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Full**		
4	4	2	3.3	4	1	2.5	**8.3**

Responsible use of discarded wood as an alternative fuel source (Positive Impact)

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: High (+)					**Degree of Mitigation: N/A**		
5	4	5	4.6	5	5	5	**23**

Reduced need for commercial fuels on site (Positive Impact)

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: High (+)					**Degree of Mitigation: Partial**		
5	4	4	4.3	5	5	5	**21.5**

DECOMMISSIONING PHASE

Dilapidated infrastructure left upon decommissioning of the activity

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

Pollution of the environment with waste and building rubble not removed from site

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium					**Degree of Mitigation: Full**		
2	4	1	2.3	4	5	4.5	**10.4**

Dust nuisance as a result of discarded wood chips/sawdust

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium					**Degree of Mitigation: Full**		
3	4	2	3	4	5	4.5	**13.5**

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

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

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

DEFINITIONS AND CONCEPTS:

Environmental significance:

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

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

Significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e. intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e. level of

acceptability) (DEAT (2002) Impact Significance, Integrated Environmental Management, Information Series 5).

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

Impact

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

Consequence

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

Likelihood

A qualitative term covering both probability and frequency.

Frequency

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

Probability

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

Environment

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

Methodology that will be used

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

Environmental Significance = Overall Consequence X Overall Likelihood

Determination of Overall Consequence

Consequence analysis is a mixture of quantitative and qualitative information and the outcome can be positive or negative. Several factors can be used to determine consequence. For the purpose of determining the environmental significance in terms of consequence, the following

factors were chosen: ***Severity/Intensity, Duration and Extent/Spatial Scale***. Each factor is assigned a rating of 1 to 5, as described in the tables below.

Determination of Severity / Intensity

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

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

Table 9: Table to be used to obtain an overall rating of severity, taking into consideration the various criteria.

Type of criteria	Rating				
	1	2	3	4	5
Quantitative	0-20%	21-40%	41-60%	61-80%	81-100%
Qualitative	Insignificant / Non-harmful	Small / Potentially harmful	Significant/ Harmful	Great/ Very harmful	Disastrous Extremely harmful
Social/ Community response	Acceptable / I&AP satisfied	Slightly tolerable / Possible objections	Intolerable/ Sporadic complaints	Unacceptable / Widespread complaints	Totally unacceptable / Possible legal action
Irreversibility	Very low cost to mitigate/ High potential to mitigate impacts to level of insignificance/ Easily reversible	Low cost to mitigate	Substantial cost to mitigate/ Potential to mitigate impacts/ Potential to reverse impact	High cost to mitigate	Prohibitive cost to mitigate/ Little or no mechanism to mitigate impact Irreversible
Biophysical (Air quality, water quantity and quality, waste production, fauna and flora)	Insignificant change / deterioration or disturbance	Moderate change / deterioration or disturbance	Significant change / deterioration or disturbance	Very significant change / deterioration or disturbance	Disastrous change / deterioration or disturbance

Determination of Duration

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

Table 10: Criteria for the rating of duration.

Rating	Description
1	Up to ONE MONTH
2	ONE MONTH to THREE MONTHS (QUARTER)
3	THREE MONTHS to ONE YEAR
4	ONE to TEN YEARS
5	Beyond TEN YEARS

Determination of Extent/Spatial Scale

Extent or spatial scale is the area affected by the event, aspect or impact.

Table 11: Criteria for the rating of extent / spatial scale.

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

Determination of Overall Consequence

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

Table 12: Example of calculating overall consequence.

Consequence	Rating
Severity	Example 4
Duration	Example 2
Extent	Example 4
SUBTOTAL	**10**
TOTAL CONSEQUENCE: (Subtotal divided by 3)	**3.3**

Determination of Likelihood:

The determination of likelihood is a combination of Frequency and Probability. Each factor is assigned a rating of 1 to 5, as described below and in tables 6 and 7.

Determination of Frequency

Frequency refers to how often the specific activity, related to the event, aspect or impact, is undertaken.

Table 13: Criteria for the rating of frequency.

Rating	Description
1	Once a year or once/more during operation
2	Once/more in 6 Months
3	Once/more a Month
4	Once/more a Week
5	Daily

Determination of Probability

Probability refers to how often the activity or aspect has an impact on the environment.

Table 14: Criteria for the rating of probability.

Rating	Description
1	Almost never / almost impossible
2	Very seldom / highly unlikely
3	Infrequent / unlikely / seldom
4	Often / regularly / likely / possible
5	Daily / highly likely / definitely

Overall Likelihood

Overall likelihood is calculated by adding the factors determined above and summarised below, and then dividing the sum by 2.

Table 15: Example of calculating overall likelihood.

Consequence	Rating
Frequency	Example 4
Probability	Example 2
SUBTOTAL	**6**
TOTAL LIKELIHOOD (Subtotal divided by 2)	**3**

Determination of Overall Environmental Significance:

The multiplication of overall consequence with overall likelihood will provide the environmental significance, which is a number that will then fall into a range of **LOW**, **LOW-MEDIUM**, **MEDIUM**, **MEDIUM-HIGH** or **HIGH**, as shown in the table below.

Table 16: Determination of overall environmental significance.

Significance or Risk	Low	Low-Medium	Medium	Medium-High	High
Overall Consequence X Overall Likelihood	1 – 4.9	5 – 9.9	10 – 14.9	15 – 19.9	20 – 25

Qualitative description or magnitude of Environmental Significance

This description is qualitative and is an indication of the nature or magnitude of the Environmental Significance. It also guides the prioritisations and decision making process associated with this event, aspect, or impact.

Table 17: Description of environmental significance and related action required.

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

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

High — Of the highest order possible within the bounds of impacts which could occur. In the case of negative impacts, there would be no possible mitigation and / or remedial activity to offset the impact at the spatial or time scale for which it was predicted. In the case of positive impacts, there is no real alternative to achieving the benefit.

Medium-High — Impacts of a substantial order. In the case of negative impacts, mitigation and / or remedial activity would be feasible but difficult, expensive, time-consuming or some combination of these. In the case of positive impacts, other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.

Medium — Impact would be real but not substantial within the bounds of those, which could occur. In the case of negative impacts, mitigation and / or remedial activity would be both feasible and fairly easily possible, in case of positive impacts; other means of achieving these benefits would be about equal in time, cost and effort.

Low-Medium — Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and / or remedial activity would be either easily achieved of little would be required, or both. In case of positive impacts alternative means for achieving this benefit would likely be easier, cheaper, more effective, less time-consuming, or some combination of these.

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

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

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

The preferred project-, layout- and technology alternatives regarding this application entails the:

1. commercial selling of unwanted overburden, removed from the clay quarry, as aggregate to interested clients;
2. addition of three (aboveground) dangerous goods storage tanks near the brick factory;
3. chipping of wood that originates from (amongst others) discarded pallets and alien vegetation clearing programmes as a substitute fuel source at the tunnel kiln of the brick factory to reduce the commercial fuel need of the site;
4. application of used oil, collected from clients in and around the municipal area, as an alternative fuel source at one burner group on the tunnel kiln.

POSITIVE AND NEGATIVE IMPACTS ASSOCIATED THE PROPOSAL:

Table 18: Positive and negative impacts associated with the project proposal

POTENTIAL POSITIVE IMPACTS		
ACTIVITY	**IMPACT**	**SIGNIFICANCE**
Dangerous goods storage tanks & burning of used oil: ❖ Operational phase. **Sorting, Shredding, Chipping, and Burning of Discarded Wood:** ❖ Operational phase.	❖ Responsible use of old oil as alternative fuel source (+) ❖ Responsible use of discarded wood as an alternative fuel source (+)	⁎ High (+) ⁎ High (+)
Dangerous goods storage tanks & burning of used oil: ❖ Operational phase. **Sorting, Shredding, Chipping, and Burning of Discarded Wood:**	❖ Reduced need for commercial fuels on site (+) ❖ Reduced need for commercial fuels on site (+)	⁎ High (+) ⁎ High (+)

POTENTIAL POSITIVE IMPACTS		
ACTIVITY	**IMPACT**	**SIGNIFICANCE**
❖ Operational phase.		

Also refer to:

- Part A(1)(f) Need and desirability of the proposed activities; and
- Part A(1)(g) Motivation for the overall preferred site, activity and technology alternatives.

POTENTIAL NEGATIVE IMPACTS			
ACTIVITY	**POTENTIAL IMPACT**	**SIGNIFICANCE (BEFORE MITIGATION**	**SIGNIFICANCE (AFTER MITIGATION)**
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. **Dangerous goods storage tanks & burning of used oil:** ❖ Site establishment & infrastructure development.	- Visual intrusion as a result of the activities. - Visual intrusion as a result of site establishment.	- Low - Low-Medium	- Low - Low
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. ❖ Sloping and landscaping during rehabilitation. **Sorting, shredding, chipping and burning of discarded wood:** ❖ Operational phase.	❖ Infestation of the stockpile area with invader plant species. ❖ Infestation of the reinstated areas with invader plant species. ❖ Infestation of the sorting area (wood) with weeds/invader plants	❖ Low-Medium ❖ Low-Medium ❖ Low-Medium	❖ Low ❖ Low ❖ Low
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. **Sorting, shredding, chipping and burning of discarded wood:** ❖ Operational phase. ❖ Decommissioning phase.	❖ Dust nuisance as a result of the processing activities. ❖ Dust nuisance resulting from stockpiled wood chips/sawdust. ❖ Dust nuisance as a result of discarded wood chips/sawdust.	❖ Low-Medium ❖ Medium ❖ Medium	❖ Low ❖ Low ❖ Low
Aggregate Mining:	❖ Noise nuisance as a result of the mining activities.	❖ Low-Medium ❖ Low-Medium	❖ Low ❖ Low

POTENTIAL NEGATIVE IMPACTS			
ACTIVITY	**POTENTIAL IMPACT**	**SIGNIFICANCE (BEFORE MITIGATION**	**SIGNIFICANCE (AFTER MITIGATION)**
❖ Processing, loading and, hauling of aggregate. **Dangerous goods storage tanks & burning of used oil:** ❖ Site establishment & infrastructure development. ❖ Decommissioning phase **Sorting, shredding, chipping and burning of discarded wood:** ❖ Operational phase.	❖ Noise nuisance generated as a result of construction activities. ❖ Noise nuisance as a result of the decommissioning activities. ❖ Noise nuisance due to the operation of the chipper.	❖ Low-Medium ❖ Low-Medium	❖ Low ❖ Low
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. ❖ Sloping and landscaping during rehabilitation. **Dangerous goods storage tanks & burning of used oil:** ❖ Site establishment & infrastructure development. ❖ Operational phase ❖ Decommissioning phase **Sorting, shredding, chipping and burning of discarded wood:** ❖ Operational phase. ❖ Decommissioning phase.	❖ Soil contamination from hydrocarbon spills. ❖ Potential impact associated with littering at the area. ❖ Potential impact associated with litter left at the mining area. ❖ Pollution of environment with construction waste. ❖ Seeping of dangerous goods from defective storage tanks and bund walls. ❖ Spillage of dangerous goods when filling the tanks. ❖ Contamination of soil with hydrocarbons. ❖ Pollution of the environment with waste and building rubble not removed from the site. ❖ Contamination of the area with litter or other waste materials. ❖ Pollution of the environment with waste and building rubble not removed from site.	❖ Low-Medium ❖ Medium ❖ Low-Medium ❖ Low-Medium ❖ Low-Medium ❖ Low-Medium ❖ Low-Medium ❖ Low-Medium ❖ Medium ❖ Medium	❖ Low ❖ Low ❖ Low ❖ Low ❖ Low ❖ Low ❖ Low ❖ Low ❖ Low ❖ Low
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate.	❖ Deterioration of the access road to the mining area.	❖ Low-Medium	❖ Low
Aggregate Mining:	❖ Facilitation of erosion due to mining activities. ❖ Erosion of returned topsoil after rehabilitation.	❖ Low-Medium ❖ Low-Medium	❖ Low ❖ Low

POTENTIAL NEGATIVE IMPACTS			
ACTIVITY	**POTENTIAL IMPACT**	**SIGNIFICANCE (BEFORE MITIGATION**	**SIGNIFICANCE (AFTER MITIGATION)**
❖ Processing, loading and, hauling of aggregate. ❖ Sloping and landscaping during rehabilitation.			
Dangerous goods storage tanks & burning of used oil: ❖ Site establishment & infrastructure development.	❖ Potential damage to the existing infrastructure on site.	❖ Low-Medium	❖ Low
Dangerous goods storage tanks & burning of used oil: ❖ Site establishment & infrastructure development. ❖ Operational phase.	❖ Safety risk posed by construction workers' presence on the property. ❖ Safety risk posed by the operation of the dangerous goods tanks.	❖ Low ❖ Low	❖ Low ❖ Low
Dangerous goods storage tanks & burning of used oil: ❖ Operational phase. **Sorting, Shredding, Chipping and Burning of Discarded Wood:** ❖ Operational phase.	❖ Non-compliance with the conditions of the atmospheric emissions licence. ❖ Non-compliance with the conditions of the atmospheric emissions licence (wood burning)	❖ Low-Medium ❖ Low-Medium	❖ Low ❖ Low
Dangerous goods storage tanks & burning of used oil: ❖ Decommissioning phase. **Sorting, Shredding, Chipping and Burning of Discarded Wood:** ❖ Operational phase.	❖ Dilapidated infrastructure left upon decommissioning of the activity. ❖ Dilapidated infrastructure left upon decommissioning of the activity (wood).	❖ Medium ❖ Medium	❖ Low ❖ Low
Sorting, Shredding, Chipping and Burning of Discarded Wood: ❖ Operational phase.	❖ Sprawling of the sorting area impacting natural vegetated areas.	❖ Medium	❖ Low

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

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

(Information extracted from the 2014 EMPR of the mine)

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

TOPOGRAPHY

Rehabilitating/Landscaping of the Aggregate Stockpile and Wood Sorting Area:

- Stockpiles must be removed during the decommissioning phase, the area ripped, and the topsoil returned to its original depth to provide a growth medium.
- On completion of operations, all structures or objects shall be dealt with in accordance with section 44 of the MPRDA, 2002.
- Photographs of the sites, before and during the mining operation, and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the DMRE Regional Manager.
- On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 200 mm and graded to an even surface condition. Where applicable/possible topsoil needs to be returned to its original depth over the area.
- The area shall then be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a vegetation seed mix to his or her specification.

VISUAL CHARACTERISTICS

Visual Mitigation:

- The sites must have a neat appearance and always be kept in good condition.
- Mining equipment must be stored neatly in dedicated areas when not in use.
- Upon closure the sites must be fully rehabilitated, and all manmade structures removed (if no longer needed by the landowner) to reduce the residual visual impacts to the minimum.

AIR AND NOISE QUALITY

Fugitive Dust Emission Mitigation Measures:

- The liberation of dust into the surrounding environment must be effectively controlled using, inter alia, straw, water spraying and/or environmentally friendly dust-allaying agents that contains no PCB's (e.g. DAS products).
- The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression.
- The dust monitoring programme of the mine must continue.
- Speed on the haul roads must be limited to 20 km/h and 40 km/h on the access road to prevent the generation of excess dust.
- Areas devoid of vegetation, which could act as a dust source, must be minimized.
- The crusher plant must have operational water sprayers to alleviate dust generation from the conveyor belts.
- Fines, blowing from the drop end of the crusher plant, can be minimized by attaching strips of used conveyor belts to the conveyor's end.
- Compacted dust must weekly be removed from the crusher plant to eliminate the dust source.
- Loads must be flattened to prevent spillage during transportation on public roads.
- Weather conditions must be taken into consideration upon commencement of daily operations. Limiting operations during very windy periods would reduce airborne dust and resulting impacts.
- All dust generating activities shall comply with the National Dust Control Regulations, GN No R827 promulgated in terms of NEM:AQA (Act 39 of 2004) and ASTM D1739 (SANS 1137:2012).

Compliance with the atmospheric emissions licence (AEL)

- Should the Waste Licence be issued, the AEL licencing authority (DEDEAT-EC) must approve the changes in the type and quantities of input materials and products prior to the introduction of used oil and/or woodchips/sawdust as alternative fuel source at the brick factory.
- The AEL holder must comply with the obligations as set out in Chapter 5 of the AQA, 2004 as amended and the Government Notice 893 of 22 November 2013.
- Air quality monitoring must be implemented at the site. Monitoring will be undertaken according to the SANAS 1929:2005 (Edition 1.1).
- The AEL holder is required to report to the National Atmospheric Emission Inventory System on an annual basis before 31 March of the calendar year.

- The AEL holder must also report at the beginning of the calendar year the results of the monitoring programme in the established format as prescribed by the AEL.

Noise Handling:

- The Right Holder must ensure that employees and staff conduct themselves in an acceptable manner while on site.
- No loud music may be permitted at the work areas.
- All project vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996 (Act No 93 of 1996).
- A qualified occupational hygienist must be contracted to quarterly monitor and report on the personal noise exposure of the employees working at the mine. The monitoring must be done in accordance with the SANS 10083:2004 (Edition 5) sampling method as well as NEM:AQA, 2004, SANS 10103:2008.
- Best practice measures shall be implemented to minimize potential noise impacts.

GEOLOGY AND SOIL

Topsoil/Soil Management:

- The overburden must be stored in berms not exceeding 2.5 m in height.
- The stockpiled topsoil must be evenly spread, to a depth of 300 mm, over the rehabilitated area upon closure of the site.
- The Right Holder must strive to re-instate topsoil at a time of year when vegetation cover can be established as quickly as possible afterwards, so that erosion of returned topsoil by both rain and wind, before vegetation is established, is minimized. The best time of year is at the end of the rainy season, when there is moisture in the soil for vegetation establishment and the risk of heavy rainfall events is minimal.
- A cover crop must be planted and established immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. The cover crop must be fertilized for optimum biomass production. It is important that rehabilitation be taken up to the point of cover crop stabilization. Rehabilitation cannot be considered complete until the first cover crop is well established.
- The rehabilitated area must be monitored for erosion, and appropriately stabilized if any erosion occurs for at least 12 months after reinstatement.

HYDROLOGY

Erosion Control and Storm Water Management:

- Stockpiles must be protected from erosion, stored on flat areas where possible, and be surrounded by appropriate berms (if deemed applicable).
- Roads and other disturbed areas within the project area must be regularly monitored for erosion and problem areas must receive follow-up monitoring to assess the success of the remediation.
- Any erosion problems within the earmarked areas must be rectified immediately (within 48 hours) and monitored thereafter to ensure that it does not re-occur.
- Silt/sediment traps/barriers must be used where there is a danger of material stockpiles eroding and entering downstream drainage lines and other sensitive areas. These sediment/silt barriers must regularly be maintained and cleared to ensure effective drainage of the areas.
- Activities must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department may impose:
  - Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems.
  - Dirty water must be collected and contained in a system separate from the clean water system.
  - Dirty water must be prevented from spilling or seeping into clean water systems.
  - A storm water management plan must apply for the entire life cycle of the mining activity and over different hydrological cycles (rainfall patterns).
  - The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into a storm water management plan.
- Polluting activities including storage of fleet, equipment wash down facilities and vehicle maintenance yards must be restricted to the workshop areas and must be undertaken on impermeable hard standing surfaces, which are formally drained to a dirty water drainage system at the site.
- All fuels and chemicals stored or used on site must be contained within fit for purpose containers and stored within designated storage areas. To prevent pollution of the surrounding environment during an accidental spillage, the designated storage areas must be situated on an impermeable surface and must feature a perimeter bund and a drainage sump. The volume of the bund and sump must be sized to contain at least

110% of the total volume of the fuel and chemicals being stored within the designated storage area.

TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS AND GROUNDCOVER

Management of Vegetated Areas:

- The operational boundaries must be clearly defined, and all operations must be contained to the approved areas. The area outside the mining right boundary must be declared a no-go area, and all staff must be educated accordingly.
- A pre-commencement environmental induction for all site staff must be provided to ensure that basic environmental principles are adhered to. This includes awareness of littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, remaining within demarcated construction areas, etc.
- The on-site environmental officer must provide supervision and oversight of vegetation clearing activities and other activities which may cause damage to the environment, especially during the site establishment phase.
- Care must be taken to maintain indigenous tree species e.g. Cabbage Trees (*Cussonia* spp.)
- All vehicles must remain on demarcated roads and no unnecessary driving in the veld outside these areas may be allowed.
- No plants may be translocated or otherwise uprooted or disturbed for rehabilitation or other purposes without express permission from the ECO and without the relevant permits.
- All fires must be contained in structures designed for this specific purpose.

Management of Invasive Plant Species:

- An invasive plant species management plan must be implemented at the site to ensure the management and control of all species regarded as Category 1a and 1b invasive species in terms of NEM:BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto). Weed/alien clearing must be done on an ongoing basis throughout the life of the activities.
- No planting or importing of any alien species to the site for landscaping, rehabilitation or any other purpose may be allowed.
- All stockpiles must be kept free of invasive plant species.
- Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. The following control methods can be used:
  - The plants can be uprooted, felled, or cut off and can be destroyed completely.

- The plants can be treated chemically by a registered pest control officer (PCO) using an herbicide recommended for use by the PCO in accordance with the directions for the use of such an herbicide.

FAUNA

Protection of Fauna:

- The site manager must ensure no fauna is caught, killed, harmed, sold, or played with.
- Any fauna directly threatened by the operational activities must be removed to a safe location by the ECO or other suitably qualified person.
- All personnel must undergo environmental induction regarding fauna management and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition. Workers must be instructed to report any animals that may be trapped in the working area.
- No snares may be set, or nests raided for eggs or young.
- No litter, food or other foreign material may be thrown or left around the site. Such items must be kept in the site vehicles and daily removed to the site camp.

CULTURAL AND HERITAGE ENVIRONMENT

Archaeological, Heritage and Palaeontological Aspects:

- The activities must be confined to the development footprint area.
- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area.
- The senior on-site Manager must inform the ECO of the chance find and its immediate impact on operations. The ECO must then contact a professional archaeologist for an assessment of the finds who must notify the SAHRA.
- Work may only continue once the go-ahead was issued by SAHRA.
- Should a quartz quarry at any time be proposed on Brakkefontein recommendations in this regard should be obtained from a palaeontologist.
- Should the mine penetrate through the kaolin clay to bedrock a palaeontologist should be informed to evaluate its scientific interest.

- Should any suspected palaeontological material be at any time encountered during mining of Kweekvlei Formation mudstones, a palaeontologist should likewise be immediately contacted to sample and record such occurrence.

EXISTING INFRASTRUCTURE

Existing Infrastructure Management:

- Any damage to the brick factory infrastructure, as a direct result of the proposed activities, must be refurbished by the Right Holder at his own cost.
- Activities and construction workers must remain within the proposed footprints of the various activities.

Management of the Access Road:

- Storm water must be diverted around the access road to prevent erosion.
- Vehicular movement must be restricted to the existing access road and crisscrossing of tracks through undisturbed areas must be prohibited.
- Rutting and erosion of the access road caused as a direct result of the activities must be repaired by the Right Holder.
- Overloading of the trucks must be prevented, and proof of load weights must be filed and be available for auditing by relevant officials.
- The speed of all mining equipment/vehicles must be restricted to 40 km/h on the access roads.

GENERAL

Waste Management:

- Uncontaminated construction rubble can be used as fill material during the rehabilitation of the quarry pit. The Right Holder must however ensure that the rubble does not contain any waste.
- If no on-site disposal opportunities exist, then rubble and waste rock must be disposed of at the nearest registered solid waste disposal facility.
- Regular vehicle maintenance, repairs and services may only take place at the workshop and service area. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a closed container/bin to be removed from the emergency service area (same day) to the workshop to ensure proper disposal. This waste must be treated as hazardous waste and must be disposed of at a registered hazardous waste handling facility, alternatively

collected by a registered hazardous waste handling contractor. The safe disposal certificates must be filed for auditing purposes.

- If a diesel bowser is used on site, it must always be equipped with a drip tray. Drip trays must be used during every refuelling event. The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling.
- Site management must ensure drip trays are cleaned after each use. No dirty drip trays may be used on site. The dirty rags used to clean the drip trays must be disposed as hazardous waste into a designated bin at the workshop, where it is incorporated into the hazardous waste removal system.
- An oil spill kit must be obtained, and the employees must be trained in the emergency procedures to follow when a spill occurs as well as the application of the spill kit.
- Spills must be cleaned up immediately, within two hours of occurrence, to the satisfaction of the Regional Manager (DMRE) by removing the spillage together with the polluted soil and containing it in a designated hazardous waste bin until it is disposed of at a registered hazardous waste landfill site. Proof must be filed.
- A regular maintenance and monitoring programme must be implemented that reports on the integrity of the dangerous goods storage tanks and bund walls.
- Suitable covered receptacles must be always available and conveniently placed for the disposal of general waste.
- Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point to be collected at least once a month and disposed of at a registered general waste landfill site. Specific precautions must be taken to prevent refuse from being dumped on or in the vicinity of the mine area. Proof of disposal must be available for auditing purposes.
- Biodegradable refuse must be handled as indicated above.
- Re-use or recycling of waste products must be encouraged on site.
- Ablution facilities must be provided in the form of a chemical- or flush toilets connected to septic tanks. The chemical toilet must be anchored (to prevent blowing/falling over) and shall be serviced at least once a week for the duration of the mining activities by a registered liquid waste handling contractor. The safe disposal certificates must be filed for auditing purposes.
- The use of any temporary, chemical toilet facilities must not cause any pollution to water sources or pose a health hazard. In addition, no form of secondary pollution should arise from the disposal of refuse or sewage from the temporary, chemical toilets. Any pollution problems arising from the above are to be addressed immediately by the Right Holder.
- When small volumes of wastewater are generated during the life of the project the following is applicable:
  - Water containing waste must not be discharged into the natural environment.

- Measures to contain the wastewater and safely dispose thereof must be implemented.

- It is important that any significant spillage of chemicals, fuels etc. during the lifespan of the activities is reported to the Department of Water and Sanitation and other relevant authorities.
- Site management must implement the use of waste registers to keep record of the waste generated and removed from the mine.
- All decommissioned/rehabilitated areas must be cleared of building rubble and/or unwanted infrastructure at the end of the project.

Storage/Handling of Hazardous Substances/Chemicals:

- A thorough risk analysis associated with the installation of the dangerous goods tanks and related bunds must be conducted prior to the development of the proposed tanks.
- Flammable and combustible liquids, and other dangerous goods must be stored, transported, used, and disposed of in accordance with safe practice requirements and local regulatory requirements.
- All personnel that use or handle hazardous material are trained in the use and potential dangers of the materials, on emergency response procedures required to counter the nature and hazards of an accidental release, and the handling and storage practices, for all containers with which they will come into contact.
- Chemical storage areas must be placed on level ground to prevent offsite migration of any spilled product.
- The floor of the storage area must be impermeable to prevent seepage of spilled products into the ground or groundwater.
- Access to the chemicals/substances must be controlled and require prior notification of an appropriate staff member.
- All containers must be labelled so that the hazard nature of the material is clear.
- The storage area must be out of the 1:100 year floodline or further than 100 m from the edge of a watercourse, whichever is greatest.
- A Hazardous Substances Register must be maintained, and Material Safety Data Sheets (MSDS) must be kept current for all chemicals used on site.
- Any fuel/used oil tanks must have secondary containment in the form of an impermeable bund wall and base. The bund capacity must be sufficient to contain 110% of the tank's maximum capacity. The distance and height of the bund wall relative to that of the tank must also be taken into consideration to ensure that spillage does not result in hydrocarbons/other substances spouting beyond the confines of the bund.
- The site manager must establish a formal inspection routine to check all equipment in the bund area, as well as the bund area itself for malfunctions or leakages. The bund

area must be inspected at least weekly, and any accumulated rainwater removed and handled as contaminated water. All valves and outlets must be checked to ensure that its intact and closed securely.

- Site management must establish a formal tank maintenance programme that lists specific upkeep activities to be implemented on site as well as the frequency of the activities to be implemented.
- The bund base must slope towards an oil sump of sufficient size. Contaminated water may not be allowed to mix with clean water and must be contained until it is collected by a registered hazardous waste handling contractor or disposed of at a registered hazardous waste handling facility.
- The site must adhere to the conditions as outlined in the Environmental Authorisation as issued in 2008 by the Department of Economic Development and Environmental Affairs with reference number: EC06/386/7/07-104.
- Drip trays must be used underneath all stationary equipment or vehicles. Used drip trays must be placed within a bunded area and not stored on bare soil. The wastewater originating from the cleaning of drip trays must be discarded into the oil sump.
- Ensure compliance with all national, regional, and local legislation about the storage, transport and use of hydrocarbons, chemicals, solvents, and any other harmful and hazardous substances and materials.
- No combustible material (e.g. wood, rags, paper, carton boxes) are to be kept in the presence of flammable liquids.
- “No Open Flames” and “No Smoking” signs are to be displayed in the vicinity of the flammable liquid storage areas.
- An adequate number and type of firefighting equipment is to be available in close vicinity of the flammable liquid store.
- Training must be provided in the use of the appropriate fire-fighting equipment.
- Provide for controlled loading/unloading areas, underlain by an impervious paving or PVC sheet to protect against soil and water pollution.
- All hazardous waste containers designated for off-site transport to be secured and labelled with the contents and associated hazards, be properly loaded.
- The vehicle displays clear markings in English indicating the nature of the materials being carried, what to do in the event of an emergency, and an emergency telephone number (24 hour) of a responsible person who can provide advice in the event of an emergency.

Management of Health and Safety Risks:

- Any new employees, or sub-contractors must be vetted prior to inception of their contract.

- ❖ No unauthorised personnel may be allowed to enter the mine.
- ❖ Employees, including truck drivers, must be educated to report suspicious looking person/s and/or matters within the surrounding area.
- ❖ Communication between the mine and surrounding residents must be maintained for the duration of the site establishment-, operational- and decommissioning phases.
- ❖ Workers must have access to the correct personal protection equipment (PPE) as required by law.
- ❖ Sanitary facilities must be located within 100 m from any point of work.
- ❖ All operations must comply with the Mine Health and Safety Act, 1996 (Act No 29 of 1996) as amended.
- ❖ The dangerous goods storage tanks must be installed in accordance with the requirements of the Hazardous Substances Act, 1973 (Act No 15 of 1973) as amended.

ix) Motivation where no alternative sites were considered.

As mentioned in Part A(1)(g) *Motivation for the overall preferred site, activities and technology alternative*, the proposed activities constitute the preferred and only viable development option as:

- ❖ the selling of the overburden as aggregate will generate an additional income source for the Right Holder. Further to this, the constant removal of stockpiled overburden from the property will reduce the areas needed for stockpiling, and in doing so contribute to the conservation of intact vegetation cover on the property (around the current stockpile areas). As the Applicant proposes to make use of a mobile crushing plant (when needed), this application does not require the construction of any permanent infrastructure on site. The use of temporary equipment will also lessen the rehabilitation actions to be taken upon the decommissioning of the site. Should the Applicant be allowed to continue with this activity, there will be no residual impacts on the receiving environmental once the mine closes.

- ❖ As mentioned earlier, the proposed reuse of the wood and used oil as fuel resources at the brick factory directly links with the objectives of the NWMS and the “circular economy” concept. Considering this, the proposal will not merely contribute to the responsible reuse of waste products, but also reduce the fossil fuel need of the site that will directly lower the financial costs of the operation. The projects will further generate income for wood sellers in the surrounding community, as well as provide used oil generators with an environmentally responsible option of hazardous waste (used oil) disposal, while also earning an income rather than it being a cost. This project therefore does not only provide the Applicant with cost savings, but also contributes to the local economy in more than one sector. Further to this, the assessment (as part of the S102 application) showed that

if the proposed mitigation measures are implemented, the impacts significance is deemed to be Low.

- The reuse of used oil as an alternative fuel source at the brick factory will increase the storage capacity needs of the site, and therefore the Applicant identified the need for three additional dangerous goods storage tanks at the property. Should the Applicant not be allowed to install the additional tanks, it would mean that less used oil can be stored at a time. That would directly increase the number of trips the Applicant would need to make to collect the oil. An increase in collection trips will directly increase the cost for the Applicant, and indirectly affect the cost offered to the clients for the oil. It is therefore imperative that the Applicant can collect full loads of used oil with evert trip to make the project cost effective. This will however only be possible if the site has adequate storage capacity.

- The proposed project (selling of aggregate, placement of dangerous goods tanks, and the burning of wood and used oil on site) will take place (if approved) in already altered/surfaced areas on the property and will not require the removal of any intact vegetation cover. Moving any of the activities from the proposed footprints, will however necessitate the clearance of vegetation and the stripping of topsoil that was not deemed to be the preferred or most environmentally friendly option.

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

Please refer to Part A(1)(g) *Motivation for the overall preferred site, activities, and technology alternative*, as well as Part A(1)(h)(ix) *Motivation where no alternative sites were considered*.

i) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity.
(Including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures)

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

The significance rating was again determined for each impact using the methodology as explained under *vi) Methodology Used in Determining and Ranking the Significance*. The impact ratings

listed below was determined for each impact **after** bringing the proposed mitigation measures into consideration and therefore represents the final layout/activity proposal.

1. AGGREGATE MINING

PROCESSING, LOADING, AND HAULING OF AGGREGATE

Visual intrusion as a result of the activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Low					**Degree of Mitigation: Partial**		
1	5	1	2.3	2	2	2	**4.6**

Infestation of the stockpile area with invader plant species

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Low					**Degree of Mitigation: Full**		
1	2	1	1.3	2	2	2	**2.6**

Dust nuisance as a result of the processing activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Low					**Degree of Mitigation: Full**		
2	1	1	1.3	2	2	2	**2.6**

Noise nuisance as a result of the mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Low					**Degree of Mitigation: Partial**		
1	3	1	1.6	2	2	2	**3.2**

Soil contamination from hydrocarbon spills

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

Potential impact associated with littering at the area

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Rating: Low					**Degree of Mitigation: Full**		
2	1	1	1.3	2	2	2	**2.6**

Deterioration of the access road to the mining area

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low						**Degree of Mitigation: Full**	
1	1	2	1.3	2	2	2	**2.6**

Facilitation of erosion due to mining activities

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

SLOPING AND LANDSCAPING DURING REHABILITATION:

Erosion of returned topsoil after rehabilitation

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

Infestation of the reinstated area with invader plant species

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low						**Degree of Mitigation: Full**	
2	1	1	1.3	2	2	2	**2.6**

Potential impact associated with litter left at the mining area

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

2. DANGEROUS GOODS STORAGE TANKS & BURNING OF USED OIL

SITE ESTABLISHMENT & INFRASTRUCTURE DEVELOPMENT

Visual intrusion as a result of site establishment

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

Pollution of environment with construction waste

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

Potential damage to the existing infrastructure on site

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

Noise nuisance generated as a result of construction activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Full**		
1	2	2	1.6	2	4	3	**4.8**

Safety risk posed by construction workers' presence on the property

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Full**		
1	2	2	1.6	2	1	1.5	**2.4**

OPERATIONAL PHASE

Seeping of dangerous goods from defective storage tanks and bund walls

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

Spillage of dangerous goods when filling the tanks

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

Safety risk posed by the operation of the dangerous goods tanks

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

Non-compliance with the conditions of the atmospheric emissions licence

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Full**		
2	1	2	1.6	2	1	1.5	**2.4**

DECOMMISSIONING PHASE

Dilapidated infrastructure left upon decommissioning of the activity

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low						**Degree of Mitigation: Full**	
2	1	1	1.3	1	1	1	**1.3**

Contamination of soil with hydrocarbons

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

Noise nuisance as a result of the decommissioning activities

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

Pollution of the environment with waste and building rubble not removed from site

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

3. SORTING, SHREDDING, CHIPPING AND BURNING OF DISCARDED WOOD

OPERATIONAL PHASE

Infestation of the sorting area with weeds/invader plants

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

Sprawling of the sorting area impacting natural vegetated areas

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low						**Degree of Mitigation: Full**	
2	1	1	1.3	2	1	1.5	**2**

Contamination of the area with litter or other waste materials

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

Dust nuisance resulting from stockpiled wood chips/sawdust

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

Noise nuisance due to the operation of the chipper

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Full**		
1	4	2	2.3	2	2	2	**2.6**

Non-compliance with the conditions of the atmospheric emissions licence

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Full**		
2	1	2	1.6	2	1	1.5	**2.4**

DECOMMISSIONING PHASE

Dilapidated infrastructure left upon decommissioning of the activity

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Full**		
2	1	1	1.3	1	1	1	**1.3**

Pollution of the environment with waste and building rubble not removed from site

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

Dust nuisance as a result of discarded wood chips/sawdust

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

j) Assessment of each identified potentially significant impact and risk

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

Table 19: Assessment of each identified potentially significant impact and risk

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
Whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	(E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, air pollution, etc…etc…etc.)		In which impact is anticipated. (E.g. Construction, commissioning, operational Decommissioning closure, post closure.)	If not mitigated.	(modify, remedy, control, or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc etc) E.g. Modify through alternative method Control through noise control Control through management and monitoring through rehabilitation.	If not mitigated.
<u>Aggregate Mining:</u> ❖ Processing, loading and, hauling of aggregate. **<u>Dangerous goods storage tanks & burning of used oil:</u>**	❖ Visual intrusion as a result of the activities. ❖ Visual intrusion as a result of site establishment.	The visual impact may affect the aesthetics of the landscape.	Site Establishment & Operational Phase	❖ Low ❖ Low-Medium	<u>Control:</u> Implementing proper housekeeping.	❖ Low ❖ Low

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
❖ Site establishment & infrastructure development.						
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. ❖ Sloping and landscaping during rehabilitation. **Sorting, shredding, chipping and burning of discarded wood:** ❖ Operational phase.	❖ Infestation of the stockpile area with invader plant species. ❖ Infestation of the reinstated areas with invader plant species. ❖ Infestation of the sorting area (wood) with weeds/invader plants	Infestation of the footprint by invader plant species may affect the biodiversity of the receiving environment.	Site Establishment-, Operational, and Decommissioning Phase	❖ Low-Medium ❖ Low-Medium ❖ Low-Medium	Control & Remedy: Implementation of an invasive plant species management plan.	❖ Low ❖ Low ❖ Low
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. **Sorting, shredding, chipping and burning of discarded wood:** ❖ Operational phase. ❖ Decommissioning phase.	❖ Dust nuisance as a result of the processing activities. ❖ Dust nuisance resulting from stockpiled wood chips/sawdust. ❖ Dust nuisance as a result of discarded wood chips/sawdust.	Increased dust generation will impact on the air quality of the receiving environment.	Site Establishment-, Operational- and Decommissioning Phase	❖ Low-Medium ❖ Medium ❖ Medium	Control: Dust suppression methods and proper housekeeping.	❖ Low ❖ Low ❖ Low
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. **Dangerous goods storage tanks & burning of used oil:**	❖ Noise nuisance as a result of the mining activities. ❖ Noise nuisance generated as a result of construction activities.	Should noise levels become excessive it may have an impact on the noise ambiance of the	Site Establishment-, Operational Phase	❖ Low-Medium ❖ Low-Medium ❖ Low-Medium ❖ Low-Medium	Control: Noise suppression methods and proper housekeeping.	❖ Low ❖ Low ❖ Low ❖ Low

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
❖ Site establishment & infrastructure development. ❖ Decommissioning phase **<u>Sorting, shredding, chipping and burning of discarded wood:</u>** ❖ Operational phase.	❖ Noise nuisance as a result of the decommissioning activities. ❖ Noise nuisance due to the operation of the chipper.	receiving environment.				
<u>Aggregate Mining:</u> ❖ Processing, loading and, hauling of aggregate. ❖ Sloping and landscaping during rehabilitation. **<u>Dangerous goods storage tanks & burning of used oil:</u>** ❖ Site establishment & infrastructure development. ❖ Operational phase ❖ Decommissioning phase **<u>Sorting, shredding, chipping and burning of discarded wood:</u>** ❖ Operational phase. ❖ Decommissioning phase.	❖ Soil contamination from hydrocarbon spills. ❖ Potential impact associated with littering at the area. ❖ Potential impact associated with litter left at the mining area. ❖ Pollution of environment with construction waste. ❖ Seeping of dangerous goods from defective storage tanks and bund walls. ❖ Spillage of dangerous goods when filling the tanks.	Contamination of the footprint areas will negatively impact the soil, surface runoff and potentially the groundwater. It will also incur additional costs to the Right Holder.	Site Establishment-, Operational-, and Decommissioning Phase	❖ Low-Medium ❖ Medium ❖ Low-Medium ❖ Low-Medium ❖ Low-Medium ❖ Low-Medium ❖ Low-Medium ❖ Low-Medium ❖ Medium ❖ Medium	<u>Control & Remedy:</u> Proper housekeeping and implementation of an emergency response plan and waste management plan.	❖ Low ❖ Low ❖ Low ❖ Low ❖ Low ❖ Low ❖ Low ❖ Low ❖ Low ❖ Low

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
	❖ Contamination of soil with hydrocarbons. ❖ Pollution of the environment with waste and building rubble not removed from the site. ❖ Contamination of the area with litter or other waste materials. ❖ Pollution of the environment with waste and building rubble not removed from site.					
<u>Aggregate Mining:</u> ❖ Processing, loading and, hauling of aggregate.	❖ Deterioration of the access road to the mining area.	Collapse of the internal road infrastructure will affect the landowner and lawful occupiers negatively. If the mine negatively affect public traffic it may incur additional costs and complaints from the public.	Operational phase	❖ Low-Medium	<u>Control & Remedy:</u> Maintaining the access road for the duration of the operational phase, as well as leabing it in a representative or better condition than prior to mining.	❖ Low
<u>Aggregate Mining:</u> ❖ Processing, loading and, hauling of aggregate.	❖ Facilitation of erosion due to mining activities.	The loss/contamination of topsoil and erosion of the footprint will affect	Site Establishment-, Operational and Decommissioning Phase	❖ Low-Medium ❖ Low-Medium	<u>Control & Remedy:</u> Proper housekeeping and storm water management.	❖ Low ❖ Low

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
❖ Sloping and landscaping during rehabilitation.	❖ Erosion of returned topsoil after rehabilitation.	the rehabilitation of the excavation upon closure of the site.				
Dangerous goods storage tanks & burning of used oil: ❖ Site establishment & infrastructure development.	❖ Potential damage to the existing infrastructure on site.	Damage to the existing infrastructure on the site will incur rectification costs to the Right Holder.	Operational Phase	❖ Low-Medium	Stop & Control: Proper housekeeping and demarcation of operational areas.	❖ Low
Dangerous goods storage tanks & burning of used oil: ❖ Site establishment & infrastructure development. ❖ Operational phase.	❖ Safety risk posed by construction workers' presence on the property. ❖ Safety risk posed by the operation of the dangerous goods tanks.	An unsafe working environment affects the labour force, as well as pose a threat to infrastructure and humans.	Operational-, and Decommissioning Phase	❖ Low ❖ Low	Control: All contractors must be vetted before commencement of construction, and all equipemnt must be installed in accordance with the relevent safety regulations.	❖ Low ❖ Low
Dangerous goods storage tanks & burning of used oil: ❖ Operational phase. **Sorting, Shredding, Chipping and Burning of Discarded Wood:** ❖ Operational phase.	❖ Non-compliance with the conditions of the atmospheric emissions licence. ❖ Non-compliance with the conditions of the atmospheric emissions licence (wood burning)	This impact may affect the air quality and compliance with the conditions of the atmospheric emissions licence.	Operational Phase	❖ Low-Medium ❖ Low-Medium	Modify & Control: Monitor the emmissions of the plant and test the results agains the requirements of the atmospheric licence.	❖ Low ❖ Low
Dangerous goods storage tanks & burning of used oil: ❖ Operational phase.	❖ Responsible use of old oil as alternative fuel source (+)	The re-use of general- and hazardous waste in a responsible manner	Operational Phase.	❖ High+ ❖ High+	N/A	❖ High+ ❖ High+

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
Sorting, Shredding, Chipping and Burning of Discarded Wood: ❖ Operational phase.	❖ Responsible use of discarded wood as an alternative fuel source (+)	contributes to the minimising of waste materials.				
Dangerous goods storage tanks & burning of used oil: ❖ Operational phase. **Sorting, Shredding, Chipping and Burning of Discarded Wood:** ❖ Operational phase.	❖ Reduced need for commercial fuels on site (+) ❖ Reduced need for commercial fuels on site (+)	A reduction in commercial fuels will save the site costs.	Operational Phase.	❖ High+ ❖ High+	N/A	❖ High+ ❖ High+
Dangerous goods storage tanks & burning of used oil: ❖ Decommissioning phase. **Sorting, Shredding, Chipping and Burning of Discarded Wood:** ❖ Operational phase.	❖ Dilapidated infrastructure left upon decommissioning of the activity. ❖ Dilapidated infrastructure left upon decommissioning of the activity (wood).	Dilapidated infrastructure may have a negative impact on the aesthetic and health and safety matters on site.	Decommissioning Phase	❖ Medium ❖ Medium	Rectify/Control: All structures, no longer needed by the applicant, must be decommissioned in accordance with this document.	❖ Low ❖ Low
Sorting, Shredding, Chipping and Burning of Discarded Wood: ❖ Operational phase.	❖ Sprawling of the sorting area impacting natural vegetated areas.	The unauthorised removal of natural vegetation may impact on the biodiversity of the area.	Operational Phase	❖ Medium	**Control:** All operations must be contained to the already disturbed footprint.	❖ Low

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

k) Summary of specialist reports.

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

Table 20: Summary of specialist reports

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
Palaeontological Heritage Impact Assessment for Brakkefontein Farm and quarries, east of Makhanda/Grahamstown February 2022 *(See Appendix F for a full copy of the report)*	❖ Should however a quartz quarry at any time be proposed on Brakkefontein recommendations in this regard should be obtained from a palaeontologist. ❖ Should mines penetrate through the kaolin clay to bedrock a palaeontologist should be informed to evaluate its scientific interest. ❖ Should any suspected palaeontological material be at any time encountered during mining of Kweekvlei Formation mudstones, a palaeontologist should likewise be immediately contacted to sample and record such occurrence.	All the recommendations proposed by the specialist were included in this report.	Part A(1)(h)(viii) The possible mitigation measures that could be applied and the level of risk

I) Environmental impact statement

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

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

Project Proposal:

- Makhanda Mining (Pty) Ltd, applied for a Section 102 amendment application in terms of the MPRDA, 2002 to add aggregate as additional commodity to the mining right;
- In addition to the S102 application, the Applicant also applied for the development and related operation of facilities for the storage of dangerous goods within the footprint of the mining right in support of the brick factory.
- The EA application is also combined with a NEM:WA basic assessment application for the burning of wood (general waste) and used oil (hazardous waste) as substitute fuel sources at the tunnel kiln of the brick factory in an effort to reduce the commercial fuel need of the site.
- The proposed burning of wood chips/sawdust and used oil directly links with the objectives of the NWMS and the “circular economy” concept.

Topography:

- None of the proposed activities, will have an impact on the topography of the receiving environment, and upon closure there will be no residual impacts.

Visual Characteristics:

- The viewshed analysis showed that the potential visual impact of the proposed activities will be of very low concern, and there for the visual impact is deemed to be of low significance.

Air and Noise Quality:

- The DEDEAT-EC issued a Full Atmospheric Emissions Licence (EC/CAR/MAK/021/2016) for the activities at the site.
- Neither the selling of aggregates, nor the chipping of wood will trigger an application in terms of the said Act.

- The proposed burning of the chipped wood/sawdust and/or used oil will take place at the existing brick factory and will be controlled, and reported on, in accordance with the existing Atmospheric Emissions Licence.
- The proposed crushing/screening of the overburden will be intermittent, while the chipping of the wood will be contained in a warehouse. Considering this, none of the proposed activities is expected to generate excessive noise levels that isn't compatible with the current operations at the property.
- Although the proposed activities may will have a slight cumulative impact on the air quality and ambient noise levels, the development will not take place in a pristine environment, and the impact is therefore deemed compatible with the current operations and of low significance.

Hydrology:

- There are no natural streams on or near the proposed development areas that could be affected; neither will the proposed activities affect the groundwater.
- Therefore, should the mitigation measures proposed in this document, be implemented, the potential impact on the hydrology will be negligible.

Terrestrial Biodiversity, Conservation Areas and Groundcover:

- The CBA does not extend across the already disturbed/altered areas of the quarry pit and brick plant. The proposed activities will take place on already disturbed areas that will not necessitate the removal of any natural occurring vegetation and does therefore not pose any risk to the conservation status of the CBA or broad-scale ecological processes.

Cultural and Heritage Environment:

- The palaeontologist did not identify any significant palaeontological material at the areas of interest. The potential impact of the proposed activities on the cultural and/or heritage environment is therefore deemed insignificant.

Existing Infrastructure:

- No infrastructure exists at the overburden stockpile area that could be affected by the proposed activity. Further to this, the wood sorting area is removed from any sensitive site infrastructure.

- ❖ Neither the chipping of the wood at the existing warehouse, nor the installation of the additional dangerous goods storage tanks is expected to impact on the existing infrastructure of the site other than enhancing the value thereof.

ii) Final Site Map

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

See the map indicating site activities attached as Appendix C.

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

The positive impacts of the proposed activity entails:

- ❖ Responsible use of old oil as alternative fuel source;
- ❖ Responsible use of discarded wood as an alternative fuel source;
- ❖ The fossil fuel need of the site will be reduced that will directly lessen the operational costs of the company, but also reduce the need for non-renewable resources on site, as it will be substituted with recycled wood/used oil;
- ❖ Taking advantage of the commercial value of the unwanted overburden stockpiled on the property;
- ❖ The use/selling of the aggregate material will reduce the need for stockpile areas on site, thereby indirectly contribute to the conservation of intact vegetation cover on the property;
- ❖ The proposed burning of wood chips/sawdust and used oil directly links with the objectives of the NWMS and the "circular economy" concept and offers the private sector (Right Holder) and opportunity to become involved/support these objectives;
- ❖ The project will generate income for wood sellers in the surrounding community, as well as provide used oil generators with an environmentally responsible option of hazardous waste (used oil) disposal, while also earning an income rather than it being a cost;
- ❖ Prolonging the lifespan of the mine through the generation of additional income from the unwanted overburden currently merely stockpiled on site. A prolonged lifespan will directly afford job security to the employees of the Right Holder.

Refer to Part A(1)(h)(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* for a summary of the potential negative impacts

that were identified for the proposed activity. As mentioned earlier, all the impacts are deemed to be of low significance upon mitigation.

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

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

Table 21: Proposed impact management objectives and the impact management outcomes for inclusion in the EMPR

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
TOPOGRAPHY Landscaping of Aggregate Stockpile and Wood Sorting Area.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	❖ Remove all stockpiles during the decommissioning phase, rip the area, and return the topsoil to its original depth to provide a growth medium. ❖ Deal with all structures or objects in accordance with section 44 of the MPRDA, 2002 on completion of operations ❖ Take photographs of the sites, before and during the mining operation, and after rehabilitation, at selected fixed points and keep on record for the information of the DMRE Regional Manager. ❖ Scarify the surface of compacted areas, due to hauling and dumping operations, to a depth of at least 200 mm and grade it to an even surface condition on completion of mining operations. Where applicable/possible topsoil needs to be returned to its original depth over the area. ❖ Fertilize the area if necessary to allow vegetation to establish rapidly. Seed the site with a local, adapted indigenous seed mix. ❖ If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, analyse the soil and correct any deleterious effects on the soil arising from the mining operation before seeding the area with a vegetation seed mix to the Regional Manager's specification.	❖ Effectively restoring the stockpile/sorting areas to allow the return of land use to agriculture.
VISUAL CHARACTERISTICS Visual mitigation	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.	❖ Ensure that the site have a neat appearance and is always kept in good condition. ❖ Store mining equipment in a dedicated area when not in use.	❖ Minimise the impact of the operations on the visual characteristics of the receiving environment during the operational phase and

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
	Compliance to be monitored by the Environmental Control Officer.	❖ Upon closure, rehabilitate the site and remove all manmade structures (if no longer needed by the landowner) to reduce the residual visual impact to the minimum.	minimise the residual impact after closure.
AIR AND NOISE QUALITY Dust Mitigation	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer. Air Quality Monitoring Specialist to monitor and report on all air emissions.	❖ Control the liberation of dust into the surrounding environment using; inter alia, water spraying and/or other dust-allaying agents. ❖ Ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. ❖ Continue the dust monitoring programme of the mine. ❖ Limit speed on the haul roads to 20 km/h and 40 km/h on the access road to prevent the generation of excess dust. ❖ Minimise areas devoid of vegetation, and only remove vegetation immediately prior to mining. ❖ Install water sprayers at the crusher plant to alleviate dust generation from the conveyor belts. ❖ Minimise fines, blowing from the drop end of the crusher plant by attaching strips of used conveyor belts to the conveyor's end. ❖ Weekly remove compacted dust from the crusher plant to eliminate the dust source. ❖ Flatten loads to prevent spillage during transportation on public roads. ❖ Consider weather conditions upon commencement of daily operations. Limit operations during very windy periods to reduce airborne dust and resulting impacts. ❖ Ensure dust generating activities comply with the National Dust Control Regulations, GN No R827 promulgated in terms of NEM:AQA, 2004 and ASTM D1739 (SANS 1137:2012).	❖ Dust prevention measures are applied to minimise the impact.
AIR AND NOISE QUALITY Compliance with the AEL	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.	❖ Upon receipt of the Waste Licence be issued, request approval from the AEL licencing authority (DEDEAT-EC) for the changes in the type and quantities of input materials and products prior to the introduction	❖ All operations comply with the conditions of the AEL and associated legislation.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
	Compliance to be monitored by the Environmental Control Officer. Air Quality Monitoring Specialist to monitor and report on all air emissions.	of used oil and/or woodchips/sawdust as alternative fuel source at the brick factory. ❖ Ensure compliance with the obligations as set out in Chapter 5 of the AQA, 2004 as amended and the Government Notice 893 of 22 November 2013. ❖ Implement air quality monitoring in accordance with the SANAS 1929:2005 (Edition 1.1). ❖ Report to the National Atmospheric Emission Inventory System on an annual basis before 31 March of the calendar year. ❖ Report, at the beginning of the calendar year, the results of the monitoring programme in the established format as prescribed by the AEL.	
AIR AND NOISE QUALITY Noise Mitigation	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	❖ Ensure that employees and staff conduct themselves in an acceptable manner while on site. ❖ No loud music may be permitted at the mining area. ❖ Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996. ❖ Contract a qualified occupational hygienist to quarterly monitor and report on the personal noise exposure of the employees working at the mine. Monitoring must be in accordance with SANS 10083:2004 (Edition 5) sampling method as well as NEM:AQA 2004, SANS 10103:2008. ❖ Implement best practice measures to minimise potential noise impacts.	❖ Prevent unnecessary noise to the environment by ensuring that noise from development activity is mitigated.
GEOLOGY AND SOIL Topsoil/Soil Management	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.	❖ Store the overburden in berms not exceeding 2.5 m in height. ❖ Spread the topsoil evenly, to a depth of 300 mm, over the rehabilitated area upon closure of the site. ❖ Strive to re-instate topsoil at a time of the year when vegetation cover can be established as quickly as possible afterwards, to that erosion of	❖ Adequate fertile topsoil is available to rehabilitate the mined area.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
	Compliance to be monitored by the Environmental Control Officer.	returned topsoil is minimized. The best time of year is at the end of the rainy season. ❖ Plant a cover crop immediately after spreading topsoil to stabilise the soil and protect it from erosion. Fertilise the cover crop for optimum production. Rehabilitation extends until the first cover crop is well established. ❖ Monitor the rehabilitated area for erosion, and appropriately stabilize if erosion do occur, for at least 12 months after reinstatement.	
HYDROLOGY Erosion Control and Storm Water Management	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	❖ Protect stockpiles from erosion and store it on flat areas surrounded by appropriate berms where possible. ❖ Regularly monitor roads and other disturbed areas within the project for erosion and ensure problem areas receive follow-up monitoring to assess the success of the remediation. ❖ Rectify erosion problems within the earmarked area immediately (within 48 hours) and monitored thereafter to ensure that it does not re-occur. ❖ Use silt/sediment traps/barriers where there is a danger of topsoil or material stockpiles eroding and entering downstream drainage lines and other sensitive areas. Regularly maintain and clear the sediment/silt barriers to ensure effective drainage of the areas. ❖ Conduct activity in terms of the Best Practice Guidelines for small-scale mining as developed by DWS. ❖ Restrict polluting activities including storage of mining fleet, equipment wash down facilities and vehicle maintenance yards to the workshop areas and ensure it takes place on impermeable hard standing surfaces, which formally drain to a dirty water drainage system at the site. ❖ Contain all fuels and chemicals stored or used on site in fit for purpose containers and store within designated storage areas. Ensure the designated storage areas are situated on an impermeable surface with a perimeter bund and a drainage sump. Size the volume of the bund	❖ Impact on the environment caused by stormwater discharge is avoided and erosion is managed.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		and sump to contain at least 110% of the total volume of the fuel and chemicals being stored within the designated storage area.	
TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS AND GROUNDCOVER Management of vegetated areas.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	❖ Clearly demarcate the operational boundaries and contain all operations to the approved areas. Declare the area outside the mining right boundary a no-go area and educate all staff accordingly. ❖ Arrange a pre-commencement environmental induction for all staff on site to ensure that basic environmental principles are adhered to. This must include awareness of littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, remaining within demarcated construction areas, etc. ❖ The on-site environmental officer must provide supervision and oversight of vegetation clearing activities and other activities which may cause damage to the environment, especially during the site establishment phase. ❖ Take care to maintain indigenous tree species e.g. Cabbage Trees (*Cussonia* spp.). ❖ Ensure all vehicles remain on demarcated roads and prevent unnecessary driving in the veld outside these areas. ❖ Do not translocated, uprooted, or disturbed plants for rehabilitation or other purposes without express permission from the ECO and without the relevant permits. ❖ Contain all fires in structures designed for this specific purpose.	❖ Vegetated areas are protected against unnecessary clearing.
TERRESTRIAL BIODIVERSITY, CONSERVATION AREAS AND GROUNDCOVER Management of invasive plant species.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	❖ Implement an invasive plant species management plan to control all invasive plant species on site in terms of NEM:BA, 2004 and CARA, 1983. Do weed/alien ongoing clearing on throughout the life of the mining activities. ❖ Do not allow planting or importing of any alien species to the site for landscaping, rehabilitation, or any other purpose. ❖ Keep all stockpiles (topsoil & overburden) free of invasive plant species.	❖ Operational areas are kept free of invasive plant species.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		❖ Control declared invader or exotic species on the rehabilitated areas.	
FAUNA Protection of fauna	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	❖ Ensure no fauna is caught, killed, harmed, sold, or played with. ❖ The ECO or other suitably qualified person must remove any fauna directly threatened by the operational activities to a safe location. ❖ Arrange that all personnel undergo environmental induction regarding fauna management and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition. Instruct workers to report any animals that may be trapped in the working area. ❖ Ensure no snares are set or nests raided for eggs or young. ❖ Prevent litter, food or other foreign material thrown or left around the site. Keep such items in the site vehicles and daily removed it to the site camp.	❖ Disturbance to fauna is minimised.
CULTURAL AND HERITAGE ENVIRONMENT Archaeological, heritage and palaeontological aspects.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	❖ Confine all mining to the development footprint area. ❖ Implement the following change find procedure when discoveries are made on site: ▪ If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. ▪ It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area. ▪ The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact	❖ Impact to cultural/heritage resources is avoided or at least minimised.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		a professional archaeologist for an assessment of the finds who will notify the SAHRA. ▪ Work may only continue once the go-ahead was issued by SAHRA. ❖ Obtain a recommendation from a palaeontologist should a quartz quarry at any time be proposed on Brakkefontein. ❖ Appoint a palaeontologist to evaluate the scientific interest of work penetrating kaolin clay to bedrock. ❖ Contact a palaeontologist, should any suspected palaeontological material be at any time encountered during mining of Kweekvlei Formation mudstones.	
EXISTING INFRASTRUCTURE Existing Infrastructure Management	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	❖ Refurbish any damage to the brick factory infrastructure, as a direct result of the proposed activities. ❖ Ensure that activities and construction workers remain within the proposed footprints of the various activities.	❖ No impact to the surrounding existing infrastructure.
EXISTING INFRASTRUCTURE Management of the access road.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	❖ Divert storm water around the access road to prevent erosion. ❖ Restrict vehicular movement to the existing access road to prevent crisscrossing of tracks through undisturbed areas. ❖ Repair rutting and erosion of the access road caused as a direct result of the activities. ❖ Prevent the overloading of the trucks and file proof of load weights for auditing by relevant officials. ❖ Restrict the speed of all mining equipment/vehicles to 40 km/h on the access roads.	❖ The access road remains accessible to the landowner and lawful occupiers during the operational phase, and upon closure, the road is returned in a better, or at least the same state as received by the Right Holder.
GENERAL Waste management	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.	❖ Use uncontaminated construction rubble as fill material during the rehabilitation of the quarry pit. Ensure that the rubble does not contain any waste.	❖ Wastes are appropriately handled and safely disposed of at recognised waste facilities.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
	Compliance to be monitored by the Environmental Control Officer.	❖ If no on-site disposal opportunities exist, dispose of the rubble and waste rock at the nearest registered solid waste disposal facility. ❖ Ensure regular vehicle maintenance, repairs and services only take place at the workshop and service area. Ensure drip trays are present if emergency repairs are needed on equipment not able to move to the workshop. Dispose all waste products in a closed container/bin to be removed from the emergency service area (same day) to the workshop to ensure proper disposal. Treat this as hazardous waste and dispose of it at a registered hazardous waste handling facility, alternatively arrange collection by a registered hazardous waste handling contractor. File safe disposal certificates for auditing purposes. ❖ If a diesel bowser is used on site, always equip it with a drip tray. Use drip trays during every refuelling event. The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling. ❖ Ensure drip trays are cleaned after each use. Do not allow dirty drip trays to be used on site. Dispose of dirty rags used to clean the drip trays as hazardous waste into a designated bin at the workshop, where it is incorporated into the hazardous waste removal system. ❖ Obtain an oil spill kit and train the employees in the emergency procedures to follow when a spill occurs as well as the application of the spill kit. ❖ Clean spills immediately, within two hours of occurrence, to the satisfaction of the Regional Manager (DMRE) by removing the spillage together with the polluted soil and containing it in a designated hazardous waste bin until it is disposed of at a registered hazardous waste landfill site. File proof. ❖ Implement a regular maintenance and monitoring programme that reports on the integrity of the dangerous goods storage tanks and bund walls. ❖ Ensure suitable covered receptacles are always available and conveniently placed for the disposal of general waste.	

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		❖ Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point to be collected at least once a month and disposed of at a registered general waste landfill site. Take specific precautions to prevent refuse from being dumped on or in the vicinity of the mine area. File proof of disposal. ❖ Handle biodegradable refuse as indicated above. ❖ Encourage re-use or recycling of waste products. ❖ Do not bury or burn waste on the site. ❖ Provide ablution facilities in the form of a chemical- or flush toilets connected to a septic tank. Anchor the chemical toilet (to prevent blowing/falling over) and arrange that it is serviced at least once a week for the duration of the mining activities by a registered liquid waste handling contractor. File the safe disposal certificates. ❖ Ensure that the use of any temporary, chemical toilet facilities do not cause any pollution to water sources or pose a health hazard. In addition, ensure that no form of secondary pollution arise from the disposal of refuse or sewage from the temporary, chemical toilets. Address any pollution problems arising from the above immediately. ❖ Do not discharge water containing waste into the natural environment. ❖ Implement measures to contain the wastewater and safely dispose thereof. ❖ Report any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities to the DWS and other relevant authorities. ❖ Implement the use of waste registers to keep record of the waste generated and removed from the mining area. ❖ Clear all decommissioned/rehabilitated areas of building rubble and/or unwanted infrastructure at the end of the project.	

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
GENERAL Storage/handling of hazardous substances/chemicals.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	❖ Conduct a thorough risk analysis associated with the installation of the dangerous goods tanks and related bunds prior to the development of the proposed tanks. ❖ Store, transport, use and dispose of flammable and combustible liquids, and other dangerous goods in accordance with safe practice requirements and local regulatory requirements. ❖ Provide training in the use and potential dangers of the materials, on emergency response procedures required to counter the nature and hazards of an accidental release, and the handling and storage practices, for all containers with which they will come into contact to all personnel that use or handle hazardous material. ❖ Place chemical storage areas on level ground to prevent offsite migration of any spilled product. ❖ Ensure that the floor of the storage area is impermeable to prevent seepage of spilled products into the ground or ground water. ❖ Control access to the chemicals/substances and implement a notification system of an appropriate staff member. ❖ Label containers so that the hazard nature of the material is clear. ❖ Ensure that the storage area is out of the 1:100 year floodline or further than 100 m from the edge of a watercourse, whichever is greatest. ❖ Maintain a Hazardous Substances Register and keep Material Safety Data Sheets (MSDS) current for all chemicals used on site. ❖ Ensure any fuel/used oil tanks have secondary containment in the form of an impermeable bund wall and base. Check that the bund capacity is sufficient to contain 110% of the tank's maximum capacity. Ensure that the distance and height of the bund wall relative to that of the tank is taken into consideration to ensure that any spillage does not result in hydrocarbons/other substances spouting beyond the confines of the bund. ❖ Establish a formal inspection routine to check all equipment in the bund area, as well as the bund area itself for malfunctions or leakages.	❖ The chemical/hazardous substances used on site are stored according to specifications without contaminating the receiving environment.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		Inspect the bund area at least weekly and remove any accumulated rainwater and hand it as contaminated water. Check all valves and outlets to ensure that its intact and closed securely. ❖ Establish a formal tank maintenance programme that lists specific upkeep activities to be implemented on site as well as the frequency of the activities to be implemented. ❖ Ensure that the bund base slope towards an oil sump of sufficient size. Do not allow contaminated water to mix with clean water and contain it until it is collected by a registered hazardous waste handling contractor or disposed of at a registered hazardous waste handling facility. ❖ Adhere to the conditions as outlined in the Environmental Authorisation as issued in 2008 by the Department of Economic Development and Environmental Affairs with reference number: EC06/386/7/07-104. ❖ Use drip trays under all stationary equipment or vehicles. Place used drip trays within a bunded area and do not store on the bare soil. Discard the wastewater originating from the cleaning of drip trays into the oil sump. ❖ Ensure compliance with all national, regional, and local legislation about the storage, transport and use of hydrocarbons, chemicals, solvents, and any other harmful and hazardous substances and materials. ❖ Do not keep any combustible material (e.g. wood, rags, paper, carton boxes) in the presence of flammable liquids. ❖ Place “No Open Flames” and “No Smoking” signs in the vicinity of the flammable liquid storage areas. ❖ Keep an adequate number and type of firefighting equipment available in close vicinity of the flammable liquid store. ❖ Provide training in the use of the appropriate fire-fighting equipment. ❖ Ensure that the loading/unloading areas are underlain by an impervious paving or PVC sheet to protect against soil and water pollution.	

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTIONS	MANAGEMENT OUTCOMES
		❖ Ensure that all hazardous waste containers designated for off-site transport are secured, properly loaded, and labelled with the contents and associated hazards. ❖ Place clear markings in English indicating the nature of the materials being carried, what to do in the event of an emergency, and an emergency telephone number (24 hour) of a responsible person who can provide advice in the event of an emergency on the vehicle.	
GENERAL Management of health and safety risks	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	❖ Check any new employees, or sub-contractors prior to inception of their contract. ❖ Do not allow unauthorised personnel to enter the mine. ❖ Educate employees, including truck drivers, to report suspicious looking person/s and/or matters within the surrounding area. ❖ Maintain communication between the mine and surrounding residents for the duration of the site establishment-, operational- and decommissioning phases. ❖ Ensure that workers have access to the correct PPE as required by law. ❖ Locate sanitary facilities within 100 m from any point of work. ❖ Manage all operations in compliance with the Mine Health and Safety Act, 1996 (Act No 29 of 1996). ❖ Install the dangerous goods storage tanks in accordance with the requirements of the Hazardous Substances Act, 1973 (Act No 15 of 1973) as amended.	❖ Employees work in a healthy and safe environment.

n) Aspects for inclusion as conditions of Authorisation.

Any aspects which must be made conditions of the Environmental Authorisation

The management objectives listed in this report under *Part A(1)(m) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPR* above should be considered for inclusion in the environmental authorisation.

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

(Which relate to the assessment and mitigation measures proposed)

The assumptions made in this document which relate to the assessment and mitigation measures proposed, stem from site specific information gathered from site inspections, specialist and desktop studies, and background information that were gathered. No uncertainty about the proposed project or the receiving environment could be identified.

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

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

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

ii) Conditions that must be included in the authorisation

The management objectives listed in this report under *Part A(1)(m) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPR* should be considered for inclusion in the environmental authorisation.

In addition to the above and should the Waste Licence be issued, the AEL licencing authority (DEDEAT-EC) must approve the changes in the type and quantities of input materials and products prior to the introduction of used oil and/or woodchips/sawdust as alternative fuel source at the brick factory.

q) Period for which the Environmental Authorisation is required.

The Applicant requests that the Environmental Authorisation be valid for the duration of the mining right.

r) Undertaking

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

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

s) Financial Provision

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

i) Explain how the aforesaid amount was derived

The annual amount required to manage and rehabilitate the environment was estimated to be ±R 315 622. Please see the explanation as to how this amount was derived at attached as Appendix H – Financial and Technical Competence Report.

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

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

Makhanda Mining (Pty) Ltd will be responsible for the financial and technical aspects of the proposed project. The operating expenditure is provided for as such in the Financial and Technical Competence Report attached as Appendix H to this report.

t) Specific Information required by the competent Authority

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

(1) Impact on the socio-economic conditions of any directly affected person.

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

As the proposed activities will all be contained within the boundaries of the existing mining area, very little to no impacts are expected to affect the socio-economic conditions of any directly affected persons in a negative manner. The project proposal may however contribute to the economy and socio-economic conditions of the local community in several ways as outlined below:

- Prolonging the lifespan of the mine through the generation of additional income from the unwanted overburden currently merely stockpiled on site. A

prolonged lifespan will directly afford job security to the employees of the Right Holder.

- The project offers the private sector (Right Holder) and opportunity to become involved/support the objectives of the NWMS.
- The project will produce a market and generate income for local wood sellers that is within immediate/acceptable distance from their activities.
- Used oil generators will be able to discard their hazardous waste (used oil) in an environmentally responsible manner, while also earning an income rather than it being a cost.
- The fossil fuel need of the site will be reduced that will directly lessen the operational costs of the company, but also reduce the need for non-renewable resources on site, as it will be substituted with recycled wood/used oil.

Also refer to Part A(1)(f) Need and desirability of the project, and Part A(1)(g) Motivation for the overall preferred site, activities, and technology alternative.

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

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

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

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

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

Although various alternatives, associated with the proposed activity, were considered during the impact assessment process, none were found to be feasible as discussed in Part A(1)(h)(i) *Details of the development footprint alternatives considered*, and Part A(1)(h)(ix) *Motivation where no alternative sites were considered*.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1. DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME.

a) Details of the EAP,

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

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

b) Description of the Aspects of the Activity

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

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

c) Composite Map

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

As mentioned under Part A, section (1)(l)(ii) this map has been compiled and is attached as Appendix C to this document.

d) Description of impact management objectives including management statements

i) Determination of closure objectives. (Ensure that the closure objectives are informed by the type of environment described)

The 2014 EMPR of the mine notes that the objectives of phased closure are to ensure that:

- the site is contoured and covered with locally occurring indigenous vegetation.
- the closed quarry poses no safety risks.
- closure complies with the Mineral and Petroleum Resources Development Act 28 of 2002.

The activities proposed as part of this S102 application were divided into three parts as discussed in more detail below.

Commercial Mining Aggregates

The decommissioning phase will entail the reinstatement of the stockpile area by removing the stockpiled material, and mobile crusher plant (if applicable). The decommissioning activities will therefore consist of the following:

- Removing all stockpiled material;
- Removing all mining machinery and equipment from site;
- Landscaping all disturbed areas and replacing the topsoil;
- Vegetating the reinstated area;
- Ensuring that all rehabilitated areas are stable and self-sustaining in terms of vegetation cover; and
- Controlling/monitoring the invasive plant species.

The future land use of the proposed area will be agriculture. Upon replacement of the topsoil, the area around the excavation will once again be available for grazing purposes, and the planting of the cover crop (to protect the topsoil) will tie in with the proposed land use.

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

- Rehabilitation of stockpile area:

Stockpiles must be removed during the decommissioning phase, the area ripped, and the topsoil returned to its original depth to provide a growth medium.

On completion of operations, all structures or objects shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002):

- Where sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
- The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.

Photographs of the sites, before and during the mining operation, and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the DMRE Regional Manager.

On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 200 mm and graded to an even surface condition. Where applicable/possible topsoil needs to be returned to its original depth over the area.

The area shall then be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix.

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

❖ Final rehabilitation:

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

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

Waste material of any description, including receptacles, scrap, rubble, and tyres, must be removed entirely from the mining area and disposed of at a recognized landfill facility. It will not be permitted to be buried or burned on the site.

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

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

Once the mining area was rehabilitated the Right Holder is required to submit a closure application to the Department of Mineral Resources and Energy in accordance with section 43(4) of the MPRDA, 2002 that states: *"An application for a closure certificate must be made to the Regional Manager in whose region the land in question is situated within 180 days of the occurrence of the lapsing, abandonment, cancellation, cessation, relinquishment or completion contemplated in subsection (3) and must be*

accompanied by the prescribed environmental risk report". The Closure Application will be submitted in terms of Regulation 62 of the MPRDA, 2002, and Government Notice 940 of NEMA, 1998 (as amended).

Storage of Dangerous Goods

The decommissioning of the dangerous goods storage tanks will entail the removal of the tanks once empty of all contents by an appropriately qualified contractor. The Applicant will responsibly dispose of the discarded tanks and proof of safe disposal will be filed on site for auditing purposes. If no longer needed, the bunded areas will be removed to allow the use of the space. Uncontaminated building rubble will be used as fill material in the rehabilitation of the quarry pit. Any contaminated material will be discarded as hazardous waste at an appropriately registered waste handling facility.

Waste Related Activities

Decommissioning activities are not applicable to the wood project, as the storage area, and warehouse will remain, to be used for alternative purposes by the landowner. If no longer needed, the chipping infrastructure will be removed from site. Refer to *Storage of Dangerous Goods* (above) for detail regarding the decommissioning phase related to the burning of used oil on site.

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

Any water required for the implementation of the project will be obtained from the existing dams on the property under the auspices of the existing water use licence of the property. Presently it is proposed that ±2 200 m^3/month will be needed mainly for dust suppression purposes.

iii) Has a water use licence been applied for?

As mentioned, DWS has already issued a water use licence for the use and storage of water on site. This project therefore does not require a new application.

iv) Impacts to be mitigated in their respective phases

Table 22: Impact to be mitigated in their respective phases

ACTIVITIES (as listed in 2.11.1)	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	SIZE AND SCALE OF DISTURBANCE (volumes, tonnages and hectares or m^2)	MITIGATION MEASURES (describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
<u>Aggregate Mining:</u> ❖ Processing, loading and, hauling of aggregate. **<u>Dangerous goods storage tanks & burning of used oil:</u>** ❖ Site establishment & infrastructure development.	Site Establishment & Operational Phase	±3 ha (Aggregates) ±200 m^2 (Dangerous Goods)	**<u>Visual Mitigation:</u>** ❖ The site must have a neat appearance and always be kept in good condition. ❖ Mining equipment must be stored neatly in dedicated areas when not in use. ❖ Upon closure the site must be rehabilitated, and all manmade structure removed (if no longer needed by the landowner) to reduce the residual visual impacts to the minimum.	Management of the activities must be in accordance with the: ❖ MPRDA, 2008 ❖ NEMA, 1998	Throughout the site establishment- and operational phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. ❖ Sloping and landscaping during rehabilitation. **Sorting, shredding, chipping and burning of discarded wood:** ❖ Operational phase.	Site Establishment, Operational- and Decommissioning Phase	±3 ha (Aggregates) ±2 ha (Wood Chipping)	**Management of Invasive Plant Species:** ❖ An invasive plant species management plan must be implemented at the site to ensure the management and control of all species regarded as Category 1a and 1b invasive species in terms of NEM:BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto). Weed/alien clearing must be done on an ongoing basis throughout the life of the activities. ❖ No planting or importing of any alien species to the site for landscaping, rehabilitation or any other purpose may be allowed. ❖ All stockpiles (topsoil & overburden) must be kept free of invasive plant species. ❖ Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. The following control methods can be used: ▪ The plants can be uprooted, felled, or cut off and can be destroyed completely. ▪ The plants can be treated chemically by a registered pest control officer (PCO) using an	Weeds and invader plants on site must be managed in accordance with the: ❖ CARA, 1983 ❖ NEM:BA, 2004	Throughout the site establishment-, operational, and decommissioning phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			herbicide recommended for use by the PCO in accordance with the directions for the use of such an herbicide.		
<u>Aggregate Mining:</u> ❖ Processing, loading and, hauling of aggregate. **<u>Sorting, shredding, chipping and burning of discarded wood:</u>** ❖ Operational phase. ❖ Decommissioning phase.	Site Establishment-, Operational-, and Decommissioning Phase	±3 ha (Aggregates) ±2 ha (Wood Chipping)	**<u>Fugitive Dust Emission Mitigation Measures:</u>** ❖ The liberation of dust into the surrounding environment must be effectively controlled using, inter alia, straw, water spraying and/or environmentally friendly dust-allaying agents that contains no PCB's (e.g. DAS products). ❖ The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. ❖ The dust monitoring programme of the mine must continue. ❖ Speed on the haul roads must be limited to 20 km/h and 40 km/h on the access road to prevent the generation of excess dust. ❖ Areas devoid of vegetation, which could act as a dust source, must be minimized. ❖ The crusher plant must have operational water sprayers to alleviate dust generation from the conveyor belts.	Dust generation on site must be managed in accordance with the: ❖ NEM:AQA, 2004 Regulation 6(1) ❖ National Dust Control Regulations, GN No R827 ❖ ASTM D1739 (SANS 1137:2012)	Throughout the site establishment-, and operational phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			❖ Fines, blowing from the drop end of the crusher plant, can be minimized by attaching strips of used conveyor belts to the conveyor's end. ❖ Compacted dust must weekly be removed from the crusher plant to eliminate the dust source. ❖ Loads must be flattened to prevent spillage during transportation on public roads. ❖ Weather conditions must be taken into consideration upon commencement of daily operations. Limiting operations during very windy periods would reduce airborne dust and resulting impacts. ❖ All dust generating activities shall comply with the National Dust Control Regulations, GN No R827 promulgated in terms of NEM:AQA (Act 39 of 2004) and ASTM D1739 (SANS 1137:2012).		
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. **Dangerous goods storage tanks & burning of used oil:**	Site Establishment-, Operational Phase	±3 ha (Aggregates) ±200 m² (Dangerous Goods) ±2 ha (Wood Chipping)	**Noise Handling:** ❖ The Right Holder must ensure that employees and staff conduct themselves in an acceptable manner while on site. ❖ No loud music may be permitted at the mining area. ❖ All project vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the	Noise generation on site must be managed in accordance with the: ❖ NEM:AQA, 2004 Regulation 6(1) ❖ NRTA, 1996	Throughout the site establishment-, and operational phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
❖ Site establishment & infrastructure development. ❖ Decommissioning phase **Sorting, shredding, chipping and burning of discarded wood:** ❖ Operational phase.			National Road Traffic Act, 1996 (Act No 93 of 1996). ❖ A qualified occupational hygienist must be contracted to quarterly monitor and report on the personal noise exposure of the employees working at the mine. The monitoring must be done in accordance with the SANS 10083:2004 (Edition 5) sampling method as well as NEM:AQA, 2004, SANS 10103:2008. ❖ Best practice measures shall be implemented to minimize potential noise impacts.		
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. ❖ Sloping and landscaping during rehabilitation. **Dangerous goods storage tanks & burning of used oil:** ❖ Site establishment & infrastructure development. ❖ Operational phase	Site Establishment-, Operational-, and Decommissioning Phase	±3 ha (Aggregates) ±200 m² (Dangerous Goods) ±2 ha (Wood Chipping)	**Waste Management:** ❖ Uncontaminated construction rubble can be used as fill material during the rehabilitation of the quarry pit. The Right Holder must however ensure that the rubble does not contain any waste. ❖ If no on-site disposal opportunities exist, then rubble and waste rock must be disposed of at the nearest registered solid waste disposal facility. ❖ Regular vehicle maintenance, repairs and services may only take place at the workshop and service area. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present.	Project related waste must be managed in accordance with the: ❖ NWA, 1998 ❖ NEM:WA, 2008	Throughout the site establishment-, operational and decommissioning phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
❖ Decommissioning phase **<u>Sorting, shredding, chipping and burning of discarded wood:</u>** ❖ Operational phase. ❖ Decommissioning phase.			All waste products must be disposed of in a closed container/bin to be removed from the emergency service area (same day) to the workshop to ensure proper disposal. This waste must be treated as hazardous waste and must be disposed of at a registered hazardous waste handling facility, alternatively collected by a registered hazardous waste handling contractor. The safe disposal certificates must be filed for auditing purposes. ❖ If a diesel bowser is used on site, it must always be equipped with a drip tray. Drip trays must be used during every refuelling event. The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling. ❖ Site management must ensure drip trays are cleaned after each use. No dirty drip trays may be used on site. The dirty rags used to clean the drip trays must be disposed as hazardous waste into a designated bin at the workshop, where it is incorporated into the hazardous waste removal system. ❖ An oil spill kit must be obtained, and the employees must be trained in the emergency procedures to follow when a spill occurs as well as the application of the spill kit.		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			❖ Spills must be cleaned up immediately, within two hours of occurrence, to the satisfaction of the Regional Manager (DMRE) by removing the spillage together with the polluted soil and containing it in a designated hazardous waste bin until it is disposed of at a registered hazardous waste landfill site. Proof must be filed. ❖ A regular maintenance and monitoring programme must be implemented that reports on the integrity of the dangerous goods storage tanks and bund walls. ❖ Suitable covered receptacles must always be available and conveniently placed for the disposal of general waste. ❖ Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point to be collected at least once a month and disposed of at a registered general waste landfill site. Specific precautions must be taken to prevent refuse from being dumped on or in the vicinity of the mine area. Proof of disposal must be available for auditing purposes. ❖ Biodegradable refuse must be handled as indicated above.		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			❖ Re-use or recycling of waste products must be encouraged on site. ❖ Ablution facilities must be provided in the form of a chemical- or flush toilets connected to septic tanks. The chemical toilet must be anchored (to prevent blowing/falling over) and shall be serviced at least once a week for the duration of the mining activities by a registered liquid waste handling contractor. The safe disposal certificates must be filed for auditing purposes. ❖ The use of any temporary, chemical toilet facilities must not cause any pollution to water sources or pose a health hazard. In addition, no form of secondary pollution should arise from the disposal of refuse or sewage from the temporary, chemical toilets. Any pollution problems arising from the above are to be addressed immediately by the Right Holder. ❖ When small volumes of wastewater are generated during the life of the mine the following is applicable: ▪ Water containing waste must not be discharged into the natural environment. ▪ Measures to contain the wastewater and safely dispose thereof must be implemented.		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			❖ It is important that any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities is reported to the DWS and other relevant authorities. ❖ Site management must implement the use of waste registers to keep record of the waste generated and removed from the mining area. ❖ All decommissioned/rehabilitated areas must be cleared of building rubble and/or unwanted infrastructure at the end of the project.		
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate.	Operational Phase	±3 ha (Aggregates)	**Access road Management:** ❖ Storm water must be diverted around the access road to prevent erosion. ❖ Vehicular movement must be restricted to the existing access road and crisscrossing of tracks through undisturbed areas must be prohibited. ❖ Rutting and erosion of the access road caused as a direct result of the mining activities must be repaired by the Right Holder. ❖ Overloading of the trucks must be prevented, and proof of load weights must be filed and be available for auditing by relevant officials. ❖ The speed of all mining equipment/vehicles must be	The access road must be managed in accordance with the: ❖ NRTA, 1996	Throughout the operational phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			restricted to 40 km/h on the access roads.		
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. ❖ Sloping and landscaping during rehabilitation.	Operational-, and Decommissioning Phase	±3 ha (Aggregate)	**Erosion Control and Storm Water Management:** ❖ Stockpiles must be protected from erosion, stored on flat areas where possible, and be surrounded by appropriate berms (if deemed applicable). ❖ Roads and other disturbed areas within the project area must be regularly monitored for erosion and problem areas must receive follow-up monitoring to assess the success of the remediation. ❖ Any erosion problems within the earmarked area must be rectified immediately (within 48 hours) and monitored thereafter to ensure that it does not re-occur. ❖ Silt/sediment traps/barriers must be used where there is a danger of topsoil or material stockpiles eroding and entering downstream drainage lines and other sensitive areas. These sediment/silt barriers must regularly be maintained and cleared to ensure effective drainage of the areas. ❖ Activities must be conducted only in accordance with the Best Practice Guideline for small scale mining that	Erosion and storm water must be managed in accordance with the: ❖ CARA, 1983 ❖ NEMA, 1998 ❖ NWA, 1998	Throughout the operational-, and decommissioning phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			relates to storm water management, erosion and sediment control and waste management, developed by the DWS, and any other conditions which that Department may impose: ▪ Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. ▪ Dirty water must be collected and contained in a system separate from the clean water system. ▪ Dirty water must be prevented from spilling or seeping into clean water systems. ▪ A storm water management plan must apply for the entire life cycle of the mining activity and over different hydrological cycles (rainfall patterns). ▪ The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into a storm water management plan. ❖ Polluting activities including storage of fleet, equipment wash down facilities and vehicle maintenance yards must be restricted to the		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			workshop areas and must be undertaken on impermeable hard standing surfaces, which are formally drained to a dirty water drainage system at the site. ❖ All fuels and chemicals stored or used on site must be contained within fit for purpose containers and stored within designated storage areas. To prevent pollution of the surrounding environment during an accidental spillage, the designated storage areas must be situated on an impermeable surface and must feature a perimeter bund and a drainage sump. The volume of the bund and sump must be sized to contain at least 110% of the total volume of the fuel and chemicals being stored within the designated storage area. The storage areas must feature a roof to prevent inflow of rainwater, which would require the sump to be emptied more frequently.		
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate.	Operational-, and Decommissioning Phase	±3 ha (Aggregate)	**Topsoil/Soil Management:** ❖ The overburden must be stored in berms not exceeding 2.5 m in height. ❖ The stockpiled topsoil must be evenly spread, to a depth of 300 mm, over the rehabilitated area upon closure of the site.	Stockpiles must be managed in accordance with the: ❖ CARA, 1983	Throughout the operational-, and decommissioning phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
❖ Sloping and landscaping during rehabilitation.			❖ The Right Holder must strive to re-instate topsoil at a time of year when vegetation cover can be established as quickly as possible afterwards, so that erosion of returned topsoil by both rain and wind, before vegetation is established, is minimized. The best time of year is at the end of the rainy season, when there is moisture in the soil for vegetation establishment and the risk of heavy rainfall events is minimal. ❖ A cover crop must be planted and established immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. The cover crop must be fertilized for optimum biomass production. It is important that rehabilitation be taken up to the point of cover crop stabilization. Rehabilitation cannot be considered complete until the first cover crop is well established. ❖ The rehabilitated area must be monitored for erosion, and appropriately stabilized if any erosion occurs for at least 12 months after reinstatement.		
Dangerous goods storage tanks & burning of used oil:	Operational Phase	±200 m² (Dangerous Goods)	**Existing Infrastructure Management:** ❖ Any damage to the brick factory infrastructure, as a direct result of the proposed activities, must be	Management of the activities must be in accordance with the: ❖ MPRDA, 2008 ❖ NEMA, 1998	Throughout the operational phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
❖ Site establishment & infrastructure development.			refurbished by the Right Holder at his own cost. ❖ Activities and construction workers must remain within the proposed footprints of the various activities.	❖ NEMA:WA, 2008	
Dangerous goods storage tanks & burning of used oil: ❖ Site establishment & infrastructure development. ❖ Operational phase.	Operational-, and Decommissioning Phase	±200 m² (Dangerous Goods)	**Management of health and safety risks:** ❖ Any new employees, or sub-contractors must be vetted prior to inception of their contract. ❖ No unauthorised personnel may be allowed to enter the mine. ❖ Employees, including truck drivers, must be educated to report suspicious looking person/s and/or matters within the surrounding area. ❖ Communication between the mine and surrounding residents must be maintained for the duration of the site establishment-, operational- and decommissioning phases. ❖ Workers must have access to the correct personal protection equipment (PPE) as required by law. ❖ Sanitary facilities must be located within 100 m from any point of work. ❖ All operations must comply with the Mine Health and Safety Act, 1996 (Act No 29 of 1996). ❖ The dangerous goods storage tanks must be installed in accordance with the requirements of the Hazardous	Health and safety aspects on site must be managed in accordance with the: ❖ MHSA, 1996 ❖ OHSA, 1993 ❖ OHSAS 18001 ❖ HSA,1973	Throughout the operational and decommissioning phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			Substances Act, 1973 (Act No 15 of 1973) as amended.		
Dangerous goods storage tanks & burning of used oil: ❖ Site establishment & infrastructure development. ❖ Operational phase.	Operational-, and Decommissioning Phase	±200 m² (Dangerous Goods)	**Storage/handling of hazardous substances/chemicals:** ❖ A thorough risk analysis associated with the installation of the dangerous goods tanks and related bunds must be conducted prior to the development of the proposed tanks. ❖ Flammable and combustible liquids, and other dangerous goods must be stored, transported, used, and disposed of in accordance with safe practice requirements and local regulatory requirements. ❖ All personnel that use or handle hazardous material are trained in the use and potential dangers of the materials, on emergency response procedures required to counter the nature and hazards of an accidental release, and the handling and storage practices, for all containers with which they will come into contact. ❖ Chemical storage areas must be placed on level ground to prevent offsite migration of any spilled product. ❖ The floor of the storage area must be impermeable to prevent seepage of	Chemicals and hazardous substances must be managed in accordance with the: ❖ MHSA, 1996 ❖ HSA,1973	Throughout the operational and decommissioning phases.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			spilled products into the ground or groundwater. ❖ Access to the chemicals/substances must be controlled and require prior notification of an appropriate staff member. ❖ All containers must be labelled so that the hazard nature of the material is clear. ❖ The storage area must be out of the 1:100 year floodline or further than 100 m from the edge of a watercourse, whichever is greatest. ❖ A Hazardous Substances Register must be maintained, and Material Safety Data Sheets (MSDS) must be kept current for all chemicals used on site. ❖ Any fuel/used oil tanks must have secondary containment in the form of an impermeable bund wall and base. The bund capacity must be sufficient to contain 110% of the tank's maximum capacity. The distance and height of the bund wall relative to that of the tank must also be taken into consideration to ensure that spillage does not result in hydrocarbons/other substances spouting beyond the confines of the bund. ❖ The site manager must establish a formal inspection routine to check all equipment in the bund area, as well		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			as the bund area itself for malfunctions or leakages. The bund area must be inspected at least weekly, and any accumulated rainwater removed and handled as contaminated water. All valves and outlets must be checked to ensure that its intact and closed securely. ❖ Site management must establish a formal tank maintenance programme that lists specific upkeep activities to be implemented on site as well as the frequency of the activities to be implemented. ❖ The bund base must slope towards an oil sump of sufficient size. Contaminated water may not be allowed to mix with clean water and must be contained until it is collected by a registered hazardous waste handling contractor or disposed of at a registered hazardous waste handling facility. ❖ The site must adhere to the conditions as outlined in the Environmental Authorisation as issued in 2008 by the Department of Economic Development and Environmental Affairs with reference number: EC06/386/7/07-104. ❖ Drip trays must be used underneath all stationary equipment or vehicles. Used drip trays must be placed within		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			a bunded area and not stored on bare soil. The wastewater originating from the cleaning of drip trays must be discarded into the oil sump. ❖ Ensure compliance with all national, regional, and local legislation with regard to the storage, transport and use of hydrocarbons, chemicals, solvents, and any other harmful and hazardous substances and materials. ❖ No combustible material (e.g. wood, rags, paper, carton boxes) are to be kept in the presence of flammable liquids. ❖ "No Open Flames" and "No Smoking" signs are to be displayed in the vicinity of the flammable liquid storage areas. ❖ An adequate number and type of firefighting equipment is to be available in close vicinity of the flammable liquid store. ❖ Training must be provided in the use of the appropriate fire-fighting equipment. ❖ Provide for controlled loading/unloading areas, underlain by an impervious paving or PVC sheet to protect against soil and water pollution. ❖ All hazardous waste containers designated for off-site transport to be		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			secured and labelled with the contents and associated hazards, be properly loaded. ❖ The vehicle displays clear markings in English indicating the nature of the materials being carried, what to do in the event of an emergency, and an emergency telephone number (24 hour) of a responsible person who can provide advice in the event of an emergency.		
Dangerous goods storage tanks & burning of used oil: ❖ Decommissioning phase. **Sorting, Shredding, Chipping and Burning of Discarded Wood:** ❖ Operational phase.	Operational Phase	±200 m² (Dangerous Goods) ±2 ha (Wood Chipping)	**Compliance with the AEL:** ❖ Should the Waste Licence be issued, the AEL licencing authority (DEDEAT-EC) must approve the changes in the type and quantities of input materials and products prior to the introduction of used oil and/or woodchips/sawdust as alternative fuel source at the brick factory. ❖ The AEL holder must comply with the obligations as set out in Chapter 5 of the AQA, 2004 as amended and the Government Notice 893 of 22 November 2013. ❖ Air quality monitoring must be implemented at the site. Monitoring will be undertaken according to the SANAS 1929:2005 (Edition 1.1). ❖ The AEL holder is required to report to the National Atmospheric Emission Inventory System on an	All air emissions must be in compliance with the: ❖ AQA, 2004 ❖ SANAS 1929:2005	Throughout the operational phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			annual basis before 31 March of the calendar year. ❖ The AEL holder must also report at the beginning of the calendar year the results of the monitoring programme in the established format as prescribed by the AEL		
Sorting, Shredding, Chipping and Burning of Discarded Wood: ❖ Operational phase.	Operational Phase	±2 ha (Wood Chipping)	**Management of Vegetated Areas:** ❖ The operational boundaries must be clearly defined, and all operations must be contained to the approved areas. The area outside the mining right boundary must be declared a no-go area, and all staff must be educated accordingly. ❖ A pre-commencement environmental induction for all site staff must be provided to ensure that basic environmental principles are adhered to. This includes awareness of littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, remaining within demarcated construction areas, etc. ❖ The on-site environmental officer must provide supervision and oversight of vegetation clearing activities and other activities which may cause damage to the	Vegetated areas must be managed in accordance with the: ❖ CARA, 1983 ❖ NEM:BA, 2004	Throughout operational phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			environment, especially during the site establishment phase. ❖ Care must be taken to maintain indigenous tree species e.g. Cabbage Trees (*Cussonia* spp.) ❖ All vehicles must remain on demarcated roads and no unnecessary driving in the veld outside these areas may be allowed. ❖ No plants may be translocated or otherwise uprooted or disturbed for rehabilitation or other purposes without express permission from the ECO and without the relevant permits. ❖ All fires must be contained in structures designed for this specific purpose.		
Aggregate Mining: ❖ Sloping and landscaping during rehabilitation. **Sorting, Shredding, Chipping and Burning of Discarded Wood:** ❖ Decommissioning phase.	Decommissioning Phase	±3 ha (Aggregate) ±2 ha (Wood Chipping)	**Rehabilitating/Landscaping of the Aggregate Stockpile and Wood Sorting Area:** ❖ Stockpiles must be removed during the decommissioning phase, the area ripped, and the topsoil returned to its original depth to provide a growth medium. ❖ On completion of operations, all structures or objects shall be dealt with in accordance with section 44 of the MPRDA, 2002.	Rehabilitation of the earmarked areas must be in accordance with the: ❖ MRDA, 2002 ❖ NEMA, 1998	Throughout decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			❖ Photographs of the sites, before and during the mining operation, and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the DMRE Regional Manager. ❖ On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 200 mm and graded to an even surface condition. Where applicable/possible topsoil needs to be returned to its original depth over the area. ❖ The area shall then be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix. ❖ If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a vegetation seed mix to his or her specification.		

e) Impact Management Outcomes

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

Table 23: Impact Management Outcomes

ACTIVITY whether listed or not listed (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)	**POTENTIAL IMPACT** (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))	**MITIGATION TYPE** (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..) E.g. • Modify through alternative method. • Control through noise control • Control through management and monitoring • Remedy through rehabilitation.	**STANDARD TO BE ACHIEVED** (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
<u>Aggregate Mining:</u> ❖ Processing, loading and, hauling of aggregate. **<u>Dangerous goods storage tanks & burning of used oil:</u>** ❖ Site establishment & infrastructure development.	❖ Visual intrusion as a result of the activities. ❖ Visual intrusion as a result of site establishment.	The visual impact may affect the aesthetics of the landscape.	Site Establishment & Operational Phase	<u>Control:</u> Implementing proper housekeeping.	Management of the activities must be in accordance with the: ❖ MPRDA, 2008 ❖ NEMA, 1998

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. ❖ Sloping and landscaping during rehabilitation. **Sorting, shredding, chipping and burning of discarded wood:** ❖ Operational phase.	❖ Infestation of the stockpile area with invader plant species. ❖ Infestation of the reinstated areas with invader plant species. ❖ Infestation of the sorting area (wood) with weeds/invader plants	Infestation of the footprint by invader plant species may affect the biodiversity of the receiving environment.	Site Establishment-, Operational, and Decommissioning Phase	Control & Remedy: Implementation of an invasive plant species management plan.	Weeds and invader plants on site must be managed in accordance with the: ❖ CARA, 1983 ❖ NEM:BA, 2004
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. **Sorting, shredding, chipping and burning of discarded wood:** ❖ Operational phase. ❖ Decommissioning phase.	❖ Dust nuisance as a result of the processing activities. ❖ Dust nuisance resulting from stockpiled wood chips/sawdust. ❖ Dust nuisance as a result of discarded wood chips/sawdust.	Increased dust generation will impact on the air quality of the receiving environment.	Site Establishment-, Operational- and Decommissioning Phase	Control: Dust suppression methods and proper housekeeping.	Dust generation on site must be managed in accordance with the: ❖ NEM:AQA, 2004 Regulation 6(1) ❖ National Dust Control Regulations, GN No R827 ❖ ASTM D1739 (SANS 1137:2012)
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate.	❖ Noise nuisance as a result of the mining activities. ❖ Noise nuisance generated as a result of construction activities.	Should noise levels become excessive it may have an impact on the noise ambiance of the receiving environment.	Site Establishment-, Operational Phase	Control: Noise suppression methods and proper housekeeping.	Noise generation on site must be managed in accordance with the: ❖ NEM:AQA, 2004 Regulation 6(1) ❖ NRTA, 1996

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Dangerous goods storage tanks & burning of used oil: ❖ Site establishment & infrastructure development. ❖ Decommissioning phase **Sorting, shredding, chipping and burning of discarded wood:** ❖ Operational phase.	❖ Noise nuisance as a result of the decommissioning activities. ❖ Noise nuisance due to the operation of the chipper.				
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. ❖ Sloping and landscaping during rehabilitation. **Dangerous goods storage tanks & burning of used oil:** ❖ Site establishment & infrastructure development. ❖ Operational phase ❖ Decommissioning phase	❖ Soil contamination from hydrocarbon spills. ❖ Potential impact associated with littering at the area. ❖ Potential impact associated with litter left at the mining area. ❖ Pollution of environment with construction waste. ❖ Seeping of dangerous goods from defective storage tanks and bund walls. ❖ Spillage of dangerous goods when filling the tanks.	Contamination of the footprint areas will negatively impact the soil, surface runoff and potentially the groundwater. It will also incur additional costs to the Right Holder.	Site Establishment-, Operational-, and Decommissioning Phase	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan.	Project related waste must be managed in accordance with the: ❖ NWA, 1998 ❖ NEM:WA, 2008

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Sorting, shredding, chipping and burning of discarded wood: ❖ Operational phase. ❖ Decommissioning phase.	❖ Contamination of soil with hydrocarbons. ❖ Pollution of the environment with waste and building rubble not removed from the site. ❖ Contamination of the area with litter or other waste materials. ❖ Pollution of the environment with waste and building rubble not removed from site.				
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate.	❖ Deterioration of the access road to the mining area.	Collapse of the internal road infrastructure will affect the landowner and lawful occupiers negatively. If the mine negatively affect public traffic it may incur additional costs and complaints from the public.	Operational phase	Control & Remedy: Maintaining the access road for the duration of the operational phase, as well as leaving it in a representative or better condition than prior to mining.	The access road must be managed in accordance with the: ❖ NRTA, 1996
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate.	❖ Facilitation of erosion due to mining activities. ❖ Erosion of returned topsoil after rehabilitation.	The loss/contamination of topsoil and erosion of the footprint will affect the rehabilitation	Site Establishment-, Operational and Decommissioning Phase	Control & Remedy: Proper housekeeping and storm water management.	Erosion and storm water must be managed in accordance with the: ❖ CARA, 1983 ❖ NEMA, 1998 ❖ NWA, 1998

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
❖ Sloping and landscaping during rehabilitation.	❖ Facilitation of erosion due to mining activities. ❖ Erosion of returned topsoil after rehabilitation.	of the excavation upon closure of the site.			
Dangerous goods storage tanks & burning of used oil: ❖ Site establishment & infrastructure development.	❖ Potential damage to the existing infrastructure on site.	Damage to the existing infrastructure on the site will incur rectification costs to the Right Holder.	Operational Phase	Stop & Control: Proper housekeeping and demarcation of operational areas.	Management of the activities must be in accordance with the: ❖ MPRDA, 2008 ❖ NEMA, 1998 ❖ NEMA:WA, 2008
Dangerous goods storage tanks & burning of used oil: ❖ Site establishment & infrastructure development. ❖ Operational phase.	❖ Safety risk posed by construction workers' presence on the property. ❖ Safety risk posed by the operation of the dangerous goods tanks.	An unsafe working environment affects the labour force, as well as pose a threat to infrastructure and humans.	Operational-, and Decommissioning Phase	Control: All contractors must be vetted before commencement of construction, and all equipemnt must be installed in accordance with the relevent safety regulations.	Health and safety aspects on site must be managed in accordance with the: ❖ MHSA, 1996 ❖ OHSA, 1993 ❖ OHSAS 18001 ❖ HSA,1973
Dangerous goods storage tanks & burning of used oil: ❖ Operational phase. **Sorting, Shredding, Chipping and Burning of Discarded Wood:** ❖ Operational phase.	❖ Non-compliance with the conditions of the atmospheric emissions licence. ❖ Non-compliance with the conditions of the atmospheric emissions licence (wood burning)	This impact may affect the air quality and compliance with the conditions of the atmospheric emissions licence.	Operational Phase	Modify & Control: Monitor the emmissions of the plant and test the results agains the requirements of the atmospheric licence.	All air emissions must be in compliance with the: ❖ AQA, 2004 ❖ SANAS 1929:2005
Dangerous goods storage tanks & burning of used oil: ❖ Operational phase.	❖ Responsible use of old oil as alternative fuel source (+)	The re-use of general- and hazardous waste in a responsible manner contributes to	Operational Phase	N/A	Use of any fuel resources must be managed in accordance with the: ❖ NEM:WA, 2008 ❖ HSA, 1973

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Sorting, Shredding, Chipping and Burning of Discarded Wood: ❖ Operational phase.	❖ Responsible use of discarded wood as an alternative fuel source (+)	the minimising of waste materials.			
Dangerous goods storage tanks & burning of used oil: ❖ Operational phase. **Sorting, Shredding, Chipping and Burning of Discarded Wood:** ❖ Operational phase.	❖ Reduced need for commercial fuels on site (+) ❖ Reduced need for commercial fuels on site (+)	A reduction in commercial fuels will save the site costs.	Operational Phase.	N/A	Use of any fuel resources must be managed in accordance with the: ❖ NEM:WA, 2008 ❖ HSA, 1973
Dangerous goods storage tanks & burning of used oil: ❖ Decommissioning phase. **Sorting, Shredding, Chipping and Burning of Discarded Wood:** ❖ Operational phase.	❖ Dilapidated infrastructure left upon decommissioning of the activity. ❖ Dilapidated infrastructure left upon decommissioning of the activity (wood).	Dilapidated infrastructure may have a negative impact on the aesthetic and health and safety matters on site.	Decommissioning Phase	Rectify/Control: All structures, no longer needed by the applicant, must be decommissioned in accordance with this document.	Rehabilitation of the earmarked areas must be in accordance with the: ❖ MRDA, 2002 ❖ NEMA, 1998
Sorting, Shredding, Chipping and Burning of Discarded Wood: ❖ Operational phase.	❖ Sprawling of the sorting area impacting natural vegetated areas.	The unauthorised removal of natural vegetation may impact on the biodiversity of the area.	Operational Phase	**Control:** All operations must be contained to the already disturbed footprint.	Vegetated areas must be managed in accordance with the: ❖ CARA, 1983 ❖ NEM:BA, 2004 ❖ MPRDA, 2002

f) Impact Management Actions

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

Table 24: Impact Management Actions

ACTIVITY whether listed or not listed (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc..etc.)	**POTENTIAL IMPACT** (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)	**MITIGATION TYPE** (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc... etc.) E.g. • Modify through alternative method. • Control through noise control • Control through management and monitoring • Remedy through rehabilitation.	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: Upon cessation of the individual activity Or. Upon the cessation of mining bulk sampling or alluvial diamond prospecting as the case may be.	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. **Dangerous goods storage tanks & burning of used oil:** ❖ Site establishment & infrastructure development.	❖ Visual intrusion as a result of the activities. ❖ Visual intrusion as a result of site establishment.	Control: Implementing proper housekeeping.	Throughout the site establishment- and operational phases.	Management of the activities must be in accordance with the: ❖ MPRDA, 2008 ❖ NEMA, 1998
Aggregate Mining:	❖ Infestation of the stockpile area with invader plant species.	Control & Remedy: Implementation of an invasive plant species management plan.	Throughout the site establishment-, operational, and decommissioning phases.	Weeds and invader plants on site must be managed in accordance with the:

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
❖ Processing, loading and, hauling of aggregate. ❖ Sloping and landscaping during rehabilitation. **Sorting, shredding, chipping and burning of discarded wood:** ❖ Operational phase.	❖ Infestation of the reinstated areas with invader plant species. ❖ Infestation of the sorting area (wood) with weeds/invader plants.			❖ CARA, 1983 ❖ NEM:BA, 2004
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. **Sorting, shredding, chipping and burning of discarded wood:** ❖ Operational phase. ❖ Decommissioning phase.	❖ Dust nuisance as a result of the processing activities. ❖ Dust nuisance resulting from stockpiled wood chips/sawdust. ❖ Dust nuisance as a result of discarded wood chips/sawdust.	Control: Dust suppression methods and proper housekeeping.	Throughout the site establishment-, operational- and decommissioning phases.	Dust generation on site must be managed in accordance with the: ❖ NEM:AQA, 2004 Regulation 6(1) ❖ National Dust Control Regulations, GN No R827 ❖ ASTM D1739 (SANS 1137:2012)
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. **Dangerous goods storage tanks & burning of used oil:** ❖ Site establishment & infrastructure development. ❖ Decommissioning phase	❖ Noise nuisance as a result of the mining activities. ❖ Noise nuisance generated as a result of construction activities. ❖ Noise nuisance as a result of the decommissioning activities.	Control: Noise suppression methods and proper housekeeping.	Throughout the site establishment-, and operational phases.	Noise generation on site must be managed in accordance with the: ❖ NEM:AQA, 2004 Regulation 6(1) ❖ NRTA, 1996

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
Sorting, shredding, chipping and burning of discarded wood: ❖ Operational phase.	❖ Noise nuisance due to the operation of the chipper.			
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. ❖ Sloping and landscaping during rehabilitation. **Dangerous goods storage tanks & burning of used oil:** ❖ Site establishment & infrastructure development. ❖ Operational phase ❖ Decommissioning phase **Sorting, shredding, chipping and burning of discarded wood:** ❖ Operational phase. ❖ Decommissioning phase.	❖ Soil contamination from hydrocarbon spills. ❖ Potential impact associated with littering at the area. ❖ Potential impact associated with litter left at the mining area. ❖ Pollution of environment with construction waste. ❖ Seeping of dangerous goods from defective storage tanks and bund walls. ❖ Spillage of dangerous goods when filling the tanks. ❖ Contamination of soil with hydrocarbons. ❖ Pollution of the environment with waste and building rubble not removed from the site. ❖ Contamination of the area with litter or other waste materials.	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan.	Throughout the site establishment-, operational and decommissioning phases.	Project related waste must be managed in accordance with the: ❖ NWA, 1998 ❖ NEM:WA, 2008

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
	❖ Pollution of the environment with waste and building rubble not removed from site.			
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate.	❖ Deterioration of the access road to the mining area.	Control & Remedy: Maintaining the access road for the duration of the operational phase, as well as leaving it in a representative or better condition than prior to mining.	Throughout the operational phase.	The access road must be managed in accordance with the: ❖ NRTA, 1996
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. ❖ Sloping and landscaping during rehabilitation.	❖ Facilitation of erosion due to mining activities. ❖ Erosion of returned topsoil after rehabilitation.	Control & Remedy: Proper housekeeping and storm water management.	Throughout the site establishment-, operational-, and decommissioning phases.	Erosion and storm water must be managed in accordance with the: ❖ CARA, 1983 ❖ NEMA, 1998 ❖ NWA, 1998
Dangerous goods storage tanks & burning of used oil: ❖ Site establishment & infrastructure development.	❖ Potential damage to the existing infrastructure on site.	Stop & Control: Proper housekeeping and demarcation of operational areas.	Throughout the operational phase.	Management of the activities must be in accordance with the: ❖ MPRDA, 2008 ❖ NEMA, 1998 ❖ NEMA:WA, 2008
Dangerous goods storage tanks & burning of used oil: ❖ Site establishment & infrastructure development. ❖ Operational phase.	❖ Safety risk posed by construction workers' presence on the property. ❖ Safety risk posed by the operation of the dangerous goods tanks.	Control: All contractors must be vetted before commencement of construction, and all equipemnt must be installed in accordance with the relevent safety regulations.	Throughout the operational and decommissioning phases.	Health and safety aspects on site must be managed in accordance with the: ❖ MHSA, 1996 ❖ OHSA, 1993 ❖ OHSAS 18001 ❖ HSA,1973

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
Dangerous goods storage tanks & burning of used oil: ❖ Operational phase. **Sorting, Shredding, Chipping and Burning of Discarded Wood:** ❖ Operational phase.	❖ Non-compliance with the conditions of the atmospheric emissions licence. ❖ Non-compliance with the conditions of the atmospheric emissions licence (wood burning)	Modify & Control: Monitor the emmissions of the plant and test the results agains the requirements of the atmospheric licence.	Throughout operational phase.	All air emissions must be in compliance with the: ❖ AQA, 2004 ❖ SANAS 1929:2005
Dangerous goods storage tanks & burning of used oil: ❖ Operational phase. **Sorting, Shredding, Chipping and Burning of Discarded Wood:** ❖ Operational phase.	❖ Responsible use of old oil as alternative fuel source (+) ❖ Responsible use of discarded wood as an alternative fuel source (+)	N/A	Throughout operational phase.	Use of any fuel resources must be managed in accordance with the: ❖ NEM:WA, 2008 ❖ HSA, 1973
Dangerous goods storage tanks & burning of used oil: ❖ Operational phase. **Sorting, Shredding, Chipping and Burning of Discarded Wood:** ❖ Operational phase.	❖ Reduced need for commercial fuels on site (+) ❖ Reduced need for commercial fuels on site (+)	N/A	Throughout operational phase.	Use of any fuel resources must be managed in accordance with the: ❖ NEM:WA, 2008 ❖ HSA, 1973
Dangerous goods storage tanks & burning of used oil: ❖ Decommissioning phase.	❖ Dilapidated infrastructure left upon decommissioning of the activity.	Rectify/Control: All structures, no longer needed by the applicant, must be decommissioned in accordance with this document.	Throughout the decommissioning phase.	Rehabilitation of the earmarked areas must be in accordance with the: ❖ MRDA, 2002 ❖ NEMA, 1998

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
Sorting, Shredding, Chipping and Burning of Discarded Wood: ❖ Operational phase.	❖ Dilapidated infrastructure left upon decommissioning of the activity (wood).			
Sorting, Shredding, Chipping and Burning of Discarded Wood: ❖ Operational phase.	❖ Sprawling of the sorting area impacting natural vegetated areas.	**Control:** All operations must be contained to the already disturbed footprint.	Throughout operational phase.	Vegetated areas must be managed in accordance with the: ❖ CARA, 1983 ❖ NEM:BA, 2004 ❖ MPRDA, 2002

i) Financial Provision

(1) Determination of the amount of Financial Provision.

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

The decommissioning phase of the proposed mining (aggregate) activity will entail the reinstatement of the stockpile area by removing the stockpiled material, and mobile crusher plant (if applicable).

When no longer needed, the dangerous goods tanks will be removed from site once empty, and any contaminated waste associated with the decommissioning of the tanks will be discarded as hazardous waste at an appropriately registered waste handling facility. The applicant will comply with the minimum closure objectives as prescribed by DMRE. Upon which the affected footprint will be reinstated.

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

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

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

The requested rehabilitation plan is attached as Appendix E.

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

The decommissioning phase will entail the final rehabilitation of the mine. Final landscaping, levelling and top dressing will be done on all areas to be rehabilitated. The rehabilitation of the earmarked areas, as indicated on the rehabilitation plan attached as Appendix E, will comply with the minimum closure objectives as prescribed by DMRE and detailed below, and therefore is deemed to be compatible:

- Rehabilitation of stockpile area:

Stockpiles must be removed during the decommissioning phase, the area ripped, and the topsoil returned to its original depth to provide a growth medium.

On completion of operations, all structures or objects shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002):

- Where sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
- The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.

Photographs of the sites, before and during the mining operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the DMRE Regional Manager.

On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 200 mm and graded to an even surface condition. Where applicable/possible topsoil needs to be returned to its original depth over the area.

The area shall then be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix.

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

❖ Final rehabilitation:

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

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

Waste material of any description, including receptacles, scrap, rubble, and tyres, must be removed entirely from the mining area and disposed of at a recognized landfill facility. It will not be permitted to be buried or burned on the site.

The management of invasive plant species must be done in a sporadic manner during the life of the mining activities. Species regarded as Category 1a and 1b invasive

species in terms of NEM:BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto) will be eradicated from the site.

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

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

S102 PROJECT PROPOSAL – COMMERCIAL MINING OF AGGREGATES

Should the S102 application be approved, and the Right Holder be allowed to sell the unwanted overburden as aggregate, the material will be sold from the existing stockpiles at the property. The plant to be used (when needed) to process the overburden to desired sizes, will be of temporary nature, and no buildings or infrastructure will be erected. In light thereof, the proposed activity (selling of aggregates) will not affect the current closure cost of the mine already lodged with the DMRE. For ease of reference, the latest (2021) financial provision calculation of the Makhanda Mining (Pty) Ltd is included under this section. It must however be noted that this calculation makes provision for all the mining related operations on the property.

The calculation of the financial provision amount required to manage and rehabilitate the environment was aligned with the guideline document prescribed in terms of Regulation 54 (1). The master rate for each closure component was taken from the DMRE guideline, and inflated by the Consumer Price Index (CPI) to account for escalation since January 2005 as presented in the table below:

Table 25: Annual average CPI % used to escalate the master rates.

Year	2006	2007	2008	2014	2015	2016	2017	2018	2019	2020	2021
Average CPI %	4.7	7.1	11.5	6.1	4.6	6.3	5.2	4.5	4.0	4.2	3.2

Mine type and saleable mineral by-product

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

Mine type	❖ Clay ❖ Aggregates (if S102 approved)
Saleable mineral by-product	None

Risk ranking

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

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

Environmental sensitivity of the mine area

According to Table B.4

Environmental sensitivity of the mine area	Low

Level of information

According to Step 4.2:

Level of information available	Extensive

Identify closure components

According to Table B.5 and site-specific conditions

Component No.	Main description	Applicability of closure components (Circle Yes or No)	
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	-	**NO**
2(A)	Demolition of steel buildings and structures	-	**NO**
2(B)	Demolition of reinforced concrete buildings and structures	-	**NO**
3	Rehabilitation of access roads	-	**NO**
4(A)	Demolition and rehabilitation of electrified railway lines	-	**NO**
4(B)	Demolition and rehabilitation of non-electrified railway lines	-	**NO**
5	Demolition of housing and facilities	-	**NO**
6	Opencast rehabilitation including final voids and ramps	**YES**	-
7	Sealing of shafts, adits and inclines	-	**NO**
8(A)	Rehabilitation of overburden and spoils	-	**NO**
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing)	-	**NO**
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich)	-	**NO**
9	Rehabilitation of subsided areas	-	**NO**
10	General surface rehabilitation, including grassing of all denuded areas	**YES**	-
11	River diversions	-	**NO**
12	Fencing	-	**NO**
13	Water management (Separating clean and dirty water, managing polluted water and managing the impact on groundwater)	-	**NO**
14	2 to 3 years of maintenance and aftercare	**YES**	-

Unit rates for closure components

According to Table B.6 master rates and multiplication factors for applicable closure components. The master rates were based on the DMRE guideline, inflating the rates with the CPI % to account for escalation since January 2005. The FP calculation further applied a multiplication factor depending on the risk of ranking and the environmental sensitivity as determined in the above sections.

Component No.	Main description	Master rate	Multiplication factor
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	-	-
2(A)	Demolition of steel buildings and structures	-	-
2(B)	Demolition of reinforced concrete buildings and structures	-	-
3	Rehabilitation of access roads	-	-
4(A)	Demolition and rehabilitation of electrified railway lines	-	-
4(B)	Demolition and rehabilitation of non-electrified railway lines	-	-
5	Demolition of housing and facilities	-	-
6	Opencast rehabilitation including final voids and ramps	229 450	0.04
7	Sealing of shafts, adits and inclines	-	-
8(A)	Rehabilitation of overburden and spoils	-	-
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing)	-	-
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich)	-	-
9	Rehabilitation of subsided areas	-	-
10	General surface rehabilitation, including grassing of all denuded areas	61 688	1.00
11	River diversions	-	-
12	Fencing	-	-
13	Water management (Separating clean and dirty water, managing polluted water and managing the impact on groundwater)	-	-
14	2 to 3 years of maintenance and aftercare	1 642	1.00

Determine weighting factors

According to Tables B.7 and B.8

Weighting factor 1: Nature of terrain/accessibility	1.00 (Flat)
Weighting factor 2: Proximity to urban area where goods and services are to be supplied	1.05 (Peri-Urban)

Calculation of closure costs

Table B.10 Template for Level 2: "Rules-based" assessment of the quantum for financial provision

Table 26: Calculation of closure cost

CALCULATION OF THE QUANTUM							
Mine:	Makhanda Mine			**Location:**	Makhanda		
Evaluators:	C Fouché			**Date:**	16 July 2021		
No	**Description**	**Unit**	**A Quantity**	**B Master rate**	**C Multiplication factor**	**D Weighting factor 1**	**E=A *B*C*D Amount (Rand)**
			Step 4.5	**Step 4.3**	**Step 4.3**	**Step 4.4**	
6	Opencast rehabilitation including final voids and ramps	ha	14	229 450	0.04	1.00	R 128 492.00
10	General surface rehabilitation	ha	4	61 688	1.00	1.00	R 246 752.00
14	2 to 3 years of maintenance and aftercare	ha	18	1 642	1.00	1.00	R 29 556.00
15(A)	Specialists study	Sum	0				R 0.00
15(B)	Specialists study	Sum	0				R 0.00
Sum of items 1 to 15 above							R 404 800.00
Multiply Sum of 1-15 by Weighting factor 2 (Step 4.4)		1.05		R 404 800.00		**Sub Total 1**	R 425 040.00

1	Preliminary and General	6% of Subtotal 1 if Subtotal 1 <R100 000 000.00	R 42 504.00
		12% of Subtotal 1 if Subtotal 1 >R100 000 000.00	-
2	Contingency	10.0% of Subtotal 1	R 42 504.00
		Sub Total 2 (Subtotal 1 plus management and contingency)	R 493 046.40
		Vat (15%)	R 73 956.96
		GRAND TOTAL (Subtotal 3 plus VAT)	**R 567 003.36**

Considering the above, the amount that is necessary for the rehabilitation of damages caused by the operation, both sudden closures during the normal operation of the project and at final, planned closure gives a sum of **R 567 003.36**.

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

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

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

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

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

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. **Dangerous goods storage tanks & burning of used oil:** ❖ Site establishment & infrastructure development.	Visual Characteristics: ❖ Visual intrusion as a result of site establishment. ❖ Visual intrusion as a result of site establishment.	❖ Minimize the visual impact of the activity on the surrounding environment through proper site management and implementing good housekeeping practices.	Responsibility: ❖ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ❖ Compliance to be monitored by the independent Environmental Control Officer during the biennial environmental audit. Role: ❖ Ensure that the site have a neat appearance and is always kept in good condition. ❖ Store mining equipment in a dedicated area when not in use. ❖ Upon closure, rehabilitate the site and remove all manmade structures (if no longer needed by the landowner) to reduce the residual visual impact to the minimum.	Applicable throughout site establishment-, operational-, and decommissioning phases. ❖ Daily compliance monitoring by site management. ❖ Biennial compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. ❖ Sloping and landscaping during rehabilitation. **Sorting, shredding, chipping and burning of discarded wood:** ❖ Operational phase.	Terrestrial biodiversity, conservation areas and groundcover: ❖ Infestation of the stockpile area with invader plant species. ❖ Infestation of the reinstated areas with invader plant species. ❖ Infestation of the sorting area (wood) with weeds/invader plants.	❖ Designated team to cut or pull out invasive plant species that germinated on site. ❖ Herbicide application equipment.	Responsibility: ❖ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ❖ Compliance to be monitored by the independent Environmental Control Officer during the biennial environmental audit. Role: ❖ Implement an invasive plant species management plan to control all invasive plant species on site in terms of NEM:BA, 2004 and CARA, 1983. Do weed/alien ongoing clearing on throughout the life of the mining activities. ❖ Do not allow planting or importing of any alien species to the site for landscaping, rehabilitation, or any other purpose. ❖ Keep all stockpiles (topsoil & overburden) free of invasive plant species. ❖ Control declared invader or exotic species on the rehabilitated areas.	Applicable throughout site establishment-, operational-, and decommissioning phases. ❖ Daily compliance monitoring by site management. ❖ Biennial compliance monitoring of site by an Environmental Control Officer.
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate.	Air and Noise Quality: ❖ Dust nuisance as a result of the processing activities.	❖ Gravimetric- and fallout dust monitoring equipment. ❖ Dust suppression equipment such as a	Responsibility: ❖ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ❖ Compliance to be monitored by the independent Environmental Control Officer during the biennial environmental audit.	Applicable throughout site establishment-, and operational phases.

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
Sorting, shredding, chipping and burning of discarded wood: ❖ Operational phase. ❖ Decommissioning phase.	❖ Dust nuisance resulting from stockpiled wood chips/sawdust. ❖ Dust nuisance as a result of discarded wood chips/sawdust.	water car, water dispenser and sprayers on the crusher plant. ❖ Signage that clearly reduce the speed on the access roads.	Role: ❖ Control the liberation of dust into the surrounding environment using; inter alia, water spraying and/or other dust-allaying agents. ❖ Ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. ❖ Continue the dust monitoring programme of the mine. ❖ Limit speed on the haul roads to 20 km/h and 40 km/h on the access road to prevent the generation of excess dust. ❖ Minimise areas devoid of vegetation, and only remove vegetation immediately prior to mining. ❖ Install water sprayers at the crusher plant to alleviate dust generation from the conveyor belts. ❖ Minimise fines, blowing from the drop end of the crusher plant by attaching strips of used conveyor belts to the conveyor's end. ❖ Weekly remove compacted dust from the crusher plant to eliminate the dust source. ❖ Flatten loads to prevent spillage during transportation on public roads. ❖ Consider weather conditions upon commencement of daily operations. Limit operations during very windy periods to reduce airborne dust and resulting impacts.	❖ Daily compliance monitoring by site management. ❖ Monthly monitoring, and quarterly reporting by occupational hygienist. ❖ Biennial compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			❖ Ensure dust generating activities comply with the National Dust Control Regulations, GN No R827 promulgated in terms of NEM:AQA, 2004 and ASTM D1739 (SANS 1137:2012).	
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. **Dangerous goods storage tanks & burning of used oil:** ❖ Site establishment & infrastructure development. ❖ Decommissioning phase **Sorting, shredding, chipping and burning of discarded wood:** ❖ Operational phase.	Air and Noise Quality: ❖ Noise nuisance as a result of the mining activities. ❖ Noise nuisance generated as a result of construction activities. ❖ Noise nuisance as a result of the decommissioning activities. ❖ Noise nuisance due to the operation of the chipper.	❖ Personal noise exposure monitoring equipment. ❖ Signage indicating noise zones. ❖ Silencers fitted to all project related vehicles, and the use of vehicles that are in road worthy condition in terms of the National Road Traffic Act, 1996.	Responsibility: ❖ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ❖ Compliance to be monitored by the independent Environmental Control Officer during the biennial environmental audit. Role: ❖ Ensure that employees and staff conduct themselves in an acceptable manner while on site. ❖ No loud music may be permitted at the mining area. ❖ Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996. ❖ Contract a qualified occupational hygienist to quarterly monitor and report on the personal noise exposure of the employees working at the mine. Monitoring must be in accordance with SANS 10083:2004 (Edition 5) sampling method as well as NEM:AQA 2004, SANS 10103:2008.	Applicable throughout site establishment-, and operational phases. ❖ Daily compliance monitoring by site management. ❖ Quarterly monitoring by occupational hygienist. ❖ Biennial compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			❖ Implement best practice measures to minimise potential noise impacts.	
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. ❖ Sloping and landscaping during rehabilitation. **Dangerous goods storage tanks & burning of used oil:** ❖ Site establishment & infrastructure development. ❖ Operational phase ❖ Decommissioning phase **Sorting, shredding, chipping and burning of discarded wood:** ❖ Operational phase. ❖ Decommissioning phase.	General: ❖ Soil contamination from hydrocarbon spills. ❖ Potential impact associated with littering at the area. ❖ Potential impact associated with litter left at the mining area. ❖ Pollution of environment with construction waste. ❖ Seeping of dangerous goods from defective storage tanks and bund walls. ❖ Spillage of dangerous goods when filling the tanks.	❖ Oil spill kit. ❖ Sealed drip trays. ❖ Formal waste disposal system with waste registers. ❖ Maintenance and monitoring programme for the dangerous goods storage tanks. ❖ Adequate ablution facilities.	Responsibility: ❖ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ❖ Compliance to be monitored by the independent Environmental Control Officer during the biennial environmental audit. Role: ❖ Use uncontaminated construction rubble as fill material during the rehabilitation of the quarry pit. Ensure that the rubble does not contain any waste. ❖ If no on-site disposal opportunities exist, dispose of the rubble and waste rock at the nearest registered solid waste disposal facility. ❖ Ensure regular vehicle maintenance, repairs and services only take place at the workshop and service area. Ensure drip trays are present if emergency repairs are needed on equipment not able to move to the workshop. Dispose all waste products in a closed container/bin to be removed from the emergency service area (same day) to the workshop to ensure proper disposal. Treat this as hazardous waste and dispose of it at a registered hazardous waste handling facility,	Applicable throughout site establishment-, operational-, and decommissioning phases. ❖ Daily compliance monitoring by site management. ❖ Biennial compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	❖ Contamination of soil with hydrocarbons. ❖ Pollution of the environment with waste and building rubble not removed from the site. ❖ Contamination of the area with litter or other waste materials. ❖ Pollution of the environment with waste and building rubble not removed from site. ❖ Potential contamination of footprint area and surface runoff as a result of hydrocarbon spillages. ❖ Soil contamination from hydrocarbon spills and/or littering. ❖ Potential contamination of environment due to improper waste management.		alternatively arrange collection by a registered hazardous waste handling contractor. File safe disposal certificates for auditing purposes. ❖ If a diesel bowser is used on site, always equip it with a drip tray. Use drip trays during every refuelling event. The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling. ❖ Ensure drip trays are cleaned after each use. Do not allow dirty drip trays to be used on site. Dispose of dirty rags used to clean the drip trays as hazardous waste into a designated bin at the workshop, where it is incorporated into the hazardous waste removal system. ❖ Obtain an oil spill kit and train the employees in the emergency procedures to follow when a spill occurs as well as the application of the spill kit. ❖ Clean spills immediately, within two hours of occurrence, to the satisfaction of the Regional Manager (DMRE) by removing the spillage together with the polluted soil and containing it in a designated hazardous waste bin until it is disposed of at a registered hazardous waste landfill site. File proof. ❖ Implement a regular maintenance and monitoring programme that reports on the integrity of the dangerous goods storage tanks and bund walls.	

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
			❖ Ensure suitable covered receptacles are always available and conveniently placed for the disposal of general waste. ❖ Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point to be collected at least once a month and disposed of at a registered general waste landfill site. Take specific precautions to prevent refuse from being dumped on or in the vicinity of the mine area. File proof of disposal. ❖ Handle biodegradable refuse as indicated above. ❖ Encourage re-use or recycling of waste products. ❖ Do not bury or burn waste on the site. ❖ Provide ablution facilities in the form of a chemical- or flush toilets connected to a septic tank. Anchor the chemical toilet (to prevent blowing/falling over) and arrange that it is serviced at least once a week for the duration of the mining activities by a registered liquid waste handling contractor. File the safe disposal certificates. ❖ Ensure that the use of any temporary, chemical toilet facilities do not cause any pollution to water sources or pose a health hazard. In addition, ensure that no form of secondary pollution arise from the disposal of refuse or sewage from the	

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
			temporary, chemical toilets. Address any pollution problems arising from the above immediately. ❖ Do not discharge water containing waste into the natural environment. ❖ Implement measures to contain the wastewater and safely dispose thereof. ❖ Report any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities to the DWS and other relevant authorities. ❖ Implement the use of waste registers to keep record of the waste generated and removed from the mining area. ❖ Clear all decommissioned/rehabilitated areas of building rubble and/or unwanted infrastructure at the end of the project	
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate.	Existing Infrastructure: ❖ Deterioration of the access road to the mining area.	❖ Grader to restore the road surface when needed. ❖ Speed signs.	Responsibility: ❖ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ❖ Compliance to be monitored by the independent Environmental Control Officer during the biennial environmental audit. Role: ❖ Divert storm water around the access road to prevent erosion.	Applicable throughout operational phase. ❖ Daily compliance monitoring by site management. ❖ Biennial compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			❖ Restrict vehicular movement to the existing access road to prevent crisscrossing of tracks through undisturbed areas. ❖ Repair rutting and erosion of the access road caused as a direct result of the activities. ❖ Prevent the overloading of the trucks and file proof of load weights for auditing by relevant officials. ❖ Restrict the speed of all mining equipment/vehicles to 40 km/h on the access roads.	
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. ❖ Sloping and landscaping during rehabilitation.	Geology: ❖ Topsoil/Soil Management.	❖ Earthmoving equipment to move stockpiles and rehabilitate the area. ❖ Cover crop to seed rehabilitated areas.	Responsibility: ❖ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ❖ Compliance to be monitored by the independent Environmental Control Officer during the biennial environmental audit. Role: ❖ Store the overburden in berms not exceeding 2.5 m in height. ❖ Spread the topsoil evenly, to a depth of 300 mm, over the rehabilitated area upon closure of the site. ❖ Strive to re-instate topsoil at a time of the year when vegetation cover can be established as quickly as possible afterwards, to that erosion of	Applicable throughout site establishment-, operational-, and decommissioning phases. ❖ Daily compliance monitoring by site management. ❖ Biennial compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			returned topsoil is minimized. The best time of year is at the end of the rainy season. ❖ Plant a cover crop immediately after spreading topsoil to stabilise the soil and protect it from erosion. Fertilise the cover crop for optimum production. Rehabilitation extends until the first cover crop is well established. ❖ Monitor the rehabilitated area for erosion, and appropriately stabilize if erosion do occur, for at least 12 months after reinstatement.	
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. ❖ Sloping and landscaping during rehabilitation.	Hydrology: ❖ Facilitation of erosion due to mining activities. ❖ Erosion of returned topsoil after rehabilitation.	❖ Storm water management structures such as berms to direct storm- and runoff water around the stockpiled topsoil area.	Responsibility: ❖ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ❖ Compliance to be monitored by the independent Environmental Control Officer during the biennial environmental audit. Role: ❖ Protect stockpiles from erosion and store it on flat areas surrounded by appropriate berms where possible. ❖ Regularly monitor roads and other disturbed areas within the project for erosion and ensure problem areas receive follow-up monitoring to assess the success of the remediation.	Applicable throughout site establishment-, operational-, and decommissioning phases. ❖ Daily compliance monitoring by site management. ❖ Biennial compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			❖ Rectify erosion problems within the earmarked area immediately (within 48 hours) and monitored thereafter to ensure that it does not re-occur. ❖ Use silt/sediment traps/barriers where there is a danger of topsoil or material stockpiles eroding and entering downstream drainage lines and other sensitive areas. Regularly maintain and clear the sediment/silt barriers to ensure effective drainage of the areas. ❖ Conduct activity in terms of the Best Practice Guidelines for small-scale mining as developed by DWS. ❖ Restrict polluting activities including storage of mining fleet, equipment wash down facilities and vehicle maintenance yards to the workshop areas and ensure it takes place on impermeable hard standing surfaces, which formally drain to a dirty water drainage system at the site. ❖ Contain all fuels and chemicals stored or used on site in fit for purpose containers and store within designated storage areas. Ensure the designated storage areas are situated on an impermeable surface with a perimeter bund and a drainage sump. Size the volume of the bund and sump to contain at least 110% of the total volume of the fuel and chemicals being stored within the designated storage area.	

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
Dangerous goods storage tanks & burning of used oil: ❖ Site establishment & infrastructure development.	Existing Infrastructure: ❖ Potential damage to the existing infrastructure on site.	❖ Maintenance team to rectify and damages caused.	Responsibility: ❖ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ❖ Compliance to be monitored by the independent Environmental Control Officer during the biennial environmental audit. Role: ❖ Refurbish any damage to the brick factory infrastructure, as a direct result of the proposed activities. ❖ Ensure that activities and construction workers remain within the proposed footprints of the various activities.	Applicable throughout operational phase. ❖ Daily compliance monitoring by site management. ❖ Biennial compliance monitoring of site by an Environmental Control Officer.
Dangerous goods storage tanks & burning of used oil: ❖ Site establishment & infrastructure development. ❖ Operational phase.	Health and Safety: ❖ Safety risk posed by construction workers' presence on the property. ❖ Safety risk posed by the operation of the dangerous goods tanks.	❖ Stocked first aid box. ❖ Level 1 certified first aider. ❖ All appointments in terms of the Mine Health and Safety Act, 1996. ❖ No entry signage.	Responsibility: ❖ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ❖ Compliance to be monitored by the independent Environmental Control Officer during the biennial environmental audit. Role: ❖ Check any new employees, or sub-contractors prior to inception of their contract. ❖ Do not allow unauthorised personnel to enter the mine.	Applicable throughout operational-, and decommissioning phases. ❖ Daily compliance monitoring by site management. ❖ Biennial compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			❖ Educate employees, including truck drivers, to report suspicious looking person/s and/or matters within the surrounding area. ❖ Maintain communication between the mine and surrounding residents for the duration of the site establishment-, operational- and decommissioning phases. ❖ Ensure that workers have access to the correct PPE as required by law. ❖ Locate sanitary facilities within 100 m from any point of work. ❖ Manage all operations in compliance with the Mine Health and Safety Act, 1996 (Act No 29 of 1996). ❖ Install the dangerous goods storage tanks in accordance with the requirements of the Hazardous Substances Act, 1973 (Act No 15 of 1973) as amended.	
Dangerous goods storage tanks & burning of used oil: ❖ Operational phase. **Sorting, Shredding, Chipping and Burning of Discarded Wood:** ❖ Operational phase.	Air and Noise Quality: ❖ Non-compliance with the conditions of the atmospheric emissions licence. ❖ Non-compliance with the conditions of the	❖ Copy of the atmoshperic emissions licence. ❖ Air quality monitoring equipment.	Responsibility: ❖ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ❖ Compliance to be monitored by the independent Environmental Control Officer during the biennial environmental audit.	Applicable throughout operational phase. ❖ Daily compliance monitoring by site management. ❖ Biennial compliance monitoring of site by

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
	atmospheric emissions licence (wood burning).		Role: ❖ Upon receipt of the Waste Licence be issued, request approval from the AEL licencing authority (DEDEAT-EC) for the changes in the type and quantities of input materials and products prior to the introduction of used oil and/or woodchips/sawdust as alternative fuel source at the brick factory. ❖ Ensure compliance with the obligations as set out in Chapter 5 of the AQA, 2004 as amended and the Government Notice 893 of 22 November 2013. ❖ Implement air quality monitoring in accordance with the SANAS 1929:2005 (Edition 1.1). ❖ Report to the National Atmospheric Emission Inventory System on an annual basis before 31 March of the calendar year. ❖ Report, at the beginning of the calendar year, the results of the monitoring programme in the established format as prescribed by the AEL.	an Environmental Control Officer. ❖ Annual reporting by the air quality specialist.
Dangerous goods storage tanks & burning of used oil: ❖ Decommissioning phase.	Existing Infrastructure: ❖ Dilapidated infrastructure left upon decommissioning of the activity.	❖ Machinery for the removal of building rubble from decommissioned area. ❖ Seedmix to vegetate rehabilitated area.	Responsibility: ❖ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ❖ Compliance to be monitored by the independent Environmental Control Officer during the biennial environmental audit.	Applicable throughout operational phase. ❖ Daily compliance monitoring by site management. ❖ Biennial compliance monitoring of site by

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
Sorting, Shredding, Chipping and Burning of Discarded Wood: ❖ Decommissioning phase.	❖ Dilapidated infrastructure left upon decommissioning of the activity (wood).		Role: ❖ Remove all stockpiles during the decommissioning phase, rip the area, and return the topsoil to its original depth to provide a growth medium. ❖ Deal with all structures or objects in accordance with section 44 of the MPRDA, 2002 on completion of operations ❖ Take photographs of the sites, before and during the mining operation, and after rehabilitation, at selected fixed points and keep on record for the information of the DMRE Regional Manager. ❖ Scarify the surface of compacted areas, due to hauling and dumping operations, to a depth of at least 200 mm and grade it to an even surface condition on completion of mining operations. Where applicable/possible topsoil needs to be returned to its original depth over the area. ❖ Fertilize the area if necessary to allow vegetation to establish rapidly. Seed the site with a local, adapted indigenous seed mix. ❖ If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, analyse the soil and correct any deleterious effects on the soil arising from the mining operation before seeding the area with a vegetation seed mix to the Regional Manager's specification.	an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Sorting, Shredding, Chipping and Burning of Discarded Wood: ❖ Operational phase.	Terrestrial biodiversity, conservation areas and groundcover: ❖ Sprawling of the sorting area impacting natural vegetated areas.	❖ Beacons to demarcate the approved areas. ❖ Environmental induction programme.	Responsibility: ❖ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ❖ Compliance to be monitored by the independent Environmental Control Officer during the biennial environmental audit. Role: ❖ Clearly demarcate the operational boundaries and contain all operations to the approved areas. Declare the area outside the mining right boundary a no-go area and educate all staff accordingly. ❖ Arrange a pre-commencement environmental induction for all staff on site to ensure that basic environmental principles are adhered to. This must include awareness of littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, remaining within demarcated construction areas, etc. ❖ The on-site environmental officer must provide supervision and oversight of vegetation clearing activities and other activities which may cause damage to the environment, especially during the site establishment phase. ❖ Take care to maintain indigenous tree species e.g. Cabbage Trees (*Cussonia* spp.).	Applicable throughout operational phase. ❖ Daily compliance monitoring by site management. ❖ Biennial compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			❖ Ensure all vehicles remain on demarcated roads and prevent unnecessary driving in the veld outside these areas. ❖ Do not translocated, uprooted, or disturbed plants for rehabilitation or other purposes without express permission from the ECO and without the relevant permits. ❖ Contain all fires in structures designed for this specific purpose	
Aggregate Mining: ❖ Processing, loading and, hauling of aggregate. ❖ Sloping and landscaping during rehabilitation. **Dangerous goods storage tanks & burning of used oil:** ❖ Operational phase. **Sorting, Shredding, Chipping and Burning of Discarded Wood:**	Fauna: ❖ Protection of fauna.	❖ Toolbox talks to educate employees how to handle fauna that enter the work areas.	Responsibility: ❖ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ❖ Compliance to be monitored by the independent Environmental Control Officer during the biennial environmental audit. Role: ❖ Ensure no fauna is caught, killed, harmed, sold, or played with. ❖ The ECO or other suitably qualified person must remove any fauna directly threatened by the operational activities to a safe location. ❖ Arrange that all personnel undergo environmental induction regarding fauna management and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of	Applicable throughout site establishment-, and operational phases. ❖ Daily compliance monitoring by site management. ❖ Biennial compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
❖ Operational phase.			superstition. Instruct workers to report any animals that may be trapped in the working area. ❖ Ensure no snares are set or nests raided for eggs or young. ❖ Prevent litter, food or other foreign material thrown or left around the site. Keep such items in the site vehicles and daily removed it to the site camp.	
<u>Aggregate Mining:</u> ❖ Processing, loading and, hauling of aggregate. ❖ Sloping and landscaping during rehabilitation. **<u>Dangerous goods storage tanks & burning of used oil:</u>** ❖ Operational phase. **<u>Sorting, Shredding, Chipping and Burning of Discarded Wood:</u>** ❖ Operational phase.	Cultural and Heritage Environment.	❖ Contact number of an archaeologist & palaeontologist that can be contacted if a discovery is made on site.	<u>Responsibility:</u> ❖ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ❖ Compliance to be monitored by the independent Environmental Control Officer during the biennial environmental audit. <u>Role:</u> ❖ Confine all mining to the development footprint area. ❖ Implement the following change find procedure when discoveries are made on site: ▪ If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must	Applicable throughout site establishment-, and operational phases. ❖ Daily compliance monitoring by site management. ❖ Biennial compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. ▪ It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area. ▪ The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA. ▪ Work may only continue once the go-ahead was issued by SAHRA. ❖ Should a quartz quarry at any time be proposed on Brakkefontein recommendations in this regard should be obtained from a palaeontologist. ❖ Should the mine penetrate through the kaolin clay to bedrock a palaeontologist should be informed to evaluate its scientific interest. ❖ Should any suspected palaeontological material be at any time encountered during mining of Kweekvlei Formation mudstones, a palaeontologist should likewise be immediately contacted to sample and record such occurrence.	

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
Dangerous goods storage tanks & burning of used oil: ❖ Operational phase.	General: ❖ Storage/handling of hazardous substance/chemicals.	❖ Storage areas with impermeable surfaces and bund walls that can hold 110% of the product amount stored in it. ❖ Hazardous Substances Register and Material Safety Data Sheets. ❖ Drip trays. ❖ Emergency response procedures and training programme. ❖ Inspection programme. ❖ Operational oil sump. ❖ Appropriate signage. ❖ Fire fighting equipment.	Responsibility: ❖ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ❖ Compliance to be monitored by the independent Environmental Control Officer during the biennial environmental audit. Role: ❖ Conduct a thorough risk analysis associated with the installation of the dangerous goods tanks and related bunds prior to the development of the proposed tanks. ❖ Store, transport, use and dispose of flammable and combustible liquids, and other dangerous goods in accordance with safe practice requirements and local regulatory requirements. ❖ Provide training in the use and potential dangers of the materials, on emergency response procedures required to counter the nature and hazards of an accidental release, and the handling and storage practices, for all containers with which they will come into contact to all personnel that use or handle hazardous material. ❖ Place chemical storage areas on level ground to prevent offsite migration of any spilled product.	Applicable throughout site establishment-, and operational phases ❖ Daily compliance monitoring by site management. ❖ Biennial compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			❖ Ensure that the floor of the storage area is impermeable to prevent seepage of spilled products into the ground or ground water. ❖ Control access to the chemicals/substances and implement a notification system of an appropriate staff member. ❖ Label containers so that the hazard nature of the material is clear. ❖ Ensure that the storage area is out of the 1:100 year floodline or further than 100 m from the edge of a watercourse, whichever is greatest. ❖ Maintain a Hazardous Substances Register and keep Material Safety Data Sheets (MSDS) current for all chemicals used on site. ❖ Ensure any fuel/used oil tanks have secondary containment in the form of an impermeable bund wall and base. Check that the bund capacity is sufficient to contain 110% of the tank's maximum capacity. Ensure that the distance and height of the bund wall relative to that of the tank is taken into consideration to ensure that any spillage does not result in hydrocarbons/other substances spouting beyond the confines of the bund. ❖ Establish a formal inspection routine to check all equipment in the bund area, as well as the bund area itself for malfunctions or leakages. Inspect the bund area at least weekly and remove any accumulated rainwater and hand it as	

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
			contaminated water. Check all valves and outlets to ensure that its intact and closed securely. ❖ Establish a formal tank maintenance programme that lists specific upkeep activities to be implemented on site as well as the frequency of the activities to be implemented. ❖ Ensure that the bund base slope towards an oil sump of sufficient size. Do not allow contaminated water to mix with clean water and contain it until it is collected by a registered hazardous waste handling contractor or disposed of at a registered hazardous waste handling facility. ❖ Adhere to the conditions as outlined in the Environmental Authorisation as issued in 2008 by the Department of Economic Development and Environmental Affairs with reference number: EC06/386/7/07-104. ❖ Use drip trays under all stationary equipment or vehicles. Place used drip trays within a bunded area and do not store on the bare soil. Discard the wastewater originating from the cleaning of drip trays into the oil sump. ❖ Ensure compliance with all national, regional, and local legislation with regard to the storage, transport and use of hydrocarbons, chemicals, solvents, and any other harmful and hazardous substances and materials.	

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
			❖ Do not keep any combustible material (e.g. wood, rags, paper, carton boxes) in the presence of flammable liquids. ❖ Place “No Open Flames” and “No Smoking” signs in the vicinity of the flammable liquid storage areas. ❖ Keep an adequate number and type of firefighting equipment available in close vicinity of the flammable liquid store. ❖ Provide training in the use of the appropriate fire-fighting equipment. ❖ Ensure that the loading/unloading areas are underlain by an impervious paving or PVC sheet to protect against soil and water pollution. ❖ Ensure that all hazardous waste containers designated for off-site transport are secured, properly loaded, and labelled with the contents and associated hazards. ❖ Place clear markings in English indicating the nature of the materials being carried, what to do in the event of an emergency, and an emergency telephone number (24 hour) of a responsible person who can provide advice in the event of an emergency on the vehicle.	

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

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

m) Environmental Awareness Plan

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

Once the S102 application is approved, and the activities may commence, a copy of the BAR & EMPR will be handed to the site manager for his perusal. Issues such as activity boundaries, waste management, and fire principals will be discussed.

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

Also refer to Section 11. Environmental Awareness Plan (Section 39 (3)(C)) of the 2014 EMPR.

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

The operations manager must ensure that he/she understands the EMPR, its requirement and commitments before commencement. An Environmental Control Officer needs to check compliance of the activities with the management programmes described in the EMPR.

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

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

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

- Do not swim in or drink from quarry pits.

❖ **Waste Management:**

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

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

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

❖ **Discoveries:**

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

❖ **Air Quality:**

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

❖ **Driving and Noise:**

- Use only approved access roads.
- Respect speed limits.

- Only use turn-around areas – no crisscrossing through undisturbed areas.
- Avoid unnecessary loud noises.
- Report or repair noisy vehicles.

❖ **Vegetation and Animal life:**

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

❖ **Fire Management:**

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

n) Specific information required by the Competent Authority

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

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

2. UNDERTAKING

The EAP herewith confirms

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

Signature of the environmental assessment practitioner:

Greenmined Environmental (Pty) Ltd

Name of Company:

14 June 2022

Date:

UNDERTAKING

I, JOHN COLIN MEYER the undersigned and duly authorised thereto by.....*Makhanda Mining (Pty) Ltd*.....

Company / ~~Closed Corporation / Municipality or Council~~
(Delete whichever is not applicable)

hereby undertake to implement all the aspects contained in the BAR and EMPR / ~~EIA and EMPR~~ and accept full responsibility therefore.
(Delete whichever is not applicable)

SIGNED at .....Makhanda..... this ....14th..... day JUNE 2022

SIGNATURE

WITNESSES:

1.....

2.....

Official use

APPROVAL

Approved in terms of the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998), as amended.

SIGNED at ..... this ..... day ..... 202.....

REGIONAL MANAGER

EASTERN CAPE

Undertaking/eg

-END-

APPENDIX A1

REGULATION 2(2) MINE MAP

APPENDIX A2

REGULATION 42 MINE MAP

APPENDIX B
1:250 000 LOCALITY MAP

APPENDIX C
SITE ACTIVITIES MAP

APPENDIX D
SURROUNDING LAND USE MAP

APPENDIX E
REHABILITATION PLAN

APPENDIX F

PALAEONTOLOGICAL HERITAGE IMPACT ASSESSMENT

APPENDIX G

SUPPORTING IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT STATEMENT

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

ENVIRONMENTAL IMPACT STATEMENT			
AGGREGATE MINING			
TYPE OF IMPACT	**DURATION**	**LIKELIHOOD**	**SIGNIFICANCE**
Processing, Loading, and Hauling of Aggregate:			
❖ Visual intrusion as a result of the activities.	**Operational phase (>16 years)**	**Low Possibility**	**Low Concern**
❖ Infestation of the stockpile area with invader plant species.		**Low Possibility**	**Low Concern**
❖ Dust nuisance as a result of the processing activities.		**Low Possibility**	**Low Concern**
❖ Noise nuisance as a result of the mining activities.		**Low Possibility**	**Low Concern**
❖ Soil contamination from hydrocarbon spills.		**Low Possibility**	**Low Concern**
❖ Potential impact associated with littering at the area.		**Low Possibility**	**Low Concern**
❖ Deterioration of the access road to the mining area.		**Low Possibility**	**Low Concern**
❖ Facilitation of erosion due to mining activities.		**Low Possibility**	**Low Concern**
Sloping and Landscaping during Rehabilitation:			
❖ Erosion of returned topsoil after rehabilitation.	**Decommissioning Phase (±4 months)**	**Low Possibility**	**Low Concern**
❖ Infestation of the reinstated area with invader plant species.		**Low Possibility**	**Low Concern**
❖ Potential impact associated with litter left at the mining area.		**Low Possibility**	**Low Concern**
DANGEROUS GOODS STORAGE TANKS & BURNING OF USED OIL			
TYPE OF IMPACT	**DURATION**	**LIKELIHOOD**	**SIGNIFICANCE**
Site Establishment & Infrastructure Development:			
❖ Visual intrusion as a result of site establishment.	**Duration of site establishment phase (±1 month)**	**Low Possibility**	**Low Concern**
❖ Pollution of environment with construction waste.		**Low Possibility**	**Low Concern**

❖ Potential damage to the existing infrastructure on site.		**Low Possibility**	**Low Concern**
❖ Noise nuisance generated as a result of construction activities.		**Low Possibility**	**Low Concern**
❖ Safety risk posed by construction workers' presence on the property.		**Low Possibility**	**Low Concern**
Operational Phase:			
❖ Seeping of dangerous goods from defective storage tanks and bund walls.	**Operational Phase (>16 years)**	**Low Possibility**	**Low Concern**
❖ Spillage of dangerous goods when filling the tanks.		**Low Possibility**	**Low Concern**
❖ Safety risk posed by the operation of the dangerous goods tanks.		**Low Possibility**	**Low Concern**
❖ Non-compliance with the conditions of the atmospheric emissions licence.		**Low Possibility**	**Low Concern**
Decommissioning Phase:			
❖ Dilapidated infrastructure left upon decommissioning of the activity.	**Decommissioning Phase (±4 months)**	**Low Possibility**	**Low Concern**
❖ Contamination of soil with hydrocarbons.		**Low Possibility**	**Low Concern**
❖ Noise nuisance as a result of the decommissioning activities.		**Low Possibility**	**Low Concern**
❖ Pollution of the environment with waste and building rubble not removed from site.		**Low Possibility**	**Low Concern**
SORTING, SHREDDING, CHIPPING AND BURNING OF DISCARDED WOOD			
Operational Phase:		**LIKELIHOOD**	**SIGNIFICANCE**
❖ Infestation of the sorting area with weeds/invader plants.	**Operational Phase (>16 years)**	**Low Possibility**	**Low Concern**
❖ Sprawling of the sorting area impacting natural vegetated areas.		**Low Possibility**	**Low Concern**
❖ Contamination of the area with litter or other waste materials.		**Low Possibility**	**Low Concern**
❖ Dust nuisance resulting from stockpiled wood chips/sawdust.		**Low Possibility**	**Low Concern**
❖ Noise nuisance due to the operation of the chipper.		**Low Possibility**	**Low Concern**
❖ Non-compliance with the conditions of the atmospheric emissions licence.		**Low Possibility**	**Low Concern**

ENVIRONMENTAL IMPACT STATEMENT			
Decommissioning Phase:			
❖ Dilapidated infrastructure left upon decommissioning of the activity.		**Low Possibility**	**Low Concern**
❖ Pollution of the environment with waste and building rubble not removed from site.		**Low Possibility**	**Low Concern**
❖ Dust nuisance as a result of discarded wood chips/sawdust.		**Possible**	**Low Concern**

APPENDIX H
FINANCIAL AND TECHNICAL COMPETENCE

APPENDIX I

PHOTOGRAPHS OF THE PROPOSED SITE

PROJECT RELATED PHOTOGRAPHS



PHOTOS SHOWING THE CLAY QUARRY FROM WHICH THE OVERBURDEN IS REMOVED


PHOTOS SHOWING THE STOCKPILED OVERBURDEN ON SITE

PROJECT RELATED PHOTOGRAPHS	
	
SOLAR PLANT OF THE PROPERTY	**WAREHOUSE TO BE USED FOR THE CHIPPING OF WOOD**
	
BRICK PLANT WHERE DANGEROUS GOODS STORAGE TANKS WILL BE PLACED	

APPENDIX J
DRAFT SOCIAL AND LABOUR PLAN

APPENDIX K1

COMMENTS AND RESPONSE REPORT

APPENDIX K2

PROOF OF PUBLIC PARTICIPATION PROCESS

APPENDIX L

CV AND EXPERIENCE RECORD OF EAP